Monetary Authority of Singapore

**MAS Notice 637**

14 September 2012
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NOTICE TO BANKS
BANKING ACT, CAP 19

# NOTICE ON RISK BASED CAPITAL ADEQUACY REQUIREMENTS FOR BANKS INCORPORATED IN SINGAPORE

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## PART I: INTRODUCTION

1.1.1 This Notice is issued pursuant to section 10(2), section 36(2) and section 55 of the Banking Act and applies to all Reporting Banks.

1.1.2 This Notice establishes the minimum capital adequacy ratios for a Reporting Bank and the methodology a Reporting Bank shall use for calculating these ratios ("Pillar 1"). While this Notice provides a range of approaches for calculating regulatory capital requirements, a Reporting Bank should adopt the approaches that are commensurate with the complexity and sophistication of its businesses and operations. A Reporting Bank is also encouraged to move towards the risk management practices in the more advanced approaches even though it may not be ready to adopt them for the purpose of calculating its regulatory capital requirements.

1.1.3 In addition to complying with the minimum regulatory capital requirements in this Notice, a Reporting Bank shall consider whether it has adequate capital to cover its exposure to all risks. This Notice sets out the expectations of the Authority in respect of the internal capital adequacy assessment process of a Reporting Bank under the supervisory review process ("Pillar 2").

1.1.4 This Notice also specifies the minimum disclosure requirements for a Reporting Bank in relation to its capital adequacy, with a view to enhancing market discipline ("Pillar 3").

1.1.4A In addition, this Notice sets out the data submission and disclosure requirements for assessing global systemically important banks ("G-SIBs").

[MAS Notice 637 (Amendment) 2013]

1.1.4B A Reporting Bank shall refer to publications issued by the Basel Committee on Banking Supervision providing interpretative guidance on the Basel capital framework and the framework for assessing G-SIBs[A].

[MAS Notice 637 (Amendment) 2013]

1.1.5 This Notice shall take effect on 14 September 2012. MAS Notice 637 dated 14 December 2007 is cancelled with effect from 14 September 2012.

[MAS Notice 637 (Amendment No. 2) 2017]

1.1.6 [Deleted by MAS Notice 637 (Amendment No. 2) 2014]

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[A] This includes "Basel III definition of capital – Frequently asked questions" (revised December 2011); "Interpretative issues with respect to the revisions to the market risk framework" (revised November 2011); "Basel III counterparty credit risk - Frequently asked questions" (revised December 2012); "Global systemically important banks: updated assessment methodology and the higher loss absorbency requirement" (revised July 2013); "Frequently asked questions on the Basel III leverage ratio framework" (April 2016 (update of FAQs published in July 2015)); "Frequently asked questions on the Basel III Countercyclical Capital Buffer" (October 2015); and subsequent publications and revisions that may be issued by the Basel Committee on Banking Supervision from time to time.

[MAS Notice 637 (Amendment) 2013]
[MAS Notice 637 (Amendment No. 2) 2014]
[MAS Notice 637 (Amendment) 2016]

## PART II: DEFINITIONS

2.1.1 The expressions used in this Notice are defined in the Glossary at Annex 2A.

2.1.2 The expressions used in this Notice shall, except where defined in this Notice or where the context otherwise requires, have the same meanings as in the Banking Act.

2.1.3 Any reference to a paragraph, Sub-division, Division, Part or Annex is a reference to a paragraph, Sub-division, Division, Part or Annex in this Notice unless otherwise specified.

**Annex 2A**

## GLOSSARY

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| $\alpha$ | means –<br>(a) in relation to the CCR internal models method, the alpha factor set out in paragraph 2.14 of Annex 7Q of Part VII; and<br>(b) in relation to the BIA, 15%; |
| $\beta$ | means in relation to the SA(OR) and the ASA, the fixed beta factor set out for each business line in Table 9-2 of Part IX;<br><br>[MAS Notice 637 (Amendment) 2016] |
| ABCP programme or asset-backed commercial paper programme | means a programme which predominantly issues commercial paper to third party investors with an original maturity of one year or less and is backed by assets or other exposures held in a bankruptcy-remote SPE;<br><br>[MAS Notice 637 (Amendment No. 2) 2017] |
| ABCP programme sponsor | means an entity which –<br>(a) purchases or advises or causes an SPE to purchase the exposures of a third party, which are then used to back commercial papers issued under an ABCP programme; or<br>(b) places ABCP securities into the market, or provides liquidity or credit enhancements to the ABCP;<br><br>[MAS Notice 637 (Amendment No. 2) 2017] |
| Accounting Loss Allowance | means the loss allowance for expected credit losses on the selected non-credit-impaired exposures[AA] set out in Appendix C of MAS Notice 612, that is determined and recognised in accordance with the impairment measurement requirements under FRS 109;<br><br>[MAS Notice 637 (Amendment No. 3) 2017] |
| Accounting Standards | has the same meaning as in section 4(1) of the Companies Act (Cap. 50); |
| affiliate | means,<br>(a) an entity that has a beneficial interest in 20% or more of the total number of ordinary shares or controls 20% or more of the voting power in the Reporting Bank, or<br>(b) an entity in which the Reporting Bank has a beneficial interest in 20% or more of the total number of ordinary shares or controls 20% or more of the voting power in the entity, or<br>(c) an entity in which a related corporation of the Reporting Bank has a beneficial interest in 20% or more of the number of |

[AA] For the avoidance of doubt, "non-credit-impaired exposures" means credit exposures that do not fall within the definition of "credit-impaired financial asset" under FRS 109.
[MAS Notice 637 (Amendment No. 3) 2017]

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| | ordinary shares or controls 20% or more of the voting power in the entity;<br>[MAS Notice 637 (Amendment No. 2) 2014] |
| A-IRBA or advanced IRBA | in relation to the IRBA wholesale asset class, means the approach under the IRBA under which a Reporting Bank uses its own estimates of PD, LGD and EAD; |
| allocation mechanism | in relation to the AMA where a Reporting Bank is a subsidiary of a banking institution incorporated outside Singapore, means the methodology used by the Reporting Bank to determine its operational risk capital based on an allocation of the operational risk capital of the banking institution incorporated outside Singapore; |
| AMA or advanced measurement approach | means the approach for calculating operational risk capital requirements set out in Division 5 of Part IX or, if the reference is to any regulatory requirements of, or administered by, a bank regulatory agency other than the Authority, the equivalent under those requirements; |
| AMA elements | means the internal and relevant external data on operational risk losses, scenario analysis and factors reflecting the business environment and internal control systems; |
| AMA exposure | means any exposure for which a Reporting Bank is using the AMA to calculate its operational risk capital requirement; |
| approved exchange | has the same meaning as in section 2 of the Securities and Futures Act (Cap. 289);<br>[MAS Notice 637 (Amendment) 2018] |
| ASA or alternative standardised approach | means the approach for calculating operational risk capital requirements set out in Division 4 of Part IX or, if the reference is to any regulatory requirements of, or administered by, a bank regulatory agency other than the Authority, the equivalent under those requirements; |
| asset class | means –<br>(a) in relation to the SA(CR), one of the classes of exposures set out in Sub-division 1 of Division 3 of Part VII; and<br>(b) in relation to the IRBA, one of the classes of exposures set out in Sub-division 4 of Division 4 of Part VII; |
| associate | has the same meaning as “associate” under the Accounting Standards; |
| AT1 Capital or Additional Tier 1 Capital | means -<br>(a) in relation to a Reporting Bank, the sum of items set out in paragraph 6.2.1; and |

(b) in relation to a subsidiary of a Reporting Bank, the sum of items set out in paragraph 6.2.1, where a reference to "Reporting Bank" shall be construed as a reference to "the subsidiary of the Reporting Bank";

[MAS Notice 637 (Amendment No. 2) 2014]

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| AT1 capital instrument | means a capital instrument which complies with the requirements set out in paragraph 6.2.2; |
| automatic interest rate option | means an option arising from a standalone instrument such as an exchange-traded or OTC option contract, or explicitly embedded within the contractual terms of an instrument such as a capped rate loan where the option holder may be reasonably expected to exercise the option if it is in their financial interest to do so; |

[MAS Notice 637 (Amendment No. 2) 2018]

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| Banking Act | means Banking Act (Cap. 19); |
| banking book | means all on-balance sheet and off-balance sheet exposures of a Reporting Bank other than its trading book positions; |
| banking group | means the Reporting Bank and its banking group entities; |
| banking group entity | means any subsidiary or any other entity which is treated as part of the Reporting Bank's group of entities according to Accounting Standards; |
| banking institution | means –<br>(a) any bank licensed under the Banking Act;<br>(b) any finance company licensed under the Finance Companies Act (Cap. 108); or<br>(c) any entity which is approved, licensed, registered or otherwise regulated by a bank regulatory agency in a foreign jurisdiction to carry on banking business as defined in the Banking Act; |
| bank regulatory agency | in relation to a foreign jurisdiction, means an authority in the foreign jurisdiction exercising any function that corresponds to a regulatory function of the Authority under the Banking Act; |
| BCBS | means the Basel Committee on Banking Supervision; |
| BE&IC | means the business environment and internal control factors; |
| behavioural interest rate option | means an option embedded implicitly or within the terms of financial contracts, such that changes in interest rates may effect a change in the behaviour of the client; |

[MAS Notice 637 (Amendment No. 2) 2018]

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| BIA or basic indicator approach | means the approach for calculating operational risk capital requirements set out in Division 2 of Part IX or, if the reference is to any regulatory requirements of, or administered by, a bank regulatory agency other than the Authority, the equivalent under those requirements; |
| Board | means the board of directors, or a designated committee of the board of directors;<br>[MAS Notice 637 (Amendment No. 2) 2014] |
| borrower grade | in relation to wholesale exposures, means a risk category within the obligor rating scale of a rating system to which obligors are assigned on the basis of a specified and distinct set of rating criteria and from which estimates of PD are derived; |
| CCF | means credit conversion factor; |
| CCP or central counterparty | means a clearing facility that interposes itself between counterparties to contracts traded in one or more financial markets, becoming the buyer to every seller and the seller to every buyer and thereby ensuring the future performance of open contracts, through novation, an open offer system or other legally binding arrangements. For the purposes of this Notice, a CCP is a financial institution;<br>[MAS Notice 637 (Amendment) 2012]<br>[MAS Notice 637 (Amendment No. 2) 2014] |
| CCP RWA | means the risk-weighted assets for exposures to CCPs calculated in accordance with Annex 7AJ;<br>[MAS Notice 637 (Amendment) 2012] |
| CCP trade exposures | means current exposure, including the variation margin due to a clearing member but not yet received, potential future exposure and initial margin of a clearing member or a client of a clearing member arising from any OTC derivative transaction, exchange-traded derivative transaction, long settlement transaction or SFT;<br>[MAS Notice 637 (Amendment) 2012]<br>[MAS Notice 637 (Amendment) 2016] |
| CCR or counterparty credit risk | means the risk that the counterparty to a transaction could default before the final settlement of the transaction's cash flows; |
| CCR internal models method | means the method for calculating E or EAD, whichever is applicable, for any pre-settlement counterparty exposure arising from any OTC derivative transaction, long settlement transaction or SFT set out in Annex 7Q of Part VII or, if the reference is to any regulatory requirements of, or administered by, a bank regulatory agency other than the Authority, the equivalent under those requirements; |

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| CDR | means cumulative default rate; |
| CET1 Capital or Common Equity Tier 1 Capital | means -<br>(a) in relation to a Reporting Bank, the sum of the items set out in paragraph 6.1.1; and<br>(b) in relation to a subsidiary of a Reporting Bank, the sum of items set out in paragraph 6.1.1, where a reference to "Reporting Bank" shall be construed as a reference to "the subsidiary of the Reporting Bank";<br><br>[MAS Notice 637 (Amendment No. 2) 2014] |
| CET1 capital instrument | means a capital instrument which compiles with the requirements set out in paragraph 6.1.2;<br><br>[MAS Notice 637 (Amendment) 2014] |
| CET1 CAR | means Common Equity Tier 1 capital adequacy ratio, calculated in accordance with paragraph 4.1.1; |
| CF | means commodities finance; |
| clean-up call | means an option which permits the securitisation exposures to be called before all of the underlying exposures or securitisation exposures have been repaid. In the case of a traditional securitisation, this is generally accomplished by repurchasing the remaining securitisation exposures once the underlying exposures or the outstanding securities issued have fallen below some specified level. In the case of a synthetic securitisation, the clean-up call may take the form of a clause that extinguishes the credit protection; |
| clearing member | means a member of, or a direct participant in, a CCP that is entitled to enter into a transaction with the CCP, regardless of whether it enters into trades with a CCP for its own hedging, investment or speculative purposes or whether it also enters into trades as a financial intermediary between the CCP and other market participants. Where a CCP has a link to a second CCP, that second CCP shall be treated as a clearing member of the CCP[AB];<br><br>[MAS Notice 637 (Amendment) 2012] |

[AB] Whether the second CCP's collateral contribution to the first CCP is treated as initial margin or a default fund contribution shall depend upon the legal arrangement between the CCPs. A Reporting Bank shall consult the Authority to determine whether such collateral contribution by the second CCP to the first CCP should be treated as an initial margin or default fund contribution. The Authority intends to consult and communicate with other financial services regulatory authorities via the "frequently asked questions" process of the Basel Committee on Banking Supervision to ensure consistency.

[MAS Notice 637 (Amendment) 2012]
[MAS Notice 637 (Amendment No. 3) 2017]

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| client | in relation to a clearing member, means a party to a transaction with a CCP through either the clearing member acting as a financial intermediary, or the clearing member guaranteeing the performance of the client to the CCP;<br><br>[MAS Notice 637 (Amendment) 2012]<br>[MAS Notice 637 (Amendment) 2014] |
| client sub-account | in relation to a clearing member, means an account for (a) transactions that it enters into with a client acting as a financial intermediary between the client and the CCP, and (b) collateral posted by such a client, that is held separately from the clearing member's proprietary transactions and collateral;<br><br>[MAS Notice 637 (Amendment) 2016] |
| closed-end fund | has the same meaning as in section 2 of the Securities and Futures Act (Cap. 289);<br><br>[MAS Notice 637 (Amendment) 2018] |
| CM or capital measure | has the same meaning as Tier 1 Capital;<br><br>[MAS Notice 637 (Amendment) 2014] |
| collective investment scheme | has the same meaning as in section 2 of the Securities and Futures Act (Cap. 289);<br><br>[MAS Notice 637 (Amendment) 2018] |
| co-operative society | means a co-operative society registered under the Co-operative Societies Act (Cap. 62);<br><br>[MAS Notice 637 (Amendment No. 2) 2014] |
| core market participant | means any of the entities listed in Annex 7L of Part VII; |
| corporate exposure | means –<br>(a) in relation to the SA(CR), an exposure that falls within the definition in paragraph 7.3.1(f); and<br>(b) in relation to the IRBA, an exposure that falls within the definition in paragraph 7.4.15(a); |
| corporation | has the same meaning as in section 4(1) of the Companies Act, but includes a co-operative society;<br><br>[MAS Notice 637 (Amendment No. 2) 2014] |
| CPF | means the Central Provident Fund Board constituted under section 3 of the Central Provident Fund Act (Cap. 36); |

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| CPR | means conditional prepayment rate; |
| | [MAS Notice 637 (Amendment No. 2) 2018] |
| CPSS | means Committee on Payment and Settlement Systems; |
| | [MAS Notice 637 (Amendment) 2012] |
| CRE | means commercial real estate; |
| credit derivative | means any contract which transfers the credit risk of a reference obligation or set of reference obligations from the protection buyer to the protection seller, such that the protection seller has an exposure to the reference obligation(s); |
| credit enhancement | means a contractual arrangement in which a Reporting Bank or other entity retains or assumes a securitisation exposure that, in substance, provides some degree of credit protection to other parties to the securitisation; |
| | [MAS Notice 637 (Amendment No. 2) 2017] |
| credit RWA | means the sum of all credit risk-weighted exposure amounts in respect of all credit exposures calculated as set out in paragraph 7.1.1; |
| credit-enhancing interest only strip | means an on-balance sheet asset that represents a valuation of cash flows related to future margin income and is subordinated to the other securitisation exposures in a securitisation; |
| CRM or credit risk mitigation | means any technique used by a Reporting Bank to reduce the credit risk associated with any exposure which the Reporting Bank holds; |
| cross-product netting | means the netting between a Reporting Bank and a counterparty of pre-settlement counterparty exposures arising from transactions involving two or more of the following product categories:<br>(a) OTC derivative transaction;<br>(b) repo, reverse repo, securities or commodities lending transaction and securities or commodities borrowing transaction; and<br>(c) margin lending transaction; |
| | [MAS Notice 637 (Amendment No. 2) 2017] |
| CSRBB | means credit spread risk in the banking book; |
| | [MAS Notice 637 (Amendment No. 2) 2018] |
| CTP or correlation trading portfolio | means a portfolio that incorporates – |

(a) securitisation exposures and n-th-to-default credit derivatives meeting the following criteria:
   (i) the positions are neither resecuritisation positions, nor derivatives of securitisation exposures that do not provide a pro-rata share in the proceeds of a securitisation tranche (therefore excluding options on a securitisation tranche, or a synthetically leveraged super-senior tranche);
   (ii) all reference entities are single-name products, including single-name credit derivatives, for which a liquid two-way market exists. This will include commonly traded indices based on these reference entities;
   (iii) the positions do not reference an underlying exposure that would be treated as an SA(CR) exposure in the regulatory retail asset class, an SA(CR) exposure in the residential mortgage asset class, or an SA(CR) exposure in the CRE asset class; and
   (iv) the positions do not reference a claim on a special purpose entity, including any special purpose entity-issued instrument backed, directly or indirectly, by a position that would itself be excluded if held by a Reporting Bank directly,

and

(b) positions that hedge the securitisation exposures and n-th-to-default credit derivatives described in paragraph (a) above, where –
   (i) the positions are neither securitisation exposures nor n-th-to-default credit derivatives; and
   (ii) a liquid two-way market exists for the instrument by which the position is taken or its underlying exposures,

and for the purpose of this definition, a two-way market is deemed to exist where there are independent bona fide offers to buy and sell so that a price reasonably related to the last sales price or current bona fide competitive bid and offer quotations can be determined within one day and trades settled at such price within a relatively short time conforming to trade custom;

currency mismatch — means a situation where an exposure and the collateral or credit protection provided in support of it are denominated in different currencies;

current exposure — means the larger of zero, or the market value of a transaction or portfolio of transactions within a netting set with a counterparty that would be lost upon the default of the counterparty, assuming no recovery on the value of those transactions in a bankruptcy or insolvency;

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| CVA or credit valuation adjustment | in relation to a Reporting Bank, means an adjustment to the mid-market valuation of the portfolio of trades with a counterparty, which reflects the market value of credit risk, and may include either the market value of the credit risk of the counterparty or the market value of the credit risk of both the Reporting Bank and the counterparty; [MAS Notice 637 (Amendment No. 2) 2014] |
| CVA RWA | means the risk-weighted assets for CVA calculated in accordance with Annex 7AI; |
| default | in relation to the IRBA, has the meaning in Annex 7X of Part VII; |
| default fund[AC] | means a fund established by a CCP, comprising the pre-funded or unfunded contributions of a CCP and its clearing members towards, or underwriting of, a CCP's mutualised loss sharing arrangements, and includes initial margins posted to a CCP in the case where the CCP uses the initial margins to mutualise losses among clearing members; [MAS Notice 637 (Amendment) 2012] |
| default fund exposure | means exposure arising from contributions of a Reporting Bank to a default fund of a CCP; [MAS Notice 637 (Amendment) 2012] |
| dilution | means any reduction in an amount receivable from a counterparty through cash or non-cash credits to the counterparty; |
| double default framework | means the framework for the recognition of credit protection for IRBA exposures set out in Annex 7G of Part VII; |
| DvP | means delivery-versus-payment; |
| EAD or exposure at the time of default | has the meaning in paragraph 4.1 of Annex 7Y of Part VII; |
| early amortisation provision | means a contractual provision that, once triggered, accelerates the reduction of the investor's interests in underlying exposures of a securitisation of revolving credit facilities[AD], and allows |

[AC] A default fund may also be known as clearing deposits, guaranty fund deposits or any other name. The description given by a CCP to its mutualised loss sharing arrangements is not determinative of the status of the arrangement as a default fund, rather, the substance of such arrangements shall govern its status as a default fund.

[MAS Notice 637 (Amendment) 2012]
[MAS Notice 637 (Amendment No. 3) 2017]

[AD] A securitisation of revolving credit facilities is a securitisation in which one or more underlying exposures represent, directly or indirectly, current or future draws on a revolving credit facility. Examples of revolving credit facilities include credit card exposures, home equity lines of credit, commercial lines of credit, and other lines of credit.

[MAS Notice 637 (Amendment No. 2) 2017]
[MAS Notice 637 (Amendment No. 3) 2017]

investors to be paid out prior to the originally stated maturity of the securities issued;

[MAS Notice 637 (Amendment No. 2) 2017]

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| early redemption risk | means the risk of early withdrawal for fixed rate term deposits;<br>[MAS Notice 637 (Amendment No. 2) 2018] |
| ECAI | means an external credit assessment institution, and includes all entities trading under the trade name of that external credit assessment institution;<br>[MAS Notice 637 (Amendment) 2014] |
| EE or expected exposure | means the average of the distribution of exposures at any particular future date before the longest maturity transaction in the netting set matures; |
| effective EE | means as at a specific date, the maximum EE that occurs at that date or any prior date. Alternatively, it may be defined for a specific date as the greater of the expected exposure at that date, or the effective EE at the previous date; |
| effective EPE | means the weighted average over time of effective EEs over the first year of future exposures, or if all the contracts within the netting set mature before one year, over the time period of the longest maturity contract in the netting set, where the weights are the proportion that an individual effective EE represents of the entire time interval; |
| EL or expected loss | in relation to the IRBA, means the ratio of the amount expected to be lost on an exposure arising from a potential default of a counterparty, dilution or both, over a one-year period to the amount outstanding at default; |
| EL amount | has the meaning in Sub-division 14 of Division 4 of Part VII; |
| eligible CRE | means any CRE held as collateral where the requirements and guidelines set out in Annex 7F of Part VII are satisfied; |
| eligible credit protection | means any guarantee (or other instrument as the Authority may allow) or credit derivative where the requirements and guidelines set out in Annex 7F of Part VII are satisfied; |
| eligible financial collateral | means –<br>(a) in relation to the FC(SA), one or more types of collateral set out in paragraph 2.2 of Annex 7F of Part VII; and<br>(b) in relation to the FC(CA), one or more types of collateral set out in paragraph 2.3 of Annex 7F of Part VII,<br>where the requirements and guidelines set out in Annex 7F of Part VII are satisfied; |

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| eligible IRBA collateral | means one or more types of collateral set out in paragraph 2.5 of Annex 7F of Part VII where the requirements and guidelines set out in that Annex are satisfied; |

eligible liquidity facility

in relation to the leverage ratio, means an off-balance sheet securitisation exposure that is a liquidity facility where the following requirements are complied with –

(a) the facility documentation clearly identifies the nature, purpose and extent of any undertaking or commitment provided to the SPE, and limits the circumstances under which it may be drawn;

(b) the facility is limited to a specified amount and duration, unless the Reporting Bank is able to withdraw, at its absolute discretion, the facility at any time with a reasonable period of notice;

(c) any draw made under the facility is provided to the SPE and not directly to investors, and is limited to the amount that is likely to be repaid fully from the liquidation of the underlying exposures and any seller-provided credit enhancements;

(d) the facility does not cover any losses incurred in the underlying exposures prior to a draw, and is not structured such that draw-down is certain (as indicated by regular or continuous draws or continuous revolving funding);

(e) the facility is subject to an asset quality test that precludes it from being drawn to cover credit risk exposures where the obligor(s) are in default;

(f) if the exposures that the liquidity facility is required to fund are securities with an external credit assessment by a recognised ECAI, the facility is used to fund only securities that have a credit quality grade of "10" or better or a short-term credit quality grade of "III" or better as set out in Tables 7R-3 and 7R-4, respectively, of Annex 7R at the time of funding;

(g) the facility cannot be drawn after all applicable (e.g. transaction-specific and programme-wide) credit enhancements from which the facility would benefit have been exhausted;

(h) repayment of draws on the facility is not subordinated to any interests of any note holder in the programme or subject to deferral or waiver;

(i) the obligations of the Reporting Bank under the facility are standalone from its obligations under any other facility, commitment or undertaking provided by the Reporting Bank; and

(j) either –

    (i) an independent third party co-provides 25% of the liquidity facility that is to be drawn and re-paid on a pro-rata basis; or

    (ii) all the underlying exposures have a credit quality grade of "3" or better or a short-term credit quality grade of "III" or better as set out in Tables 7R-1 and 7R-2, respectively, of Annex 7R, and the facility

documentation expressly provides that the Reporting Bank may reduce (and ultimately withdraw) its funding if the external credit assessment of the exposures falls to a credit quality grade of "4" or worse or to a short-term credit quality grade of "IV" as set out in Tables 7R-1 and 7R-2, respectively, of Annex 7R;

[MAS Notice 637 (Amendment No. 3) 2017]

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| eligible physical collateral | means any physical collateral where the requirements and guidelines set out in Annex 7F of Part VII are satisfied; |

eligible protection provider

means -

(a) in the case of a Reporting Bank using the SA(CR), SA(EQ), SEC-IRBA, SEC-ERBA or SEC-SA, a guarantor or protection seller which is –
   - (i) a central government, a central bank, the Bank for International Settlements, the International Monetary Fund, the European Central Bank or the European Community;
   - (ii) an MDB;
   - (iii) a PSE;
   - (iv) a banking institution; or
   - (v) in the case where the credit protection is –
     - (A) not provided for a securitisation exposure, any other entity with an external credit assessment by a recognised ECAI; or
     - (B) provided for a securitisation exposure, any other entity, other than an SPE, which has a credit quality grade of "2" or better as set out in Table 7R-1 at the time the credit protection was provided, and a credit quality grade of "3" or better as set out in Table 7R-1 during the period of recognition of the effects of CRM;

(b) in the case of a Reporting Bank adopting the F-IRBA and not intending to use the double default framework, a guarantor or protection seller which is –
   - (i) any entity in paragraphs (a)(i) to (v) above; or
   - (ii) any entity which is internally rated; and

(c) in the case of a Reporting Bank adopting the F-IRBA and intending to use the double default framework, a guarantor or protection seller which complies with the requirements set out in paragraph 3.1 of Annex 7G;

[MAS Notice 637 (Amendment No. 2) 2017]

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| eligible purchased receivables exposure | in relation to the IRBA, means any exposure that falls within the definition in paragraph 7.4.18; |

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| eligible receivables | means any financial receivables held as collateral where the requirements and guidelines set out in Annex 7F of Part VII are satisfied; |
| eligible RRE | means any RRE held as collateral where the requirements and guidelines set out in Annex 7F of Part VII are satisfied; |
| Eligible Total Capital | in relation to a Reporting Bank or subsidiary of the Reporting Bank, means the sum of Tier 1 Capital and Tier 2 Capital;<br><br>[MAS Notice 637 (Amendment No. 2) 2014] |
| EM or exposure measure | means the amount as calculated in accordance with paragraph 2.3 of Annex 4A;<br>[MAS Notice 637 (Amendment) 2014] |
| EPE or expected positive exposure | means the weighted average over time of EEs over the first year, or if all the contracts within the netting set mature before one year, over the time period of the longest maturity contract in the netting set, where the weights are the proportion that an individual EE represents of the entire time interval; |
| equity exposure | has the meaning given to it in Sub-division 1 of Division 5 of Part VII;<br>[MAS Notice 637 (Amendment No. 2) 2014] |
| EVE | means the economic value of equity;<br><br>[MAS Notice 637 (Amendment No. 2) 2018] |
| ΔEVE | means change in economic value of equity under an interest rate stress or shock scenario;<br><br>[MAS Notice 637 (Amendment No. 2) 2018] |
| excess spread | means any gross finance charge collections and other income received by the trust or SPE after deducting certificate interest, servicing fees, charge-offs, and other senior trust or SPE expenses; |
| facility grade | in relation to wholesale exposures, means a risk category within the facility rating scale of a rating system to which exposures are assigned on the basis of a specified and distinct set of rating criteria and from which estimates of LGD are derived; |
| FC(CA) or financial collateral comprehensive approach | means the method for calculating the effects of CRM arising from eligible financial collateral set out in Annex 7I of Part VII; |

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| FC(SA) or financial collateral simple approach | means the method for calculating the effects of CRM arising from eligible financial collateral set out in Sub-division 4 of Division 3 of Part VII; |
| financial institution | means an entity the principal activity of which is to carry on business in one or more of the following activities[B,C]:<br>(a) banking business;<br>(b) insurance business;<br>(c) dealing or trading in securities, exchange-traded derivatives or OTC derivatives, whether as an agent or on a proprietary basis;<br>(d) foreign exchange trading and leveraged foreign exchange trading, whether as an agent or on a proprietary basis;<br>(e) advising on corporate finance;<br>(f) fund management;<br>(g) real estate investment trust management;<br>(h) securities financing;<br>(i) providing custodial services;<br>(j) operating an exchange, trading system or market;<br>(k) providing central counterparty services;<br>(l) operating a payment system, securities depository, securities settlement system or trade repository;<br>(m) providing financial advisory services;<br>(n) insurance broking;<br>(o) trust business;<br>(p) money broking;<br>(q) money-changing business;<br>(r) remittance business;<br>(s) lending;<br>(t) factoring;<br>(u) leasing;<br>(v) provision of credit enhancements;<br>(w) securitisation; or<br>(x) such other business that the Authority may specify from time-to-time; |
| financial year | has the same meaning as in section 4(1) of the Companies Act (Cap. 50); |
| F-IRBA or foundation IRBA | in relation to the IRBA wholesale asset class, means the approach under the IRBA under which a Reporting Bank uses its own estimates of PD but not its own estimates of LGD and EAD; |
| FRA | means a forward rate agreement; |

[B] This includes a financial holding company which is not an operating entity that holds as a subsidiary, a banking institution or an insurance subsidiary.

[MAS Notice 637 (Amendment No. 2) 2014]

[C] For avoidance of doubt, this includes any entity that is approved, licensed, registered or otherwise regulated by the Authority, or any foreign entity that carries out activities which, if carried out in Singapore, would have to be approved, licensed, registered or otherwise regulated by the Authority.

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| FRS 109 | means the Singapore Financial Reporting Standard 109; |
| | [MAS Notice 637 (Amendment No. 3) 2017] |
| funded credit protection | means a CRM where the reduction of the credit risk of an exposure of a Reporting Bank is derived from the right of the Reporting Bank, in the event of the default of a counterparty or on the occurrence of other specified credit events relating to the counterparty, to liquidate, to obtain transfer or appropriation of, or to retain, certain assets or amounts; |
| gain-on-sale | means any increase in the equity of a Reporting Bank which is an originator resulting from the sale of underlying exposures in a securitisation; [MAS Notice 637 (Amendment No. 2) 2014] |
| general allowance | means loss allowance for credit exposures that do not fall within the definition of "credit-impaired financial asset" under FRS 109[CA]; |
| | [MAS Notice 637 (Amendment No. 3) 2017] |
| general wrong-way risk | means the risk that arises when the probability of default of counterparties is positively correlated with general market risk factors; |
| hedging set | means a group of transactions within a single netting set within which full or partial offsetting is recognised for the purpose of calculating the potential future exposure under the SA-CCR; |
| | [MAS Notice 637 (Amendment) 2016] |
| higher level client | in relation to a multi-level client structure, means the financial institution providing clearing services; |
| | [MAS Notice 637 (Amendment) 2016] |
| house sub-account | in relation to a clearing member, means an account for (a) transactions conducted for its proprietary purposes and (b) collateral posted by the clearing member for such transactions, and that account is held separately from transactions conducted by the clearing member acting as a financial intermediary between the CCP and its client and collateral posted by such clients, in client sub-accounts; [MAS Notice 637 (Amendment) 2016] |
| HVCRE | means high-volatility commercial real estate; |

[CA] For avoidance of doubt, general allowances include loss allowances maintained by a bank in excess of the Accounting Loss Allowance.

[MAS Notice 637 (Amendment No. 3) 2017]

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| IA | means the internal audit function or an equally independent function of a Reporting Bank; |
| IAA or internal assessment approach | means the method for calculating credit risk-weighted exposure amounts for securitisation exposures set out in Annex 7AF or, if the reference is to any regulatory requirements of, or administered by, a bank regulatory agency other than the Authority, the equivalent under those requirements; |
| | [MAS Notice 637 (Amendment No. 2) 2017] |
| ICA or independent collateral amount | means the amount of collateral other than variation margin posted by the counterparty that the Reporting Bank may seize upon default of the counterparty, which does not change in response to the value of transactions it secures, and includes the Independent Amount parameter defined in standard industry documentation[D]; |
| | [MAS Notice 637 (Amendment) 2016] |
| ICAAP | means internal capital adequacy assessment process; |
| IMA or internal models approach | means the approach for calculating market risk capital requirements set out in Division 3 of Part VIII or, if the reference is to any regulatory requirements of, or administered by, a bank regulatory agency other than the Authority, the equivalent under those requirements; |
| IMA exposure | means any exposure for which a Reporting Bank is using the IMA to calculate its market risk capital requirement; |
| IMM or internal models method | means the method for calculating credit risk-weighted exposure amounts for IRBA(EQ) exposures set out in Sub-division 4 of Division 5 of Part VII or, if the reference is to any regulatory requirements of, or administered by, a bank regulatory agency other than the Authority, the equivalent under those requirements; |
| implicit support | in relation to a securitisation, means any support that a Reporting Bank provides to a securitisation in excess of its predetermined contractual obligations; |
| | [MAS Notice 637 (Amendment No. 2) 2017] |
| IMS | means internal measurement system; |
| | [MAS Notice 637 (Amendment No. 2) 2018] |

[D] For example, the 1992 (Multicurrency-Cross Border) Master Agreement and the 2002 Master Agreement published by the International Swaps & Derivatives Association, Inc. (ISDA Master Agreement). The ISDA Master Agreement includes the ISDA CSA: the 1994 Credit Support Annex (Security Interest – New York Law), or, as applicable, the 1995 Credit Support Annex (Transfer – English Law) and the 1995 Credit Support Deed (Security Interest – English Law).

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| initial margin | in relation to exposures to a CCP, means collateral of a clearing member or a client of a clearing member posted to the CCP to mitigate the potential future exposure of the CCP to the clearing member arising from the possible future change in value of their transactions, but shall not include any contribution to a CCP for mutualised loss sharing arrangements. This includes collateral in excess of the minimum amount required, provided the CCP or clearing member may prevent the clearing member or the client of a clearing member from withdrawing such excess collateral;<br><br>[MAS Notice 637 (Amendment) 2012]<br>[MAS Notice 637 (Amendment) 2016] |
| insurance subsidiary | means –<br>(a) a subsidiary which carries on insurance business as an insurer;<br>(b) a subsidiary which is –<br>(i) a holding company of the subsidiary referred to in sub-paragraph (a); and<br>(ii) subject to specific capital adequacy requirements set out in a direction issued by the Authority under section 28 of the Monetary Authority of Singapore Act; or<br>(c) a subsidiary of the holding company referred to in sub-paragraph (b), which is included by the holding company in its computation of specific capital adequacy requirements set out in a direction issued by the Authority under section 28 of the Monetary Authority of Singapore Act.<br><br>[MAS Notice 637 (Amendment No. 3) 2017] |
| internal loss data | in relation to the AMA, means the internal data on operational risk losses; |
| IOSCO | means the International Organisation of Securities Commissions; |
| IPRE | means income-producing real estate; |
| IRBA or internal ratings-based approach | means the approach for calculating credit risk-weighted exposure amounts set out in Division 4 of Part VII or, if the reference is to any regulatory requirements of, or administered by, a bank regulatory agency other than the Authority, the equivalent under those requirements; |
| IRBA adoption date | means the date from which a Reporting Bank begins using the IRBA for calculating any part of its regulatory capital requirements; |
| IRBA asset class | means any one of the classes of exposures belonging to the IRBA wholesale asset class, the IRBA retail asset class or the IRBA eligible purchased receivables asset class; |

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| IRBA asset sub-class | in relation to IRBA, means any one of the classes of exposures set out in paragraphs 7.4.15 to 7.4.18; |
| IRBA eligible purchased receivables asset class | in relation to the IRBA, means the class of exposures comprising eligible purchased receivables exposures; |
| IRBA exposure | means any exposure for which a Reporting Bank is using the IRBA to calculate its credit risk-weighted exposure amount; |
| IRBA parameters | means PD, LGD and EAD; |
| IRBA retail asset class | in relation to the IRBA, means the class of exposures comprising retail exposures; |
| IRBA wholesale asset class | in relation to the IRBA, means the class of exposures comprising wholesale exposures; |
| IRBA(EQ) or internal ratings-based approach for equity exposures | means the approach for calculating credit risk-weighted exposure amounts for equity exposures set out in Sub-division 4 of Division 5 of Part VII or, if the reference is to any regulatory requirements of, or administered by, a bank regulatory agency other than the Authority, the equivalent under those requirements; |
| IRBA(EQ) exposure | means –<br>(a) any equity exposure (excluding equity investments in funds held in the banking book) for which a Reporting Bank is using the IRBA(EQ) to calculate its credit risk-weighted exposure amount; or<br>(b) in the case where the Reporting Bank uses IRBA(EQ) to calculate the credit risk-weighted exposure amount for its equity exposures, any equity investment in funds held in the banking book;<br>[MAS Notice 637 (Amendment No. 3) 2017] |
| IRB pool or internal ratings-based pool | in relation to a securitisation, means a pool of underlying exposures to a securitisation for which a Reporting Bank has approval from the Authority under sub-division 3 of Division 4 of Part VII, and sufficient information, to calculate capital requirements using the IRBA for all underlying exposures;<br>[MAS Notice 637 (Amendment No. 2) 2017] |
| IRC or incremental risk charge | means the capital charges on incremental default and credit migration risks of positions which are subject to specific risk; |
| IRRBB | means interest rate risk in the banking book;<br>[MAS Notice 637 (Amendment No. 2) 2018] |
| ISDA | means the International Swaps and Derivatives Association; |

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| IT | means information technology; |
| JTD or jump to default | means an event where a credit exposure defaults before the market has factored its increased default risk into its current credit spreads; |
| JTD01 | means the estimated decline in the mark-to-market value associated with a JTD of an entity, assuming a zero recovery rate for the entity's liabilities; |
| LGD or loss given default | in relation to the IRBA, has the meaning in paragraph 3.1 of Annex 7Y of Part VII; |
| long settlement transaction | means any transaction where a counterparty undertakes to deliver a security, a commodity or a foreign exchange amount against cash, other financial instruments or commodities, or vice versa, at a settlement or delivery date which is contractually specified as more than the lower of the market standard for this particular transaction type and five business days after the date on which the Reporting Bank enters into the transaction; |
| loss | in relation to the IRBA, means any economic loss on an exposure as described in Annex 7Y of Part VII; |
| lower level client | in relation to a multi-level client structure, means the financial institution clearing through:<br>(a) a client of a clearing member; or<br>(b) a client of a client of a clearing member;<br>[MAS Notice 637 (Amendment) 2016] |
| LR or leverage ratio | means the percentage calculated in accordance with paragraph 1.1 of Annex 4A;<br>[MAS Notice 637 (Amendment) 2014] |
| M or effective maturity | in relation to the IRBA, means the maturity of an exposure, determined in the manner set out in Annex 7Z of Part VII; |
| main index | means an index which –<br>(a) comprises equities listed on any approved exchange or overseas exchange; and<br>(b) is referenced by futures or options traded on any approved exchange or overseas exchange;<br>[MAS Notice 637 (Amendment No. 2) 2018] |
| major stake company | in relation to a Reporting Bank, means any company in which the Reporting Bank is deemed, by virtue of section 32(7) of the Banking Act, to hold a major stake; |

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| margin agreement | means any contractual agreement or any terms and conditions of an agreement, where one counterparty has to supply collateral to a second counterparty when an exposure of that second counterparty to the first counterparty exceeds a specified level; |
| margin lending transaction | means a transaction in which a Reporting Bank extends credit in connection with the purchase, sale, carrying or trading of securities, where the loan amount is collateralised by securities whose value is generally greater than the amount of the loan, and does not include other loans that happen to be collateralised by securities; |
| margin period of risk | means the time period from the last exchange of collateral covering a netting set of transactions with a defaulting counterparty until that counterparty is closed out and the resulting market risk is re-hedged; |
| margin threshold | means the largest amount of an exposure that remains outstanding until one party has the right to call for collateral; |
| market RWA | means the risk-weighted assets for market risks determined in the manner set out in Part VIII; |
| maturity mismatch | means a situation where the residual maturity of the credit risk mitigant is less than the residual maturity of the underlying credit exposure; |
| MDB | means a multilateral development bank; |
| mixed pool | in relation to a securitisation, means a pool of underlying exposures to a securitisation for which a Reporting Bank has approval from the Authority under sub-division 3 of Division 4 of Part VII, and sufficient information, to calculate capital requirements using the IRBA for some, but not all, underlying exposures;<br>[MAS Notice 637 (Amendment No. 2) 2017] |
| multi-level client structure | means any structure in which clearing services are provided by a financial institution which is not a direct clearing member, but is itself a client of a clearing member or a client of a client of a clearing member;<br>[MAS Notice 637 (Amendment) 2016] |
| n-th-to-default credit derivative | means a contract where –<br>(a) the payoff is based on the n-th asset to default in a basket of underlying reference instruments; and<br>(b) the transaction terminates and is settled once the n-th default occurs; |
| netting | means bilateral netting, including –<br>(a) netting by novation, where obligations between two counterparties to deliver a given currency on a given value |

date under a transaction are automatically amalgamated with all other obligations under other transactions to deliver on the same currency and value date, thereby extinguishing former transactions with a single legally binding new transaction; and

(b) close-out netting, where some or all of the ongoing transactions between two counterparties are terminated due to the default of either counterparty or upon the occurrence of a termination event as defined in the netting agreement, whereupon the values of such transactions are combined and reduced to a single payable sum,

but excluding payments netting which is designed to reduce the operational cost of daily settlements, where the gross obligations of the counterparties are not in any way affected;

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| netting agreement | means any agreement which effects netting between two counterparties, or any other arrangement to effect netting, which does not contain a walkaway clause[1]; |
| netting set | means a group of transactions between two counterparties that is subject to a qualifying bilateral netting agreement or a qualifying cross-product netting agreement, as the case may be; any transaction which is not subject to a qualifying bilateral netting agreement or a qualifying cross-product netting agreement shall be deemed a netting set; |
| NICA or net independent collateral amount | means the amount of segregated and unsegregated collateral posted by the counterparty less the unsegregated collateral posted by the Reporting Bank, and in relation to the Independent Amount defined in standard industry documentation, takes into account the differential of Independent Amount required for the Reporting Bank minus Independent Amount required for the counterparty[1A]; [MAS Notice 637 (Amendment) 2016] |
| NII | means net interest income; [MAS Notice 637 (Amendment No. 2) 2018] |
| ΔNII | means change in net interest income under an interest rate stress or shock scenario; [MAS Notice 637 (Amendment No. 2) 2018] |

[1] "Walkaway clause" means any provision which permits a party to a netting agreement that is not in default to make limited payments or no payments at all, to a defaulting party under the same netting agreement, even if the party that is in default is a net creditor under the netting agreement.

[1A] For the avoidance of doubt, NICA represents the amount of collateral that a Reporting Bank may use to offset its exposure on the default of the counterparty, and does not include collateral that the Reporting Bank has posted to a segregated, bankruptcy remote account.

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| NMDs or non-maturity deposits | means non-maturing deposits, which are liabilities of a Reporting Bank that have no contractually agreed maturity date and where a depositor is free to withdraw the deposits any time;<br><br>[MAS Notice 637 (Amendment No. 2) 2018] |
| OF | means object finance; |
| offsetting transaction | means the transaction leg between a clearing member and the CCP when the clearing member acts on behalf of a client, for example, when a clearing member clears or novates a client's trade;<br>[MAS Notice 637 (Amendment) 2012] |
| operating entity | means an entity that is conducting business with the intention of earning a profit in its own right;<br><br>[MAS Notice 637 (Amendment No. 2) 2014] |
| operational risk | means the risk of loss resulting from –<br>(a) inadequate or failed internal processes;<br>(b) actions or omissions of persons;<br>(c) systems; or<br>(d) external events,<br>including legal risk[1B], but does not include strategic or reputational risk;<br>[MAS Notice 637 (Amendment) 2016] |
| operational RWA | means the risk-weighted assets for operational risks determined in the manner set out in Part IX; |
| originator | means –<br>(a) an entity which, either itself or through related entities, directly or indirectly, creates the exposure being securitised[2]; or |

[1B] Legal risk includes exposures to fines, penalties, or punitive damages resulting from criminal prosecution, regulatory or supervisory actions, as well as such damages or other sums payable resulting from civil claims or settlements.

[2] Where an entity lends to an SPE with a view to enabling that SPE to make loans which are then used in a securitisation, the entity will generally be deemed to be acting as an originator.

(b) any entity which sponsors a securitisation, i.e. purchases or advises or causes an SPE to purchase the exposures of a third party, which are then used in a securitisation (for avoidance of doubt, selling credit protection such that the entity or the SPE has a long position in the credit risk of the obligor is equivalent to purchasing exposures) [2A], and includes an ABCP programme sponsor;

[MAS Notice 637 (Amendment No. 2) 2017]

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| ORM framework or operational risk management and measurement framework | means the approach of a Reporting Bank in identifying, assessing, monitoring, controlling and mitigating operational risk and includes the operational risk management processes and measurement systems of the Reporting Bank; |
| ORMF | means the operational risk management function; |
| ORMS or operational risk measurement system | means a subset of the ORM framework and includes the systems and data of a Reporting Bank that are used to measure operational risk. Central to the ORMS is the AMA model that is used by the Reporting Bank to quantify its operational risk capital requirement; |
| OTC | means over-the-counter; |
| OTC derivative transaction | means an exchange rate contract, interest rate contract, equity contract, precious metal or other commodity contract or credit derivative contract which is not traded on an exchange; |

[MAS Notice 637 (Amendment) 2012]

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| overseas exchange | has the same meaning as in section 2 of the Securities and Futures Act (Cap. 289); |

[MAS Notice 637 (Amendment No. 2) 2018]

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| own-estimate haircuts | means haircuts calculated using the internal estimates of the Reporting Bank of market price volatility and foreign exchange volatility, based on an approach that complies with the requirements and meets the guidelines set out in Section 3 of Annex 7J of Part VII; |

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[2A] An entity which advises or causes an SPE to purchase the exposures of a third party, which are then used in a securitisation will generally not be deemed to be acting as an originator if –

(a) the entity has not advised or caused the SPE to purchase any exposures which are then used in a securitisation before the date of issue of securities effecting the transfer of credit risk of those exposures to the investors in the securitisation;

(b) the entity will not be liable for any losses incurred by the SPE arising from the exposures (for avoidance of doubt, the entity may still be liable for losses arising from a breach of its fiduciary duties); and

(c) the entity does not undertake to achieve a minimum performance for the exposures.

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| parameterisation process | means the process by which a Reporting Bank derives estimates of IRBA parameters as set out in Section 5 of Annex 7AB of Part VII; |
| PD or probability of default | in relation to the IRBA, has the meaning in paragraph 2.1 of Annex 7Y of Part VII; |
| peak exposure | means a high percentile (typically 95% or 99%) of the distribution of exposures at any particular future date before the maturity date of the longest transaction in the netting set; |
| PE/VC investments | has the same meaning as defined in MAS Notice 630; |
| PF | means project finance; |
| PSE or public sector entity | means –<br>(a) a regional government or local authority that is able to exercise one or more functions of the central government at the regional or local level;<br>(b) an administrative body or non-commercial undertaking responsible to, or owned by, a central government, regional government or local authority, which performs regulatory or non-commercial functions;<br>(c) a statutory board in Singapore (other than the Authority); or<br>(d) a town council in Singapore established pursuant to the Town Councils Act (Cap. 392A); |
| QRRE | means qualifying revolving retail exposures; |
| qualifying bilateral netting agreement | means a bilateral netting agreement where the requirements set out in Annex 7N of Part VII are complied with; |
| qualifying cross-product netting agreement | means a cross-product netting agreement where the requirements set out in Annex 7N of Part VII are complied with; |
| qualifying MDB | means an MDB listed in Annex 7S of Part VII; |
| qualifying SFT | means an SFT where the requirements set out in Annex 7K of Part VII are complied with; |
| rating system | in relation to a class of exposures under the IRBA, means all of the methods, processes, controls, data collection and IT systems that support the assessment of credit risk, the assignment of exposures to grades or pools (internal risk ratings), and the parameterisation process for that class of exposures; |
| recognised ECAI | means an ECAI recognised by the Authority pursuant to paragraph 7.3.53 and listed in Annex 7RA; |

[MAS Notice 637 (Amendment) 2014]

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| recognised group A exchange | has the same meaning as in regulation 2 of the Securities and Futures (Financial and Margin Requirements for Holders of Capital Markets Services Licenses) Regulations; |
| reference obligation | means any obligation specified under a credit derivative contract used for purposes of either determining cash settlement value or the deliverable obligation; |
| repo | means a repurchase transaction; |
| Reporting Bank | means a bank incorporated in Singapore; |
| regulated exchange | means an exchange approved, licensed or otherwise regulated by the Authority or by a financial services regulatory authority other than the Authority; |
| regulatory capital | means capital which is used to meet regulatory requirements; |
| | [MAS Notice 637 (Amendment No. 2) 2014] |
| resecuritisation exposure | means a securitisation exposure in which the risk associated with an underlying pool of exposures is tranched and at least one of the underlying exposures is a securitisation exposure, and includes an exposure to one or more resecuritisation exposures[2B]; |
| | [MAS Notice 637 (Amendment No. 2) 2017] |
| retail exposure | in relation to the IRBA, means any exposure which falls within paragraph 7.4.16; |
| risk charge | in relation to a market risk position, means the percentage assigned to that position to derive the capital requirement; |
| | [MAS Notice 637 (Amendment No. 2) 2014] |
| risk-free rate | means the interest rate that a Reporting Bank would expect from a risk-free investment for a given maturity; |
| | [MAS Notice 637 (Amendment No. 2) 2018] |
| risk weight | in relation to an exposure, means a degree of risk expressed as a percentage assigned to that exposure; |
| risk weight function | in relation to the IRBA, means the formula for calculating risk-weighted exposure amounts using estimates of IRBA parameters; |
| RRE | means residential real estate; |

[2B] An exposure resulting from retranching of a securitisation exposure is not a resecuritisation exposure if the Reporting Bank is able to demonstrate that the cash flows to and from the Reporting Bank could be replicated in all circumstances and conditions by an exposure to the securitisation of a pool of assets that contains no securitisation exposures.

[MAS Notice 637 (Amendment No. 2) 2017]

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| RWA | means risk-weighted assets; |
| RWE | means risk-weighted exposure; |
| SA-CCR or standardised approach for counterparty credit risk | means the method for calculating E or EAD, whichever is applicable, for any pre-settlement counterparty exposure arising from OTC derivative or exchange-traded derivative transactions, or long settlement transactions set out in Annex 7O of Part VII or, if the reference is to any regulatory requirements of, or administered by, a bank regulatory agency other than the Authority, the equivalent under those requirements;<br><br>[MAS Notice 637 (Amendment) 2016] |
| SA(CR) or standardised approach to credit risk | means the approach for calculating credit risk-weighted exposure amounts set out in Division 3 of Part VII or, if the reference is to any regulatory requirements of, or administered by, a bank regulatory agency other than the Authority, the equivalent under those requirements; |
| SA(CR) exposure | means any exposure for which a Reporting Bank is using the SA(CR) to calculate its credit risk-weighted exposure amount; |
| SA(EQ) or standardised approach for equity exposures | means the approach for calculating credit risk-weighted exposure amounts for equity exposures set out in Sub-division 3 of Division 5 of Part VII or, if the reference is to any regulatory requirements of, or administered by, a bank regulatory agency other than the Authority, the equivalent under those requirements; |
| SA(EQ) exposure | means –<br>(a) any equity exposure (excluding equity investments in funds held in the banking book) for which a Reporting Bank is using the SA(EQ) to calculate its credit risk-weighted exposure amount; or<br>(b) in the case where the Reporting Bank uses SA(EQ) to calculate the credit risk-weighted exposure amount for its equity exposures, any equity investment in funds held in the banking book;<br>[MAS Notice 637 (Amendment No. 3) 2017] |
| SA(IR) | means the standardised approach for calculating IRRBB as set out in Annex 10B or, if the reference is to any regulatory requirement of, or administered by, a bank regulatory agency other than the Authority, the equivalent under those requirements;<br><br>[MAS Notice 637 (Amendment No. 2) 2018] |

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| SA(MR) or standardised approach to market risk | means the approach for calculating market risk capital requirements set out in Division 2 of Part VIII or, if the reference is to any regulatory requirements of, or administered by, a bank regulatory agency other than the Authority, the equivalent under those requirements; |
| SA(OR) or standardised approach to operational risk | means the approach for calculating operational risk capital requirements set out in Division 3 of Part IX or, if the reference is to any regulatory requirements of, or administered by, a bank regulatory agency other than the Authority, the equivalent under those requirements; |
| SA pool or standardised approach pool | in relation to a securitisation, means a pool of underlying exposures to a securitisation for which a Reporting Bank –<br>(a) does not have approval from the Authority to use the IRBA to calculate capital requirements for any underlying exposures or does not have sufficient information to calculate capital requirements using the IRBA for any underlying exposures; or<br>(b) is prohibited by the Authority from treating the pool as a IRB pool or a mixed pool;<br>[MAS Notice 637 (Amendment No. 2) 2017] |
| SEC-ERBA or securitisation external ratings-based approach | means the approach for calculating credit risk-weighted exposure amounts for securitisation exposures set out in Sub-division 5 of Division 6 of Part VII or, if the reference is to any regulatory requirements of, or administered by, a bank regulatory agency other than the Authority, the equivalent under those requirements;<br>[MAS Notice 637 (Amendment No. 2) 2017] |
| SEC-IRBA or securitisation internal ratings-based approach | means the approach for calculating credit risk-weighted exposure amounts for securitisation exposures set out in Sub-division 4 of Division 6 of Part VII or, if the reference is to any regulatory requirements of, or administered by, a bank regulatory agency other than the Authority, the equivalent under those requirements;<br>[MAS Notice 637 (Amendment No. 2) 2017] |
| SEC-SA or securitisation standardised approach | means the approach for calculating credit risk-weighted exposure amounts for securitisation exposures set out in Sub-division 6 of Division 6 of Part VII or, if the reference is to any regulatory requirements of, or administered by, a bank regulatory agency other than the Authority, the equivalent under those requirements;<br>[MAS Notice 637 (Amendment No. 2) 2017] |

securities — means –

(a) any securities as defined in section 2 of the Securities and Futures Act (Cap. 289);
(b) any specified securities-based derivatives contracts as defined in section 2 of the Securities and Futures Act (Cap. 289); or
(c) any units in a collective investment scheme;

[MAS Notice 637 (Amendment) 2018]

securities firm — means –

(a) any entity holding a capital markets services licence under section 84(1) of the Securities and Futures Act (Cap. 289); or
(b) any entity that is approved, licensed, registered or otherwise regulated by a regulatory agency other than the Authority to carry out activities permitted under a capital markets services licence under section 84(1) of the Securities and Futures Act (Cap. 289);

securitisation — means any transaction or scheme involving the tranching of credit risk associated with an exposure or a pool of exposures and which has the following characteristics:

(a) payments in the transaction or scheme depend on the performance of the exposure or pool of exposures;
(b) the subordination of tranches determines the distribution of losses during the ongoing life of the transaction or scheme; and
(c) junior tranches can absorb losses without interrupting contractual payments to more senior tranches;

securitisation exposure — means any exposure of a Reporting Bank to a securitisation, and includes –

(a) any on-balance sheet exposure to securities issued pursuant to a securitisation (e.g. asset-backed securities, mortgage-backed securities and collateralised debt obligations), regardless of whether it was retained by the Reporting Bank at, or repurchased by the Reporting Bank after, the origination of the securitisation;
(b) any off-balance sheet exposure to a securitisation (e.g. through credit enhancements, liquidity facilities, credit derivatives, tranched cover, interest rate swaps or currency swaps); and
(c) reserve accounts (e.g. cash collateral accounts) recorded as an asset by the originating bank;

[MAS Notice 637 (Amendment No. 2) 2017]

securitised exposure — means an exposure, securitised by a Reporting Bank in its capacity as originator or ABCP programme sponsor, that forms an underlying exposure of a securitisation;

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| segmentation | in relation to retail exposures, means the process by which a Reporting Bank aggregates retail exposures into homogenous pools; |
| senior securitisation exposure | in relation to a securitisation, is an exposure to a senior securitisation tranche;<br><br>[MAS Notice 637 (Amendment No. 2) 2017] |
| senior securitisation tranche | in relation to a securitisation, is a tranche that is effectively backed or secured by a first claim on the cash flows from the underlying exposures[3];<br><br>[MAS Notice 637 (Amendment No. 2) 2017] |
| servicer | means a Reporting Bank which carries out administrative functions relating to the cash flows of the underlying exposure or pool of exposures of a securitisation, including setting up and operating the mechanism for collecting payments of interest or principal derived from the underlying exposures and channeling these funds to the investors or the trustee representing them, customer service, cash management, maintenance of records and reporting duties; |
| SFT | means a securities or commodities financing transaction comprising any one of the following:<br>(a) a repo or a reverse repo;<br>(b) a securities or commodities lending transaction or securities or commodities borrowing transaction;<br>(c) a margin lending transaction,<br>for which the value of the transaction depends on market valuation and the transaction is often subject to margin agreements;<br>[MAS Notice 637 (Amendment) 2012] |
| SL | means specialised lending; |
| small business | means a corporation, partnership, limited liability partnership, sole proprietorship or trustee in respect of a trust with reported annual sales of less than $100 million;<br><br>[MAS Notice 637 (Amendment) 2012] |

[3] While this generally includes only the most senior securities issued pursuant to a securitisation, in some instances there may be other claims that may be more senior in the cash flow waterfall (e.g. a swap claim) but may be disregarded for the purpose of determining which tranches are senior. Different maturities of several senior tranches that share pro rata loss allocation shall have no effect on the seniority of these tranches, since they benefit from the same level of credit enhancement. The material effects of differing tranche maturities are captured by maturity adjustments on the risk weights to be assigned to the securitisation exposures. If a senior tranche is retranched or partially hedged (i.e. not on a pro rata basis), only the new most senior tranche would be treated as senior for capital purposes.
[MAS Notice 637 (Amendment No. 2) 2017]

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| SPE or special purpose entity | means a corporation, trust, or other entity established for a specific purpose, the activities of which are limited to those appropriate to accomplish that purpose, and the structure of which is intended to isolate the SPE from the credit risk of an originator or seller of exposures; |
| specific allowance | means loss allowance for credit exposures that fall within the definition of "credit-impaired financial asset" under FRS 109;<br><br>[MAS Notice 637 (Amendment No. 3) 2017] |
| specific wrong-way risk | means the risk that arises when the exposure to a particular counterparty is positively correlated with the probability of default of the counterparty due to the nature of the transactions with that counterparty;<br>[MAS Notice 637 (Amendment) 2014] |
| structured note | has the same meaning as in section 240AA(5) of the Securities and Futures Act (Cap. 289);<br><br>[MAS Notice 637 (Amendment) 2018] |
| subsidiary | has the same meaning as in section 5 of the Companies Act (Cap. 50); |
| supervisory slotting criteria | in relation to the IRBA, means the method of calculating risk-weighted exposure amounts for exposures in the SL asset sub-class or the HVCRE asset sub-class in accordance with Sub-division 12 of Division 4 of Part VII and Annex 7V of Part VII; |
| supervisory validation | means the process by which the Authority examines the readiness of a Reporting Bank for adopting the IRBA or the AMA, as the case may be, for the purpose of deciding whether the Reporting Bank may begin a recognised parallel run; |
| synthetic securitisation | means a structure with at least two different tranches which reflect different degrees of credit risk, where credit risk of an underlying exposure or pool of exposures is transferred, in whole or in part, through the use of funded or unfunded credit derivatives or guarantees; |
| TDRR | means term deposit redemption rate;<br><br>[MAS Notice 637 (Amendment No. 2) 2018] |
| TEP or total eligible provisions | means the sum of all allowances, including specific allowances, partial write-offs, portfolio-specific general allowances such as country risk allowances and general allowances, which are attributed to credit exposures subject to the IRBA, and includes any discounts on defaulted assets, but excludes any CVA which |

has already been recognised by the Reporting Bank as an incurred write-down (i.e. a CVA loss);

**the Authority** means the Monetary Authority of Singapore established under the Monetary Authority of Singapore Act (Cap. 186);

**Tier 1 Capital** in relation to a Reporting Bank or subsidiary of the Reporting Bank, means the sum of CET1 Capital and AT1 Capital;

[MAS Notice 637 (Amendment No. 2) 2014]

**Tier 1 CAR** means Tier 1 capital adequacy ratio, calculated in accordance with paragraph 4.1.2;

**Tier 2 Capital** means -

(a) in relation to a Reporting Bank, the sum of the items set out in paragraph 6.3.1; and

(b) in relation to a subsidiary of a Reporting Bank, the sum of items set out in paragraph 6.3.1, where a reference to "Reporting Bank" shall be construed as a reference to "the subsidiary of the Reporting Bank";

[MAS Notice 637 (Amendment No. 2) 2014]

**Tier 2 capital instrument** means a capital instrument which complies with the requirements set out in paragraph 6.3.2;

**Total CAR** means total capital adequacy ratio, calculated in accordance with paragraph 4.1.3;

**trading book** has the meaning in Sub-division 3 of Division 1 of Part VIII;

**traditional securitisation** means a structure where the cash flow from an underlying exposure or pool of exposures is used to service at least two different tranches reflecting different degrees of credit risk;

**tranche** means a contractually established segment of the credit risk associated with an underlying exposure or pool of exposures, where a position in the segment entails a risk of credit loss greater than or less than a position of the same amount in each other such segment, without taking account of credit protection provided by third parties directly to the holders of positions in the segment or in other segments;

**uncompensated prepayments** means any prepayment of a loan, or any part of it, for which the economic cost is not charged to the borrower;

[MAS Notice 637 (Amendment No. 2) 2018]

**unconsolidated subsidiary** means a subsidiary whose assets and liabilities are not included in the consolidated financial statements of the banking group;

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| unconsolidated financial institution | means a financial institution whose assets and liabilities are not included in the consolidated financial statements of the banking group;<br>[MAS Notice 637 (Amendment) 2016] |
| unconsolidated major stake company | means a major stake company whose assets and liabilities are not included in the consolidated financial statements of the banking group;<br>[MAS Notice 637 (Amendment) 2016] |
| unfunded credit protection | means a CRM where the reduction of the credit risk of an exposure of a Reporting Bank is derived from the undertaking of a third party to pay an amount in the event of the default of a counterparty or on the occurrence of other specified events; |
| unrated | in relation to any exposure, means that the exposure does not have an external credit assessment from a recognised ECAI; |
| USD | means the United States dollar; |
| VaR or value-at-risk | means the maximum amount that can be lost from an investment or a portfolio of investments under normal market conditions over a given holding period at a particular confidence interval; |
| variation margin | in relation to exposures to a CCP, means funded collateral of a clearing member or a client of a clearing member posted on a daily or intraday basis to a CCP based on price movements of the transactions of the clearing member or the client of a clearing member;<br>[MAS Notice 637 (Amendment) 2012]<br>[MAS Notice 637 (Amendment) 2016] |
| wholesale exposure | in relation to the IRBA, means an exposure that falls within the definition in paragraph 7.4.15; and |
| written law | has the same meaning as in section 2 of the Interpretation Act. |

[MAS Notice 637 (Amendment No. 2) 2017]
[MAS Notice 637 (Amendment No. 3) 2017]
[MAS Notice 637 (Amendment) 2018]
[MAS Notice 637 (Amendment No. 2) 2018]

## PART III: SCOPE OF APPLICATION

### Division 1: Capital Adequacy Ratio Requirements

[MAS Notice 637 (Amendment) 2014]

Requirements to Apply at the Solo and Group Levels

3.1.1 A Reporting Bank shall comply with the capital adequacy ratio requirements in this Notice at two levels:

(a) the bank standalone ("Solo") level capital adequacy ratio requirements, which measure the capital adequacy of a Reporting Bank based on its standalone capital strength and risk profile; and

(b) the consolidated ("Group") level capital adequacy ratio requirements, which measure the capital adequacy of a Reporting Bank based on its capital strength and risk profile after consolidating the assets and liabilities of its banking group entities, taking into account –

(i) any exclusions of certain banking group entities provided for under paragraphs 3.1.2 and 3.1.3; and

(ii) any adjustments pursuant to Division 6 of Part VII.

Non-consolidation of Certain Subsidiaries at the Group Level

3.1.2 A Reporting Bank shall –

(a) not consolidate its investment in an insurance subsidiary; and

(b) account for such investment at cost,

when preparing the consolidated financial statements of the banking group for the purpose of calculating its capital adequacy ratio requirements at the Group level.

3.1.3 Subject to paragraph 3.1.2 and Part VI, a Reporting Bank may exclude from consolidation its investment in any other subsidiary when preparing the consolidated financial statements of the banking group for the purpose of calculating its capital adequacy ratio requirements at the Group level only if such non-consolidation is permitted under the Accounting Standards. Notwithstanding the provisions set out in this paragraph, the exemption in paragraph 4(a) of Singapore Financial Reporting Standards 110 ("SFRS 110") Consolidated Financial Statements[3A] shall not apply for the purpose of complying with paragraph 3.1.1(b).

[MAS Notice 637 (Amendment) 2014]

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[3A] Paragraph 4(a) of SFRS 110 exempts a parent from presenting consolidated financial statements, subject to certain conditions.

[MAS Notice 637 (Amendment) 2014]

Issuers of covered bonds

3.1.4 Where the Reporting Bank issues covered bonds (as defined in MAS Notice 648), the Reporting Bank shall continue to hold capital against its exposures in respect of the assets included in a cover pool (as defined in MAS Notice 648) in accordance with this Notice. In the case where the Reporting Bank uses an SPE to issue covered bonds or where the cover pool is held by an SPE, the Reporting Bank shall apply a "look through" approach for the purpose of computing capital requirements under this Notice. Under the "look through" approach, the Reporting Bank and the SPE shall be treated as a single entity for the purposes of this Notice[3B].

[MAS Notice 637 (Amendment) 2013]
[MAS Notice 637 (Amendment) 2014]

## Division 2: Leverage Ratio Requirements

[MAS Notice 637 (Amendment No. 3) 2017]

Requirements to Apply at the Solo and Group Levels

3.2.1 A Reporting Bank shall comply with the leverage ratio requirements in this Notice at two levels:

(a) the bank standalone ("Solo") level, which measures the leverage ratio of a Reporting Bank based on its standalone capital strength; and

(b) the consolidated ("Group") level, which measures the leverage ratio of a Reporting Bank based on its capital strength after consolidating the assets and liabilities of its banking group entities, taking into account –

(i) any exclusions of certain banking group entities provided for under paragraphs 3.2.2 and 3.2.3; and

(ii) any adjustments pursuant to Division 6 of Part VII.

[MAS Notice 637 (Amendment No. 3) 2017]

Non-consolidation of Certain Subsidiaries at the Group Level

3.2.2 A Reporting Bank shall –

(a) not consolidate its investment in an insurance subsidiary; and

(b) account for such investment at cost,

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[3B] This means, for example, that (a) the assets of the cover pool held in the SPE (if any) shall be deemed as assets of the Reporting Bank, at both the bank Solo and bank Group levels; and (b) transactions between the Reporting Bank and the SPE would be deemed to be eliminated.

[MAS Notice 637 (Amendment) 2014]

when preparing the consolidated financial statements of the banking group for the purpose of calculating its leverage ratio at the Group level.

3.2.3 Subject to paragraph 3.2.2 and Part VI, a Reporting Bank may exclude from consolidation its investment in any other subsidiary when preparing the consolidated financial statements of the banking group for the purpose of calculating its leverage ratio at the Group level only if such non-consolidation is permitted under the Accounting Standards. Notwithstanding the provisions set out in this paragraph, the exemption in paragraph 4(a) of Singapore Financial Reporting Standards 110 ("SFRS 110") Consolidated Financial Statements[3A] shall not apply for the purpose of complying with paragraph 3.2.1(b).

[MAS Notice 637 (Amendment) 2014]

## PART IV: CAPITAL ADEQUACY RATIOS AND LEVERAGE RATIO

### Division 1: Capital Adequacy Ratios

4.1.1 A Reporting Bank shall calculate its Common Equity Tier 1 CAR as follows:

$$\textbf{CET1 CAR} = \frac{\textbf{CET1 Capital}}{\textbf{Credit RWA + Market RWA + Operational RWA}}$$

4.1.2 A Reporting Bank shall calculate its Tier 1 CAR as follows:

$$\textbf{Tier 1 CAR} = \frac{\textbf{Tier 1 Capital}}{\textbf{Credit RWA + Market RWA + Operational RWA}}$$

4.1.3 A Reporting Bank shall calculate its Total CAR as follows:

$$\textbf{Total CAR} = \frac{\textbf{Eligible Total Capital}}{\textbf{Credit RWA + Market RWA + Operational RWA}}$$

4.1.3A A Reporting Bank shall include any floor adjustment calculated under paragraph 5.1.3C in the denominators of CET1 CAR, Tier 1 CAR and Total CAR.

[MAS Notice 637 (Amendment) 2017]

Minimum ratios

4.1.4 Where a Reporting Bank is designated by the Authority as a domestic systemically important bank[3C] ("D-SIB"), it shall, at all times, maintain at both the Solo and Group levels, the minimum ratios set out in Table 4-1:

Table 4-1: Minimum ratios[4]

| | Minimum CAR |
|---|---|
| Minimum CET1 CAR | 6.5% |
| Minimum Tier 1 CAR | 8% |
| Minimum Total CAR | 10% |

[MAS Notice 637 (Amendment) 2016]

[3C] A Reporting Bank shall refer to the Authority's D-SIB framework and the list of designated D-SIBs published on the Authority's website.

[MAS Notice 637 (Amendment) 2016]

[4] Where the Reporting Bank is not designated by the Authority as a D-SIB, it shall, at all times, maintain at both the Solo and Group levels the minimum ratios set out in Annex 4 of "Basel III: A global regulatory framework for more resilient banks and banking systems" issued by the BCBS in December 2010 (revised June 2011).

[MAS Notice 637 (Amendment) 2016]

Capital Conservation Buffer[5]

4.1.5 In addition to complying with the minimum ratios in paragraph 4.1.4, a Reporting Bank shall, at all times in the periods specified, maintain at both the Solo and Group levels, a Capital Conservation Buffer comprising CET1 Capital, as set out in Table 4-2, at and above the minimum CET1 CAR, minimum Tier 1 CAR and minimum Total CAR[6].

Table 4-2: Capital Conservation Buffer

| | From 1 January 2016 | From 1 January 2017 | From 1 January 2018 | From 1 January 2019 |
|---|---|---|---|---|
| Capital Conservation Buffer | 0.625% | 1.25% | 1.875% | 2.5% |

4.1.6 Notwithstanding paragraph 4.1.5, the Authority may bring forward the effective dates in Table 4-2 for application of the Capital Conservation Buffer, if the Authority deems it necessary to do so, based on the Authority's assessment of the extent of excess credit growth and build-up of system-wide risk in Singapore.

4.1.7 A Reporting Bank's CET1 Capital shall first be used to meet the minimum ratios in paragraph 4.1.4 before the remainder can count towards its Capital Conservation Buffer.

4.1.8 For the purpose of this Part, the Capital Conservation Buffer range refers to the range of capital adequacy ratio levels between the minimum CET1 CAR, minimum Tier 1 CAR and minimum Total CAR and the level of the Capital Conservation Buffer set out in Table 4-2, as applied to CET1 CAR, Tier 1 CAR and Total CAR, respectively.

4.1.9 Where the CET1 CAR, Tier 1 CAR or Total CAR of a Reporting Bank is within the Capital Conservation Buffer range, the Reporting Bank shall meet the minimum capital conservation ratios set out in Tables 4-3[7,8]. Tables 4-4 to 4-6 illustrate the ranges of CET1 CAR corresponding to various minimum capital conservation ratios as of 1 January 2017, 2018 and 2019, respectively, which a Reporting Bank designated by the Authority as a D-SIB needs to maintain.

[5] A Reporting Bank should refer to paragraphs 122 to 135 of "Basel III: A global regulatory framework for more resilient banks and banking systems" issued by the BCBS in December 2010 (revised June 2011) for an understanding of the objectives of the Capital Conservation Buffer.

[6] For each year in the period 1 January 2013 to 31 December 2018, a Reporting Bank that already meets the sum of each minimum ratio and Capital Conservation Buffer required in that year, but remains below the sum of the minimum ratio and Capital Conservation Buffer required from 1 January 2019, should maintain prudent earnings retention policies with a view to meeting the sum of the minimum ratio and Capital Conservation Buffer required from 1 January 2019 as early as possible.

[7] The distribution constraints imposed on Reporting Banks when their capital adequacy ratios fall within the Capital Conservation Buffer range increase as the banks' capital adequacy ratios approach the minimum ratios. By design, the constraints imposed on Reporting Banks with capital adequacy ratios at the top of the Capital Conservation Buffer range would be minimal.

[8] Although the Capital Conservation Buffer may be drawn down, a Reporting Bank should not choose in normal times outside periods of stress to operate within the Capital Conservation Buffer range.

Table 4-3: Minimum capital conservation ratios for a Reporting Bank

| CET1 CAR | Minimum capital conservation ratios (expressed as a percentage of earnings) |
|---|---|
| Within first quartile of buffer | 100% |
| Within second quartile of buffer | 80% |
| Within third quartile of buffer | 60% |
| Within fourth quartile of buffer | 40% |
| Above top of buffer | 0% |

Table 4-4: Illustration of Minimum capital conservation ratios as of 1 January 2017

| CET1 CAR | Minimum capital conservation ratios (expressed as a percentage of earnings) |
|---|---|
| 6.5% - 6.8125% | 100% |
| >6.8125% - 7.125% | 80% |
| >7.125% - 7.4375% | 60% |
| >7.4375% - 7.75% | 40% |
| >7.75% | 0% |

Table 4-5: Illustration of Minimum capital conservation ratios as of 1 January 2018

| CET1 CAR | Minimum capital conservation ratios (expressed as a percentage of earnings) |
|---|---|
| 6.5% - 6.96875% | 100% |
| >6.96875% - 7.4375% | 80% |
| >7.4375% - 7.90625% | 60% |
| >7.90625% - 8.375% | 40% |
| >8.375% | 0% |

Table 4-6: Illustration of Minimum capital conservation ratios as of 1 January 2019

| CET1 CAR | Minimum capital conservation ratios (expressed as a percentage of earnings) |
|---|---|
| 6.5% - 7.125% | 100% |
| >7.125% - 7.75% | 80% |
| >7.75% - 8.375% | 60% |
| >8.375% - 9% | 40% |
| >9% | 0% |

4.1.10 For the purpose of paragraph 4.1.9:

(a) "CET1 CAR" includes CET1 capital used to meet the minimum CET1 CAR, but excludes any additional CET1 Capital needed to meet the minimum Tier 1 CAR and minimum Total CAR[9];

(b) "minimum capital conservation ratios" refer to the percentage of a Reporting Bank's earnings for a financial year that a Reporting Bank is required to conserve in the subsequent financial year, i.e. a Reporting Bank shall distribute no more than the percentage of (100% less the minimum capital conservation ratio) of its earnings for a financial year,

[9] For example, a Reporting Bank with a 10% CET1 CAR and no Additional Tier 1 Capital nor Tier 2 Capital as at 1 Jan 2016 or later would meet all the minimum ratios in paragraph 4.1.4. However, it would have a zero Capital Conservation Buffer and therefore be subject to a 100% capital conservation ratio.

in the subsequent financial year, in terms of items subject to the restriction on distributions[10];

(c) "items subject to the restriction on distributions" in sub-paragraph (b) above refer to distributions in the form of dividends, share buybacks, discretionary payments on AT1 capital instruments and discretionary bonus payments to staff. It does not include payments that do not result in a depletion of CET1 Capital by the Reporting Bank (e.g. scrip dividends);

(d) "earnings" means the Reporting Bank's distributable profits for a financial year, based on the year-end financial statements, calculated gross of the deduction of items subject to the restriction on distributions and less the tax which would have been payable had none of the items subject to the restriction on distributions been paid[11].

4.1.11 For the purpose of paragraph 4.1.9, where a Reporting Bank –

(a) does not have positive earnings in a particular financial year; and

(b) has a CET1 CAR of less than the sum of –

(i) the minimum CET1 CAR in accordance with Table 4-1; and

(ii) the Capital Conservation Buffer in accordance with Table 4-2,

the Reporting Bank shall be restricted from making distributions of items subject to the restriction on distributions in the subsequent financial year.

4.1.12 If a Reporting Bank wants to make any distributions in excess of the constraints imposed by paragraph 4.1.9 and paragraph 4.1.11, it may raise capital in the private sector equal to the amount above the constraint that it wishes to distribute, subject to prior discussions with the Authority.

4.1.13 A Reporting Bank intending to draw on its Capital Conservation Buffer shall consult the Authority in advance, and shall present a capital plan on the rebuilding of the Capital Conservation Buffer. The Reporting Bank shall demonstrate to the satisfaction of the Authority that its capital plan will rebuild the Capital Conservation Buffer within an appropriate timeframe. The Authority may impose a time limit on a Reporting Bank operating within the Capital Conservation Buffer range for, or other conditions related to, the rebuilding of the Capital Conservation Buffer.

[10] For example, a Reporting Bank with a CET1 CAR in the range of 7.125% - 7.75% after 1 Jan 2019 is required to conserve 80% of its earnings for a financial year, in the subsequent financial year (i.e. distribute no more than 20% in terms of items subject to the restriction on distributions. For the avoidance of doubt, the capital conservation requirement applies to items subject to the restriction on distributions only, not the operation of the Reporting Bank. A Reporting Bank should be able to conduct business as normal when its capital adequacy ratios fall within the Capital Conservation Buffer range as it experiences losses.

[11] This is to reverse any tax impact of making such distributions.

Countercyclical Buffer[12]

4.1.14 In addition to complying with the minimum ratios in paragraph 4.1.4 and the Capital Conservation Buffer in paragraph 4.1.5, a Reporting Bank shall, at all times in the periods specified, maintain at both the Solo and Group levels, a Countercyclical Buffer comprising CET1 Capital ranging from zero up to the percentages set out in Table 4-7 above the minimum CET1 CAR, minimum Tier 1 CAR and minimum Total CAR.[13]

Table 4-7: Countercyclical Buffer

| | From 1 January 2016 | From 1 January 2017 | From 1 January 2018 | From 1 January 2019 |
|---|---|---|---|---|
| Countercyclical Buffer | 0.625% | 1.25% | 1.875% | 2.5% |

4.1.15 The actual magnitude of the Countercyclical Buffer to be applied under paragraph 4.1.14 to a Reporting Bank shall be the weighted average of the country-specific countercyclical buffer requirements that are being applied by national authorities in jurisdictions to which the Reporting Bank has private sector credit exposures. The weighting applied to the country-specific countercyclical buffer requirement of each jurisdiction shall be the Reporting Bank's total RWA for all its private sector credit exposures in that jurisdiction[14], divided by the Reporting Bank's total RWA for all its private sector credit exposures across all jurisdictions.

4.1.16 For the purpose of paragraph 4.1.15 and 4.1.21 to 4.1.24 –

(a) "country-specific countercyclical buffer requirement" means the countercyclical buffer requirement in respect of a particular jurisdiction (expressed as a percentage of RWA), which the national authority has applied[15,16]. This shall include any countercyclical buffer requirement in respect of Singapore that the Authority may set; and

(b) "RWA for private sector credit exposures" means, in relation to a Reporting Bank –

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[12] A Reporting Bank should refer to paragraphs 136 to 150 of "Basel III: A global regulatory framework for more resilient banks and banking systems" issued by the BCBS in December 2010 (revised June 2011) for an understanding of the objectives of the Countercyclical Buffer.

[13] For the avoidance of doubt, the Countercyclical Buffer applicable to a Reporting Bank can be 0% at a particular point in time.

[14] This should be based on where the ultimate risk of the exposure resides, where possible, i.e. the jurisdiction where the guarantor resides, not where the exposure is booked.

[15] A Reporting Bank may refer to the document, "Guidance for national authorities operating the countercyclical capital buffer" issued by the BCBS in December 2010, to understand the factors that could be considered by national authorities in making such decisions, particularly for the jurisdictions to which the Reporting Bank has credit exposures.

[16] For the purpose of the calculation of the Countercyclical Buffer by the Reporting Bank, the country-specific countercyclical buffer requirement in respect of a jurisdiction outside Singapore -
(a) shall not apply where it takes effect prior to 1 January 2016; and
(b) shall be capped at 0.625% in 2016, 1.25% in 2017, 1.875% in 2018, and 2.5% from 1 Jan 2019 onwards, unless the Authority otherwise specifies.
A jurisdiction is expected to announce its decision to raise the level of its country-specific countercyclical buffer requirement up to 12 months prior to the requirement taking effect. The pre-announced buffer decisions and the actual buffers in place for BCBS member jurisdictions will be published on the website of the Bank of International Settlements.

(i) the RWA in respect of all the exposures in its banking book, other than –

(A) SA(CR) exposures referred to in paragraphs 7.3.1(a), (b), (c), (d) and (e); and

(B) IRBA exposures referred to in paragraphs 7.4.15(c) and (d); and

(ii) the RWA equivalent for the market risk capital requirements for specific risk, IRC and securitisation exposures, where applicable, in respect of all the exposures in its trading book[17].

4.1.17 A Reporting Bank shall apply each country-specific countercyclical buffer requirement in calculating its Countercyclical Buffer from the date specified by the relevant national authority. Where the period between the date of announcement and the effective date of the country-specific countercyclical capital buffer requirement by a jurisdiction other than Singapore is less than 12 months, the Authority may specify a later effective date, no more than 12 months from the date of announcement by that jurisdiction, which takes into account practical considerations and the need to effect the country-specific countercyclical buffer requirement of that jurisdiction as soon as possible.

4.1.18 The Countercyclical Buffer shall extend the size of the Capital Conservation Buffer applicable to a Reporting Bank under paragraph 4.1.5. Where the CET1 CAR, Tier 1 CAR or Total CAR of a Reporting Bank is within such an extended Capital Conservation Buffer range, the Reporting Bank shall meet the minimum capital conservation ratios set out in Table 4-8. Table 4-9 sets out an illustration of the ranges of CET1 CAR corresponding to various minimum capital conservation ratios as of 1 January 2019, assuming a Countercyclical Buffer of 2.5%.

Table 4-8: Minimum capital conservation ratios for a Reporting Bank that is subject to a Countercyclical Buffer

| CET1 CAR | Minimum capital conservation ratios (expressed as a percentage of earnings) |
| --- | --- |
| Within first quartile of buffer | 100% |
| Within second quartile of buffer | 80% |
| Within third quartile of buffer | 60% |
| Within fourth quartile of buffer | 40% |
| Above top of buffer | 0% |

[17] In the case of a Reporting Bank using the IMA for calculating its market risk capital requirement, the Reporting Bank may, subject to the prior approval of the Authority, develop an approach that would translate the VaR for specific risk, the IRC and the comprehensive risk measurement charge into individual instrument risk weights that would then be allocated to the geographic location of the specific counterparties that make up the charge. In cases where it is not possible to break down the charges in such a manner due to the risk charges being calculated on a portfolio by portfolio basis, the risk charge for a particular portfolio should be allocated to the geographic regions of the constituents of the portfolio by calculating the proportion of the portfolio's total EAD that is due to the EAD resulting from counterparties in each geographic region.

Table 4-9: Illustration of minimum capital conservation ratios for a Reporting Bank that is subject to a Countercyclical Buffer of 2.5% as of 1 January 2019

| CET1 CAR | Minimum capital conservation ratios (expressed as a percentage of earnings) |
|---|---|
| 6.5% - 7.75% | 100% |
| >7.75% - 9% | 80% |
| >9% - 10.25% | 60% |
| >10.25% - 11.5% | 40% |
| >11.5% | 0% |

4.1.19 For the avoidance of doubt, paragraphs 4.1.7, 4.1.8, 4.1.10, 4.1.11, 4.1.12 and 4.1.13 shall apply to a Reporting Bank which is subject to a Countercyclical Buffer. "Capital Conservation Buffer" in those paragraphs shall be read to include the Countercyclical Buffer in such cases.

4.1.20 A Reporting Bank shall ensure that its Countercyclical Buffer is calculated with at least the same frequency as its capital adequacy ratios. The Reporting Bank shall calculate its Countercyclical Buffer based on the latest relevant country-specific countercyclical buffer requirements that are applicable at the date which the Reporting Bank calculates its capital adequacy ratios.

National countercyclical buffer requirements

4.1.21 Where the Authority has assessed a period of excess credit growth to be leading to a build up of system-wide risk, the Authority shall consider setting a countercyclical buffer requirement in respect of Singapore ("Singapore-specific countercyclical buffer requirement"). The Authority shall determine the size of the Singapore-specific countercyclical buffer requirement.

4.1.22 For the purpose of paragraph 4.1.21, the Singapore-specific countercyclical buffer requirement shall range from zero to the percentages set out in Table 4-10 of RWA, based on the Authority's assessment of the extent of the build-up of system-wide risk.

Table 4-10: Singapore-specific countercyclical buffer requirement

| | From 1 January 2016 | From 1 January 2017 | From 1 January 2018 | From 1 January 2019 |
|---|---|---|---|---|
| Singapore-specific countercyclical buffer requirement | 0.625% | 1.25% | 1.875% | 2.5% |

The Authority shall apply the principles in the document, "Guidance for national authorities operating the countercyclical buffer" issued by the BCBS in December 2010, in making its decisions on the level of the Singapore-specific countercyclical buffer requirement.[18]

4.1.23 Notwithstanding paragraph 4.1.22, the Authority may bring forward the effective dates specified in Table 4-10 or to set a Singapore-specific countercyclical buffer

[18] The Authority may implement a range of additional macroprudential tools. This includes setting a countercyclical buffer requirement in respect of Singapore in excess of 2.5% or before 1 January 2016 to be applicable only to banks incorporated in Singapore in its calculation of its Countercyclical Buffer.

requirement that is higher than the amounts specified in Table 4-10, if the Authority deems it necessary to do so, based on the Authority's assessment of the extent of excess credit growth and build-up of system-wide risk in Singapore.[19]

4.1.24 The Authority shall announce any decision by the Authority to set or to increase the Singapore-specific countercyclical buffer requirement, prior to but no longer than 12 months before Singapore-specific countercyclical buffer requirement is to take effect.

4.1.25 The Authority shall announce any decision by the Authority to decrease the Singapore-specific countercyclical buffer requirement, and any such decision shall take effect immediately.[20]

Overall capital adequacy

4.1.26 Notwithstanding that a Reporting Bank has complied with the requirements set out in paragraphs 4.1.4, 4.1.5 and 4.1.14, it shall consider as part of its ICAAP whether it has adequate capital at both the Solo and Group levels, to cover its exposure to all risks.[21]

4.1.27 The Authority may, pursuant to section 10(3) of the Banking Act, vary the minimum CET1 CAR, minimum Tier 1 CAR, minimum Total CAR, Capital Conservation Buffer or Countercyclical Buffer applicable to a Reporting Bank. In exercising this discretion, the Authority may take into account, inter alia, any relevant risk factor, the ICAAP of a Reporting Bank and whether the CET1 CAR, Tier 1 CAR or Total CAR is commensurate with the overall risk profile of the Reporting Bank.

[19] It is noted that the international reciprocity provisions set out in the Countercyclical Buffer regime under "Basel III: A global regulatory framework for more resilient banks and banking systems" issued by the BCBS in December 2010 (revised June 2011) would not apply to countercyclical buffer requirements set by national authorities in respect of their jurisdiction, where the time frames set by national authorities are earlier than the time frames set out in Basel III or the amounts are higher than the requirements set out in Basel III.

[20] The Authority shall communicate any of its announcements relating to the Singapore-specific countercyclical buffer requirements to the Basel Committee on Banking Supervision.

[21] For example, a Reporting Bank that has adopted one or more approaches (e.g. IRBA, IMA, AMA) that uses the internal risk estimates of the Reporting Bank to calculate minimum capital requirements shall consider, among other things, the degree to which the data that it uses to derive those risk estimates are representative of the current risk profile of the Reporting Bank, and apply a margin of conservatism where appropriate.

**Division 2: Leverage Ratio[22]**

4.2.1 A Reporting Bank shall calculate its leverage ratio as set out in Annex 4A of this Part.

4.2.2 [Deleted by MAS Notice 637 (Amendment) 2014]

4.2.3 [Deleted by MAS Notice 637 (Amendment) 2014]

4.2.4 A Reporting Bank shall, at all times, maintain at both the Solo and Group levels, a minimum leverage ratio of 3%.

[MAS Notice 637 (Amendment No. 3) 2017]

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[22] A Reporting Bank should refer to "Basel III leverage ratio framework and disclosure requirements" issued by the BCBS in January 2014 for an understanding of the objectives of the leverage ratio.

[MAS Notice 637 (Amendment) 2014]
[MAS Notice 637 (Amendment No. 3) 2017]

**Annex 4A**

**CALCULATION OF THE LEVERAGE RATIO**

**Section 1: Overview**

1.1 A Reporting Bank shall calculate its leverage ratio as follows:

$$\textbf{Leverage ratio (LR)} = \frac{\textbf{Capital measure (CM)}}{\textbf{Exposure measure (EM)}}$$

Scope of application

1.2 A Reporting Bank shall calculate its leverage ratio at both the Group and Solo levels as set out in Division 2 of Part III as at the end of each quarter. Where a Reporting Bank does not consolidate its investment in an entity in accordance with Division 2 of Part III, the Reporting Bank shall only include the investment in the capital of such entity (i.e. only the carrying amount of the investment, and not the underlying assets and other exposures of the entity) in its EM.

1.3 A Reporting Bank may exclude from its EM the balance sheet assets which are deducted from CET1 Capital or AT1 Capital in accordance with paragraphs 6.1.3 and 6.2.3 respectively. This includes the following -

(a) the amount of any investment in the capital of an entity that is totally or partially deducted from CET1 Capital or AT1 Capital following the deductions in accordance with paragraphs 6.1.3(p) and 6.2.3(e) respectively, where the entity is not consolidated in accordance with Division 2 of Part III;

(b) any shortfall of the TEP relative to the EL amount in the calculation of CET1 Capital in accordance with paragraph 6.1.3(e), where the Reporting Bank has adopted the IRBA.

1.4 Where a Reporting Bank issues covered bonds (as defined in MAS Notice 648), the Reporting Bank shall calculate its leverage ratio by including its exposures in respect of assets included in a cover pool (as defined in MAS Notice 648) in its EM in accordance with this Annex. Where the Reporting Bank uses an SPE to issue covered bonds or to hold the cover pool, the Reporting Bank shall apply a "look through" approach in computing its leverage ratio under this Annex. Under the "look through" approach, the Reporting Bank and the SPE shall be treated as a single entity for the purposes of this Annex.[23]

[23] This means, for example, that (a) the assets of the cover pool held in the SPE (if any) shall be deemed as assets of the Reporting Bank, at both the bank Solo and bank Group levels; and (b) transactions between the Reporting Bank and the SPE would be deemed to be eliminated.

**Section 2: EM**

2.1 Subject to paragraphs 2.2 to 2.25 of this Annex, a Reporting Bank shall calculate its EM in accordance with the Accounting Standards and shall not take into account physical or financial collateral, guarantees or other CRM to reduce its EM.

2.2 A Reporting Bank shall not net loans against deposits when calculating its EM.

2.3 A Reporting Bank shall calculate its EM as the sum of –

(a) on-balance sheet items calculated in accordance with paragraphs 2.4 to 2.6 of this Annex other than items specified in sub-paragraphs (b) and(c) ("exposure measures of on-balance sheet items");

(b) derivative transactions calculated in accordance with paragraphs 2.7 to 2.17 of this Annex ("derivative exposure measures");

(c) SFTs calculated in accordance with paragraphs 2.18 to 2.24 of this Annex ("SFT exposure measures"); and

(d) off-balance sheet items calculated in accordance with paragraph 2.25 of this Annex ("exposure measures of off-balance sheet items").

On-Balance Sheet Items

2.4 A Reporting Bank shall include all on-balance sheet assets (including on-balance sheet collateral for any derivative transaction and collateral for any SFT) in the calculation of its exposure measure in respect of on-balance sheet items. For on-balance sheet assets which are not derivative transactions, a Reporting Bank shall calculate the exposure measure in respect of such on-balance sheet assets, based on their carrying amount as determined in accordance with the Accounting Standards, net of specific allowances and accounting valuation adjustments (e.g. accounting credit valuation adjustments). A Reporting Bank shall exclude on-balance sheet items excluded from its EM in accordance with paragraph 1.3 of this Annex from the exposure measure in respect of on-balance sheet items.

[MAS Notice 637 (Amendment No. 2) 2014]

2.5 A Reporting Bank may exclude from its EM, fiduciary assets that meet the criteria for de-recognition and, where applicable, de-consolidation, under the Accounting Standards.

2.6 A Reporting Bank shall not deduct liability items from its EM. For example, a Reporting Bank shall not deduct from its EM gains or losses on fair valued liabilities or accounting valuation adjustments on derivative liabilities due to changes in the Reporting Bank's own credit risk as described in paragraph 6.1.3(g).

Derivative Transactions

2.7 For a derivative transaction that is not covered by a qualifying bilateral netting agreement, a Reporting Bank shall calculate its exposure measure in respect of the derivative transaction by adding -

(a) the replacement cost[24] as set out in paragraph 1.1(a) of Annex 7O of MAS Notice 637 in force immediately before 1 January 2017 (except that the references to "OTC derivative transaction" shall be replaced by "derivative transaction"); and

(b) the amount for potential future exposure as set out in paragraph 1.1(b) of Annex 7O of MAS Notice 637 in force immediately before 1 January 2017 (except that the references to "OTC derivative transaction" shall be replaced by "derivative transaction").

[MAS Notice 637 (Amendment No. 2) 2018]

2.8 For a derivative transaction that is covered by a qualifying bilateral netting agreement, a Reporting Bank shall calculate its exposure measure in respect of the derivative transaction by adding -

(a) the net replacement cost[24] as set out in paragraph 1.2(a) of Annex 7O of MAS Notice 637 in force immediately before 1 January 2017 (except that the reference to "OTC derivative transactions" shall be replaced by "derivative transactions"); and

(b) an add-on, "$A_{Net}$", for the potential future exposure as set out in paragraphs 1.2(b) and 1.3 of Annex 7O of MAS Notice 637 in force immediately before 1 January 2017 (except that the reference to "OTC derivative transactions" shall be replaced by "derivative transactions").

[MAS Notice 637 (Amendment No. 2) 2018]

2.9 A Reporting Bank shall not apply cross-product netting in the calculation of its EM.

2.10 A Reporting Bank shall not reduce the exposure measure in respect of derivative transactions calculated in accordance with paragraphs 2.7 or 2.8 of this Annex, whichever is applicable, by any collateral received from its counterparty in connection with the derivative transaction. For the avoidance of doubt, the Reporting Bank shall not net any collateral received against the derivative transaction even if such netting is permitted under the Accounting Standards or Part VII. Where collateral provided by the Reporting Bank in relation to a derivative transaction has reduced the value of its balance sheet assets in accordance with the Accounting Standards, the Reporting Bank shall gross up the exposure measure in respect of the derivative transaction by the amount of such collateral.

24 Where there is no accounting measure of exposure for certain derivative instruments because they are held completely off-balance sheet, the Reporting Bank shall use the sum of positive fair values of these derivative instruments as the replacement cost.

2.11 Notwithstanding paragraph 2.10 of this Annex, a Reporting Bank may reduce the exposure measure in respect of a derivative transaction calculated in accordance with paragraphs 2.7 or 2.8 of this Annex, whichever is applicable, by the cash portion of the variation margin received or provided in relation to the derivative transaction, if the following conditions are met:

(a) for trades not cleared through a qualifying CCP as defined in Annex 7AJ, the cash received by the recipient counterparty is not segregated;

(b) the variation margin is calculated and exchanged on a daily basis based on mark-to-market valuation of derivative transactions;

[MAS Notice 637 (Amendment No. 2) 2014]

(c) the cash portion of the variation margin is received in the same currency as the currency of settlement of the derivative contract;

(d) the variation margin exchanged is the full amount necessary to fully extinguish the mark-to-market exposure of the derivative transaction subject to the threshold and minimum transfer amounts applicable to the counterparty; and

(e) the derivatives transactions and variation margins are covered by a single agreement to net[25] between the counterparties in the derivatives transaction and the agreement to net -

(i) explicitly stipulates that the counterparties agree to settle on a net basis any obligation covered by such an agreement to net, taking into account any variation margin received or provided if a credit event occurs involving either counterparty; and

(ii) is legally enforceable and effective in all relevant jurisdictions[26], including in the event of default, insolvency, and bankruptcy.

2.12 For the purposes of paragraph 2.11 of this Annex, a Reporting Bank may:

(a) reduce the replacement cost calculated in accordance with paragraphs 2.7 or 2.8 of this Annex, whichever is applicable, by the amount of the cash portion of the variation margin received[27], if the positive mark-to-market value of the derivative transaction or transactions is not already reduced by the same amount of the cash portion of the variation margin received in accordance with the Accounting Standards; or

(b) in respect of the cash portion of the variation margin provided to a counterparty, where the cash portion of the variation margin has been

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[25] For the purpose of paragraph 2.11 of this Annex, an agreement to net is any agreement that provides legally enforceable right of offsets. A master agreement to net may be deemed to be a single agreement to net.

[26] For the purpose of Annex 4A, "relevant jurisdictions" has the same meaning as in paragraph 3.1(a)(iv) of Annex 7N.

[27] The cash portion of the variation margin shall not be used to reduce the potential future exposure (including the calculation of NGR) calculated in accordance with paragraphs 2.7 and 2.8 of this Annex.

recognised as an asset in accordance with the Accounting Standards, deduct the resulting receivable from its EM.

2.13 Where a Reporting Bank, acting as a clearing member of a qualifying CCP as defined in Annex 7AJ, offers clearing services for derivative transactions to its clients, the Reporting Bank may exclude CCP trade exposures[28] to a qualifying CCP from the calculation of its exposure measure in respect of the derivative transaction if the Reporting Bank is not obligated, based on the contractual arrangements with the client, to reimburse the client for any losses suffered due to changes in the value of its derivative transactions in the event that the qualifying CCP defaults.[29] Where the CCP trade exposures are to a CCP that is not a qualifying CCP as defined in Annex 7AJ, the Reporting Bank shall include the CCP trade exposures based on the treatment for derivative transactions specified in this Annex.

2.14 Where the client enters directly into a derivatives transaction with the CCP and the Reporting Bank acting as a clearing member for the client to the CCP, guarantees the performance of its client's CCP trade exposures to the CCP for the transaction, the Reporting Bank shall calculate its related exposure resulting from the guarantee as an exposure measure in respect of the derivative transaction as set out in paragraphs 2.7 to 2.12 of this Annex, as if the Reporting Bank had entered directly into the transaction with the client, including with regard to the receipt or provision of the cash portion of the variation margin.

Written Credit Derivatives

2.15 In addition to the treatment for derivative transactions, which would include credit derivatives where the Reporting Bank is the protection seller ("written credit derivatives"), set out in paragraphs 2.7 to 2.14 of this Annex, a Reporting Bank shall include, subject to paragraphs 2.16 to 2.17 of this Annex, in its exposure measure in respect of a written credit derivative, the effective notional amount[29A] of the written credit derivative.

2.16 For the purpose of calculating the effective notional amount of the written credit derivative, a Reporting Bank may reduce the effective notional amount by any negative change in fair value amount that has been incorporated into the calculation of CM with respect to the written credit derivative. The Reporting Bank may further reduce the

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[28] For the purposes of paragraphs 2.13 and 2.14 of this Annex, CCP trade exposures shall include initial margin irrespective of whether or not it is posted in a manner that makes it remote from the insolvency of the CCP.

[29] For the avoidance of doubt, where the Reporting Bank is obligated to reimburse the client for any losses suffered due to changes in the value of its transactions in the event that the qualifying CCP defaults, the Reporting Bank shall include the CCP trade exposures based on the treatment for derivative transactions specified in this Annex.

[29A] The effective notional amount of the written credit derivative is obtained by adjusting the notional amount to reflect the true exposure of the written credit derivatives that are leveraged or otherwise enhanced by the structure of the transaction.

resulting amount by the effective notional amount of a purchased credit derivative on the same reference name[29B,29C] if -

(a) the credit protection purchased is on a reference obligation which ranks *pari passu* with or is junior to the underlying reference obligation of the written credit derivative in the case of single name credit derivatives[29D] ; and

(b) the remaining maturity of the purchased credit derivative is equal to or greater than the remaining maturity of the written credit derivative.

2.17 For the purpose of calculating the amount for potential future exposure as set out in paragraphs 2.7(b) and 2.8(b) of this Annex, a Reporting Bank may deduct from the amount for potential future exposure, the individual potential future exposure amount relating to a written credit derivative provided that it is not offset under paragraph 2.16 of this Annex and the effective notional amount is included in the calculation of the written credit derivative under paragraph 2.15 of this Annex[29E].

SFTs

2.18 A Reporting Bank shall calculate its exposure measure in respect of SFTs by adding -

[29B] Two reference names are considered identical only if they refer to the same legal entity. For single-name credit derivatives, protection purchased that references a subordinated position may offset protection sold on a more senior position of the same reference entity as long as a credit event on the senior reference asset would result in a credit event on the subordinated reference asset. A Reporting Bank may offset protection purchased on a pool of reference entities with protection sold on individual reference names if the protection purchased is economically equivalent to buying protection separately on each of the individual names in the pool (this would, for example, be the case if a Reporting Bank were to purchase protection on an entire securitisation structure). If a Reporting Bank purchases protection on a pool of reference names, but the credit protection does not cover the entire pool (i.e. the protection covers only a subset of the pool, as in the case of an nth-to-default credit derivative or a securitisation tranche), then the Reporting Bank shall not be permitted to offset the protection sold on individual reference names. However, a Reporting Bank may offset such purchased protections with sold protections on a pool provided the purchased protection covers the entirety of the subset of the pool on which protection has been sold. In other words, a Reporting Bank may recognise offsetting only when the pool of reference entities and the level of subordination in both transactions are identical.

[29C] The Reporting Bank may reduce the effective notional amount of a written credit derivative by any negative change in fair value reflected in the Reporting Bank's CM provided the effective notional amount of the offsetting purchased credit protection is also reduced by any resulting positive change in fair value reflected in CM. Where a Reporting Bank buys credit protection through a total return swap and records the net payments received as net income, but does not record offsetting deterioration in the value of the written credit derivative (either through reductions in fair value or by an addition to reserves) reflected in CM, the Reporting Bank shall not recognise the credit protection for the purpose of offsetting the effective notional amounts related to written credit derivatives.

[29D] For tranched products, the Reporting Bank shall ensure that the purchased credit protection is on a reference obligation with the same level of seniority.

[29E] For a written credit derivative not covered by a qualifying bilateral netting agreement, a Reporting Bank may set the add-on factor applied to compute the amount for potential future exposure to zero. For a written credit derivative which is covered by a qualifying bilateral netting agreement, a Reporting Bank may reduce $A_{GROSS}$ by the individual add-on amounts for the portion of the written credit derivative whose notional amounts are included in the exposure measure in respect of the written credit derivative. The Reporting bank shall not make any adjustments to NGR.

(a) the gross SFT assets recognised in accordance with the Accounting standards (i.e. with no recognition of accounting netting)[29F] with the following adjustments:

(i) the Reporting Bank shall exclude the value of any securities received under an SFT, where the Reporting Bank has recognised the securities as an asset on its balance sheet; and

(ii) the Reporting Bank may net the cash payables and cash receivables in SFTs with the same counterparty if the following criteria are met:

(A) the transactions have the same explicit final settlement date;

(B) the right to set off the amount owed to the counterparty with the amount owed by the counterparty is legally enforceable both currently in the normal course of business and in the event of default, insolvency, and bankruptcy;

(C) the counterparties intend to settle net or settle simultaneously, or the transactions are subject to a settlement mechanism that results in the functional equivalent of net settlement i.e. the cash flows of the transactions are equivalent, in effect, to a single net amount on the settlement date[29G];

(b) the SFT counterparty exposure calculated in accordance with the following formula:

(i) where the Reporting Bank has entered into a qualifying agreement to net with the counterparty:

$CE_{SFT}^* = \max\{0, [\Sigma(CE_{SFT,i}) - \Sigma(C_{SFT,i})]\}$

where -

(A) "$CE_{SFT}^*$" refers to the SFT counterparty exposure;

(B) "$\Sigma(CE_{SFT,i})$" refers to the total fair value of securities and cash lent to the counterparty for all transactions included in the qualifying agreement to net; and

(C) "$\Sigma(C_{SFT,i})$" refers to the total fair value of securities and cash received from the counterparty for all transactions included in the qualifying agreement to net; and

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29F The Reporting Bank shall not reflect any recognition of accounting netting of cash payables against cash receivables in the gross SFT assets recognised, subject to paragraph 2.18(a)(ii) of this Annex.

29G To achieve such equivalence, both transactions are to be settled through the same settlement system and the settlement arrangements are supported by cash, or intraday credit facilities, or both, intended to ensure that settlement of both transactions will occur by the end of the business day and the linkages to collateral flows do not result in the unwinding of net cash settlement. The latter condition ensures that any issues arising from the securities leg of the SFTs do not interfere with the completion of the net settlement of the cash receivables and payables.

(ii) where the Reporting Bank has not entered into a qualifying agreement to net with the counterparty, calculate for each transaction:

$CE_{SFT,i}* = \max \{0, [(CE_{SFT,i}) - (C_{SFT,i})]\}$

where -

(A) "$CE_{SFT,i}*$" refers to the SFT counterparty exposure for an SFT transaction, *i*;

(B) "$CE_{SFT,i}$" refers to the fair value of securities and cash lent to the counterparty for the SFT transaction, *i*; and

(C) "$C_{SFT,i}$" refers to the fair value of securities and cash received from the counterparty for the SFT transaction, *i*.

2.19 For the purposes of paragraph 2.18(a) of this Annex, where the SFT assets are subject to novation and cleared through a qualifying CCP as defined in Annex 7AJ, a Reporting Bank shall use the final contractual exposure in place of gross SFT assets.

2.20 For the purposes of paragraph 2.18(b) of this Annex, a qualifying agreement to net is an agreement to net that meets the following criteria:

(a) be legally enforceable in each relevant jurisdiction[29H] upon the occurrence of an event of default and regardless of whether the counterparty is insolvent or bankrupt;

(b) provide the non-defaulting party with the right to terminate and close out in a timely manner all transactions under the agreement upon an event of default, including in the event of insolvency or bankruptcy of the counterparty;

(c) provide for the netting of gains and losses on transactions (including the value of any collateral) terminated and closed out under it so that a single net amount is owed by one party to the other; and

(d) allow for the prompt liquidation or setoff of collateral upon the event of default.

2.21 For the purposes of paragraph 2.18(b)(i) of this Annex, a Reporting Bank shall recognise netting across positions in the banking book and trading book only if -

(a) all transactions are marked to market daily; and

(b) the collateral used in the transactions is an eligible financial collateral in the banking book as set out in Annex 7F.

[29H] For the purpose of Annex 4A, "relevant jurisdictions" has the same meaning as in paragraph 3.1(a)(iv) of Annex 7N.

2.22 Where a Reporting Bank has accounted for its SFT using sales accounting, the Reporting Bank shall reverse all sales-related accounting entries and calculate its exposure measure in respect of the SFT in accordance with paragraph 2.18 of this Annex as if the SFT had been treated as a financing transaction in accordance with the Accounting Standards.

2.23 Where a Reporting Bank acting as an agent in an SFT provides an indemnity or guarantee to a customer or counterparty for the difference between the value of the security or cash the customer or counterparty has lent and the value of the collateral the borrower has provided, and only if the Reporting Bank's exposure to the SFT transaction is limited to the guaranteed difference between the value of the security or cash its customer or counterparty has lent and the value of the collateral the borrower has provided, the Reporting Bank shall calculate its exposure measure in respect of the SFT by applying only paragraph 2.18(b) of this Annex.[29I] A Reporting Bank shall include the full amount of the security or cash in the exposure measure in respect of the SFT where the Reporting Bank is economically exposed beyond the guaranteed difference to the underlying security or cash.[29J]

2.24 Subject to paragraph 2.23 of this Annex, where the Reporting Bank acting as an agent in an SFT, does not provide an indemnity or guarantee to any of the parties involved in the SFT, the Reporting Bank may exclude the SFT from its exposure measure in respect of SFTs.

Off-Balance Sheet Items

2.25 For an off-balance sheet item, a Reporting Bank shall calculate its exposure measure in respect of the off-balance sheet item by multiplying the notional amount for the item with -

(a) the applicable CCF set out in Annex 4B of this Part for an off-balance sheet item other than an off-balance sheet securitisation item; and

(b) the applicable CCF set out in Annex 4C of this Part for an off-balance sheet securitisation item.

[MAS Notice 637 (Amendment) 2014]

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[29I] The Reporting Bank generally provides an indemnity or guarantee to one of the two parties involved, and only for the difference between the value of the security or cash its customer or counterparty has lent and the value of the collateral the borrower has provided. Where the Reporting Bank does not own or control the underlying cash or security resource, the resource cannot be leveraged by the Reporting Bank.

[29J] For example, due to the Reporting Bank managing collateral received in the Reporting Bank's name or on its own account rather than on the customer's or borrower's account (e.g. by on-lending or managing unsegregated collateral, cash or securities).

**CCFs FOR OFF-BALANCE SHEET ITEMS OTHER THAN SECURITISATION ITEMS UNDER THE LEVERAGE RATIO[29K]**

| | Description of Off-balance Sheet Item[29KA] | CCF |
|---|---|---|
| (a) | Direct credit substitutes[29L] | 100% |
| (b) | Certain transaction-related contingent items[29M] | 50% |
| (c) | Short-term self-liquidating trade-related contingent items[29N] (applicable to both issuing and confirming banks), and commitments with an original maturity of one year or less, to underwrite debt and equity securities | 20% |
| (d) | Note issuance facilities and revolving underwriting facilities | 50% |
| (e) | Sale and repurchase agreements and asset sales with recourse (other than SFTs), where the credit risk remains with the Reporting Bank[29O] | 100% |
| (f) | Other commitments with certain drawdown[29P] | 100% |
| (g) | Other commitments[29Q] | |
| | (i) with an original maturity of more than one year | 50%[29QA] |
| | (ii) with an original maturity of one year or less | 20% |
| | (iii) which are unconditionally cancellable at any time by the Reporting Bankwithout prior notice, or that effectively provide for automatic cancellation due to deterioration in an obligor's creditworthiness[29R] | 10% |

[MAS Notice 637 (Amendment) 2014]

[29K] Where there is an undertaking to provide a commitment on another off-balance sheet exposure, a Reporting Bank shall apply the lower of the two applicable CCFs.

[29KA] Commitments should be recognised by a Reporting Bank, and recorded as an exposure for the purposes of calculating EM, on the date at which the loan contract or agreement is entered into by the Reporting Bank
[MAS Notice 637 (Amendment) 2016]

[29L] For example, general guarantees of indebtedness, standby letters of credit serving as financial guarantees for loans and securities, and acceptances (including endorsements with the character of acceptances).

[29M] For example, performance bonds, bid bonds, warranties and standby letters of credit related to particular transactions.

[29N] For example, documentary credits collateralised by the underlying shipments.

[29O] The terms of the agreement are such that there is no substantial transfer of all risks and rewards of ownership to the counterparty.

[29P] These would include forward purchases, forward deposits and partly paid securities.

[29Q] For example, formal standby facilities and credit lines.

[29QA] This shall apply in the case where the Reporting Bank makes a commitment to provide a loan that is to be drawn down in a number of tranches, and it shall apply to the full undisbursed portion of the loan.
[MAS Notice 637 (Amendment) 2016]

[29R] The Reporting Bank shall be able to demonstrate to the satisfaction of the Authority that it actively monitors the financial condition of the obligor, and that its internal control systems are such that it is able to cancel the facility upon evidence of a deterioration in the credit quality of the obligor.

**Annex 4C**

## CCFs FOR OFF-BALANCE SHEET SECURITISATION ITEMS UNDER THE LEVERAGE RATIO

| | Description of Off-balance Sheet Item | CCF |
|---|---|---|
| (a) | Unrated eligible liquidity facilities | 50% |
| (b) | Eligible servicer cash advance facilities[29S] | 10%[29T] |
| (c) | Others | 100% |

[MAS Notice 637 (Amendment) 2014]

[29S] This refers to undrawn servicer cash advances or facilities that are contractually provided for and unconditionally cancellable without prior notice, so long as the servicer is entitled to full reimbursement and this right is senior to other claims on cash flows from the underlying exposures.

[29T] A Reporting Bank shall notify the Authority if it intends to provide such cash advance facilities and when there is a drawdown.

## PART V: TRANSITIONAL ARRANGEMENTS

Capital Floors

5.1.1 For the first year from the date of adoption of the IRBA, a Reporting Bank which has adopted the IRBA shall, at both the Solo and Group levels, meet capital floors based on -

(a) the Total Capital Resources Requirement calculated using the approaches adopted by the Reporting Bank under this Notice; or

(b) 95% or such other percentage (in any case, not more than 100%) as the Authority may determine of the Total Capital Resources Requirement calculated using the rules in MAS Notice 637 in force immediately before 1 Jan 2008,

whichever will result in a higher amount of capital floors.

[MAS Notice 637 (Amendment) 2017]

5.1.2 For the second year from the date of adoption of the IRBA, a Reporting Bank which has adopted the IRBA shall, at both the Solo and Group levels, meet capital floors based on -

(a) the Total Capital Resources Requirement calculated using the approaches adopted by the Reporting Bank under this Notice; or

(b) 90% or such other percentage (in any case, not more than 100%) as the Authority may determine of the Total Capital Resources Requirement calculated using the rules in MAS Notice 637 in force immediately before 1 Jan 2008,

whichever will result in a higher amount of capital floors.

[MAS Notice 637 (Amendment) 2017]

5.1.3 For the third year and all subsequent years from the date of adoption of the IRBA, a Reporting Bank which has adopted the IRBA shall, at both the Solo and Group levels, meet capital floors based on-

(a) the Total Capital Resources Requirement calculated using the approaches adopted by the Reporting Bank under this Notice; or

(b) 80% or such other percentage (in any case, not more than 100%) as the Authority may determine of the Total Capital Resources Requirement calculated using the rules in MAS Notice 637 in force immediately before 1 Jan 2008,

whichever will result in a higher amount of capital floors.

[MAS Notice 637 (Amendment) 2017]

5.1.3A As an alternative to the use of the amounts referred to in paragraphs 5.1.1(b), 5.1.2(b) and 5.1.3(b), a Reporting Bank may use 80% or such other percentage (in any case, not more than 100%) as the Authority may determine of the Total Capital Resources Requirement calculated using the rules in this Notice, with RWA of the Reporting Bank comprising the sum of –

(a) its –

(i) SA(CR) RWA;

(ii) SA(EQ) RWA;

(iii) SEC-ERBA RWA;

(iv) SEC-SA RWA; and

(v) RWA from securitisation exposures to which the SEC-IRBA, SEC-ERBA and SEC-SA cannot be applied,

assuming the Reporting Bank had not adopted IRBA[29U];

(b) its RWA for investments referred to in para 6.1.3(p), calculated in accordance with paragraph 6.1.3(p)(iii); and

(c) its SA(MR) RWA.

[MAS Notice 637 (Amendment) 2017]
[MAS Notice 637 (Amendment No. 3) 2017]

5.1.3B The Reporting Bank shall notify the Authority in advance if it intends to use the alternative approach referred to in paragraph 5.1.3A or if, having used the alternative approach, it intends to revert to using the amount referred to in paragraph 5.1.1(b), 5.1.2(b) or 5.1.3(b), as the case may be.

[MAS Notice 637 (Amendment) 2017]

5.1.3C If the amount calculated in paragraph 5.1.1(b), 5.1.2(b), 5.1.3(b) or 5.1.3A, as the case may be, is greater than the corresponding amount calculated in paragraph 5.1.1(a), 5.1.2(a) or 5.1.3(a), as the case may be, a Reporting Bank shall –

(a) multiply the difference by the reciprocal of the minimum Total CAR requirement in paragraph 4.1.4; and

[29U] For the avoidance of doubt, a Reporting Bank shall calculate:
(a) an SA(CR) RWA in respect of all its actual SA(CR) exposures and IRBA exposures;
(b) an SA(EQ) RWA in respect of all its actual SA(EQ) exposures and IRBA(EQ) exposures; and
(c) an SEC-ERBA RWA, SEC-SA RWA, or RWA from securitisation exposures to which the SEC-IRBA, SEC-ERBA and SEC-SA cannot be applied, as determined in accordance with the hierarchy of approaches set out in paragraphs 7.6.14 to 7.6.17, in respect of all its securitisation exposures.

[MAS Notice 637 (Amendment No. 3) 2017]

(b) add the figure obtained in sub-paragraph (a) (referred to as the "floor adjustment") to the Total RWA in the denominators of its capital adequacy ratios in paragraphs 4.1.1, 4.1.2 and 4.1.3 respectively.

[MAS Notice 637 (Amendment) 2017]

5.1.4 The Authority may impose additional bank-specific capital requirements, including extending the period of operation of the capital floors set out in paragraph 5.1.1, 5.1.2 and 5.1.3.

5.1.5 A Reporting Bank which has adopted the AMA shall meet capital floors that shall be calculated in a manner specified by the Authority.[30]

5.1.6 For the purposes of this Part, "Total Capital Resources Requirement" means –

(a) in the case where the Reporting Bank is using the rules in MAS Notice 637 in force immediately before 1 Jan 2008, the RWA of the Reporting Bank multiplied by the minimum Total CAR applicable to the Reporting Bank, adjusted by adding deductions from Tier 1 Capital and deductions from Total Capital referred to in paragraphs 12 and 18 respectively, and deducting the general provisions referred to in paragraph 16(a), of that Notice; or

(b) in the case where the Reporting Bank is using the rules in this Notice, the RWA of the Reporting Bank multiplied by the minimum Total CAR applicable to the Reporting Bank, adjusted by adding regulatory adjustments in CET1 Capital referred to in paragraph 6.1.3, regulatory adjustments in AT1 Capital referred to paragraph 6.2.3, and regulatory adjustments in Tier 2 Capital referred to in 6.3.3, and deducting the items referred to in paragraphs 6.3.1(d) and (e), subject to the transitional arrangements set out in Division 5 of Part VI.

[MAS Notice 637 (Amendment) 2017]
[MAS Notice 637 (Amendment No. 3) 2017]

[30] Where the Reporting Bank has adopted the AMA before the adoption of the IRBA, the Reporting Bank shall meet capital floors as computed in paragraphs 5.1.1, 5.1.2 and 5.1.3 for respectively the first, second, and third and all subsequent years of adoption of the AMA.

## PART VI: DEFINITION OF CAPITAL

### Division 1: Common Equity Tier 1 Capital

Components of CET1 Capital

6.1.1 CET1 Capital of a Reporting Bank shall be the sum of the following items, whether at the Solo or Group level, as the case may be:

[MAS Notice 637 (Amendment No. 2) 2014]

(a) paid-up ordinary shares of the Reporting Bank that comply with the requirements in paragraph 6.1.2;

(b) share premium, resulting from the issuance of ordinary shares which fall within sub-paragraph (a), if any;

[MAS Notice 637 (Amendment No. 2) 2014]

(c) retained earnings, after deducting any interim or final dividends which have been declared by the Board of the Reporting Bank or any banking group entity on any class of shares and any interim losses incurred since the end of the last financial reporting period and may include any interim profits earned since the end of the last financial reporting period where the following conditions are met:

(i) every quarterly financial statement is prepared using the same accounting policies and practices applied in the preparation of the year-end financial statements, unless the change in the accounting policy or practice is in accordance with any statutory requirement;

(ii) every quarterly financial statement and every significant transaction is reviewed in a timely manner by an external auditor; and

(iii) the external auditor of the Reporting Bank has not expressed a qualified opinion on any of the quarterly financial statements in the preceding 12 months of the end of the interim financial reporting period;

[MAS Notice 637 (Amendment No. 2) 2014]

(d) accumulated other comprehensive income and other disclosed reserves, other than revaluation surpluses on land and building assets, accumulated revaluation gains from investment properties and balances maintained in a non-distributable regulatory loss allowance reserve account pursuant to paragraph 6.3 of MAS Notice 612;

[MAS Notice 637 (Amendment No. 2) 2014]
[MAS Notice 637 (Amendment No. 3) 2017]

(e) 45% of revaluation surpluses on land and building assets and accumulated

revaluation gains from investment properties, where the following conditions pertaining to revaluations are satisfied:

(i) the valuation of any land and building asset or investment property is obtained from a qualified property valuer and the increase in value is recorded as a revaluation surplus or gain in the financial statements;

(ii) a new valuation from a qualified property valuer in respect of the land and building asset or investment property is obtained -

(A) at least once every 3 years; or

(B) where the value of the land and building asset or investment property has been substantially impaired by any event,

whichever is earlier;

(iii) impairment charges taken against any land and building asset or investment property are not netted against revaluation surplus or gain from any other asset; and

(iv) the external auditor of the Reporting Bank has not expressed a qualified opinion on the revaluation of any land and building asset or investment property;

[MAS Notice 637 (Amendment No. 2) 2014]

(f) paid-up ordinary shares issued by fully consolidated subsidiaries of the Reporting Bank and held by third party investors (i.e. minority interest) that meet the criteria for inclusion in CET1 Capital pursuant to paragraph 6.1.4; and

(g) regulatory adjustments set out in paragraph 6.1.3.

Minimum Requirements for Paid-Up Ordinary Shares

6.1.2 For the purpose of paragraph 6.1.1(a), a Reporting Bank shall not include a paid-up ordinary share[31] of the Reporting Bank as CET1 Capital unless -

[MAS Notice 637 (Amendment No. 2) 2014]

(a) the ordinary share represents the most subordinated claim in liquidation;

(b) the entitlement of ordinary shareholders to a claim on the residual assets is proportional to their share of issued share capital, after all senior claims have been repaid in liquidation. In this regard, the claims of such holders

[31] In the case where the Reporting Bank issues non-voting ordinary shares as part of CET1 Capital, the non-voting ordinary shares shall be identical to the voting ordinary shares of the Reporting Bank in all respects, except the absence of voting rights.

are unlimited and variable (i.e. not fixed or capped);

(c) the amount paid-up by ordinary shareholders is perpetual and is not repaid outside of liquidation. This excludes discretionary repurchases by the Reporting Bank or other means of reducing capital in a discretionary manner that is allowable under written law;

[MAS Notice 637 (Amendment No. 2) 2014]

(d) the Reporting Bank does not create an expectation at issuance that the ordinary shares will be bought back, redeemed or cancelled, nor do the contractual terms provide any feature that might give rise to such an expectation;

(e) distributions in respect of ordinary shares ("distributions") are only paid by the Reporting Bank to the extent that the Reporting Bank has profits distributable under written law. The level of distributions is not tied or linked to the amount paid-up at issuance, and is not subject to a contractual cap, except to the extent that the Reporting Bank is unable to pay distributions that exceed the level of profits distributable under written law;

[MAS Notice 637 (Amendment No. 2) 2014]

(f) there are no circumstances under which distributions are obligatory and the non-payment of distributions is not an event of default;

[MAS Notice 637 (Amendment No. 2) 2014]

(g) distributions are only paid after all legal and contractual obligations have been met, and after payments on AT1 capital instruments and Tier 2 capital instruments have been made. In this regard, there are no preferential distributions, including in respect of other CET1 capital instruments;

[MAS Notice 637 (Amendment No. 2) 2014]

(h) the ordinary share takes the first and proportionately greatest share of any losses as they occur.[32] In this regard, it absorbs losses on a going-concern basis proportionately and *pari passu* with all other CET1 capital instruments;

(i) the amount paid-up by ordinary shareholders is recognised as equity and not a liability, for the purposes of determining balance sheet insolvency;

[MAS Notice 637 (Amendment No. 2) 2014]

(j) the amount paid-up by ordinary shareholders is classified as equity under the Accounting Standards;

[32] For the avoidance of doubt, in cases where capital instruments have a permanent write-down feature, this criterion is still deemed to be met by ordinary shares.

(k) the ordinary share is directly issued and fully paid-up in cash, and purchase of the ordinary share is not directly or indirectly funded by the Reporting Bank;

(l) the amount paid-up by ordinary shareholders is not secured or covered by a guarantee of the Reporting Bank or any of its related corporations or other affiliates. In addition, the ordinary share is not subject to any other arrangement that legally or economically enhances the seniority of the claim;

(m) the ordinary share is issued with the approval of the ordinary shareholders. The approval is either given directly by the ordinary shareholders or, if permitted by written law, given by the Board of the Reporting Bank or by other persons duly authorised by the ordinary shareholders; and

(n) the ordinary share is clearly and separately disclosed on the Reporting Bank's balance sheet.

Regulatory Adjustments Applied in the Calculation of CET1 Capital

6.1.3 A Reporting Bank shall apply the following regulatory adjustments in the calculation of CET1 Capital at the Solo or Group level, as the case may be:

[MAS Notice 637 (Amendment No. 2) 2014]

(a) goodwill, including any goodwill included in the valuation of investments in unconsolidated major stake companies, shall be deducted in the calculation of CET1 Capital.[33] The full amount representing goodwill shall be deducted, net of any associated deferred tax liability that would be extinguished if the goodwill becomes impaired or is derecognised under the Accounting Standards;

[MAS Notice 637 (Amendment No. 2) 2014]
[MAS Notice 637 (Amendment) 2016]

(b) intangible assets, including but not limited to copyright, patents and other intellectual property, shall be deducted in the calculation of CET1 Capital. The full amount representing intangible assets shall be deducted, net of any associated deferred tax liability that would be extinguished if the intangible assets become impaired or are derecognised under the Accounting Standards;

[MAS Notice 637 (Amendment No. 2) 2014]

[33] For the avoidance of doubt, goodwill included in the carrying amount of associates accounted for using the equity method shall be deducted from CET1 Capital at the Group level. Such goodwill shall be calculated by separating any excess of the acquisition cost over the Reporting Bank's share of the net fair value of the identifiable assets and liabilities of the entity.

(c) deferred tax assets that rely on the future profitability of the Reporting Bank or any banking group entity to be realised shall be deducted in the calculation of CET1 Capital.[34]

At the Solo level, deferred tax assets may be netted with associated deferred tax liabilities prior to being deducted in the calculation of CET1 Capital, only if offsetting is permitted by the relevant tax authority. The deferred tax liabilities permitted to be netted against deferred tax assets shall exclude amounts that have been netted against the deduction of goodwill, intangible assets and defined benefit pension assets pursuant to sub-paragraphs (a), (b) and (h) respectively of this paragraph.

The Reporting Bank shall not permit the following for the purposes of calculating CET1 CAR, Tier 1 CAR or Total CAR at the Group level:

(i) intra-entity netting of deferred tax assets against deferred tax liabilities for any banking group entity incorporated or established outside Singapore; and

(ii) inter-entity netting of deferred tax assets against deferred tax liabilities.

However, the Authority may permit sub-paragraphs (i) and (ii) above if the Reporting Bank confirms in writing to the Authority that the deferred tax assets and deferred tax liabilities relate to taxes levied by the same tax authority, and that it has received written opinions from external auditors and legal advisors that the relevant tax authorities allow or would allow, deferred tax assets to be offset against the deferred tax liabilities. For the avoidance of doubt, the deferred tax liabilities permitted to be netted against deferred tax assets shall exclude amounts that have been netted against the deduction of goodwill, intangible assets and defined benefit pension assets pursuant to sub-paragraphs (a), (b) and (h) respectively of this paragraph;

(d) the amount of cash flow hedge reserve that relates to the hedging of items that are not fair valued on the balance sheet, including projected cash flows, shall be derecognised in the calculation of CET1 Capital. In this regard, positive amounts shall be deducted, and negative amounts shall be added back[35];

(e) in the case where the Reporting Bank has adopted the IRBA, any shortfall of the TEP relative to the EL amount shall be deducted in the calculation of CET1 Capital. The full amount shall be deducted, and shall not be reduced by any tax effects that could be expected to occur if provisions

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[34] An overinstallment of tax or current year tax losses carried back to prior years may give rise to a claim or receivable from the government or relevant tax authority. Such amounts are usually classified as current tax assets for accounting purposes. As the recovery of such a claim or receivable does not rely on the future profitability of the Reporting Bank or any banking group entity, it shall be assigned the relevant sovereign risk-weighting.

[35] This adjustment specifically identifies and removes the element of the cash flow hedge reserve that gives rise to artificial volatility in common equity, as the reserve only reflects the fair value of the derivative, and not the change in the fair value of the hedged future cash flow.

were to rise to the level of EL amount;

(f) any increase in equity resulting from a securitisation transaction, such as that which is associated with expected future margin income resulting in a gain-on-sale, shall be deducted in the calculation of CET1 Capital;

[MAS Notice 637 (Amendment No. 2) 2014]

(fa) any exposures to credit-enhancing interest-only strips, net of:

(i) specific allowances attributable to such exposures; and

(ii) the amount that shall be deducted in the calculation of CET1 Capital under sub-paragraph (f) that is attributable to such exposures;

shall be deducted in the calculation of CET1 Capital;

[MAS Notice 637 (Amendment No. 2) 2017]
[MAS Notice 637 (Amendment No. 3) 2017]

(g) all unrealised fair value gains or losses on financial liabilities arising from changes in the credit risk of the Reporting Bank or any banking group entity shall be derecognised in the calculation of CET1 Capital. In this regard, positive amounts shall be deducted, and negative amounts shall be added back. In addition, all accounting valuation adjustments on derivative liabilities arising from changes in the credit risk of the Reporting Bank or any banking group entity shall be derecognised in the calculation of CET1 Capital. The offsetting between valuation adjustments arising from changes in the credit risk of the Reporting Bank or any banking group entity and those arising from changes in the credit risk of the counterparties shall not be allowed. In addition, any funding valuation adjustment applied by a Reporting Bank or any banking group entity shall not have the effect of offsetting or reducing its unrealised fair value gains or losses on financial liabilities or accounting valuation adjustments on derivative liabilities arising from changes in the credit risk of the Reporting Bank or any banking group entity, for the purpose of calculating the amount to be derecognised in the calculation of CET1 Capital;

[MAS Notice 637 (Amendment) 2016]

(h) any defined benefit pension fund liabilities, as included in the balance sheet, shall be fully recognised in the calculation of CET1 Capital. For each defined benefit pension fund that is an asset on the balance sheet, the asset shall be deducted in the calculation of CET1 Capital net of any associated deferred tax liabilities which would be extinguished if the asset becomes impaired or derecognised under the Accounting Standards. Assets in the fund to which the Reporting Bank has unrestricted and unfettered access may, with the prior approval of the Authority, offset the deduction. Such offsetting assets shall be given the risk weight they would

receive if they were owned directly by the Reporting Bank[36];

(i) all investments in the Reporting Bank's own ordinary shares (including treasury shares, where applicable), whether held directly or indirectly[37] by the Reporting Bank or any of its banking group entities, shall be deducted in the calculation of CET1 Capital, unless already derecognised under the Accounting Standards.[38] If the Reporting Bank or any of its banking group entities is contractually obliged to purchase any of its own ordinary shares, the Reporting Bank shall deduct such ordinary shares in the calculation of CET1 Capital. This adjustment shall apply to exposures in both the banking book and trading book.[39]

Gross long positions may be deducted net of short positions in the same underlying exposure, only if the short positions involve no counterparty credit risk. The Reporting Bank shall look through holdings of index securities to deduct exposures to its own ordinary shares.[40] However, gross long positions in its own ordinary shares resulting from holdings of index securities may be netted against short positions in its own ordinary shares, which result from short positions in the same underlying index[41];

[MAS Notice 637 (Amendment No. 2) 2014]

(j) reciprocal cross holdings in the ordinary share capital of financial institutions that are designed to artificially inflate the capital position of the Reporting Bank shall be deducted in the calculation of CET1 Capital;

(k) [Deleted by MAS Notice 637 (Amendment) 2016]

(l) PE/VC investments held beyond the relevant holding periods set out in MAS Notice 630 shall be deducted in the calculation of CET1 Capital, unless otherwise approved by the Authority;

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36 This adjustment addresses the concern that assets arising from pension funds may not be capable of being withdrawn and used for the protection of depositors and other creditors of the Reporting Bank. The concern is that their only value stems from a reduction in future payments into the fund. The treatment allows the Reporting Bank to reduce the deduction of the assets if it can address these concerns and show that the assets can be easily and promptly withdrawn from the fund.

37 Indirect holdings are exposures or parts of exposures that, if a direct holding loses its value, will result in a loss to the Reporting Bank substantially equivalent to the loss in value of the direct holding.

38 This deduction is to avoid the double counting of the Reporting Bank's own capital that arises from direct holdings, indirect holdings via index funds and potential future holdings as a result of contractual obligations to purchase own shares.

39 For the avoidance of doubt, this adjustment does not cover ordinary shares held by the Reporting Bank or any of its banking group entities where:
(a) the investments in the ordinary shares are funded by third parties other than the Reporting Bank or any of its banking group entities (e.g. life insurance policyholders or other third party investors);
(b) the risks and rewards associated with the investments in ordinary shares are borne primarily by the third parties; and
(c) decisions to transact in the ordinary shares are made independently from the issuer of the capital instruments and in the interests of the third parties.

40 If the Reporting Bank finds it operationally burdensome to look through and monitor its exact exposure to its own capital as a result of its holdings of index securities, the Reporting Bank may, with the prior approval of the Authority, use a conservative estimate. The methodology for the estimate should demonstrate that in no case will the actual exposure be higher than the estimated exposure.

41 In such cases, the short positions may involve counterparty credit risk, which will be subject to the relevant counterparty credit risk charge.

42 [Deleted by MAS Notice 637 (Amendment) 2016]

(m) the full amount of capital deficits in subsidiaries that are financial institutions and that are subject to minimum prudential standards and supervision by a regulatory agency, and the pro-rata share of capital deficits in associates that are financial institutions and that are subject to minimum prudential standards and supervision by a regulatory agency, shall be deducted in the calculation of CET1 Capital. In the event that a recapitalisation plan is in place or an irrevocable commitment has been given by other shareholders to make up the capital deficit, the Authority may approve a corresponding reduction in the amount of deductions in respect of such capital deficits;

(n) valuation adjustments made in accordance with Annex 8N that exceed the valuation adjustments made under financial reporting standards shall be deducted in the calculation of CET1 Capital;

(o) certain investments in the ordinary shares of unconsolidated financial institutions in which the Reporting Bank does not hold a major stake, shall be deducted in the calculation of CET1 Capital, in accordance with sub-paragraphs (i) and (ii) below:

(i) the amount of such investments to be deducted in the calculation of CET1 Capital shall be the proportion of ordinary share holdings to total capital holdings multiplied by the amount by which total capital holdings in aggregate exceed 10% of the Reporting Bank's common equity. In this sub-paragraph, the Reporting Bank's common equity for the purpose of calculating the 10% threshold shall be calculated after applying the regulatory adjustments set out in sub-paragraphs (a) to (n) above to the sum of the elements set out in paragraphs 6.1.1(a) to (f);

(ii) the total capital holdings and ordinary share holdings referred to in sub-paragraph (i) above shall be calculated as follows:

(A) direct, indirect[37] and synthetic holdings of capital instruments shall be included. For example, the Reporting Bank shall look through holdings of index securities to determine the underlying holdings of capital[43];

(B) the net long positions in both the banking book and trading book shall be included. In this regard, the gross long position can be offset against the short position in the same underlying exposure, if the maturity of the short position either matches the maturity of the long position, or has a residual maturity of

[43] If the Reporting Bank finds it operationally burdensome to look through and monitor its exact exposure to the capital of such entities as a result of its holdings of index securities, the Reporting Bank may, with the prior approval of the Authority, use a conservative estimate. The methodology for the estimate should demonstrate that in no case will the actual exposure be higher than the estimated exposure.

at least one year[44,45,46];

(C) underwriting positions held for a period longer than five working days shall be included, while those positions held for five working days or less can be excluded;

(D) if the capital instrument of the entity in which the Reporting Bank has invested does not meet the criteria for CET1 Capital, AT1 Capital or Tier 2 Capital of the Reporting Bank, the capital instrument is to be considered as ordinary shares for the purpose of this regulatory adjustment[47];

(E) the maximum amount that could be paid out on any guarantee or capital enhancement, through which capital support is provided by the Reporting Bank to a financial institution shall be included. The Reporting Bank shall consult the Authority if there is uncertainty whether such guarantee or capital enhancement is to be considered as ordinary shares for the purpose of the regulatory adjustment; and

(F) certain investments where these have been made in the context of resolving or providing financial assistance to reorganise a distressed institution may be temporarily excluded with the approval of the Authority; and

(iii) the amount of total capital holdings that do not exceed the 10%

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[44] For positions in the trading book, if the Reporting Bank has a contractual right or obligation to sell a long equity position at a specific point in time and the counterparty in the contract has an obligation to purchase the long equity position if the Reporting Bank exercises its right to sell, this point in time may be treated as the maturity of the long position, and the maturity of the long and short positions are deemed to be matched.

[45] For a position hedged against market risk where the hedge does not qualify to offset the gross long position for the purpose of determining the amount to be deducted, the Reporting Bank may choose to include the long position in its calculation of market RWA, in addition to deducting the long position. Where the hedge qualifies to offset the gross long position, the Reporting Bank may choose to exclude both positions from its calculation of market RWA.

[46] Where a Reporting Bank uses a short position in an index to hedge a long position, the portion of the index that is composed of the same underlying exposure that is being hedged may be used to offset the long position only if (a) both positions are held in the trading book; (b) the positions are accounted for at fair value; and (c) the hedge is recognised as effective under the Reporting Bank's internal control processes, as assessed by the Authority.

[47] For the avoidance of doubt,

(a) a capital instrument would be deemed to have met the criteria for CET1 Capital, AT1 Capital or Tier 2 Capital of the Reporting Bank, if it satisfies the applicable regulatory capital criteria imposed by a bank regulatory agency that has implemented the Basel III standards;

(b) if the entity in which the Reporting Bank has invested is a financial institution that is subject to minimum prudential standards and supervision by a regulatory agency and the investment is not included as regulatory capital of the entity, the investment can be excluded for the purpose of this regulatory adjustment; and

[MAS Notice 637 (Amendment) 2016]

(c) if the entity in which the Reporting Bank has invested is a financial institution that is not a bank, the entity is subject to minimum prudential standards and supervision by a regulatory agency and the investment is not in the form of ordinary shares but is nevertheless recognised as Tier 1 capital (or its equivalent) or Tier 2 capital (or its equivalent) of the entity, the capital instrument shall be considered as an AT1 capital instrument or Tier 2 capital instrument, respectively, for the purpose of this regulatory adjustment.

[MAS Notice 637 (Amendment) 2016]

threshold calculated in accordance with sub-paragraph (i) above and are not deducted shall continue to be risk-weighted[48]. For the application of risk-weighting, the amount of the holdings shall be allocated on a pro rata basis between those below and those above the threshold;

[MAS Notice 637 (Amendment) 2016]

(p) certain investments in the ordinary shares of unconsolidated financial institutions in which the Reporting Bank holds a major stake (including insurance subsidiaries at the Solo and Group levels), shall be deducted in the calculation of CET1 Capital, in accordance with sub-paragraphs (i) and (ii) below, unless a deduction has been made pursuant to sub-paragraph (l) above:

(i) the amount of such investments to be deducted in the calculation of CET1 Capital shall be the amount by which such investments in aggregate exceed the threshold amount. In this sub-paragraph, the threshold amount is the lower of[49]:

(A) 10% of the Reporting Bank's common equity, calculated by applying the regulatory adjustments set out in sub-paragraphs (a) to (o) above to the sum of elements set out in paragraph 6.1.1(a) to (f); and

(B) 15% of the Reporting Bank's CET1 Capital[50];

(ii) the investments in aggregate referred to in sub-paragraph (i) above shall be calculated as follows:

(A) direct, indirect[37] and synthetic holdings shall be included. For example, the Reporting Bank shall look through holdings of index securities to determine the underlying holdings of ordinary shares[43];

(B) the net long positions in both the banking book and trading book shall be included. In this regard, the gross long position can be offset against the short position in the same underlying exposure, if the maturity of the short position either matches the maturity of the long position or has a residual maturity of at least one year[44,45,46];

(C) underwriting positions held for a period longer than five working days shall be included, while those positions held for

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48 Capital instruments in the banking book and trading book will thus be subject to the appropriate capital treatment as set out in Part VII and Part VIII, respectively.

49 For the period from 1 January 2013 to 31 December 2017, the threshold amount is based on sub-paragraph (A) only. The requirement to calculate the threshold amount based on the lower of sub-paragraph (A) and sub-paragraph (B) will take effect from 1 January 2018.

50 This is equivalent to 17.65% of the Reporting Bank's common equity after (a) applying all regulatory adjustments set out in paragraphs 6.1.3(a) to (o); and (b) deducting in full such investments described in paragraph 6.1.3(p)(ii).

five working days or less can be excluded;

(D) if the capital instrument of the entity in which the Reporting Bank has invested does not meet the criteria for CET1 Capital, AT1 Capital or Tier 2 Capital of the Reporting Bank, the capital instrument is to be considered as ordinary shares for the purpose of this regulatory adjustment[50A];

(E) the maximum amount that could be paid out on any guarantee or capital enhancement, through which capital support is provided by the Reporting Bank to a financial institution shall be included. The Reporting Bank shall consult the Authority if there is uncertainty whether such guarantee or capital enhancement is to be considered as ordinary shares for the purpose of the regulatory adjustment; and

(F) certain investments where these have been made in the context of resolving or providing financial assistance to reorganise a distressed institution may be temporarily excluded with the approval of the Authority; and

(iii) the amounts of such investments that do not exceed the thresholds set out in sub-paragraph (i) above and are not deducted shall be risk-weighted at 250%;

[MAS Notice 637 (Amendment No. 2) 2014]
[MAS Notice 637 (Amendment) 2016]

(q) any other item or class of items which the Authority may specify in writing to the Reporting Bank for the purpose of this paragraph; and

(r) in the case where the Reporting Bank does not have enough AT1 Capital to satisfy the required deductions set out in paragraph 6.2.3, the shortfall shall be deducted in the calculation of CET1 Capital.

Ordinary Shares Issued by Fully Consolidated Subsidiaries

6.1.4 A Reporting Bank shall calculate the amount of minority interest that will be

[50A] For the avoidance of doubt,
(a) a capital instrument would be deemed to have met the criteria for CET1 Capital, AT1 Capital or Tier 2 Capital of the Reporting Bank, if it satisfies the applicable regulatory capital criteria imposed by a bank regulatory agency that has implemented the Basel III standards;
(b) if the entity in which the Reporting Bank has invested is a financial institution that is subject to minimum prudential standards and supervision by a regulatory agency and the investment is not included as regulatory capital of the entity, the investment can be excluded for the purpose of this regulatory adjustment; and
(c) if the entity in which the Reporting Bank has invested is a financial institution that is not a bank, the entity is subject to minimum prudential standards and supervision by a regulatory agency and the investment is not in the form of ordinary shares but is nevertheless recognised as Tier 1 capital (or its equivalent) or Tier 2 capital (or its equivalent) of the entity, the capital instrument shall be considered as an AT1 capital instrument or Tier 2 capital instrument, respectively, for the purpose of this regulatory adjustment.

[MAS Notice 637 (Amendment) 2016]

recognised as consolidated CET1 Capital as follows (please refer to Annex 6A for an illustrative example):

(a) CET1 capital that is held by third party investors ("eligible minority interest"); less

(b) the surplus CET1 Capital of the subsidiary attributable to the minority shareholders;

where:

(i) eligible minority interest is such minority interest that arises from paid-up ordinary shares issued by a fully consolidated subsidiary of the Reporting Bank which is a bank (whether licensed or regulated in Singapore or outside Singapore)[51,52] that if issued by the Reporting Bank, would meet all of the criteria for classification as ordinary shares for regulatory capital purposes, and includes retained earnings and reserves of such a subsidiary that are attributable to third party investors;

(ii) the surplus CET1 Capital of the subsidiary is calculated as the CET1 Capital of the subsidiary, minus the lower of:

(A) 9%[53] of the subsidiary's total RWA; and

(B) 9%[54] of the consolidated RWA attributable to the subsidiary; and

(iii) the surplus CET1 Capital of the subsidiary attributable to minority shareholders is calculated by multiplying the surplus CET1 Capital of the subsidiary calculated in sub-paragraph (ii), by the percentage of eligible minority interest.

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51 For the purpose of this paragraph, any financial institution that is subject to the same minimum prudential standards and level of supervision as a bank may be considered to be a bank.

52 Minority interest in a subsidiary that is itself a bank is strictly excluded from the consolidated CET1 Capital if the Reporting Bank or any of its related corporations or other affiliates have entered into any arrangements to fund directly or indirectly, minority investment in the subsidiary whether through an SPE or through another vehicle or arrangement. The treatment outlined above is thus applicable only where all minority investments in that subsidiary represent genuine third party common equity contributions to the subsidiary.

53 This represents the sum of the minimum CET1 CAR of 6.5% and Capital Conservation Buffer of 2.5% that is applicable to the banking group. Where the Reporting Bank is not designated by the Authority as a D-SIB, the ratios set out in paragraph 62 of "Basel III: A global regulatory framework for more resilient banks and banking systems" issued by the BCBS in December 2010 (last revised in June 2011), shall apply (i.e. 7% of the subsidiary's total RWA, which represents the sum of the minimum CET1 CAR of 4.5% and Capital Conservation Buffer of 2.5%).

[MAS Notice 637 (Amendment) 2016]

54 This represents the sum of the minimum CET1 CAR of 6.5% and Capital Conservation Buffer of 2.5% that is applicable to the banking group. Where the Reporting Bank is not designated by the Authority as a D-SIB, the ratios set out in paragraph 62 of "Basel III: A global regulatory framework for more resilient banks and banking systems" issued by the BCBS in December 2010 (last revised in June 2011), shall apply (i.e. 7% of the consolidated RWA attributable to the subsidiary, which represents the sum of the minimum CET1 CAR of 4.5% and Capital Conservation Buffer of 2.5%).

[MAS Notice 637 (Amendment) 2016]

For the avoidance of doubt, a Reporting Bank shall not include capital that has been issued to third party investors out of an SPE in CET1 Capital.

[MAS Notice 637 (Amendment No. 2) 2014]

**Division 2: Additional Tier 1 Capital**

Components of AT1 Capital

6.2.1 AT1 Capital of a Reporting Bank shall be the sum of the following items, whether at the Solo or Group level, as the case may be:

[MAS Notice 637 (Amendment No. 2) 2014]

(a) capital instruments issued by the Reporting Bank which comply with the requirements in paragraph 6.2.2, and are not included in CET1 Capital;

[MAS Notice 637 (Amendment No. 2) 2014]

(b) share premium, resulting from the issuance of capital instruments which fall within sub-paragraph (a), if any. Any share premium that is not eligible for inclusion in CET1 Capital shall be included in AT1 Capital only if the shares giving rise to the share premium comply with the requirements in paragraph 6.2.2;

[MAS Notice 637 (Amendment No. 2) 2014]

(c) capital instruments issued by fully consolidated subsidiaries of the Reporting Bank and held by third party investors that meet the criteria for inclusion in AT1 Capital pursuant to paragraphs 6.2.4 and 6.2.5, and are not included in CET1 Capital; and

(d) regulatory adjustments set out in paragraph 6.2.3.

Minimum Requirements for AT1 Capital Instruments

6.2.2 For the purpose of paragraph 6.2.1(a), a Reporting Bank shall not include a capital instrument of the Reporting Bank as AT1 Capital unless -

[MAS Notice 637 (Amendment No. 2) 2014]

(a) the capital instrument is issued and fully paid-up in cash[55];

(b) the capital instrument is subordinated to depositors and general creditors of the Reporting Bank, and holders of Tier 2 capital instruments issued by the Reporting Bank;

(c) the paid-up amount is not guaranteed by the Reporting Bank or any of its

[55] Only the net proceeds received from the issuance of the capital instrument shall be included as capital.

related corporations or other affiliates, or covered under any other arrangement that legally or economically enhances the seniority of the claim vis-a-vis the Reporting Bank's creditors[56];

[MAS Notice 637 (Amendment) 2012]
[MAS Notice 637 (Amendment No. 2) 2014]

(d) the holder of the capital instrument waives his right, if any, to set off any amounts he owes the Reporting Bank against any subordinated amount owed to him due to the capital instrument and commits to return any set-off amounts or benefits received to the liquidator;

(e) the subordination provisions of the capital instrument are governed by the laws of Singapore and for capital instruments issued on or after 1 January 2017, the agreements governing the issuance of the capital instruments shall provide that any dispute arising out of or in connection with the provisions governed by the laws of Singapore shall be determined exclusively by the courts of Singapore. Where the capital instrument is to be subject to the laws of a jurisdiction other than Singapore, the Reporting Bank shall satisfy itself that all the relevant conditions specified in this paragraph are met under the laws of that jurisdiction;

[MAS Notice 637 (Amendment) 2016]

(f) the capital instrument is perpetual. In this regard, there shall be no maturity date, and there shall be no step-ups or other provisions that mandate or create an incentive for the Reporting Bank to redeem the capital instrument[57];

[MAS Notice 637 (Amendment No. 2) 2014]

(g) subject to paragraph 6.2.2A, the capital instrument is callable at the option of the Reporting Bank only after a minimum of five years from the issue date, subject to the following requirements:

(i) a call option may be exercised only with the prior approval of the Authority;

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56 For example, where the Reporting Bank issues AT1 capital instruments via an SPE and provides support to the SPE (e.g. by contributing a reserve), the provision of support will constitute an enhancement and be deemed to fail to meet this requirement.

57 For example, the following shall be considered as an incentive to redeem:
(a) a call option combined with an increase in the credit spread of the capital instrument if the call option is not exercised;
(b) a call option combined with a requirement or an investor option to convert the capital instrument into ordinary shares if the call is not exercised; or
(c) a call option combined with a change in reference rate where the credit spread over the second reference rate is greater than the initial payment rate less the swap rate (i.e. the fixed rate paid to the call date to receive the second reference rate).
For the avoidance of doubt, a conversion from a fixed rate to a floating rate or vice versa in combination with a call option without any increase in credit spread shall not in itself be deemed an incentive to redeem. The Reporting Bank shall, however, not do anything to create an expectation that the call will be exercised.
[MAS Notice 637 (Amendment) 2012]

58 [Deleted by MAS Notice 637 (Amendment No. 2) 2014]

(ii) the Reporting Bank shall not create an expectation that the call option will be exercised[59]; and

(iii) the Reporting Bank shall not exercise a call option unless -

(A) the capital instrument is replaced by the Reporting Bank with capital of the same or better quality, and the replacement of this capital is done at conditions which are sustainable for the income capacity of the Reporting Bank[60]; or

(B) the Reporting Bank demonstrates that its capital position is well above the minimum capital requirements after the call option is exercised;

[MAS Notice 637 (Amendment No. 2) 2014]

(h) any repayment of principal (e.g. through repurchases or redemptions) is done only with the prior approval of the Authority. The Reporting Bank shall not assume or create any expectation that approval will be given by the Authority. Without prejudice to any other matter that the Authority may consider relevant, the Authority shall, in determining whether to grant its approval, consider whether the Reporting Bank's capital is likely to remain adequate after redemption;

[MAS Notice 637 (Amendment No. 2) 2014]

(i) with regard to the dividend or coupon payable on the capital instrument,

(i) the Reporting Bank has full discretion at all times to cancel distributions or payments[61];

(ii) any cancellation of dividend or coupon is not an event of default;

(iii) the Reporting Bank has full access to cancelled payments to meet obligations as they fall due; and

(iv) any cancellation of dividend or coupon does not impose restrictions

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59 For example, the Authority is not likely to grant approval for redemption where a Reporting Bank calls a capital instrument and replaces it with another capital instrument that is more costly (e.g. with a higher credit spread).

60 Replacement issues can be concurrent with, but not after the capital instrument is called.

61 In this regard, "dividend pushers" are prohibited. A capital instrument with a dividend pusher obliges the Reporting Bank to make a dividend or coupon payment on the instrument, if it has made a payment on another (typically more junior) capital instrument or share. This obligation is inconsistent with the requirement for the Reporting Bank to have full discretion at all times to cancel distributions or payments. Furthermore, the cancellation of distributions or payments means that these payments are extinguished; it does not permit features that require the Reporting Bank to make distributions or payments in kind. For the avoidance of doubt, "dividend stoppers" are not prohibited, provided that the Reporting Bank retains full discretion at all times to cancel distributions or payments. A capital instrument with a dividend stopper stops the Reporting Bank from making a dividend on its ordinary shares or other AT1 capital instruments if a dividend or coupon payment is not paid on its AT1 capital instruments.

on the Reporting Bank[61A], except in relation to distributions to ordinary shareholders;

[MAS Notice 637 (Amendment No. 2) 2014]

(j) any dividend or coupon to be paid under the capital instrument is only paid to the extent that the Reporting Bank has profits distributable under written law;

(k) the capital instrument does not have a credit sensitive dividend feature, i.e. a dividend or coupon that is reset periodically, based in whole or in part on the credit standing of the Reporting Bank or any banking group entity;

[MAS Notice 637 (Amendment No. 2) 2014]

(l) the capital instrument does not contribute to liabilities exceeding assets, if such a balance sheet test forms part of the law of insolvency;

[MAS Notice 637 (Amendment) 2014]

(m) where the capital instrument is classified as a liability under the Accounting Standards, it shall have principal loss absorption features through –

(i) a provision under which it converts to ordinary shares if the CET1 CAR of the Reporting Bank falls to 7% or below; or

(ii) a write-down mechanism that allocates losses to the capital instrument if the CET1 CAR of the Reporting Bank falls to 7% or below. The write-down shall have the following effects:

(A) it reduces the amount claimable by the holder of the capital instrument in the liquidation of the Reporting Bank;

(B) it reduces the amount to be repaid when a call option is exercised; and

(C) it partially or fully reduces dividend or coupon payments on the capital instrument;

Under both sub-paragraphs (i) and (ii) above, the conversion or write-down shall generate CET1 Capital under the Accounting Standards and the capital instrument will only receive recognition as AT1 Capital up to the minimum level of CET1 generated by a full conversion or write-down of the capital instrument. In addition, the aggregate amount to be converted or written down for all such capital instruments shall be at least the amount needed to immediately return the Reporting Bank's CET1 CAR to

[61A] For example, restrictions which impede the Reporting Bank's ability to restructure or improve its capital position.

[MAS Notice 637 (Amendment No. 2) 2014]

7% or, if this is not possible, the full principal value of the capital instruments.

Where a Reporting Bank issues the capital instrument in a foreign currency, the capital instrument shall be revalued periodically (at least monthly) in terms of Singapore dollars at the prevailing exchange rates. Where the Reporting Bank intends to use a swap to hedge the foreign exchange exposure arising from the foreign currency capital instrument, it shall consult the Authority on the capital treatment applicable to the hedge prior to such use;

[MAS Notice 637 (Amendment No. 2) 2014]

(n) neither the Reporting Bank nor any of its banking group entities or associates may purchase the capital instrument, nor can the Reporting Bank have directly or indirectly funded the purchase of the capital instrument;

[MAS Notice 637 (Amendment No. 2) 2014]

(o) the capital instrument does not have any feature that hinders recapitalisation, such as provisions that require the issuer to compensate investors if a new instrument is issued at a lower price during a specified time frame[62];

(p) if the capital instrument is not issued out of an operating entity or the holding company of the Reporting Bank (e.g. issued out of a SPE), the proceeds from the issuance of the capital instrument shall be immediately available without limitation to an operating entity or the holding company of the Reporting Bank in a form which at the minimum meets all of the other requirements set out in this paragraph, for inclusion as AT1 Capital;

[MAS Notice 637 (Amendment No. 2) 2014]

(q) the main features of the capital instrument are disclosed clearly and accurately to the investors of the capital instruments;

[MAS Notice 637 (Amendment No. 2) 2014]

(r) the agreement governing the issuance of the capital instrument shall not be changed without the prior approval of the Authority where such proposed changes could impact its eligibility as AT1 Capital; and

(s) the agreement governing the issuance of the capital instrument contain provisions which ensure its loss absorbency at the point of non-viability

[62] Where there is a dividend stopper within the terms and conditions of the AT1 capital instrument, such a feature shall not hinder the recapitalisation of the Reporting Bank. For example, a dividend stopper on an AT1 capital instrument shall not (a) attempt to stop payment on another capital instrument where such payments are not fully discretionary; (b) prevent distributions to ordinary shareholders for a period that extends beyond the point in time that dividend or coupon payments on the AT1 capital instrument are resumed; or (c) impede the normal operation of the Reporting Bank or any restructuring activity such as acquisitions or disposals.

that meet the requirements set out in Annex 6B.

[MAS Notice 637 (Amendment No. 2) 2014]

6.2.2A The Authority may grant approval for redemption of a capital instrument within the first five years from the issue date where –

(a) there is a change in tax status of the capital instrument due to changes in applicable tax laws of the country or territory in which the capital instrument was issued; or

(b) there is a change relating to the recognition of the capital instrument as capital for calculating Tier 1 CAR and Total CAR,

and provided that the requirements set out in paragraph 6.2.2(g)(i) to (iii) are met. The Authority shall, in determining whether to grant approval, consider whether the Reporting Bank was in a position to anticipate the event at the issuance of the capital instrument.

[MAS Notice 637 (Amendment No. 2) 2014]

Regulatory Adjustments Applied in the Calculation of AT1 Capital

6.2.3 A Reporting Bank shall apply the following regulatory adjustments in the calculation of AT1 Capital at the Solo or Group level, as the case may be:

[MAS Notice 637 (Amendment No. 2) 2014]

(a) all investments in the Reporting Bank's own AT1 capital instruments, whether held directly or indirectly[37] by the Reporting Bank or any of its banking group entities, shall be deducted in the calculation of AT1 Capital, unless already derecognised under the Accounting Standards. If the Reporting Bank or any of its banking group entities is contractually obliged to purchase any of its own AT1 capital instruments, the Reporting Bank shall deduct such AT1 capital instruments in the calculation of AT1 Capital. This adjustment shall apply to exposures in both the banking book and trading book.[63]

Gross long positions may be deducted net of short positions in the same underlying exposure, only if the short positions involve no counterparty credit risk. The Reporting Bank shall look through holdings of index securities to deduct exposures to its own AT1 capital instruments.[40]

[63] For the avoidance of doubt, this adjustment does not cover AT1 capital instruments held by the Reporting Bank or any of its banking group entities where:
(a) the investments in the AT1 capital instruments are funded by third parties other than the Reporting Bank or any of its banking group entities (e.g. life insurance policyholders or other third party investors);
(b) the risks and rewards associated with the investments in AT1 capital instruments are borne primarily by the third parties; and
(c) decisions to transact in the AT1 capital instruments are made independently from the issuer of the capital instruments and in the interests of the third parties.

However, gross long positions in its own AT1 capital instruments resulting from holdings of index securities may be netted against short positions in its own AT1 capital instruments, which result from short positions in the same underlying index[41];

[MAS Notice 637 (Amendment) 2014]
[MAS Notice 637 (Amendment No. 2) 2014]

(b) reciprocal cross holdings in the AT1 capital instruments[63A] of financial institutions that are designed to artificially inflate the capital position of the Reporting Bank shall be deducted in the calculation of AT1 Capital;

(c) [Deleted by MAS Notice 637 (Amendment) 2016]

(d) certain investments in the AT1 capital instruments of unconsolidated financial institutions in which the Reporting Bank does not hold a major stake, shall be deducted in the calculation of AT1 Capital[64A], in accordance with sub-paragraphs (i) and (ii) below:

(i) the amount of such investments to be deducted in the calculation of AT1 Capital shall be the proportion of AT1 capital instrument holdings to total capital holdings, multiplied by the amount by which total capital holdings in aggregate exceed 10% of the Reporting Bank's common equity. In this sub-paragraph, the Reporting Bank's common equity for the purpose of calculating the 10% threshold shall be calculated in accordance with paragraph 6.1.3(o)(i) and the AT1 capital instrument holdings shall be calculated as follows:

(A) direct, indirect[64B] and synthetic holdings of capital instruments

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[63A] For the avoidance of doubt,
(a) a capital instrument would be deemed to have met the criteria for AT1 Capital of the Reporting Bank, if it satisfies the applicable regulatory capital criteria imposed by a bank regulatory agency that has implemented the Basel III standards; and
(b) if the entity in which the Reporting Bank has invested is a financial institution that is not a bank, the entity is subject to minimum prudential standards and supervision by a regulatory agency and the investment is not in the form of ordinary shares but is nevertheless recognised as Tier 1 capital (or its equivalent) of the entity, the capital instrument shall be considered as an AT1 capital instrument for the purpose of this regulatory adjustment.

[MAS Notice 637 (Amendment) 2016]

[64] [Deleted by MAS Notice 637 (Amendment) 2016]
[65] [Deleted by MAS Notice 637 (Amendment) 2016]
[64A] For the avoidance of doubt,
(a) a capital instrument would be deemed to have met the criteria for AT1 Capital of the Reporting Bank, if it satisfies the applicable regulatory capital criteria imposed by a bank regulatory agency that has implemented the Basel III standards;
(b) if the entity in which the Reporting Bank has invested is a financial institution that is subject to minimum prudential standards and supervision by a regulatory agency and the investment is not included as regulatory capital of the entity, the investment can be excluded for the purpose of this regulatory adjustment; and
(c) if the entity in which the Reporting Bank has invested is a financial institution that is not a bank, the entity is subject to minimum prudential standards and supervision by a regulatory agency and the investment is not in the form of ordinary shares but is nevertheless recognised as Tier 1 capital (or its equivalent) of the entity, the capital instrument shall be considered as an AT1 capital instrument for the purpose of this regulatory adjustment.

[MAS Notice 637 (Amendment) 2016]

[64B] Indirect holdings are exposures or parts of exposures that, if a direct holding loses its value, will result in a loss to the Reporting Bank substantially equivalent to the loss in value of the direct holding.

shall be included. For example, the Reporting Bank shall look through holdings of index securities to determine the underlying holdings of capital[64C];

(B) the net long positions in both the banking book and trading book shall be included. In this regard, the gross long position can be offset against the short position in the same underlying exposure, if the maturity of the short position either matches the maturity of the long position, or has a residual maturity of at least one year[64D,64E,64F];

(C) underwriting positions held for a period longer than five working days shall be included, while those positions held for five working days or less can be excluded; and

(D) certain investments where these have been made in the context of resolving or providing financial assistance to reorganise a distressed institution may be temporarily excluded with the prior approval of the Authority;

[MAS Notice 637 (Amendment) 2016]

(ii) the total capital holdings referred to in sub-paragraph (i) above shall be calculated in accordance with paragraph 6.1.3(o)(ii); and

(iii) the amount of total capital holdings that do not exceed the 10% threshold calculated in accordance with paragraph 6.1.3(o)(i) and are not deducted shall continue to be risk-weighted[48]. For the application of risk-weighting, the amount of the holdings shall be allocated on a pro rata basis between those below and those above the threshold;

[MAS Notice 637 (Amendment) 2016]

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[MAS Notice 637 (Amendment) 2016]

64C If the Reporting Bank finds it operationally burdensome to look through and monitor its exact exposure to the capital of such entities as a result of its holdings of index securities, the Reporting Bank may, with the prior approval of the Authority, use a conservative estimate. The methodology for the estimate should demonstrate that in no case will the actual exposure be higher than the estimated exposure.

[MAS Notice 637 (Amendment) 2016]

64D For positions in the trading book, if the Reporting Bank has a contractual right or obligation to sell a long equity position at a specific point in time and the counterparty in the contract has an obligation to purchase the long equity position if the Reporting Bank exercises its right to sell, this point in time may be treated as the maturity of the long position, and the maturity of the long and short positions are deemed to be matched.

[MAS Notice 637 (Amendment) 2016]

64E For a position hedged against market risk where the hedge does not qualify to offset the gross long position for the purpose of determining the amount to be deducted, the Reporting Bank may choose to include the long position in its calculation of market RWA, in addition to deducting the long position. Where the hedge qualifies to offset the gross long position, the Reporting Bank may choose to exclude both positions from its calculation of market RWA.

[MAS Notice 637 (Amendment) 2016]

64F Where a Reporting Bank uses a short position in an index to hedge a long position, the portion of the index that is composed of the same underlying exposure that is being hedged may be used to offset the long position only if (a) both positions are held in the trading book; (b) the positions are accounted for at fair value; and (c) the hedge is recognised as effective under the Reporting Bank's internal control processes, as assessed by the Authority.

[MAS Notice 637 (Amendment) 2016]

(e) investments in the AT1 capital instruments of unconsolidated financial institutions in which the Reporting Bank holds a major stake (including insurance subsidiaries at the Solo and Group levels), shall be deducted in the calculation of AT1 Capital[64G]. The total of such investments shall be calculated as follows:

(i) direct, indirect[37] and synthetic holdings shall be included. For example, the Reporting Bank shall look through holdings of index securities to determine the underlying holdings of AT1 capital instruments[43];

(ii) the net long positions in both the banking book and trading book shall be included. In this regard, the gross long position can be offset against the short position in the same underlying exposure, if the maturity of the short position either matches the maturity of the long position or has a residual maturity of at least one year[44,45,46];

(iii) underwriting positions held for a period longer than five working days shall be included, while those positions held for five working days or less can be excluded; and

(iv) certain investments where these have been made in the context of resolving or providing financial assistance to reorganise a distressed institution may be temporarily excluded with the approval of the Authority;

[MAS Notice 637 (Amendment No. 2) 2014]
[MAS Notice 637 (Amendment) 2016]

(f) any other item or class of items which the Authority may specify in writing to the Reporting Bank for the purpose of this paragraph; and

(g) in the case where the Reporting Bank does not have enough Tier 2 Capital to satisfy the required deductions set out in paragraph 6.3.3, the shortfall shall be deducted in the calculation of AT1 Capital.

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[64G] For the avoidance of doubt,
(a) a capital instrument would be deemed to have met the criteria for AT1 Capital of the Reporting Bank, if it satisfies the applicable regulatory capital criteria imposed by a bank regulatory agency that has implemented the Basel III standards;
(b) if the entity in which the Reporting Bank has invested is a financial institution that is subject to minimum prudential standards and supervision by a regulatory agency and if the investment is not included as regulatory capital of the entity, the investment can be excluded for the purpose of this regulatory adjustment; and
(c) if the entity in which the Reporting Bank has invested is a financial institution that is not a bank, the entity is subject to minimum prudential standards and supervision by a regulatory agency and the investment is not in the form of ordinary shares but is nevertheless recognised as Tier 1 capital (or its equivalent) of the entity, the capital instrument shall be considered as an AT1 capital instrument for the purpose of this regulatory adjustment.

[MAS Notice 637 (Amendment) 2016]

Qualifying Capital Instruments Issued by Fully Consolidated Subsidiaries Recognised as Tier 1 Capital

6.2.4 CET1 capital instruments and AT1 capital instruments issued by a fully consolidated subsidiary of a Reporting Bank to third party investors (including amounts under paragraph 6.1.4) may receive recognition as Tier 1 Capital only if the capital instruments would, if issued by the Reporting Bank, meet all of the criteria for classification as Tier 1 Capital[65A]. The Reporting Bank shall calculate the amount that will be recognised as Tier 1 Capital as follows (please refer to Annex 6A for an illustrative example):

(a) Tier 1 capital of the subsidiary issued to third party investors; less

(b) the surplus Tier 1 Capital of the subsidiary attributable to third party investors;

where:

(i) Tier 1 capital of the subsidiary issued to third party investors means the sum of eligible minority interest and AT1 capital instruments issued by the subsidiary which are owned by third party investors;

(ii) the surplus Tier 1 Capital of the subsidiary is calculated as the Tier 1 Capital of the subsidiary, minus the lower of:

(A) 10.5%[66] of the subsidiary's total RWA; and

(B) 10.5%[67] of the consolidated RWA attributable to the subsidiary; and

(iii) the surplus Tier 1 Capital of the subsidiary attributable to third party investors is calculated by multiplying the surplus Tier 1 Capital of the subsidiary calculated in sub-paragraph (ii), by the percentage of Tier 1 capital that is held by third party investors.

A Reporting Bank when recognising the amount of Tier 1 Capital calculated in this paragraph as AT1 Capital, shall exclude amounts recognised as CET1 Capital under paragraph 6.1.4.

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65A CET1 capital instruments and AT1 capital instruments shall meet all of the criteria for classification as CET1 capital instruments and AT1 capital instruments, respectively.

[MAS Notice 637 (Amendment No. 2) 2014]

66 This represents the sum of the minimum Tier 1 CAR of 8% and Capital Conservation Buffer of 2.5% that is applicable to the banking group. Where the Reporting Bank is not designated by the Authority as a D-SIB, the ratios set out in paragraph 63 of "Basel III: A global regulatory framework for more resilient banks and banking systems" issued by the BCBS in December 2010 (last revised in June 2011), shall apply (i.e. 8.5% of the subsidiary's total RWA, which represents the sum of the minimum Tier 1 CAR of 6% and Capital Conservation Buffer of 2.5%).

[MAS Notice 637 (Amendment) 2016]

67 This represents the sum of the minimum Tier 1 CAR of 8% and Capital Conservation Buffer of 2.5% that is applicable to the banking group. Where the Reporting Bank is not designated by the Authority as a D-SIB, the ratios set out in paragraph 63 of "Basel III: A global regulatory framework for more resilient banks and banking systems" issued by the BCBS in December 2010 (last revised in June 2011), shall apply (i.e. 8.5% of the consolidated RWA attributable to the subsidiary, which represents the sum of the minimum Tier 1 CAR of 6% and Capital Conservation Buffer of 2.5%).

[MAS Notice 637 (Amendment) 2016]

[MAS Notice 637 (Amendment No. 2) 2014]

6.2.5 Where capital instruments purchased by third party investors are issued for and on behalf of a Reporting Bank out of an SPE, such capital can be included in AT1 Capital and treated as if the Reporting Bank itself had issued the capital directly to the third party investors only if it meets all the relevant entry criteria and the only asset of the SPE is its investment in the capital of the Reporting Bank in a form that meets or exceeds all the relevant entry criteria[68] (as required by the criterion set out in paragraph 6.2.2(p) for AT1 Capital). In cases where the capital has been issued to third party investors through an SPE via a fully consolidated subsidiary of the Reporting Bank, such capital may, subject to the requirements of this paragraph in relation to capital instruments issued through an SPE, be treated as if the subsidiary itself had issued it directly to third party investors and may be included in the Reporting Bank's consolidated AT1 Capital in accordance with the treatment outlined in paragraph 6.2.4.

[MAS Notice 637 (Amendment No. 2) 2014]

**Division 3: Tier 2 Capital**

Components of Tier 2 Capital

6.3.1 Tier 2 Capital of a Reporting Bank shall be the sum of the following items, whether at the Solo or Group level, as the case may be:

[MAS Notice 637 (Amendment No. 2) 2014]

(a) capital instruments issued by the Reporting Bank that comply with the requirements in paragraph 6.3.2, and are not included in Tier 1 Capital;

(b) share premium, resulting from the issuance of capital instruments which fall within sub-paragraph (a), if any. Any share premium that is not eligible for inclusion in Tier 1 Capital shall be included in Tier 2 Capital only if the shares giving rise to the share premium comply with the requirements in paragraph 6.3.2;

[MAS Notice 637 (Amendment No. 2) 2014]

(c) capital instruments issued by fully consolidated subsidiaries of the Reporting Bank and held by third party investors that meet the criteria for inclusion in Tier 2 Capital pursuant to paragraphs 6.3.4 and 6.3.5, and are not included in Tier 1 Capital;

(d) subject to paragraph 6.3.1A, in the case where the Reporting Bank has adopted the SA(CR), SA(EQ), SEC-ERBA, SEC-SA or the approach for securitisation exposures to which the SEC-IRBA, SEC-ERBA and SEC-SA cannot be applied, general allowances that are held against future, presently unidentified losses, and that are freely available to meet losses

[68] Assets that relate to the operation of the SPE may be excluded from this assessment if they are *de minimis*.

which subsequently materialise.[69] Allowances ascribed to the identified deterioration of particular assets or known liabilities, whether individual or grouped, shall be excluded. The general allowances eligible for inclusion shall not exceed 1.25% of the sum of (i) the credit RWA set out in paragraph 7.1.1(a), and (ii) its SEC-ERBA RWA, SEC-SA RWA, and RWA from securitisation exposures to which the SEC-IRBA, SEC-ERBA, and SEC-SA cannot be applied and which are set out in paragraph 7.1.1(ba);

(e) subject to paragraph 6.3.1A, in the case where the Reporting Bank has adopted the IRBA, any excess of the TEP maintained by the Reporting Bank over the EL amount calculated by the Reporting Bank. The amount eligible for inclusion shall not exceed 0.6% of the sum of (i) the credit RWA set out in paragraph 7.1.1(b) and (ii) its SEC-IRBA RWA set out in paragraph 7.1.1(ba)[69,71,72]; and

(f) regulatory adjustments set out in paragraph 6.3.3.

[MAS Notice 637 (Amendment No. 3) 2017]

6.3.1A Paragraphs 6.3.1B and 6.3.1C shall apply in the case of a Reporting Bank that has adopted (a) the SA(CR), SA(EQ), SEC-SA, SEC-ERBA, or the approach for securitisation exposures to which the SEC-IRBA, SEC-ERBA, and SEC-SA cannot be applied for a portion of its credit exposures, and (b) the IRBA, IRBA(EQ) or SEC-IRBA for the remaining portion of its credit exposures.

[MAS Notice 637 (Amendment No. 3) 2017]

6.3.1B For the purpose of determining the inclusion of general allowances in Tier 2 Capital under paragraph 6.3.1(d), a Reporting Bank referred to in paragraph 6.3.1A shall pro-rate the general allowances it maintains using the following formula:

$$\text{Pro-rated general allowances} = \text{total general allowances} \times \frac{\text{the sum of the Reporting Bank's credit RWA set out in paragraph 7.1.1(a) and its SEC-ERBA RWA, SEC-SA RWA, and RWA from securitisation exposures to which the SEC-IRBA, SEC-ERBA, and SEC-SA cannot be applied, set out in paragraph 7.1.1(ba)}}{\text{the sum of the Reporting Bank's credit RWA set out in paragraphs 7.1.1(a), 7.1.1(b), and 7.1.1(ba)}}$$

69 For the avoidance of doubt, any deferred tax assets associated with these general allowances or TEP maintained by the Reporting Bank shall be deducted in the calculation of CET1 Capital, as set out in paragraph 6.1.3(c).

[MAS Notice 637 (Amendment No. 3) 2017]

70 [Deleted by MAS Notice 637 (Amendment No. 3) 2017]

71 For the purpose of this sub-paragraph, in calculating the credit RWA, the 1.06 scaling factor set out in paragraph 7.1.1(b) does not apply.

72 Where the Authority is not satisfied that the EL amount fully reflects the conditions in the market in which the Reporting Bank operates, such excess amounts shall not be included as Tier 2 Capital. This also applies where the excess amounts on defaulted assets are used to offset the EL amount on non-defaulted assets.

Alternatively, subject to the prior approval of the Authority and such conditions as the Authority may impose, the Reporting Bank may rely on its internal methods for allocating general allowances for the purposes of determining their inclusion in Tier 2 Capital under paragraph 6.3.1(d).

[MAS Notice 637 (Amendment No. 3) 2017]

6.3.1C For the purpose of determining the inclusion of general allowances in TEP under paragraph 6.3.1(e), a Reporting Bank referred to in paragraph 6.3.1A shall pro-rate the general allowances it maintains using the following formula:

| | | | | |
|---|---|---|---|---|
| Pro-rated general allowances | = | total general allowances | x | the Reporting Bank's IRBA RWA calculated in accordance with Sub-division 4 of Division 1 of Part VII, multiplied by 1.06<br>________________________________<br>the sum of the Reporting Bank's credit RWA set out in paragraphs 7.1.1(a), 7.1.1(b), and 7.1.1(ba) |

Alternatively, subject to the prior approval of the Authority and such conditions as the Authority may impose, the Reporting Bank may rely on its internal models for allocating general allowances for the purposes of determining their inclusion in TEP under paragraph 6.3.1(e).

[MAS Notice 637 (Amendment No. 3) 2017]

Minimum Requirements for Tier 2 Capital Instruments

6.3.2 For the purpose of paragraph 6.3.1(a), a Reporting Bank shall not include a capital instrument of the Reporting Bank as Tier 2 Capital unless –

[MAS Notice 637 (Amendment No. 2) 2014]

(a) the capital instrument is issued and fully paid-up in cash[55];

(b) the capital instrument is subordinated to depositors and general creditors of the Reporting Bank;

(c) the paid-up amount is not guaranteed by the Reporting Bank or any of its related corporations or other affiliates, or covered under any other arrangement that legally or economically enhances the seniority of the claim vis-a-vis the Reporting Bank's creditors and depositors[56];

[MAS Notice 637 (Amendment) 2012]
[MAS Notice 637 (Amendment No. 2) 2014]

(d) the holder of the capital instrument waives his right, if any, to set off any amounts he owes the Reporting Bank against any subordinated amount owed to him due to the capital instrument and commits to return any set-

off amounts or benefits received to the liquidator;

(e) the subordination provisions of the capital instrument are governed by the laws of Singapore and for capital instruments issued on or after 1 January 2017, the agreements governing the issuance of the capital instruments shall provide that any dispute arising out of or in connection with the provisions governed by the laws of Singapore shall be determined exclusively by the courts of Singapore. Where the capital instrument is to be subject to the laws of a jurisdiction other than Singapore, the Reporting Bank shall satisfy itself that all the relevant conditions specified in this paragraph are met under the laws of that jurisdiction;

(f) with regard to the maturity of the capital instrument:

(i) the capital instrument has a minimum original maturity of at least 5 years. Where the agreement governing the issuance of the capital instrument provides for the loan to be drawn down in a series of tranches, the minimum original maturity for each tranche shall be 5 years from the date of its draw-down;

(ii) recognition of the capital instrument as Tier 2 Capital in its final five years to maturity is amortised on a straight-line basis by 20% per annum in accordance with Table 6-1. Where the capital instrument is repayable in separate tranches, each tranche shall be amortised individually, as if it were a separate loan; and

Table 6-1: Amortisation Schedule for a Tier 2 capital instrument

| Years to maturity (x) | Amortised amount eligible to be included in Tier 2 Capital |
|---|---|
| $x > 4$ | 100% |
| $3 < x \leq 4$ | 80% |
| $2 < x \leq 3$ | 60% |
| $1 < x \leq 2$ | 40% |
| $x \leq 1$ | 20% |

(iii) there are no step-ups or other provisions that mandate or create an incentive for the Reporting Bank to redeem the capital instrument[57];

[MAS Notice 637 (Amendment No. 2) 2014]

(g) subject to paragraph 6.3.2A, the capital instrument is callable at the option of the Reporting Bank only after a minimum of five years from the issue date, subject to the following requirements:

[73] [Deleted by MAS Notice 637 (Amendment No. 2) 2014]
[74] Where this requirement is met, an option to call the capital instrument after five years but prior to the start of the amortisation period will not be deemed an incentive to redeem.

(i) a call option may be exercised only with the prior approval of the Authority;

(ii) the Reporting Bank shall not create an expectation that the call option will be exercised[59,74] and

(iii) the Reporting Bank shall not exercise a call option unless -

(A) the capital instrument is replaced by the Reporting Bank with capital of the same or better quality, and the replacement of this capital is done at conditions which are sustainable for the income capacity of the Reporting Bank[60] or

(B) the Reporting Bank demonstrates that its capital position is well above the minimum capital requirements after the call option is exercised;

[MAS Notice 637 (Amendment No. 2) 2014]

(h) the holder of the capital instrument has no rights to accelerate the repayment of future scheduled payments (either coupon or principal), except in a bankruptcy or liquidation of the Reporting Bank;

(i) the capital instrument does not have a credit sensitive dividend feature, i.e. a dividend or coupon that is reset periodically, based in whole or in part on the credit standing of the Reporting Bank or any banking group entity;

[MAS Notice 637 (Amendment No. 2) 2014]

(j) neither the Reporting Bank nor any of its banking group entities or associates may purchase the capital instrument, nor can the Reporting Bank have directly or indirectly funded the purchase of the capital instrument;

[MAS Notice 637 (Amendment No. 2) 2014]

(k) if the capital instrument is not issued out of an operating entity or the holding company of the Reporting Bank (e.g. issued out of a SPE), the proceeds from the issuance of the capital instrument shall be immediately available without limitation to an operating entity or the holding company of the Reporting Bank in a form which at the minimum meets all of the other requirements set out in this paragraph, for inclusion as Tier 2 Capital;

[MAS Notice 637 (Amendment No. 2) 2014]

(l) the main features of the capital instrument are disclosed clearly and accurately to the investors of the capital instruments;

[MAS Notice 637 (Amendment No. 2) 2014]

(m) the agreement governing the issuance of the capital instrument shall not be changed without the prior approval of the Authority where such proposed changes could impact its eligibility as Tier 2 Capital;

(n) where a Reporting Bank issues the capital instrument in a foreign currency, the capital instrument shall be revalued periodically (at least monthly) in terms of Singapore dollars at the prevailing exchange rates. Where the Reporting Bank intends to use a swap to hedge the foreign exchange exposure arising from the foreign currency capital instrument, it shall consult the Authority on the capital treatment applicable to the hedge prior to such use; and

(o) the agreement governing the issuance of the capital instrument contain provisions which ensure its loss absorbency at the point of non-viability that meet the requirements set out in Annex 6B.

[MAS Notice 637 (Amendment No. 2) 2014]

6.3.2A The Authority may grant approval for redemption of a capital instrument within the first five years from the issue date where –

(a) there is a change in tax status of the capital instrument due to changes in applicable tax laws of the country or territory in which the capital instrument was issued; or

(b) there is a change relating to the recognition of the capital instrument as capital for calculating Total CAR,

and provided that the requirements set out in paragraph 6.3.2(g)(i) to (iii) are met. The Authority shall, in determining whether to grant approval, consider whether the Reporting Bank was in a position to anticipate the event at the issuance of the capital instrument.

[MAS Notice 637 (Amendment No. 2) 2014]

Regulatory Adjustments Applied in the Calculation of Tier 2 Capital

6.3.3 A Reporting Bank shall apply the following regulatory adjustments in the calculation of Tier 2 Capital at the Solo or Group level, as the case may be:

[MAS Notice 637 (Amendment No. 2) 2014]

(a) all investments in the Reporting Bank's own Tier 2 capital instruments, whether held directly or indirectly[37] by the Reporting Bank or any of its banking group entities, shall be deducted in the calculation of Tier 2 Capital, unless already derecognised under the Accounting Standards. If the Reporting Bank or any of its banking group entities is contractually obliged to purchase any of its own Tier 2 capital instruments, the Reporting Bank shall deduct such Tier 2 capital instruments in the

calculation of Tier 2 Capital. This adjustment shall apply to exposures in both the banking book and trading book.[75]

Gross long positions may be deducted net of short positions in the same underlying exposure, only if the short positions involve no counterparty credit risk. The Reporting Bank shall look through holdings of index securities to deduct exposures to its own Tier 2 capital instruments.[40] However, gross long positions in its own Tier 2 capital instruments resulting from holdings of index securities may be netted against short positions in its own Tier 2 capital instruments, which result from short positions in the same underlying index[41];

[MAS Notice 637 (Amendment) 2014]
[MAS Notice 637 (Amendment No. 2) 2014]

(b) reciprocal cross holdings in the Tier 2 capital instruments[75A] of financial institutions that are designed to artificially inflate the capital position of the Reporting Bank shall be deducted in the calculation of Tier 2 Capital;

(c) [Deleted by MAS Notice 637 (Amendment) 2016]

(d) certain investments in Tier 2 capital instruments of unconsolidated financial institutions in which the Reporting Bank does not hold a major stake, shall be deducted in the calculation of Tier 2 Capital[76A], in accordance with sub-paragraphs (i) and (ii) below:

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75 For the avoidance of doubt, this adjustment does not cover Tier 2 capital instruments held by the Reporting Bank or any of its banking group entities where:
(a) the investments in the Tier 2 capital instruments are funded by third parties other than the Reporting Bank or any of its banking group entities (e.g. life insurance policyholders or other third party investors);
(b) the risks and rewards associated with the investments in Tier 2 capital instruments are borne primarily by the third parties; and
(c) the decisions to transact in the Tier 2 capital instruments are made independently from the issuer of the capital instruments and in the interests of the third parties.

75A For the avoidance of doubt,
(a) a capital instrument would be deemed to have met the criteria for Tier 2 Capital of the Reporting Bank, if it satisfies the applicable regulatory capital criteria imposed by a bank regulatory agency that has implemented the Basel III standards; and
(b) if the entity in which the Reporting Bank has invested is a financial institution that is not a bank, the entity is subject to minimum prudential standards and supervision by a regulatory agency and the investment is not in the form of ordinary shares but is nevertheless recognised as Tier 2 capital (or its equivalent) of the entity, the capital instrument shall be considered as a Tier 2 capital instrument for the purpose of this regulatory adjustment.

[MAS Notice 637 (Amendment) 2016]

76 [Deleted by MAS Notice 637 (Amendment) 2016]

77 [Deleted by MAS Notice 637 (Amendment) 2016]

76A For the avoidance of doubt,
(a) a capital instrument would be deemed to have met the criteria for Tier 2 Capital of the Reporting Bank, if it satisfies the applicable regulatory capital criteria imposed by a bank regulatory agency that has implemented the Basel III standards;
(b) if the entity in which the Reporting Bank has invested is a financial institution that is subject to minimum prudential standards and supervision by a regulatory agency and if the investment is not included as regulatory capital of the entity, the investment can be excluded for the purpose of this regulatory adjustment; and
(c) if the entity in which the Reporting Bank has invested is a financial institution that is not a bank, the entity is subject to minimum prudential standards and supervision by a regulatory agency and the investment is not in the form of ordinary shares and is recognised as Tier 2 capital (or its equivalent) of the entity, the capital instrument shall be considered as a Tier 2 capital instrument for the purpose of this regulatory adjustment.

[MAS Notice 637 (Amendment) 2016]

(i) the amount of such investments to be deducted in the calculation of Tier 2 Capital shall be the proportion of Tier 2 capital instrument holdings to total capital holdings multiplied by the amount by which total capital holdings in aggregate exceed 10% of the Reporting Bank's common equity. In this sub-paragraph, the Reporting Bank's common equity for the purpose of calculating the 10% threshold shall be calculated in accordance with paragraph 6.1.3(o)(i) and the Tier 2 capital instrument holdings shall be calculated as follows:

(A) direct, indirect[76B] and synthetic holdings of capital instruments shall be included. For example, the Reporting Bank shall look through holdings of index securities to determine the underlying holdings of capital[76C];

(B) the net long positions in both the banking book and trading book shall be included. In this regard, the gross long position can be offset against the short position in the same underlying exposure, if the maturity of the short position either matches the maturity of the long position, or has a residual maturity of at least one year[76D,76E,76F;]

(C) underwriting positions held for a period longer than five working days shall be included, while those positions held for five working days or less can be excluded; and

(D) certain investments where these have been made in the context of resolving or providing financial assistance to reorganise a distressed institution may be temporarily excluded with the approval of the Authority;

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76B Indirect holdings are exposures or parts of exposures that, if a direct holding loses its value, will result in a loss to the Reporting Bank substantially equivalent to the loss in value of the direct holding.
[MAS Notice 637 (Amendment) 2016]

76C If the Reporting Bank finds it operationally burdensome to look through and monitor its exact exposure to the capital of such entities as a result of its holdings of index securities, the Reporting Bank may, with the prior approval of the Authority, use a conservative estimate. The methodology for the estimate should demonstrate that in no case will the actual exposure be higher than the estimated exposure.
[MAS Notice 637 (Amendment) 2016]

76D For positions in the trading book, if the Reporting Bank has a contractual right or obligation to sell a long equity position at a specific point in time and the counterparty in the contract has an obligation to purchase the long equity position if the Reporting Bank exercises its right to sell, this point in time may be treated as the maturity of the long position, and the maturity of the long and short positions are deemed to be matched.
[MAS Notice 637 (Amendment) 2016]

76E For a position hedged against market risk where the hedge does not qualify to offset the gross long position for the purpose of determining the amount to be deducted, the Reporting Bank may choose to include the long position in its calculation of market RWA, in addition to deducting the long position. Where the hedge qualifies to offset the gross long position, the Reporting Bank may choose to exclude both positions from its calculation of market RWA.
[MAS Notice 637 (Amendment) 2016]

76F Where a Reporting Bank uses a short position in an index to hedge a long position, the portion of the index that is composed of the same underlying exposure that is being hedged may be used to offset the long position only if (a) both positions are held in the trading book; (b) the positions are accounted for at fair value; and (c) the hedge is recognised as effective under the Reporting Bank's internal control processes, as assessed by the Authority.
[MAS Notice 637 (Amendment) 2016]

(ii) the total capital holdings referred to in sub-paragraph (i) above shall be calculated in accordance with paragraph 6.1.3(o)(ii); and

[MAS Notice 637 (Amendment) 2016]

(iii) the amount of total capital holdings that do not exceed the 10% threshold calculated in accordance with paragraph 6.1.3(o)(i) and are not deducted shall continue to be risk-weighted[48]. For the application of risk-weighting, the amount of the holdings shall be allocated on a pro rata basis between those below and those above the threshold;

(e) investments in the Tier 2 capital instruments of unconsolidated financial institutions in which the Reporting Bank holds a major stake (including insurance subsidiaries at the Solo and Group levels), shall be deducted in the calculation of Tier 2 Capital[77AA]. The total of such investments shall be calculated as follows:

(i) direct, indirect[37] and synthetic holdings shall be included. For example, the Reporting Bank shall look through holdings of index securities to determine the underlying holdings of Tier 2 capital instruments[43];

(ii) the net long positions in both the banking book and trading book shall be included. In this regard, the gross long position can be offset against the short position in the same underlying exposure, if the maturity of the short position either matches the maturity of the long position or has a residual maturity of at least one year[44, 45, 46];

(iii) underwriting positions held for a period longer than five working days shall be included, while those positions held for five working days or less can be excluded; and

(iv) certain investments where these have been made in the context of resolving or providing financial assistance to reorganise a distressed institution may be temporarily excluded with the approval of the Authority; and

[MAS Notice 637 (Amendment No. 2) 2014]
[MAS Notice 637 (Amendment) 2016]

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[77AA] For the avoidance of doubt,

(a) a capital instrument would be deemed to have met the criteria for Tier 2 Capital of the Reporting Bank, if it satisfies the applicable regulatory capital criteria imposed by a bank regulatory agency that has implemented the Basel III standards;

(b) if the entity in which the Reporting Bank has invested is a financial institution that is subject to minimum prudential standards and supervision by a regulatory agency and if the investment is not included as regulatory capital of the entity, the investment can be excluded for the purpose of this regulatory adjustment; and

(c) if the entity in which the Reporting Bank has invested is a financial institution that is not a bank, the entity is subject to minimum prudential standards and supervision by a regulatory agency and the investment is not in the form of ordinary shares and is recognised as Tier 2 capital (or its equivalent) of the entity, the capital instrument shall be considered as a Tier 2 capital instrument for the purpose of this regulatory adjustment.

[MAS Notice 637 (Amendment) 2016]

(f) any other item or class of items which the Authority may specify in writing to the Reporting Bank for the purpose of this paragraph.

Qualifying Capital Instruments Issued by Fully Consolidated Subsidiaries Recognised as Eligible Total Capital

6.3.4 CET1 capital instruments, AT1 capital instruments and Tier 2 capital instruments issued by a fully consolidated subsidiary of a Reporting Bank to third party investors (including amounts under paragraphs 6.1.4, 6.2.4 and 6.2.5) may receive recognition as Eligible Total Capital only if the capital instruments would, if issued by the Reporting Bank, meet all of the criteria for classification as Tier 1 Capital or Tier 2 Capital[77A]. The Reporting Bank shall calculate the amount that will be recognised as Eligible Total Capital as follows (please refer to Annex 6A for an illustrative example):

(a) total capital of the subsidiary issued to third party investors; less

(b) the surplus Eligible Total Capital of the subsidiary attributable to third party investors;

where:

(i) total capital of the subsidiary issued to third party investors means the sum of Tier 1 capital of the subsidiary and Tier 2 capital instruments issued by the subsidiary which are owned by third party investors;

(ii) the surplus Eligible Total Capital of the subsidiary is calculated as the Eligible Total Capital of the subsidiary, minus the lower of:

(A) 12.5%[78] of the subsidiary's total RWA; and

(B) 12.5%[79] of the consolidated RWA attributable to the subsidiary; and

(iii) the surplus Eligible Total Capital of the subsidiary attributable to third

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[77A] CET1 capital instruments, AT1 capital instruments and Tier 2 capital instruments shall meet all of the criteria for classification as CET1 capital instruments, AT1 capital instruments and Tier 2 capital instruments, respectively.

[MAS Notice 637 (Amendment No. 2) 2014]

[78] This represents the sum of the minimum Total CAR of 10% and Capital Conservation Buffer of 2.5% that is applicable to the banking group. Where the Reporting Bank is not designated by the Authority as a D-SIB, the ratios set out in paragraph 64 of "Basel III: A global regulatory framework for more resilient banks and banking systems" issued by the BCBS in December 2010 (last revised in June 2011), shall apply (i.e. 10.5% of the subsidiary's total RWA, which represents the sum of the minimum Total CAR of 8% and Capital Conservation Buffer of 2.5%).

[MAS Notice 637 (Amendment) 2016]

[79] This represents the sum of the minimum Total CAR of 10% and Capital Conservation Buffer of 2.5% that is applicable to the banking group. Where the Reporting Bank is not designated by the Authority as a D-SIB, the ratios set out in paragraph 64 of "Basel III: A global regulatory framework for more resilient banks and banking systems" issued by the BCBS in December 2010 (last revised in June 2011), shall apply (i.e. 10.5% of the consolidated RWA attributable to the subsidiary, which represents the sum of the minimum Total CAR of 8% and Capital Conservation Buffer of 2.5%).

[MAS Notice 637 (Amendment) 2016]

party investors is calculated by multiplying the surplus Eligible Total Capital of the subsidiary calculated in sub-paragraph (ii), by the percentage of total capital that is held by third party investors.

A Reporting Bank when recognising the amount of Eligible Total Capital calculated in this paragraph as Tier 2 Capital, shall exclude amounts recognised as CET1 Capital under paragraph 6.1.4 and amounts recognised as AT1 Capital under paragraphs 6.2.4 and 6.2.5.

[MAS Notice 637 (Amendment No. 2) 2014]

6.3.5 Where capital instruments purchased by third party investors are issued for and on behalf of a Reporting Bank out of an SPE, such capital can be included in Tier 2 Capital and treated as if the Reporting Bank itself had issued the capital directly to third party investors only if it meets all the relevant entry criteria and the only asset of the SPE is its investment in the capital of the Reporting Bank in a form that meets or exceeds all the relevant entry criteria[68] (as required by the criterion set out in paragraph 6.3.2(k) for Tier 2 Capital). In cases where the capital has been issued to third party investors through an SPE via a fully consolidated subsidiary of the Reporting Bank, such capital may, subject to the requirements of this paragraph in relation to capital instruments issued through an SPE, be treated as if the subsidiary itself had issued it directly to third party investors and may be included in the Reporting Bank's consolidated Tier 2 Capital in accordance with the treatment outlined in paragraph 6.3.4.

[MAS Notice 637 (Amendment No. 2) 2014]

Requirements for PE/VC investments and investments in unconsolidated major stake companies that are not financial institutions

6.3.6 PE/VC investments and investments in unconsolidated major stake companies that are not financial institutions in the form of any of the following:

(a) ordinary shares;

(b) preference shares;

(c) investments classified as equity under the Accounting Standards;

(d) subordinated debt;

shall be subject to the following capital treatment, at both the Solo and Group levels:

(i) the portion of individual PE/VC investments and investments in unconsolidated major stake companies that are not financial institutions, which exceed 15% of the Reporting Bank's Eligible Total Capital, shall be risk-weighted at 1250%; and

(ii) if the aggregate of a Reporting Bank's PE/VC investments and investments in unconsolidated major stake companies that are not financial institutions, exceed 60% of the Reporting Bank's Eligible Total Capital, the portion of the aggregate of these investments which exceed 60% of the Reporting Bank's Eligible Total Capital shall be risk-weighted at 1250%.

[MAS Notice 637 (Amendment No. 3) 2017]

6.3.7 Investments in unconsolidated major stake companies that are not financial institutions in the form referred to in sub-paragraphs (a) to (d) above shall be calculated as follows:

(a) direct, indirect[79AA] and synthetic holdings shall be included. For example, the Reporting Bank shall look through holdings of index securities to determine the underlying holdings of ordinary shares[79AB];

(b) the net long positions in both the banking book and trading book shall be included. In this regard, the gross long position can be offset against the short position in the same underlying exposure, if the maturity of the short position either matches the maturity of the long position or has a residual maturity of at least one year[79AC,79AD,79AE];

(c) underwriting positions held for a period longer than five working days shall be included, while those positions held for five working days or less can be excluded; and

(d) [Deleted by MAS Notice 637 (Amendment No. 3) 2017]

(e) the maximum amount that could be paid out on any guarantee or capital enhancement, through which capital support is provided by the Reporting Bank to the major stake company shall be included.

(f) [Deleted by MAS Notice 637 (Amendment No. 3) 2017]

[MAS Notice 637 (Amendment No. 3) 2017]

6.3.8 PE/VC investments and investments in unconsolidated major stake companies that are not financial institutions which do not fall within paragraphs 6.3.6(i) and (ii)

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79AA Indirect holdings are exposures or parts of exposures that, if a direct holding loses its value, will result in a loss to the Reporting Bank substantially equivalent to the loss in value of the direct holding.

79AB If the Reporting Bank finds it operationally burdensome to look through and monitor its exact exposure to the capital of such entities as a result of its holdings of index securities, the Reporting Bank may, with the prior approval of the Authority, use a conservative estimate. The methodology for the estimate should demonstrate that in no case will the actual exposure be higher than the estimated exposure.

79AC For positions in the trading book, if the Reporting Bank has a contractual right or obligation to sell a long equity position at a specific point in time and the counterparty in the contract has an obligation to purchase the long equity position if the Reporting Bank exercises its right to sell, this point in time may be treated as the maturity of the long position, and the maturity of the long and short positions are deemed to be matched.

79AD For a position hedged against market risk where the hedge does not qualify to offset the gross long position for the purpose of determining the amount of investments in unconsolidated major stake companies that are not financial institutions, the Reporting Bank may choose to include the long position in its calculation of market RWA, in addition to including the long position in determining the amount of investments in unconsolidated major stake companies that are not financial institutions. Where the hedge qualifies to offset the gross long position, the Reporting Bank may choose to exclude both positions from its calculation of market RWA.

[MAS Notice 637 (Amendment No. 3) 2017]

79AE Where a Reporting Bank uses a short position in an index to hedge a long position, the portion of the index that is composed of the same underlying exposure that is being hedged may be used to offset the long position only if (a) both positions are held in the trading book; (b) the positions are accounted for at fair value; and (c) the hedge is recognised as effective under the Reporting Bank's internal control processes, as assessed by the Authority.

above, shall be subject to the appropriate capital treatment set out in Part VII or Part VIII[79AF].

[MAS Notice 637 (Amendment) 2016]
[MAS Notice 637 (Amendment No. 3) 2017]

**Division 4: Submission Requirements**

6.4.1 A Reporting Bank intending to issue or recognise any AT1 capital instrument or Tier 2 capital instrument for the purpose of inclusion as AT1 Capital under paragraph 6.2.1 or as Tier 2 Capital under paragraph 6.3.1, respectively, shall –

(a) consult the Authority well in advance to allow adequate time for review if the capital instrument has additional features which are not explicitly addressed in paragraph 6.2.2 for AT1 Capital, or paragraph 6.3.2 for Tier 2 Capital; and

(b) submit the following documents to the Authority before including such issuance as AT1 Capital or Tier 2 Capital:

(i) a declaration signed by the chief financial officer of the Reporting Bank confirming –

(A) that the Reporting Bank is responsible for complying with the requirements for inclusion of the issuance of the AT1 capital instrument as AT1 Capital, or the issuance of the Tier 2 capital instrument as Tier 2 Capital;

(B) that all the requirements for the inclusion of the issuance of the AT1 capital instrument or Tier 2 capital instrument set out in this Notice have been met;

(C) the expected date on which the issuance would be included as AT1 Capital or Tier 2 Capital; and

(D) that the Reporting Bank is aware that the Authority may take such necessary action against the Reporting Bank, including requiring the exclusion of the issuance for inclusion as AT1 Capital or as Tier 2 Capital, if the issuance does not, or subsequently does not, comply with the requirements set out in this Notice;

(ii) all the executed agreements and offering documents governing the issuance of the AT1 capital instrument or Tier 2 capital instrument;

(iii) all external legal opinions obtained in respect of the issuance of the AT1 capital instrument or the Tier 2 capital instrument stating that the requirements in paragraphs 6.2.2 and 6.3.2 (where applicable)

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[79AF] For the application of the appropriate capital treatment in Part VII and Part VIII, the amount of the holdings shall be allocated on a pro rata basis between those below and those above the threshold.

[MAS Notice 637 (Amendment No. 3) 2017]

have been met;

(iv) a memorandum of compliance stating how the issuance complies with each of the requirements set out in paragraphs 6.2.2 and 6.3.2 (where applicable) and identifying the relevant portions of the agreements and offering documents governing the issuance of the AT1 capital instrument or Tier 2 capital instrument which address each requirement;

(v) the information and documents required to be submitted under paragraph 1.9 of Annex 6B; and

[MAS Notice 637 (Amendment) 2016]

(vi) where the agreements and offering documents governing the issuance of the AT1 capital instrument or Tier 2 capital instrument are governed by the laws of a jurisdiction other than Singapore, a written external legal opinion from an advocate and solicitor qualified to practise Singapore law, that he has reviewed all the agreements and offering documents governing the issuance, including any legal opinion from foreign law practitioners provided pursuant to paragraph 6.4.1(b)(iii) and the memorandum of compliance, and confirms that the memorandum of compliance read together with such agreements, offering documents, legal opinions and any letter of undertaking provided by the Reporting Bank or any banking group entity address the requirements of paragraphs 6.2.2 or 6.3.2, as the case may be.

6.4.2 For the purpose of paragraph 6.4.1(b)(iii), the written external legal opinion shall be reasonably unqualified, in particular with respect to the prohibition on provisions which mandate or create incentives for the redemption of the instrument, and other requirements relating to loss absorption, priority of claims, waiver of set-off amounts or benefits and subordination.

**Division 5: Transitional Arrangements**

Regulatory Adjustments

6.5.1 The regulatory adjustments to be applied in the calculation of CET1 Capital, AT1 Capital and Tier 2 Capital, set out in paragraphs 6.1.3, 6.2.3 and 6.3.3 respectively, shall be phased in between 1 January 2013 to 1 January 2018 in the following manner: 20% with effect from 1 January 2014, 40% with effect from 1 January 2015, 60% with effect from 1 January 2016, 80% with effect from 1 January 2017, and 100% with effect from 1 January 2018. During the transition period, the remainder not deducted from capital shall continue to be subject to the treatment provided for in the cancelled MAS Notice 637 dated 14 December 2007.

Ineligible Minority Interest and Other Capital Issued by Fully Consolidated Subsidiaries Held by Third Party Investors

6.5.2 A Reporting Bank shall exclude minority interests and other capital issued by

fully consolidated subsidiaries held by third party investors that do not meet the requirements set out in paragraphs 6.1.4, 6.2.4, 6.2.5, 6.3.4 or 6.3.5 (as the case may be) from the relevant component of capital under this Part in phases in the following manner: 20% with effect from 1 January 2014, 40% with effect from 1 January 2015, 60% with effect from 1 January 2016, 80% with effect from 1 January 2017, and 100% with effect from 1 January 2018. For the avoidance of doubt, capital that meets, in full, the requirements set out in paragraphs 6.1.1(f), 6.2.1(c) or 6.3.1(c) (as the case may be) may be fully included in the relevant component of capital under this Part with effect from 1 January 2013.[79A]

[MAS Notice 637 (Amendment) 2012]
[MAS Notice 637 (Amendment No. 2) 2014]

Ineligible Capital Instruments

6.5.3 A Reporting Bank shall exclude capital instruments that do not meet, in full, the requirements set out in paragraphs 6.2.2 or 6.3.2 (as the case may be) from the relevant component of capital under this Part with effect from 1 January 2013 in phases. Fixing the base at the nominal amount of such instruments outstanding[80] on 1 January 2013[81], their recognition shall be capped at 90% with effect from 1 January 2013, with the cap reducing by 10 percentage points in each subsequent year. This cap shall be applied to AT1 capital instruments and Tier 2 capital instruments separately and refers to the total amount of capital instruments outstanding that no longer meets the relevant eligibility criteria.

[MAS Notice 637 (Amendment) 2012]
[MAS Notice 637 (Amendment No. 2) 2014]

6.5.4 A Reporting Bank shall treat capital instruments with an incentive to be redeemed as follows:

(a) for a capital instrument that has a call and a step-up (or another incentive to be redeemed) prior to 1 January 2013, if the capital instrument is not called at its effective maturity date –

(i) where the capital instrument, on a forward-looking basis, fully meets the requirements set out in paragraph 6.2.2 for an AT1 capital instrument, or paragraph 6.3.2 for a Tier 2 capital instrument, it shall

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79A For the avoidance of doubt, where these capital instruments are issued by a bank subsidiary, the Reporting Bank shall first apply the provisions in paragraphs 6.5.3, 6.5.4 and 6.5.5, before applying the provisions in paragraph 6.5.2.

[MAS Notice 637 (Amendment) 2012]

80 The base shall reflect the outstanding amount that is eligible to be included in the relevant tiers of capital under the cancelled MAS Notice 637 dated 14 December 2007. In this regard, to the extent that a Tier 2 capital instrument has begun to amortise before 1 January 2013, the base shall take into account the amount after amortisation and not the full nominal amount. For the avoidance of doubt, individual Tier 2 capital instruments that are subject to amortisation requirements shall continue to be amortised by 20 percentage points in each subsequent year. To the extent a capital instrument is redeemed or amortised after 1 January 2013, the nominal amount serving as the base is not reduced.

81 Capital instruments denominated in a foreign currency shall be included in the base, using their values in the reporting currency of the Reporting Bank as at 1 January 2013. The base will therefore be fixed in the reporting currency of the Reporting Bank throughout the transition period. At each subsequent reporting date, such capital instruments shall be valued as they are reported on the balance sheet of the Reporting Bank (adjusting for any amortisation in the case of a Tier 2 capital instrument), and be subject to the relevant caps throughout the transition period.

continue to be fully recognised as AT1 Capital or Tier 2 Capital, as the case may be;

(ii) where the capital instrument, on a forward-looking basis, meets the requirements set out in paragraph 6.2.2 for an AT1 capital instrument, with the exception of paragraph 6.2.2(s), or paragraph 6.3.2 for a Tier 2 capital instrument, with the exception of paragraph 6.3.2(o), as the case may be, the provisions of paragraph 6.5.3 shall apply[82]; and

(iii) in all other cases, the capital instrument shall be derecognised in full with effect from 1 January 2013; and

(b) for a capital instrument that has a call and a step-up (or another incentive to be redeemed) on or after 1 January 2013, the provisions of paragraph 6.5.3 shall apply on 1 January 2013 until its effective maturity date. If the capital instrument is not called at its effective maturity date –

(i) where the capital instrument, on a forward-looking basis, fully meets the requirements set out in paragraph 6.2.2 for an AT1 capital instrument, or paragraph 6.3.2 for a Tier 2 capital instrument, it shall continue to be fully recognised as AT1 Capital or Tier 2 Capital, as the case may be[83]; and

(ii) where the capital instrument does not fully meet the requirements set out in paragraph 6.2.2 for an AT1 capital instrument, or paragraph 6.3.2 for a Tier 2 capital instrument, it shall be derecognised in full with effect from the effective maturity date.

[MAS Notice 637 (Amendment No. 2) 2014]

6.5.5 A Reporting Bank shall exclude from CET1 capital instruments that do not meet the requirements set out in paragraph 6.1.2 with effect from 1 January 2013.

[MAS Notice 637 (Amendment) 2012]
[MAS Notice 637 (Amendment No. 2) 2014]

6.5.6 Paragraphs 6.5.3, 6.5.4 and 6.5.5 apply only to a Reporting Bank in respect of the following capital instruments:

(a) capital instruments issued before 12 September 2010;

(b) capital instruments issued between 12 September 2010 and 31 December 2012 (both dates inclusive) which meet all the requirements set out in paragraph 6.2.2 for an AT1 capital instrument, with the exception of

82 However, for a capital instrument that had a call and a step-up (or another incentive to be redeemed) on or prior to 12 September 2010 and was not called at its effective maturity date, the provisions of paragraph 6.5.3 shall apply even if the capital instrument, on a forward-looking basis, does not meet any of the requirements set out in paragraph 6.2.2 for an AT1 capital instrument, or paragraph 6.3.2 for a Tier 2 capital instrument, as the case may be.

[MAS Notice 637 (Amendment) 2014]

83 The full amount of the capital instrument, or in the case of a Tier 2 capital instrument, the applicable amortised amount of the capital instrument, shall be recognised.

paragraph 6.2.2(s); and

(c) capital instruments issued between 12 September 2010 and 31 December 2012 (both dates inclusive) which meet all the requirements set out in paragraph 6.3.2 for a Tier 2 capital instrument, with the exception of paragraph 6.3.2(o).

[MAS Notice 637 (Amendment) 2012]
[MAS Notice 637 (Amendment No. 2) 2014]

6.5.7 [Deleted by MAS Notice 637 (Amendment No. 2) 2014]

6.5.8 [Deleted by MAS Notice 637 (Amendment No. 2) 2014]

6.5.9 A Reporting Bank shall obtain the prior approval of the Authority before redeeming (whether through a call option, repurchase or otherwise) any redeemable capital instruments issued prior to 14 September 2012.

[MAS Notice 637 (Amendment) 2014]

**Annex 6A**

## MINORITY INTEREST AND OTHER CAPITAL ISSUED BY FULLY CONSOLIDATED SUBSIDIARIES HELD BY THIRD PARTY INVESTORS – AN ILLUSTRATIVE EXAMPLE

This Annex illustrates the treatment of minority interest and other capital issued by subsidiaries to third party investors, set out in paragraphs 6.1.4, 6.2.4, 6.2.5, 6.3.4 and 6.3.5.

[MAS Notice 637 (Amendment No. 2) 2014]

A banking group consists of two legal entities that are both banks. Bank P is the parent and Bank S is the subsidiary and their unconsolidated balance sheets are set out below.

| Bank P balance sheet | | Bank S balance sheet | |
|---|---|---|---|
| **Assets** | | **Assets** | |
| Loans to customers | 100 | Loans to customers | 150 |
| Investment in CET1 capital instruments of Bank S | 7 | | |
| Investment in AT1 capital instruments of Bank S | 4 | | |
| Investment in Tier 2 capital instruments of Bank S | 2 | | |
| **Liabilities and equity** | | **Liabilities and equity** | |
| Depositors | 70 | Depositors | 127 |
| Tier 2 capital instruments | 10 | Tier 2 capital instruments | 8 |
| AT1 capital instruments | 7 | AT1 capital instruments | 5 |
| Common equity | 26 | Common equity | 10 |

The balance sheet of Bank P shows that in addition to its loans to customers, it owns 70% of the ordinary shares of Bank S, 80% of the AT1 capital of Bank S and 25% of the Tier 2 capital of Bank S. The ownership of the capital of Bank S is therefore as follows:

| Capital issued by Bank S | | | |
|---|---|---|---|
| | **Amount issued to parent (Bank P)** | **Amount issued to third party investors** | **Total** |
| CET1 capital (CET1) | 7 | 3 | 10 |
| AT1 capital (AT1) | 4 | 1 | 5 |
| ***Tier 1 capital (T1)*** | ***11*** | ***4*** | ***15*** |
| Tier 2 capital (T2) | 2 | 6 | 8 |
| ***Total capital (TC)*** | ***13*** | ***10*** | ***23*** |

The consolidated balance sheet of the banking group is set out below:

| **Consolidated balance sheet** | |
|---|---|
| **Assets** | |
| Loans to customers | 250 |
| **Liabilities and equity** | |
| Depositors | 197 |
| Tier 2 capital issued by subsidiary to third party investors | 6 |
| Tier 2 capital issued by parent | 10 |
| AT1 capital issued by subsidiary to third party investors | 1 |
| AT1 capital issued by parent | 7 |
| Common equity issued by subsidiary to third party investors (i.e. minority interest) | 3 |
| Common equity issued by parent | 26 |

For illustrative purposes Bank S is assumed to have RWA of 100. In this example, the minimum capital requirements of Bank S and the subsidiary's contribution to the consolidated requirements are the same since Bank S does not have any loans to Bank P. This means that it is subject to the following minimum plus capital conservation buffer requirements and has the following surplus capital:

**Minimum and surplus capital of Bank S**

| | **Minimum plus capital conservation buffer** | **Surplus** |
|---|---|---|
| **CET1** | 9.0<br>(= 9.0% of 100) | 1.0<br>(=10 – 9.0) |
| **T1** | 10.5<br>(= 10.5% of 100) | 4.5<br>(=10 + 5 – 10.5) |
| **TC** | 12.5<br>(= 12.5% of 100) | 10.5<br>(=10 + 5 + 8 – 12.5) |

The following table illustrates how to calculate the amount of capital issued by Bank S to include in consolidated capital, following the calculation procedure set out in paragraphs 6.1.4, 6.2.4, 6.2.5, 6.3.4 and 6.3.5:

**Bank S: Amount of capital issued to third party investors included in consolidated capital**

| | **Total amount issued (a)** | **Amount issued to third party investors (b)** | **Surplus (c)** | **Surplus attributable to third party investors (i.e. amount excluded from consolidated capital) (d) =(c) * (b)/(a)** | **Amount included in consolidated capital (e) = (b) – (d)** |
|---|---|---|---|---|---|
| **CET1** | 10 | 3 | 1.0 | 0.30 | 2.70 |
| **T1** | 15 | 4 | 4.5 | 1.20 | 2.80 |
| **TC** | 23 | 10 | 10.5 | 4.57 | 5.43 |

The following table summarises the components of capital for the consolidated group based on the amounts calculated in the table above. AT1 capital is calculated as the difference between CET1 capital and Tier 1 capital, and Tier 2 capital is the difference between Total capital and Tier 1 capital.

| | **Total amount issued by parent (all of which is to be included in consolidated capital)** | **Amount issued by subsidiaries to third party investors to be included in consolidated capital** | **Total amount issued by parent and subsidiary to be included in consolidated capital** |
|---|---|---|---|
| CET1 | 26 | 2.70 | 28.70 |
| *AT1* | *7* | *0.10* | *7.10* |
| T1 | 33 | 2.80 | 35.80 |
| *T2* | *10* | *2.63* | *12.63* |
| TC | 43 | 5.43 | 48.43 |

**REQUIREMENTS TO ENSURE LOSS ABSORBENCY AT THE POINT OF NON-VIABILITY**

1.1 Paragraphs 6.2.2(s) and 6.3.2(o) require that the terms and conditions of AT1 capital instruments and Tier 2 capital instruments contain provisions which ensure their loss absorbency at the point of non-viability. In this regard, the terms and conditions of all AT1 capital instruments and Tier 2 capital instruments issued by the Reporting Bank shall have a provision that requires such instruments, at the option of the Authority, to either be partially or fully written off[84] or converted into ordinary shares upon the occurrence of the trigger event[85].

[MAS Notice 637 (Amendment) 2014]
[MAS Notice 637 (Amendment No. 2) 2014]

1.2 Any compensation paid to the instrument holders as a result of a write-off shall be paid immediately in the form of ordinary shares of the Reporting Bank (including any successor in resolution).[85A]

[MAS Notice 637 (Amendment No. 2) 2014]

1.3 A Reporting Bank shall maintain at all times, all prior authorisation necessary to immediately issue the relevant number of ordinary shares specified in the capital instrument's terms and conditions should the trigger event occur. The conversion formula for determining the number of ordinary shares to be issued upon conversion of the capital instrument shall be fixed at the point of issuance, and shall include a limit on the maximum number of ordinary shares that would be issued upon conversion.

[MAS Notice 637 (Amendment No. 2) 2014]

1.4 The trigger event shall be the earlier of:

(a) the Authority notifying the Reporting Bank in writing that the Authority is of the opinion that a write-off or conversion is necessary, without which the Reporting Bank would become non-viable; and

(b) the Authority's decision to make a public sector injection of capital, or equivalent support, without which the Reporting Bank would have become non-viable, as determined by the Authority.

[MAS Notice 637 (Amendment) 2012]

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[84] The write-off of any capital instruments issued via an SPE to investors shall mirror the write-off of capital instruments issued by the Reporting Bank to the SPE. The Reporting Bank shall consult the Authority on such arrangements in advance, to allow adequate time for review.

[85] A write-off or conversion shall not constitute an event of default for the capital instruments.

[85A] The Authority may consider allowing the ordinary shares paid as compensation to the holders of the capital instrument to be those of the holding company of the Reporting Bank. A Reporting Bank shall approach the Authority before the issuance of such capital instruments.

[MAS Notice 637 (Amendment No. 2) 2014]

1.5 The Authority may take into account, among other considerations, the following[85B] in assessing a Reporting Bank's viability -

(a) whether the assets of the Reporting Bank are, in the Authority's opinion, sufficient to provide adequate protection to the Reporting Bank's depositors and creditors;

(b) whether the Reporting Bank has lost the confidence of depositors, other creditors or the public. This may be characterised by ongoing increased difficulty of the Reporting Bank in obtaining or rolling over short-term funding;

(c) whether the Reporting Bank's regulatory capital has, in the Authority's opinion, reached a level, or is eroding in a manner, that may detrimentally affect its depositors or creditors;

(d) whether the Reporting Bank failed to pay any liability that has become due and payable or, in the Authority's opinion, will not be able to pay its liabilities as they become due and payable;

(e) whether the Reporting Bank failed to comply with an order of the Authority to increase its capital;

(f) whether in the Authority's opinion, any other state of affairs exists in respect of the Reporting Bank that may be materially prejudicial to the interests of the Reporting Bank's depositors or creditors or the owners of any assets under the Reporting Bank's administration; and

(g) whether the Reporting Bank is able to recapitalise on its own through the issuance of ordinary shares or other forms of regulatory capital.

[MAS Notice 637 (Amendment) 2013]

1.6 The issuance of any new ordinary shares as a result of the trigger event shall occur prior to any public sector injection of capital so that the capital provided by the public sector is not diluted.

**Additional requirements for capital instruments issued by fully consolidated subsidiaries**

1.7 Where a Reporting Bank intends to include the AT1 capital instruments and Tier 2 capital instruments issued by its subsidiary or issued for and on behalf of its subsidiary by an SPE in the consolidated group's regulatory capital at the Group level, the Reporting Bank may do so, to the extent permitted by the rules on eligibility of capital issued out of subsidiaries and held by third party investors set out in paragraphs 6.1.4, 6.2.4, 6.2.5,

[85B] In its assessment, the Authority will bear in mind the aim of the requirements above, which is to ensure loss absorbency at the point of non-viability. The Authority will also have full discretion to not trigger the provision under paragraph 1.1 of Annex 6B even if the Reporting Bank is assessed to have ceased, or is about to cease, to be viable.

[MAS Notice 637 (Amendment) 2013]

6.3.4, 6.3.5 of this Part, if the terms and conditions specify an additional trigger event. This additional trigger event shall be the earlier of:

(a) the Authority notifying the Reporting Bank in writing that the Authority is of the opinion that a write-off or conversion is necessary, without which the Reporting Bank would become non-viable; and

(b) the Authority's decision to make a public sector injection of capital, or equivalent support, without which the Reporting Bank would have become non-viable, as determined by the Authority.

[MAS Notice 637 (Amendment) 2014]
[MAS Notice 637 (Amendment No. 2) 2014]

1.8 For the purpose of paragraph 1.7, any ordinary shares paid as compensation to the holders of the capital instrument shall be ordinary shares of either the subsidiary or of the Reporting Bank (including any successor in resolution).[86]

[MAS Notice 637 (Amendment No. 2) 2014]

**Submission requirements**

1.9 For the purpose of ensuring compliance with the above requirements, the Reporting Bank shall submit the following information and documents to the Authority before including any issuance of capital instruments as AT1 Capital or Tier 2 Capital:

(a) an external legal opinion confirming that the write-off or conversion feature at the point of non-viability is enforceable, and that there are no impediments to the write-off or conversion of the instrument into ordinary shares of the Reporting Bank (or a banking group entity, where applicable) upon a trigger event;

(b) where the terms of the instrument provide for trigger events in addition to the trigger events specified in this Annex, the rationale for these additional trigger events and an assessment of the possible market implications that might arise from the inclusion of these additional trigger events or upon a breach of these trigger events; and

(c) a detailed description of the rationale for the specified conversion method, including computations of the indicative dilution of the Reporting Bank's ordinary shares that would occur upon a trigger event, and an explanation of why such a conversion approach would help to ensure or maintain the viability of the Reporting Bank.

The Authority may require the Reporting Bank to submit additional information in such form and manner (as specified in writing by the Authority) before such capital instruments can be included as AT1 Capital or Tier 2 Capital.

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[86] The Authority may consider allowing the ordinary shares paid as compensation to the holders of the capital instrument to be those of the holding company of the Reporting Bank. A Reporting Bank shall approach the Authority before the issuance of such capital instruments.

## PART VII: CREDIT RISK

### Division 1: Overview of Credit RWA Calculation

#### Sub-division 1: Introduction

7.1.1 The credit RWA of a Reporting Bank is the sum of -

(a) its SA(CR) RWA calculated in accordance with Sub-division 3 of this Division and its SA(EQ) RWA calculated in accordance with Sub-division 5 of this Division;

(b) its IRBA RWA calculated in accordance with Sub-division 4 of this Division and its IRBA(EQ) RWA calculated in accordance with Sub-division 5 of this Division, with the total multiplied by 1.06[101];

(ba) its SEC-IRBA RWA, SEC-ERBA RWA, SEC-SA RWA, and RWA from securitisation exposures to which the SEC-IRBA, SEC-ERBA, and SEC-SA cannot be applied, calculated in accordance with Sub-division 6 of this Division;

(c) its CVA RWA calculated in accordance with Annex 7AI;

(d) its CCP RWA calculated in accordance with Annex 7AJ; and

(e) its RWA calculated in accordance with paragraph 6.1.3(p)(iii).

[MAS Notice 637 (Amendment) 2012]
[MAS Notice 637 (Amendment) 2014]
[MAS Notice 637 (Amendment No. 2) 2017]

#### Sub-division 2: Exposures Included in the Calculation of SA(CR) RWA and IRBA RWA

7.1.2 A Reporting Bank shall include in its calculation of either SA(CR) RWA or IRBA RWA -

(a) any on-balance sheet asset; and

(b) any off-balance sheet item[102],

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[101] This scaling factor is subject to change, taking into account further guidance from the BCBS.

[102] "Off-balance sheet item" includes -
(a) any pre-settlement counterparty exposure arising from an OTC derivative transaction, whether such OTC derivative transaction is classified by the Reporting Bank as a banking or trading book exposure;
(b) the underlying securities in a credit derivative transaction or an OTC derivative transaction that is in substance similar to a forward purchase or credit substitute; and
(c) any pre-settlement counterparty exposure arising from an SFT, whether such SFT is classified by the Reporting Bank as a banking or trading book exposure. For avoidance of doubt, a Reporting Bank shall include the on-balance sheet leg of an SFT under paragraph 7.1.2(a).

but shall not include –

(i) any equity exposure;

(ii) any securitisation exposure;

(iii) any securitised exposure that meets the requirements for the recognition of risk transference in a traditional securitisation set out in Sub-division 2 of Division 6 of this Part; or

(iv) any exposure classified as a position or instrument in the trading book in accordance with Division 1 of Part VIII.[103]

**Sub-division 3: Calculation of SA(CR) RWA**

7.1.3 To calculate its SA(CR) RWA, a Reporting Bank -

(a) shall apply the exposure measurement requirements in Division 2 of this Part to calculate E, or where applicable E*, for any SA(CR) exposure;

(b) shall categorise that SA(CR) exposure in accordance with Sub-division 1 of Division 3 of this Part;

(c) shall allocate an applicable credit quality grade and risk weight for that SA(CR) exposure in accordance with Sub-divisions 2 and 3 respectively of Division 3 of this Part;

(d) shall calculate the credit risk-weighted exposure amount for that SA(CR) exposure using the following formula:

Credit RWE = Exposure x RW

where -

(i) "Credit RWE" refers to the credit risk-weighted exposure amount for that SA(CR) exposure;

(ii) "Exposure" refers to E, or where applicable E*, for that SA(CR) exposure; and

(iii) "RW" refers to the applicable risk weight for that SA(CR) exposure determined in accordance with sub-paragraph (c) above; and

(e) shall add the credit risk-weighted exposure amounts calculated in accordance with sub-paragraph (d) above for all its SA(CR) exposures.

[103] For the avoidance of doubt, all pre-settlement counterparty exposures arising from OTC derivative transactions, long settlement transactions and SFTs shall be included in either the SA(CR) RWA or the IRBA RWA.

**Sub-division 4: Calculation of IRBA RWA**

7.1.4 To calculate its IRBA RWA, a Reporting Bank -

(a) shall apply the exposure measurement requirements in Division 2 of this Part to calculate EAD, or where applicable EAD*, for any IRBA exposure;

(b) shall categorise that IRBA exposure in accordance with Sub-division 4 of Division 4 of this Part;

(c) shall calculate $K_{corp}$, $K_{sm}$, $K_{sov}$, $K_{bank}$, $K_{mort}$, $K_{qrre}$, $K_{oret}$, $K_{cp}$, $K_{sp}$, $K_{rp}$, $K_{dd}$ or $K_{def}$, whichever is applicable to that IRBA exposure based on the categorisation in sub-paragraph (b) above (other than an IRBA exposure categorised under the SL asset sub-class or the HVCRE asset sub-class), in accordance with Sub-divisions 7, 8, 9, 11 and 14 of Division 4 of this Part and Annex 7G of this Part, as the case may be;

(d) shall, if the IRBA exposure is categorised under the SL asset sub-class or the HVCRE asset sub-class -

(i) where the Reporting Bank complies with the requirements in Annex 7AB of this Part for deriving estimates of PD for such exposures, calculate $K_{sl}$, $K_{hv}$, $K_{dd}$ or $K_{def}$ for that IRBA exposure in accordance with Sub-divisions 7 and 11 of Division 4 of this Part and Annex 7G of this Part; and

(ii) in all other cases, determine $RW_{slot}$ for that IRBA exposure in accordance with the supervisory slotting criteria set out in Annex 7V and Sub-division 12 of this Part; and

(e) shall calculate the credit risk-weighted exposure amount for that IRBA exposure as follows:

(i) for an IRBA exposure categorised under the SL asset sub-class or the HVCRE asset sub-class that is not in default and for which the Reporting Bank is using the supervisory slotting criteria to calculate the credit risk-weighted exposure amount, using the following formula:

$$\text{Credit RWE} = \text{Exposure} \times RW_{slot}$$

where -

(A) "Credit RWE" refers to the credit risk-weighted exposure amount for that IRBA exposure;

(B) "$RW_{slot}$" refers to $RW_{slot}$ determined in accordance with sub-paragraph (d) above; and

(C) "Exposure" refers to EAD, or where applicable EAD*, for that IRBA exposure; and

(ii) for all other IRBA exposures, using the following formula:

Credit RWE = Exposure x K x 12.5

where -

(A) "Credit RWE" refers to the credit risk-weighted exposure amount for that IRBA exposure;

(B) "K" refers to $K_{corp}$, $K_{sm}$, $K_{sov}$, $K_{bank}$, $K_{sl}$, $K_{hv}$, $K_{mort}$, $K_{qrre}$, $K_{oret}$, $K_{cp}$, $K_{sp}$, $K_{rp}$, $K_{dd}$, or $K_{def}$, whichever is applicable to that IRBA exposure based on the categorisation in sub-paragraph (b) above, calculated in accordance with sub-paragraph (c) above; and

(C) "Exposure" refers to EAD, or where applicable EAD*, for that IRBA exposure; and

(f) shall add the credit risk-weighted exposure amounts calculated in accordance with sub-paragraph (e) above for all its IRBA exposures.

**Sub-division 5: Calculation of Credit RWA for Equity Exposures**

7.1.5 To calculate its SA(EQ) RWA, a Reporting Bank -

(a) shall apply the exposure measurement requirements in Division 2 of this Part to calculate E for any SA(EQ) exposure;

(b) shall calculate the credit risk-weighted exposure amount for that SA(EQ) exposure (excluding equity investments in funds held in the banking book) in accordance with Sub-division 3 of Division 5 of this Part;

(ba) shall calculate the credit risk-weighted exposure amount of any equity investment in funds held in the banking book in accordance with Sub-division 5 of Division 5 of this Part; and

(c) shall add the credit risk-weighted exposure amounts calculated in accordance with sub-paragraphs (b) and (ba) above.

[MAS Notice 637 (Amendment No. 3) 2017]

7.1.5A A Reporting Bank using the SA(EQ) to calculate the credit risk-weighted exposure amounts for its equity exposures (excluding equity investments in funds held in the banking book) shall include the credit risk-weighted exposure amounts for its equity investments in funds held in the banking book in the calculation of its SA(EQ) RWA.

[MAS Notice 637 (Amendment No. 3) 2017]

7.1.6 To calculate its IRBA(EQ) RWA, a Reporting Bank -

(a) shall apply the exposure measurement requirements in Division 2 of this Part to calculate EAD for any IRBA(EQ) exposure;

(b) shall calculate the credit risk-weighted exposure amount for that IRBA(EQ) exposure (excluding equity investments in funds held in the banking book) in accordance with Sub-division 4 of Division 5 of this Part;

(ba) shall calculate the credit risk-weighted exposure amount of any equity investment in funds held in the banking book in accordance with Sub-division 5 of Division 5 of this Part; and

(c) shall add the credit risk-weighted exposure amounts calculated in accordance with sub-paragraphs (b) and (ba) above.

[MAS Notice 637 (Amendment No. 3) 2017]

7.1.7 A Reporting Bank using the IRBA(EQ) to calculate the credit risk-weighted exposure amounts for its equity exposures (excluding equity investments in funds held in the banking book) shall include the credit risk-weighted exposure amounts for its equity investments in funds held in the banking book in the calculation of its IRBA(EQ) RWA.

[MAS Notice 637 (Amendment No. 3) 2017]

**Sub-division 6: Calculation of Credit RWA for Securitisation Exposures**

[MAS Notice 637 (Amendment No. 2) 2017
(Replacement of this Sub-division in its entirety)]

7.1.8 To calculate its RWA for a securitisation exposure, a Reporting Bank shall –

(a) apply the exposure measurement requirements in Division 2 of this Part to calculate E, EAD, or where applicable E* or EAD*, for any securitisation exposure;

(b) calculate the credit-risk weighted exposure amount for each securitisation exposure, using the following formula –

Credit RWE = Exposure x RW

where –

(i) "Credit RWE" refers to the credit risk-weighted exposure amount for that securitisation exposure;

(ii) "Exposure" refers to E, EAD, or where applicable E* or EAD*, for that securitisation exposure calculated in accordance with sub-paragraph (a) above; and

(iii) "RW" refers to –

(A) the applicable risk weight for an SEC-IRBA exposure determined in accordance with Sub-division 4 of Division 6 of this Part, as adjusted by Sub-division 9 of Division 6 of this Part;

(B) the applicable risk weight for an SEC-ERBA exposure determined in accordance with Sub-division 5 of Division 6 of this Part, as adjusted by Sub-division 9 of Division 6 of this Part;

(C) the applicable risk weight for that SEC-SA exposure determined in accordance with Sub-division 6 of Division 6 of this Part, as adjusted by Sub-division 9 of Division 6 of this Part; or

(D) 1250% if the Reporting Bank is unable to use any of the three approaches referred to in sub-paragraphs (b)(iii)(A) to (b)(iii)(C) above, or where it cannot meet the requirements in sub-paragraphs (a) to (c) of paragraph 7.6.8,

subject to the maximum risk weights applicable for senior exposures, calculated in accordance with paragraphs 7.1.9 to 7.1.11;

(c) add the credit risk-weighted exposure amounts calculated in accordance with sub-paragraph (b) for all its securitisation exposures arising from the same securitisation, and in doing so, may cap the credit risk-weighted exposure amount arising from the same securitisation in accordance with paragraphs 7.1.12 to 7.1.16, and adjust the credit risk-weighted exposure

amounts to recognise the effects of credit risk mitigation in accordance with paragraph 7.1.17; and

(d) add the credit risk-weighted exposure amounts calculated in accordance with sub-paragraph (c) for all its securitisation exposures across all securitisations.

Maximum Risk Weight for Senior Exposures

7.1.9 A Reporting Bank may apply a "look-through" approach to senior securitisation exposures, where the risk weight applied to a senior securitisation exposure is capped at the exposure weighted-average risk weight applicable to the underlying exposures, provided that the Reporting Bank has knowledge of the composition of the underlying exposures at all times –

(a) where the Reporting Bank exclusively uses either the SA(CR) or the IRBA to calculate capital requirements for the underlying pool, the risk weight applied to the senior securitisation exposure is capped at the exposure weighted-average risk weight applicable to the underlying exposures under the SA(CR) or IRBA respectively; and

(b) in the case of mixed pools –

(i) when applying the SEC-IRBA, the risk weight applied to the senior securitisation exposure is capped at the exposure weighted-average risk weight calculated using -

(A) the SA(CR) risk weights for the SA portion of the underlying pool; and

(B) the IRBA risk weights for the IRB portion of the underlying pool; and

(ii) when applying the SEC-SA or the SEC-ERBA, the risk weight applied to the senior securitisation exposure is capped at the exposure weighted-average risk weight applicable to the underlying assets under the SA(CR), whether or not the Reporting Bank is able to use the IRBA to calculate their risk weights.

The Reporting Bank shall calculate the applicable risk weight under the IRBA taking into account the application of the 1.06 scaling factor pursuant to paragraph 7.1.1(b) and the expected loss multiplied by 12.5.

7.1.10 Where the risk weight cap results in a lower risk weight than the floor risk weight of 15%, a Reporting Bank shall apply the risk weight resulting from the cap.

7.1.11 A Reporting Bank shall not apply the cap on risk weights described in paragraphs 7.1.9 to 7.1.10 to resecuritisation exposures.

Maximum Risk-Weighted Exposure Amounts

7.1.12 A Reporting Bank (as an originator or investor in a securitisation) using the SEC-IRBA for a securitisation exposure may cap the risk-weighted exposure amount for the securitisation exposures it holds in the same securitisation in accordance with paragraph 7.1.14.

7.1.13 A Reporting Bank (as an originator in a securitisation) using the SEC-ERBA or SEC-SA for a securitisation exposure may cap the risk-weighted exposure amount for the securitisation exposures it holds in the same securitisation in accordance with paragraph 7.1.14.

7.1.14 A Reporting Bank which is capping the risk-weighted exposure amount shall apply a maximum aggregated risk-weighted exposure for its securitisation exposures in the same securitisation of $P \times K_P \times 12.5$, with P and $K_P$ defined as follows –

(a) P: The largest proportion of interest that the Reporting Bank holds across all tranches of a given pool–

(i) if the Reporting Bank's securitisation exposures all reside in a single tranche of a given securitisation, P equals the proportion (expressed as a percentage) of securitisation exposures that the Reporting Bank holds in that given tranche (calculated as the total nominal amount of the Reporting Bank's securitisation exposures in the tranche divided by the nominal amount of the tranche); and

(ii) if the Reporting Bank's securitisation exposures reside in different tranches of a given securitisation, P equals the maximum proportion of interest across tranches, where the proportion of interest for each of the different tranches should be calculated as described above.

(b) $K_P$: The capital requirement for the underlying pool –

(i) for an IRB pool, $K_P$ equals $K_{IRB}$ as calculated in paragraphs 7.6.19 to 7.6.30;

(ii) for an SA pool, $K_P$ equals $K_{SA}$ as calculated in paragraphs 7.6.53 to 7.6.59; and

(iii) for a mixed pool, $K_P$ equals the exposure-weighted average capital requirement of the underlying pool using $K_{SA}$ for the proportion of the underlying pool for which the Reporting Bank cannot calculate $K_{IRB}$, and $K_{IRB}$ for the proportion of the underlying pool for which the Reporting Bank can calculate $K_{IRB}$.

[MAS Notice 637 (Amendment No. 2) 2018]

7.1.15 Notwithstanding the maximum risk-weighted exposure cap, a Reporting Bank shall deduct the entire amount of any gain on sale and credit-enhancing interest-only strips arising from the securitisation transaction in accordance with paragraph 6.1.3(f) and 6.1.3(fa) of Part VI.

7.1.16 A Reporting Bank shall not apply the cap on risk-weighted exposure amounts described in paragraphs 7.1.12 to 7.1.14 to resecuritisation exposures.

7.1.17 A Reporting Bank which is adjusting its credit risk-weighted exposure amounts to recognise the effects of credit risk mitigation pursuant to paragraph 7.1.8(c) above –

(a) shall compute an effective risk weight for each securitisation exposure, using the following formula –

Effective risk weight = Credit RWE / Exposure

where –

(i) "Effective risk weight" refers to the risk weight applicable to the unprotected portion of the securitisation exposure;

(ii) "Credit RWE" refers to the credit risk-weighted exposure amount for that securitisation exposure calculated in accordance with 7.1.8(a) to 7.1.8(c), after the application of any caps;

(iii) "Exposure" refers to E, EAD, or where applicable E* or EAD*, for that securitisation exposure calculated in accordance with paragraph 7.1.8(a); and

(b) shall recognise the effects of credit risk mitigation in accordance with Sub-division 11 of Division 6 of this Part, using the effective risk weight calculated in sub-paragraph (a) as the risk weight that is applicable to the unprotected portion of the securitisation exposure.

**Division 2: Measurement of Exposures**

**Sub-division 1: Introduction**

7.2.1 A Reporting Bank shall apply the exposure measurement requirements set out in this Division and the standards for prudent valuation set out in Annex 8N to calculate -

(a) E, or where applicable E*, for any SA(CR) exposure, SA(EQ) exposure, SEC-ERBA exposure or SEC-SA exposure; and

(b) EAD, or where applicable EAD*, for any IRBA exposure, IRBA(EQ) exposure or SEC-IRBA exposure.

[MAS Notice 637 (Amendment No. 2) 2017]

7.2.2 A Reporting Bank shall consult with the Authority on the appropriate treatment to apply in the measurement of E or EAD, whichever is applicable, for transactions that have not been addressed in this Division.

7.2.3 A Reporting Bank shall calculate -

(a) E, or where applicable E*, for any SA(CR) exposure, SA(EQ) exposure, SEC-ERBA exposure or SEC-SA exposure net of any

(i) specific allowance attributable to such SA(CR) exposure, SA(EQ) exposure, SEC-ERBA exposure or SEC-SA exposure, and

(ii) purchase price discount attributable to such SEC-ERBA exposure or SEC-SA exposure,

as determined in accordance with the Accounting Standards;

(b) EAD, or where applicable EAD*, for any IRBA exposure gross of any specific allowance or partial write-offs attributable to such IRBA exposure as determined in accordance with the Accounting Standards[104A]; and

(c) EAD, or where applicable EAD*, for any IRBA(EQ) exposure or SEC-IRBA exposure net of any

(i) specific allowance attributable to such IRBA(EQ) exposure or SEC-IRBA exposure, and

(ii) purchase price discount attributable to such SEC-IRBA exposure,

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[104] [Deleted by MAS Notice 637 (Amendment No. 3) 2017]

[104A] The EAD on drawn amounts shall not be less than the sum of (i) the amount by which a Reporting Bank's regulatory capital would be reduced if the exposure were written-off fully, and (ii) any specific allowances and partial write-offs. The difference between the EAD and the sum of (i) and (ii), where positive, is defined as a discount. For the avoidance of doubt, EAD, or where applicable EAD*, and the calculation of IRBA RWA is independent of any discounts.

[MAS Notice 637 (Amendment No. 3) 2017]

as determined in accordance with the Accounting Standards.

[MAS Notice 637 (Amendment No. 2) 2017]
[MAS Notice 637 (Amendment No. 3) 2017]

**Sub-division 2: Measurement of E or EAD for On-balance Sheet Assets**

7.2.4 Subject to paragraph 7.2.5 below, E or EAD[105], whichever is applicable, for each on-balance sheet asset shall be the carrying amount of the asset as determined in accordance with the Accounting Standards.[106]

[MAS Notice 637 (Amendment) 2014]

7.2.4A In the case of a lease where the Reporting Bank is exposed to residual value risk (i.e. potential loss due to the fair value of the leased asset declining below the estimate of its residual value reflected on the balance sheet of the Reporting Bank at lease inception), the Reporting Bank shall calculate (i) an exposure to the lessee equivalent to the discounted lease payment stream; and (ii) an exposure to the residual value of the leased assets equivalent to the estimate of the residual value reflected in the balance sheet of the Reporting Bank.

7.2.5 A Reporting Bank shall not recognise the effect of netting agreements relating to on-balance sheet assets and liabilities. For the avoidance of doubt, this does not apply to the calculation of E or EAD, whichever is applicable, for pre-settlement counterparty exposures arising from derivative transactions and long settlement transactions under the SA-CCR set out in Annex 7O.

[MAS Notice 637 (Amendment) 2016]

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[105] For any asset, E or EAD, whichever is applicable, shall be equal to the fair value of that asset presented in the balance sheet except that -

(a) for any asset held at cost, E or EAD, whichever is applicable, shall be equal to the cost of the asset presented in the balance sheet; and

(b) for any land and building asset or investment property where the Reporting Bank has recognised the revaluation surpluses or gains as CET1 Capital pursuant to paragraph 6.1.1(e), E or EAD, whichever is applicable, shall include only the portion of unrealised fair value gains that have been included as CET1 Capital (broadly equivalent to the sum of historical cost (less any allowance for impairment) and 45% of the unrealised fair value gains).

[MAS Notice 637 (Amendment) 2014]

[106] Any foreign exchange transaction or translation gain or loss from a foreign currency-denominated on-balance sheet item as well as interest earned on a fixed income instrument should be allocated to the exposure to which it accrues.

**Sub-division 3: Measurement of E or EAD for Off-balance Sheet Items Other than Pre-settlement Counterparty Exposures Arising from OTC Derivative Transactions, Long Settlement Transactions and SFTs**

7.2.6 For each off-balance sheet item other than a pre-settlement counterparty exposure arising from an OTC derivative transaction, long settlement transaction or SFT[107], a Reporting Bank shall calculate E or EAD, whichever is applicable, by –

(a) [Deleted by MAS Notice 637 (Amendment No. 2) 2017]

(b) multiplying the notional amount[109] of each item[110] with -

(i) the applicable CCF set out in Annex 7A if that item is an SA(CR) exposure;

(ii) the applicable CCF set out in Annex 7B if that item is an IRBA exposure, unless the Reporting Bank is adopting the A-IRBA or the IRBA for the IRBA retail asset class, in which case it shall use its own internal estimates of CCFs[111] where relevant[112]; or

(iii) the applicable CCF set out in Annex 7C if that item is a securitisation exposure.

[MAS Notice 637 (Amendment No. 2) 2017]

7.2.6A For the avoidance of doubt, if a Reporting Bank has securitised only the drawn balances of revolving credit facilities[112A], the Reporting Bank shall hold capital against the undrawn balances associated with the securitised exposures, and shall calculate E or EAD, whichever is applicable, based on the applicable CCF set out in Annex 7A if the exposure is an SA(CR) exposure, or Annex 7B if that item is an IRBA exposure.

[MAS Notice 637 (Amendment No. 2) 2017]

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[107] Notwithstanding this, a Reporting Bank which is exposed to the risk of the underlying securities in an OTC derivative transaction, long settlement transaction or SFT which is in substance similar to a forward purchase or credit substitute shall calculate E or EAD, whichever is applicable, for such an exposure in accordance with this Sub-division.

[108] [Deleted by MAS Notice 637 (Amendment No. 2) 2017]

[109] The notional amount of an off-balance sheet item refers to the amount which has been committed but is as yet undrawn. The amount to which the CCF is applied is the lower of the value of the unused committed credit line, and the value which reflects any possible constraining availability of the facility, such as the existence of a ceiling on the potential lending amount which is related to an obligor's reported cash flow. If the facility is constrained in this way, the Reporting Bank shall have sufficient line monitoring and management procedures to support this contention.

[110] Any foreign exchange transaction or translation gain or loss from a foreign currency-denominated off-balance sheet item should be allocated to the exposure to which it accrues.

[111] A Reporting Bank adopting the A-IRBA or the IRBA for the IRBA retail asset class shall calculate historical EAD using a default-weighted average and not a time-weighted average when making its own internal estimates of CCFs.

[112] An exposure that is subject to a 100% CCF under the F-IRBA shall continue to be subject to a 100% CCF under the A-IRBA. EAD for foreign exchange and interest rate commitments within a Reporting Bank's IRBA retail asset class shall be determined in accordance with paragraph 7.2.6(b)(i).

[112A] A securitisation of revolving credit facilities is a securitisation in which one or more underlying exposures represent, directly or indirectly, current or future draws on a revolving credit facility. Examples of revolving credit facilities include credit card exposures, home equity lines of credit, commercial lines of credit, and other lines of credit.

[MAS Notice 637 (Amendment No. 2) 2017]

7.2.7 For avoidance of doubt, where a Reporting Bank has provided unfunded credit protection via a total rate of return swap, E or EAD, whichever is applicable, shall be equal to the notional amount of the underlying reference credit for which the Reporting Bank is providing protection adjusted for any payments received from or made to the protection buyer and recognised in the profit and loss account of the Reporting Bank. Where a Reporting Bank has provided unfunded credit protection via a credit default swap, E or EAD, whichever is applicable, shall be equal to the notional amount of the underlying reference credit for which the Reporting Bank is providing protection.

**Sub-division 4: Recognition of Eligible Financial Collateral for On-balance Sheet Assets and Off-balance Sheet Items Other than Equity Exposures, Securitisation Exposures, OTC Derivative Transactions, Long Settlement Transactions and SFTs**

7.2.8 A Reporting Bank which has taken eligible financial collateral for any transaction other than an equity exposure, a securitisation exposure, an OTC derivative transaction, long settlement transaction or SFT may recognise the effect of such collateral in accordance with paragraphs 7.2.9 to 7.2.14 below.

7.2.9 A Reporting Bank using the SA(CR) may use either the FC(SA) or the FC(CA) to recognise the effect of eligible financial collateral. The Reporting Bank shall apply the chosen approach consistently to the entire banking book and shall not use a combination of both approaches.

7.2.10 A Reporting Bank using the SA(CR) and the FC(SA) may recognise the effect of eligible financial collateral in accordance with Sub-division 4 of Division 3 of this Part. Paragraphs 7.2.11 to 7.2.14 do not apply where a Reporting Bank uses the FC(SA).

7.2.11 A Reporting Bank using the SA(CR) and the FC(CA) may calculate E*, the SA(CR) exposure adjusted for eligible financial collateral, in accordance with Annex 7I of this Part and substitute E* for E when calculating the credit risk-weighted exposure amount for that SA(CR) exposure under Sub-division 3 of Division 1 of this Part.

7.2.12 A Reporting Bank using the F-IRBA and the FC(CA)[113] may calculate $EAD_{adj}$, the IRBA exposure adjusted for eligible financial collateral, in accordance with Annex 7I of this Part and use $EAD_{adj}$ to calculate LGD* in accordance with Sub-division 7 of Division 4 of this Part.[114]

7.2.13 A Reporting Bank using the supervisory slotting criteria under the F-IRBA and the FC(CA) may calculate EAD*, the IRBA exposure adjusted for eligible financial collateral, in accordance with Annex 7I of this Part and substitute EAD* for EAD when calculating the credit risk-weighted exposure amount and EL amount for that IRBA exposure under Sub-division 4 of Division 1 and Sub-division 14 of Division 4 of this Part, respectively.

7.2.14 A Reporting Bank using the A-IRBA or the IRBA for the IRBA retail asset class may take collateral into account when deriving its own estimates of LGD.

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[113] The FC(SA) is not available to a Reporting Bank using the F-IRBA.

[114] For avoidance of doubt, the EAD for any IRBA exposure is not affected by this calculation of $EAD_{adj}$.

**Sub-division 5: Recognition of Eligible Financial Collateral for Securitisation Exposures**

7.2.15 A Reporting Bank which has taken eligible financial collateral for a securitisation exposure[114A] may recognise the effect of such collateral used to hedge the credit risk of a securitisation exposure, in accordance with paragraphs 7.2.16 to 7.2.19.

[MAS Notice 637 (Amendment No. 2) 2017]

7.2.16 A Reporting Bank using the SEC-ERBA or SEC-SA may use either the FC(SA) or the FC(CA) to recognise the effect of eligible financial collateral. The Reporting Bank shall apply the chosen approach consistently to the entire banking book and shall not use a combination of both approaches.

[MAS Notice 637 (Amendment No. 2) 2017]

7.2.17 A Reporting Bank using the SEC-ERBA or SEC-SA and the FC(SA) may recognise the effect of eligible financial collateral in accordance with Sub-division 11 of Division 6 of this Part. Paragraphs 7.2.18 and 7.2.19 do not apply to a Reporting Bank using the FC(SA).

[MAS Notice 637 (Amendment No. 2) 2017]

7.2.18 A Reporting Bank using the SEC-ERBA or SEC-SA and the FC(CA) may calculate E*, the SEC-ERBA or SEC-SA exposure adjusted for eligible financial collateral, in accordance with Annex 7I and substitute E* for E when calculating the credit risk-weighted exposure amount for that SEC-ERBA or SEC-SA exposure under Sub-division 6 of Division 1 of this Part.

[MAS Notice 637 (Amendment No. 2) 2017]

7.2.19 A Reporting Bank using the SEC-IRBA may calculate EAD*, the SEC-IRBA exposure adjusted for eligible financial collateral and eligible IRBA collateral, in accordance with Annex 7I and substitute EAD* for EAD when calculating the credit risk-weighted exposure amount for that SEC-IRBA exposure under Sub-division 6 of Division 1 of this Part.

[MAS Notice 637 (Amendment No. 2) 2017]

[114A] Collateral pledged by an SPE may be recognised.

[MAS Notice 637 (Amendment No. 2) 2017]

**Sub-division 6: Measurement of E or EAD for Pre-settlement Counterparty Exposures Arising from OTC Derivative Transactions and Long Settlement Transactions, Other than Transactions Covered by a Qualifying Cross-Product Netting Agreement**

7.2.20 Subject to paragraph 7.2.20A, for each OTC derivative transaction or long settlement transaction which is not covered by a qualifying cross-product netting agreement, a Reporting Bank shall calculate E or EAD, whichever is applicable, for the pre-settlement counterparty exposure arising from that OTC derivative transaction or long settlement transaction using one of the following methods:

(a) the SA-CCR set out in Annex 7O; or

(b) the CCR internal models method set out in Annex 7Q.

[MAS Notice 637 (Amendment No. 2) 2014]
[MAS Notice 637 (Amendment) 2016]

7.2.20A For each counterparty, the E or EAD, whichever is applicable, for each OTC derivative transaction calculated in accordance with paragraph 7.2.20, shall be the greater of zero and the difference between the sum of E or EAD, whichever is applicable, across all netting sets with the counterparty and the CVA for that counterparty which has already been recognised by the Reporting Bank as an incurred write-down (i.e. a CVA loss). The Reporting Bank shall calculate the CVA loss without taking into account any offsetting debit valuation adjustments which have been deducted in the calculation of CET1 Capital in accordance with paragraph 6.1.3(g) of Part VI[114AA].

[MAS Notice 637 (Amendment No. 2) 2014]
[MAS Notice 637 (Amendment No. 2) 2017]

7.2.21 A Reporting Bank shall not use the CCR internal models method unless it has received the approval of the Authority to do so.

[MAS Notice 637 (Amendment) 2016]

7.2.21A Regardless of the method used by a Reporting Bank for calculating E or EAD, whichever is applicable, for the pre-settlement counterparty exposure arising from OTC derivative transactions and SFTs, a Reporting Bank may determine E or EAD, whichever is applicable, for the pre-settlement counterparty exposure arising from long settlement transactions using either of the methods set out in paragraph 7.2.20.

[MAS Notice 637 (Amendment No. 2) 2014]
[MAS Notice 637 (Amendment) 2016]

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[114AA] Where a Reporting Bank uses a combination of the SA-CCR and CCR internal models method to calculate its E or EAD, whichever is applicable, to a single counterparty, the Reporting Bank shall allocate separately (with no double-counting) collateral posted by the counterparty, for the purposes of calculating its E or EAD, whichever is applicable, under each of the respective methods.

[MAS Notice 637 (Amendment) 2016]
[MAS Notice 637 (Amendment No. 2) 2017]

7.2.21B A Reporting Bank which has taken eligible collateral that is not under a qualifying bilateral netting agreement and margin agreement for any OTC derivative transaction may recognise the effect of such collateral in accordance with paragraphs 2.9 to 2.13 of Annex 7Q.

[MAS Notice 637 (Amendment) 2016]

**Sub-division 7: Measurement of E or EAD for Pre-Settlement Counterparty Exposures Arising from SFTs, Other than Transactions Covered by a Qualifying Cross-Product Netting Agreement**

7.2.22 A Reporting Bank shall treat an SFT as collateralised lending for the purposes of this Notice, notwithstanding the wide range of structures which could be used for SFTs.

7.2.23 A Reporting Bank shall calculate E or EAD, whichever is applicable, for a pre-settlement counterparty exposure arising from an SFT, other than an exposure covered by a qualifying cross-product netting agreement –

(a) in accordance with paragraphs 7.2.25 to 7.2.31 below; or

(b) using the CCR internal models method set out in Annex 7Q of this Part.

7.2.24 A Reporting Bank shall not use the CCR internal models method unless it has received the approval of the Authority to do so.

7.2.25 Unless a Reporting Bank is using the CCR internal models method, it shall determine E or EAD, whichever is applicable, for a pre-settlement counterparty exposure arising from an SFT which is not covered by a qualifying cross-product netting agreement as follows[114B]:

(a) in the case where the Reporting Bank has lent securities to a counterparty or sold securities to a counterparty with a commitment to repurchase those securities at a specified price on a specified future date, the latest fair value of the security lent or sold; and

(b) in the case where the Reporting Bank has lent cash to a counterparty through the borrowing of securities from the counterparty or paid cash for the purchase of securities from a counterparty with a commitment to resell those securities at a specified price on a specified future date, the amount of cash lent or paid.[114C]

7.2.26 A Reporting Bank which has taken eligible financial collateral for any SFT where the pre-settlement counterparty exposure is determined in accordance with paragraph 7.2.25 above may recognise the effect of such collateral in accordance with paragraphs 7.2.27 to 7.2.31 below.

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[114B] For the avoidance of doubt, a Reporting Bank on either side of an SFT shall hold capital for the SFT. For example, this applies to repos and reverse repos, securities lending and securities borrowing transactions, and posting of securities in connection with derivative exposures or other borrowings.

[114C] Where a Reporting Bank, acting as an agent, arranges an SFT between a counterparty and a third party and provides a guarantee to the counterparty that the third party will perform on its obligations, then the risk to the Reporting Bank is the same as if the Reporting Bank had entered into the transaction as a principal. In such circumstances, the Reporting Bank shall calculate capital requirements as if it were itself the principal.

7.2.27 A Reporting Bank using the SA(CR) may use either the FC(SA) or the FC(CA) to recognise the effect of eligible financial collateral for any SFT in the banking book. The Reporting Bank shall apply the chosen approach consistently to the entire banking book and shall not use a combination of both approaches. For a pre-settlement counterparty exposure arising from any SFT in the trading book, a Reporting Bank using SA(CR) shall only use the FC(CA) to recognise the effect of eligible financial collateral.

7.2.28 A Reporting Bank using the SA(CR) and FC(SA) may recognise the effect of eligible financial collateral for any SFT in accordance with Sub-division 4 of Division 3 of this Part. Paragraphs 7.2.29 to 7.2.34 in this Sub-division do not apply where a Reporting Bank uses the FC(SA).

7.2.29 A Reporting Bank which has taken eligible financial collateral for any SFT that is not covered by a qualifying bilateral netting agreement may -

(a) if it is using the SA(CR) and the FC(CA), calculate E*, the SA(CR) exposure adjusted for eligible financial collateral, in accordance with Annex 7I of this Part, and substitute E* for E when calculating the credit risk-weighted exposure amount for that SA(CR) exposure under Sub-division 3 of Division 1 of this Part; and

(b) if it is using the F-IRBA and the FC(CA)[115], calculate $EAD_{adj}$ , the IRBA exposure adjusted for eligible financial collateral, in accordance with Annex 7I of this Part, and use $EAD_{adj}$ to calculate LGD* in accordance with Sub-division 7 of Division 4 of this Part.[116]

7.2.30 A Reporting Bank using the A-IRBA or the IRBA for the IRBA retail asset class may take collateral into account when deriving its own estimates of LGD for -

(a) any SFT that is not covered by a qualifying bilateral netting agreement; or

(b) any SFT that is covered by a qualifying bilateral netting agreement but for which the Reporting Bank has elected not to recognise the netting effects for the purposes of calculating regulatory capital requirements pursuant to this Notice.[117]

7.2.31 A Reporting Bank which has taken eligible financial collateral for an SFT that is covered by a qualifying bilateral netting agreement may -

(a) if it is using the SA(CR) and the FC(CA), calculate E*, the SA(CR) exposure adjusted for eligible financial collateral for all its SA(CR) exposures to any single counterparty covered by the qualifying bilateral netting agreement, in accordance with Annex 7I of this Part (if the Reporting Bank is using supervisory haircuts or own-estimate haircuts) or Annex 7M of this Part (if the Reporting Bank is using VaR models), and substitute E* for E when calculating the credit risk-weighted exposure amount for its SA(CR)

[115] The FC(SA) is not available to a Reporting Bank using the F-IRBA.
[116] For avoidance of doubt, the EAD for any IRBA exposure is not affected by this calculation of $EAD_{adj}$.
[117] A Reporting Bank which has adjusted its estimates of LGD pursuant to paragraph 7.2.30(b) shall not also substitute EAD* for EAD pursuant to paragraph 7.2.31(b).

exposures to that counterparty under Sub-division 3 of Division 1 of this Part; and

(b) if it is using the IRBA (whether F-IRBA, A-IRBA or IRBA for the IRBA retail asset class) and the FC(CA), calculate EAD*, the IRBA exposure adjusted for eligible financial collateral for all its IRBA exposures to any single counterparty covered by the qualifying bilateral netting agreement, in accordance with Annex 7I of this Part (if the Reporting Bank is using supervisory haircuts or own-estimate haircuts) or Annex 7M of this Part (if the Reporting Bank is using VaR models), and substitute EAD* for EAD when calculating the credit risk-weighted exposure amount for its IRBA exposures to that counterparty under Sub-division 4 of Division 1 of this Part.[118]

**Sub-division 8: Measurement of E or EAD for Pre-Settlement Counterparty Exposures Arising from OTC Derivative Transactions, Long Settlement Transactions and SFTs Covered by a Qualifying Cross-Product Netting Agreement**

7.2.32 Subject to paragraph 7.2.32A, a Reporting Bank shall calculate E or EAD, whichever is applicable, for any pre-settlement counterparty exposure arising from any OTC derivative transaction, long settlement transaction or SFT to a single counterparty that is covered by a qualifying cross-product netting agreement, using the CCR internal models method set out in Annex 7Q of this Part.

[MAS Notice 637 (Amendment No. 2) 2014]

7.2.32A For each counterparty, the E or EAD, whichever is applicable, for each OTC derivative transaction calculated in accordance with paragraph 7.2.32, shall be the greater of zero and the difference between the sum of E or EAD, whichever is applicable, across all netting sets with the counterparty and the CVA for that counterparty which has already been recognised by the Reporting Bank as an incurred write-down (i.e. a CVA loss). The Reporting Bank shall calculate the CVA loss without taking into account any offsetting debit valuation adjustments which have been deducted in the calculation of CET1 Capital in accordance with paragraph 6.1.3(g) of Part VI.

[MAS Notice 637 (Amendment No. 2) 2014]

7.2.33 A Reporting Bank shall not use the CCR internal models method unless it has received the approval of the Authority to do so.

118 The Reporting Bank shall not recognise the effect of eligible financial collateral by adjusting LGD.

**Sub-division 9: Exceptions to the Measurement of E or EAD**

7.2.34 Notwithstanding paragraphs 7.2.1 to 7.2.33 above, a Reporting Bank may attribute a value of zero to E or EAD, whichever is applicable, for -

(a) any pre-settlement counterparty exposure arising from any credit derivative which a Reporting Bank may recognise as eligible credit protection for a banking book exposure or another CCR exposure[119A]; and

(b) any pre-settlement counterparty exposure arising from any sold credit default swap in the banking book, where the credit default swap is treated as credit protection sold by the Reporting Bank, and subject to credit risk capital requirements for the full notional amount.

[MAS Notice 637 (Amendment) 2012]

**Sub-division 10: Measurement of E or EAD for Unsettled Transactions**

7.2.35 A Reporting Bank shall determine E or EAD, whichever is applicable, for an unsettled DvP transaction as the difference between the transaction valued at the agreed settlement price and the transaction valued at current market price, or in the case where the difference is negative, a value of zero.

7.2.36 A Reporting Bank shall determine E or EAD, whichever is applicable, for an unsettled non-DvP transaction as equal to the outstanding receivables after the end of the first contractual payment or delivery date.[120]

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[119] *[This footnote has been intentionally left blank.]*

[119A] For the purpose of computing the CVA risk capital requirement, a Reporting Bank shall not attribute a value of zero to E or EAD, whichever is applicable, for the pre-settlement counterparty exposure to the protection provider arising from a credit derivative which the Reporting Bank recognises as an eligible hedge in the calculation of the CVA risk capital.

[120] If the dates when two payment legs are made are the same according to the time zones where each payment is made, they are deemed to have been settled on the same day.

**Division 3: SA(CR)**

**Sub-division 1: Categorisation of SA(CR) Exposures**

7.3.1 A Reporting Bank shall categorise any SA(CR) exposure that is not past due for more than 90 days into one of the following asset classes under SA(CR):

(a) cash items, which consist of –

(i) cash and cash equivalents[120A];

(ii) gold bullion held in the vaults of the Reporting Bank or on an allocated basis in the vaults of another entity to the extent that it is backed by gold bullion liabilities; and

(iii) all receivable funds arising from transactions that are settled on a DvP basis which are outstanding up to and including the 4th business day after the settlement date[121];

(b) central government and central bank asset class, which consists of any SA(CR) exposure to a central government or central bank;

(c) PSE asset class, which consists of any SA(CR) exposure to a PSE;

(d) MDB asset class, which consists of any SA(CR) exposure to an MDB, the Bank for International Settlements, the International Monetary Fund, the European Central Bank or the European Community;

(e) bank asset class, which consists of any SA(CR) exposure to a banking institution;

(f) corporate asset class, which consists of any SA(CR) exposure to any corporation, partnership, limited liability partnership, sole proprietorship or trustee in respect of a trust, other than exposures categorised in sub-paragraphs (a) to (e), (g) and (h)[122];

[MAS Notice 637 (Amendment) 2012]

(g) regulatory retail asset class, which consists of any SA(CR) exposure meeting all of the following conditions[122A]:

(i) the exposure is to an individual, a group of individuals, or a small business;

(ii) the exposure takes the form of any of the following:

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[120A] Cash equivalents refer to cheques, drafts and other items drawn on other banking institutions that are either payable immediately upon presentation or that are in the process of collection.

[121] This includes transactions settled on a payment-versus-payment basis.

[122] For avoidance of doubt, an SA(CR) exposure to a securities firm or an insurance entity shall be categorised within the corporate asset class.

[122A] Securities (such as bonds and equities), whether listed or not, and any SA(CR) exposure that meets the conditions to be categorised within the residential mortgage asset class, are excluded from this asset class.

(A) revolving credit and lines of credit, including credit cards and overdrafts;

(B) personal term loans and leases, including instalment loans, vehicle loans and leases, student and educational loans, and personal finance; or

(C) small business credit facilities and commitments;

(iii) the Reporting Bank shall demonstrate to the satisfaction of the Authority that the exposure is one of a sufficient number of exposures[122B] with similar characteristics and that the portfolio is sufficiently diversified such that the risks associated with such lending are reduced; and

(iv) the total exposure[123] to any obligor[123A] or group of obligors[124] is not more than $2 million;

(h) residential mortgage asset class, which consists of any SA(CR) exposure meeting all of the following conditions:

(i) the exposure is to an individual or a group of individuals, or if the exposure is to an entity other than an individual, the Reporting Bank is able to demonstrate to the satisfaction of the Authority, that it has robust processes to ascertain that the exposure is structured to replicate the risk profile of an exposure to an individual or a group of individuals and that it is able to identify and manage the legal risks that arise in such structures;

(ii) the exposure is –

(a) secured against a first charge held by the Reporting Bank for a loan; or

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[122B] A factor to be considered is whether any total exposure to any obligor or group of obligors is not more than 0.2% of the total exposures of the regulatory retail asset class. A Reporting Bank shall exclude exposures that are past due for more than 90 days for the assessment of diversification.

[MAS Notice 637 (Amendment No. 2) 2014]

[123] This includes any past due exposure to the same obligor or group of obligors. For the avoidance of doubt, this is gross of any CRM.

[123A] Where an exposure to an individual exceeds $2 million, a Reporting Bank shall categorise the exposure under the other exposures asset class.

[124] The basis of aggregation for small business exposures of not more than $2 million that are treated as retail exposures shall be (a) the definition of an obligor group used by the Reporting Bank for its risk management purposes, with the proviso that exposures to related corporations and associates of the obligor, and the sole proprietors or partners in any of the entities in the obligor group are to be included in the aggregation; and (b) based on all banking group entities that fall within the scope of application of this Notice. However, the Reporting Bank may dis-aggregate certain exposures if the dis-aggregated obligors have sufficient financial resources to fully service their liabilities and do not need to depend on any other entity within the obligor group for financial assistance in meeting their liabilities. A simplistic dis-aggregation based on product type alone would not be acceptable.

(b) secured against a junior charge held by the Reporting Bank for a loan where all the senior charges are held by the Reporting Bank or CPF, as the case may be,

in respect of -

(A) of a completed residential property;

(B) of an uncompleted residential property in Singapore; or

(C) of an uncompleted residential property in a jurisdiction approved by the Authority on an exceptional basis[124A];

[MAS Notice 637 (Amendment) 2013]

(iii) the exposure is not rated as a classified loan under MAS Notice 612; and

(iv) the exposure is not to a corporation, partnership, sole proprietorship or trustee in respect of a trust where such corporation, partnership, sole proprietorship or trust is engaged in residential building, development or management;

(i) CRE asset class, which consists of any SA(CR) exposure meeting all of the following conditions[124B]:

(i) the exposure is to an individual or a group of individuals, a corporation, partnership, limited liability partnership, sole proprietorship or trustee in respect of a trust; and

[MAS Notice 637 (Amendment) 2012]

(ii) the exposure is secured by CRE; or

(j) other exposures asset class, which consists of any SA(CR) exposure which does not fall within any of the categories in sub-paragraphs (a) to (i) above. This includes any exposure to the residual value of leased assets calculated in accordance with paragraph 7.2.4A.

[124A] Where an exposure is secured by RRE and meets the conditions in sub-paragraphs 7.3.1(h)(i) and 7.3.1(h)(iv), but not sub-paragraph 7.3.1(h)(ii), the Reporting Bank shall categorise the exposure under the other exposures asset class.

[124B] For the avoidance of doubt, a Reporting Bank shall categorise exposures which fit the description in both sub-paragraphs (f) and (i), or in both sub-paragraphs (g) and (i), under sub-paragraph (i) only.

[MAS Notice 637 (Amendment) 2012]

[125] *[This footnote has been intentionally left blank.]*

**Sub-division 2: Credit Quality Grade and External Credit Assessments**

7.3.2 A Reporting Bank shall assign an SA(CR) exposure to a credit quality grade based on the external credit assessment[126] that is applicable to the SA(CR) exposure in accordance with Tables 7R-1 and 7R-2, as the case may be, of Annex 7R of this Part.

7.3.3 A Reporting Bank shall only use external credit assessments by recognised ECAIs. The Authority may impose conditions on the use of such external credit assessments.

7.3.3A A Reporting Bank shall perform an appropriate level of due diligence prior to the use of any recognised ECAI for the purpose of calculating regulatory capital requirements.

7.3.4 A Reporting Bank shall use its chosen recognised ECAIs and their external credit assessments consistently for each type of exposure, for both risk weighting and risk management purposes. Where a Reporting Bank has two external credit assessments which map into different credit quality grades, it shall assign the SA(CR) exposure to the credit quality grade associated with the higher risk weight. Where a Reporting Bank has three or more external credit assessments which map into two or more different credit quality grades, it shall assign the SA(CR) exposure to the credit quality grade associated with the higher of the two lowest risk weights.[127] A Reporting Bank shall not cherry-pick the assessments provided by different recognised ECAIs nor arbitrarily change its choice of recognised ECAIs for each type of exposure after its initial selection.

7.3.5 A Reporting Bank shall not recognise the effects of CRM if such CRM is already reflected in the issue-specific external credit assessment of the SA(CR) exposure.

7.3.6 Where an SA(CR) exposure has an issue-specific external credit assessment, a Reporting Bank shall use such assessment. Where an SA(CR) exposure does not have an issue-specific external credit assessment[127A] -

(a) if there is an issue-specific external credit assessment for another exposure to the same obligor which maps to a risk weight that is lower than that applicable to an unrated exposure, a Reporting Bank may use the issue-specific assessment for the other exposure only if the exposure without an issue-specific assessment ranks *pari passu* with or is senior to the exposure with the issue-specific assessment in all respects;

(b) if the obligor has an issuer external credit assessment which maps to a risk weight that is lower than that applicable to an unrated exposure, a Reporting Bank may use the issuer assessment of the obligor only if the exposure is a senior claim;

[126] The Reporting Bank may only use an external credit assessment which is accessible to the public. A Reporting Bank may not use credit assessment that is made available only to the parties to a transaction.

[127] For illustration, if there are three external credit assessments mapping into credit quality grades with risk weights of 0%, 20% and 50%, then the applicable risk weight is 20%. If the external credit assessments map into credit quality grades with risk weights of 20%, 50% and 50%, then the applicable risk weight is 50%.

[127A] A short-term issue-specific external credit assessment cannot be used to derive risk weights for other short-term claims to the same obligor, except where set out in paragraphs 7.3.22A, 7.3.23 and 7.3.26. In all cases, a short-term issue-specific external credit assessment cannot be used to support a risk weight for an unrated long-term claim.

(c) if there is an issue-specific external credit assessment for another exposure to the same obligor which maps to a risk weight that is higher than that applicable to an unrated exposure, a Reporting Bank shall use the issue-specific assessment for the other exposure if the exposure without an issue-specific assessment ranks *pari passu* with or is subordinated to the exposure with the issue-specific assessment;

(d) if the obligor has an issuer external credit assessment which maps to a risk weight that is higher than that applicable to an unrated exposure, a Reporting Bank shall use the issuer assessment of the obligor if the exposure without an issue-specific assessment ranks *pari passu* with or is subordinated to the highest unsecured claim on the obligor; or

(e) in all other cases, a Reporting Bank shall apply the risk weight that is applicable to an unrated exposure.

7.3.6A A Reporting Bank shall not use external credit assessments for an obligor within a group to risk weight other obligors within the same group.

7.3.7 Where an SA(CR) exposure is risk-weighted in accordance with paragraphs 7.3.6(a) to (d) above, a Reporting Bank may use a domestic currency external credit assessment[127B], if separate, only if –

(a) the SA(CR) exposure is denominated in that domestic currency; or

(b) the SA(CR) exposure is guaranteed against convertibility and transfer risk by a qualifying MDB, in which case the domestic currency external credit assessment can be used only for the portion of the SA(CR) exposure that is covered by such a guarantee. For the portion of the SA(CR) exposure that is not covered by such a guarantee, a Reporting Bank shall use a foreign currency external credit assessment.

7.3.8 A Reporting Bank may use an external credit assessment to risk weight an SA(CR) exposure only if the external credit assessment has taken into account and reflects the entire amount of credit risk exposure the Reporting Bank has with regard to all payments owed to it.[128]

7.3.9 A Reporting Bank shall not use unsolicited external credit assessments to assign any SA(CR) exposure to a credit quality grade, unless -

(a) it has assessed the quality of the unsolicited external credit assessments that it intends to use and is satisfied that these are comparable in performance with solicited external credit assessments and maintains relevant records and documents to be made available to the Authority upon request; and

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[127B] For the avoidance of doubt, a Reporting Bank shall use a foreign currency external credit assessment for an SA(CR) exposure denominated in foreign currency.

[128] For example, if a Reporting Bank is owed both principal and interest, the assessment shall fully take into account and reflect the credit risk associated with repayment of both principal and interest.

(b) it uses unsolicited external credit assessments consistently for each type of exposures, for both risk weighting and risk management purposes.

7.3.9A The Authority may exclude the use of unsolicited external credit assessments by a recognised ECAI for the purpose of calculating regulatory capital requirements if the Authority is not satisfied that the unsolicited assessments are not inferior in quality to the general quality of solicited assessments. In the event the Authority is of the view that an ECAI uses unsolicited ratings to put pressure on entities to obtain solicited ratings, the Authority may refuse to recognise such ECAIs as eligible for capital adequacy purposes.

**Sub-division 3: Risk Weights**

7.3.10 Subject to Sub-division 4 of this Division, a Reporting Bank using the SA(CR) shall[128A] -

(a) for an SA(CR) exposure that is not past due for more than 90 days, determine the applicable risk weight in accordance with paragraphs 7.3.11 to 7.3.30 below[129];

(b) for an SA(CR) exposure that is past due for more than 90 days, determine the applicable risk weight in accordance with paragraphs 7.3.31 to 7.3.35 below; and

(c) for an SA(CR) exposure arising from an unsettled transaction, determine the applicable risk weight in accordance with paragraphs 7.3.36 to 7.3.40 below.

<u>Cash Items</u>

7.3.11 Subject to paragraph 7.3.12 below, a Reporting Bank shall apply a 0% risk weight to any SA(CR) exposure categorised as a cash item.

7.3.12 A Reporting Bank shall apply a 20% risk weight to cheques, drafts and other items drawn on other banking institutions that are either payable immediately upon presentation or that are in the process of collection.

<u>Central Government and Central Bank Asset Class</u>

7.3.13 Subject to paragraphs 7.3.14 and 7.3.15 below, a Reporting Bank shall risk-weight any SA(CR) exposure in the central government and central bank asset class in accordance with Table 7-1.

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[128A] This includes an SA(CR) exposure to lessee equivalent to the discounted lease payment as calculated in accordance with paragraph 7.2.4A.

[MAS Notice 637 (Amendment) 2014]

[129] Where an SA(CR) exposure which is not past due has a credit quality grade which corresponds to a risk weight of 150%, a Reporting Bank may apply the appropriate treatment and risk weights set out in paragraphs 7.3.31 to 7.3.35.

Table 7-1: Risk Weights for the Central Government and Central Bank Asset Class

| **Credit Quality Grade** | 1 | 2 | 3 | 4 | 5 | 6 | Unrated |
|---|---|---|---|---|---|---|---|
| **Risk Weight** | 0% | 20% | 50% | 100% | 100% | 150% | 100% |

7.3.14 A Reporting Bank shall apply a 0% risk weight to any SA(CR) exposure to the Government or the Authority which is denominated in Singapore dollars and funded by liabilities denominated in Singapore dollars.

7.3.15 For any SA(CR) exposure to any other central government or central bank which is denominated and funded in the local currency of that jurisdiction, a Reporting Bank may apply such risk weights as may be specified by the bank regulatory agency of that jurisdiction.

PSE Asset Class

7.3.16 Subject to paragraph 7.3.17 below, a Reporting Bank shall risk-weight any SA(CR) exposure in the PSE asset class in accordance with Table 7-2.

Table 7-2: Risk Weights for the PSE Asset Class

| **Credit Quality Grade** | 1 | 2 | 3 | 4 | 5 | 6 | Unrated |
|---|---|---|---|---|---|---|---|
| **Risk Weight** | 20% | 50% | 50% | 100% | 100% | 150% | 50% |

[MAS Notice 637 (Amendment No. 2) 2018]

7.3.17 A Reporting Bank shall risk weight any SA(CR) exposure in the PSE asset class in accordance with Table 7-3 if –

(a) in the case of a PSE in Singapore, the exposures to the Singapore Government have a credit quality grade of "1" as set out in Table 7R-1 of Annex 7R of this Part[129A]; and

[MAS Notice 637 (Amendment No. 2) 2018]

(b) in the case of a PSE outside Singapore, the bank regulatory agency of the jurisdiction where the PSE is established has exercised the national discretion to treat the claim on the PSE as a claim on the central government and the exposures to the central government of the jurisdiction of that PSE have a credit quality grade of "1" as set out in Table 7R-1 of Annex 7R of this Part.

Table 7-3: Risk Weights for Exposures to PSEs where the Central Government has a Credit Quality Grade of "1"[129A]

| **Credit Quality Grade** | 1 | 2 | 3 | 4 | 5 | 6 | Unrated |
|---|---|---|---|---|---|---|---|
| **Risk Weight** | 0% | 20% | 20% | 100% | 100% | 150% | 20% |

[129A] An exposure to a PSE in Singapore that is risk-weighted at 0% pursuant to paragraph 7.3.17(a) and Table 7-3 is treated as an exposure to the Singapore Government.

[MAS Notice 637 (Amendment No. 2) 2018]

MDB Asset Class

7.3.18 Subject to paragraphs 7.3.19 and 7.3.20 below, a Reporting Bank shall risk-weight any SA(CR) exposure in the MDB asset class in accordance with Table 7-4.

Table 7-4: Risk Weights for the MDB Asset Class

| **Credit Quality Grade** | 1 | 2 | 3 | 4 | 5 | 6 | Unrated |
|---|---|---|---|---|---|---|---|
| **Risk Weight** | 20% | 50% | 50% | 100% | 100% | 150% | 50% |

7.3.19 A Reporting Bank shall apply a 0% risk weight to any SA(CR) exposure to a qualifying MDB.

7.3.20 A Reporting Bank shall apply a 0% risk weight to any SA(CR) exposure to the Bank for International Settlements, the International Monetary Fund, the European Central Bank, the European Community, the European Stability Mechanism or the European Financial Stability Facility.

[MAS Notice 637 (Amendment) 2014]

Bank Asset Class

7.3.21 Subject to paragraphs 7.3.22 and 7.3.23 below, a Reporting Bank shall risk-weight any SA(CR) exposure in the bank asset class in accordance with Table 7-5.

Table 7-5: Risk Weights for the Bank Asset Class

| **Credit Quality Grade** | 1 | 2 | 3 | 4 | 5 | 6 | Unrated |
|---|---|---|---|---|---|---|---|
| **Risk Weight** | 20% | 50% | 50% | 100% | 100% | 150% | 50% |
| **Risk Weight for Short-Term Exposures**[130] | 20% | 20% | 20% | 50% | 50% | 150% | 20% |

7.3.22 A Reporting Bank shall risk-weight any short-term SA(CR) exposure in the bank asset class with an issue-specific external credit assessment in accordance with Table 7-6.

Table 7-6: Risk Weights for Short-Term SA(CR) Exposures in the Bank Asset Class with Issue-Specific External Credit Assessments

| **Short-Term Credit Quality Grade** | I | II | III | IV |
|---|---|---|---|---|
| **Risk Weight** | 20% | 50% | 100% | 150% |

7.3.22A If a short-term SA(CR) exposure in the bank asset class with an issue-specific external credit assessment attracts a risk weight that is higher than that applicable for a short-term exposure under Table 7-5, a Reporting Bank shall apply the risk weight based on the issue-specific assessment to any unrated short-term SA(CR) exposure to the same banking institution.

7.3.23 For any SA(CR) exposure in the bank asset class that does not have an external credit assessment by a recognised ECAI, a Reporting Bank shall apply the risk weight

[130] For the purposes of this table, short-term exposures refer to exposures with an original maturity of three months or less and that are not expected to be rolled over.

determined in accordance with Table 7-5 or the risk weight that is applicable to an SA(CR) exposure to the central government of the jurisdiction in which the banking institution is incorporated or established, whichever is higher.[130A] If a short-term SA(CR) exposure in the bank asset class with an issue-specific external credit assessment[130B] -

(a) attracts a risk weight of 50% or 100%, then the Reporting Bank shall apply a risk weight of not lower than 100% to any unrated short-term SA(CR) exposure to the same banking institution; or

(b) attracts a risk weight of 150%, then the Reporting Bank shall apply a risk weight of 150% to any unrated SA(CR) exposure (whether long-term or short-term) to the same banking institution.

Corporate Asset Class

7.3.24 Subject to paragraphs 7.3.25 and 7.3.26 below, a Reporting Bank shall risk-weight any SA(CR) exposure in the corporate asset class in accordance with Table 7-7.

Table 7-7: Risk Weights for the Corporate Asset Class

| **Credit Quality Grade** | 1 | 2 | 3 | 4 | 5 | 6 | Unrated |
|---|---|---|---|---|---|---|---|
| **Risk Weight** | 20% | 50% | 100% | 100% | 150% | 150% | 100% |

7.3.25 A Reporting Bank shall risk-weight any short-term SA(CR) exposure in the corporate asset class with an issue-specific external credit assessment in accordance with Table 7-8.

Table 7-8: Risk Weights for Short-Term SA(CR) Exposures in the Corporate Asset Class with Issue-Specific External Credit Assessments

| **Short-Term Credit Quality Grade** | I | II | III | IV |
|---|---|---|---|---|
| **Risk Weight** | 20% | 50% | 100% | 150% |

130A This does not apply to claims of the confirming bank on the issuing bank in the case of short-term self-liquidating letters of credit.

130B For the avoidance of doubt, in the case of an exposure to which this sentence and paragraph 7.3.22A both apply, the Reporting Bank shall apply the higher of the two risk weights.

7.3.26 For any SA(CR) exposure in the corporate asset class that does not have an external credit assessment by a recognised ECAI, a Reporting Bank shall apply the risk weight determined in accordance with Table 7-7 or the risk weight that is applicable to an SA(CR) exposure to the central government of the jurisdiction in which the corporate is incorporated or established, whichever is higher.[131] If a short-term SA(CR) exposure in the corporate asset class with an issue-specific external credit assessment -

(a) attracts a risk weight of 50% or 100%, then the Reporting Bank shall apply a risk weight of not lower than 100% to any unrated short-term SA(CR) exposure to the same corporate; or

(b) attracts a risk weight of 150%, then the Reporting Bank shall apply a risk weight of 150% to any unrated SA(CR) exposure (whether long-term or short-term) to the same corporate.

7.3.27 Subject to the approval of the Authority, a Reporting Bank may apply a 100% risk weight to its SA(CR) exposures in the corporate asset class regardless of the credit quality grade of individual exposures. The Authority will not normally grant approval for a Reporting Bank to use this approach unless the Reporting Bank has a clear implementation plan for adopting the IRBA. A Reporting Bank shall demonstrate to the satisfaction of the Authority that its use of this approach is not intended to avoid or reduce regulatory capital which the Reporting Bank would otherwise be required to maintain. Where approval has been granted by the Authority, the Reporting Bank shall apply a single consistent approach of either using external credit assessments by recognised ECAIs where available or not at all.

Regulatory Retail Asset Class

7.3.28 A Reporting Bank shall apply a 75%[132] risk weight to any SA(CR) exposure in the regulatory retail asset class.

Residential Mortgage Asset Class

7.3.29 Subject to paragraph 7.3.29A below, a Reporting Bank shall risk weight any SA(CR) exposure in the residential mortgage asset class in accordance with Table 7-9.[133]

[131] The Authority may from time to time specify a higher risk weight for a particular exposure or group of exposures, taking into account, among other things, the default experience of this type of exposures.

[132] The Authority may from time to time specify a higher risk weight for a particular exposure or group of exposures, taking into account, among other things, the default experience of this type of exposures.

[133] The Authority may from time to time specify a higher risk weight for a particular exposure or group of exposures, taking into account, among other things, the default experience of this type of exposures.

Table 7-9: Risk Weights for the Residential Mortgage Asset Class

| Condition | Risk Weight |
|---|---|
| Where the LTV ratio[134] calculated in accordance with MAS Notice 632 is - (a) less than or equal to 80%; or (b) more than 80% but less than or equal to 90%, where there is mortgage insurance which complies with the requirements in Annex 7T of this Part ("qualifying mortgage insurance") covering at least the portion of each exposure in excess of 80%. | 35% |
| Where the LTV ratio[134] calculated in accordance with MAS Notice 632 is more than 80% but less than or equal to 90%. | 75% |
| Where the LTV ratio[134] calculated in accordance with MAS Notice 632 is more than 90%. | 100% |

[MAS Notice 637 (Amendment) 2013]

7.3.29A Where the SA(CR) exposure is secured against a junior charge, the numerator of the LTV ratio referred to in Table 7-9 shall be adjusted to include all senior charges ranking above the junior charge in question, including senior charges held by the CPF.

[MAS Notice 637 (Amendment) 2013]

7.3.29B Subject to the approval of the Authority, a Reporting Bank may, instead of applying paragraph 7.3.29A, apply a 100% risk weight to SA(CR) exposures in the residential mortgage asset class secured against a junior charge.

[MAS Notice 637 (Amendment) 2013]

CRE Asset Class

7.3.29C A Reporting Bank shall apply a 100%[134A] risk weight to any SA(CR) exposure in the CRE asset class.

Other Exposures Asset Class

7.3.30 A Reporting Bank shall apply a 100%[135] risk weight to any SA(CR) exposure in the other exposures asset class.

[134] A Reporting Bank shall calculate the LTV ratio as at the inception of the exposure and on an ongoing-basis thereafter. In calculating the LTV ratio on an ongoing basis, a Reporting Bank shall have in place policies covering matters such as the frequency of revaluation, the procedures for revaluation under various market circumstances, and the revaluation methods and approaches to be used in each circumstance which could include statistical methods (e.g. reference to property indices, sampling etc.) or formal revaluation by an independent accredited valuer. Statistical methods should be regularly backtested and benchmarked, where possible, so that the results obtained are robust. In general, a Reporting Bank is expected to undertake a formal revaluation regularly.

[134A] In the case of an exposure which fits the description in both sub-paragraphs (f) and (i) of paragraph 7.3.1 on categorisation of SA(CR) exposures, the Reporting Bank shall apply the higher of the risk weights applicable to that exposure under paragraph 7.3.24 and this paragraph.

[135] The Authority may from time to time specify a higher risk weight for a particular exposure or group of exposures, taking into account, among other things, the default experience of this type of exposures.

Past Due Exposures

7.3.31 Subject to paragraphs 7.3.32 and 7.3.35, a Reporting Bank shall risk-weight the unsecured portion of any SA(CR) exposure that is past due for more than 90 days in accordance with Table 7-10.

Table 7-10: Risk Weights for Past Due Exposures

| Condition | Risk Weight |
|---|---|
| Where specific allowances are less than 20% of the outstanding amount of the exposure | 150% |
| Where specific allowances are no less than 20% of the outstanding amount of the exposure | 100% |

[MAS Notice 637 (Amendment No. 3) 2017]

7.3.32 For the purposes of paragraph 7.3.31 above, a Reporting Bank shall calculate the unsecured portion of any SA(CR) exposure that is past due for more than 90 days as follows:

(a) for a Reporting Bank using the FC(SA),

Unsecured Portion = $E - P - C_f$

where -

(i) $E$ = E calculated in accordance with Division 2 of this Part;

(ii) $P$ = notional amount of eligible credit protection received; and

(iii) $C_f$ = fair value of eligible financial collateral received;

or

(b) for a Reporting Bank using the FC(CA),

Unsecured Portion = $E^* - P$

where -

(i) $E^*$ = E* calculated in accordance with Division 2 of this Part; and

(ii) $P$ = notional amount of eligible credit protection received.

7.3.33 *[This paragraph has been intentionally left blank.]*

7.3.34 *[This paragraph has been intentionally left blank.]*

[136] *[This footnote has been intentionally left blank.]*
[137] *[This footnote has been intentionally left blank.]*

7.3.35 A Reporting Bank shall apply a 100% risk weight to any SA(CR) exposure in the residential mortgage asset class that is past due for more than 90 days.

Unsettled Transactions

7.3.36 A Reporting Bank shall comply with the requirements set out in paragraphs 7.3.37 to 7.3.39 below to calculate the credit-risk weighted exposure amount for any unsettled transaction[137A] on securities, foreign exchange instruments and commodities (other than an SFT).

7.3.37 A Reporting Bank shall apply a risk weight to any SA(CR) exposure arising from receivables[138] that remain unpaid or undelivered in respect of an unsettled DvP transaction in accordance with Table 7-11.

Table 7-11: Risk Weights for Unsettled DvP Transactions

| Number of Business Days after Agreed Settlement Date | Risk Weight |
|---|---|
| From 0 to 4 | 0% |
| From 5 to 15 | 100% |
| From 16 to 30 | 625% |
| From 31 to 45 | 937.5% |
| 46 or more | 1,250% |

7.3.38 A Reporting Bank which has fulfilled its obligations under the first contractual payment or delivery leg of a non-DvP transaction shall regard as a loan exposure to its counterparty any outstanding receivables after the end of the first contractual payment or delivery date[139]. The Reporting Bank shall risk weight any such SA(CR) exposure arising from receivables that remain unpaid or undelivered up to and including the fourth business day after the second contractual payment or delivery date in accordance with paragraphs 7.3.11 to 7.3.30 above. If such SA(CR) exposures are not material in aggregate, the Reporting Bank may apply a uniform risk weight of 100% to all of them.

7.3.39 If the receivables arising from the non-DvP transaction remain unpaid or undelivered on or after the fifth business day after the second contractual payment or delivery date, a Reporting Bank shall apply a 1250% risk weight to such receivables and the replacement cost of the transaction, if any. This treatment shall continue until the second payment or delivery leg is effectively completed.

[MAS Notice 637 (Amendment No. 2) 2014]

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137A This includes any transaction, through a settlement and clearing system recognised by the Authority or a CCP, that – (a) is subject to daily mark-to-market and payment of daily variation margins; and (b) involves a mismatched trade. An exposure value of zero for CCR can be attributed to payment transactions (for example, funds transfer transactions) and other spot transactions that are outstanding with a CCP, when the CCP's CCR exposures with all participants in its arrangements are fully collateralised on a daily basis.
[MAS Notice 637 (Amendment) 2012]

138 Such exposures shall be treated as a loan to the counterparty.

139 If the dates when two payment legs are made are the same according to the time zones where each payment is made, they are deemed to have been settled on the same day.

7.3.40 The Authority may exempt the Reporting Bank from the applicable capital treatment in paragraphs 7.3.37 and 7.3.39 above if there has been a system-wide failure of a settlement system, clearing system or CCP that causes significant disruption to normal settlement and clearing processes. The Authority may grant such exemption subject to such conditions or restrictions as the Authority may impose.

[MAS Notice 637 (Amendment) 2012]

**Sub-division 4: Treatment of Credit Protection and Recognition of Eligible Financial Collateral**

Treatment of Eligible Credit Protection Bought

7.3.41 A Reporting Bank which has bought eligible credit protection for an SA(CR) exposure may recognise the effects of CRM of the eligible credit protection as follows:

(a) break down the SA(CR) exposure into -

(i) a protected portion with E equal to the notional amount of the eligible credit protection[140]; and

(ii) an unprotected portion with E equal to the E of the SA(CR) exposure less the notional amount of the eligible credit protection; and

(b) for the purposes of calculating the credit risk-weighted exposure amount pursuant to Sub-division 3 of Division 1 of this Part, use -

(i) for the protected portion, the risk weight that is applicable to the eligible protection provider[140A]; and

(ii) for the unprotected portion, the risk weight that is applicable to the obligor.

[MAS Notice 637 (Amendment No. 2) 2014]

7.3.42 Notwithstanding paragraph 7.3.41(b), a Reporting Bank shall apply a 1250% risk weight to any materiality threshold below which no payment will be made by the protection provider in the event of loss on an SA(CR) exposure as such threshold is equivalent to a retained first loss position.

7.3.43 A Reporting Bank shall apply the relevant provisions in Annex 7H of this Part for the purpose of determining the protected portion in cases of proportional cover, principal-only cover, partially eligible credit derivatives, tranched cover and basket credit derivatives.

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[140] A Reporting Bank shall treat the protected portion of an SA(CR) exposure which has a currency mismatch or maturity mismatch in accordance with Annex 7F of this Part.

[140A] Where a Reporting Bank has bought from an eligible protection provider a credit default swap which is an eligible credit protection and cleared through a CCP, the Reporting Bank may apply a risk weight of 2% if the credit default swap constitutes a CCP trade exposure in accordance with paragraph 2.1 or 2.5 of Annex 7AJ, or 4% if the credit default swap constitutes a CCP trade exposure in accordance with paragraph 2.6 of Annex 7AJ.

[MAS Notice 637 (Amendment No. 2) 2014]

Treatment of Credit Protection Sold

7.3.44 A Reporting Bank which has sold unfunded credit protection acquires exposure to the reference asset. If such exposure is an SA(CR) exposure, the Reporting Bank shall calculate the credit risk-weighted exposure amount for the exposure using the risk weight that is applicable to the obligor of the reference asset.

7.3.45 If the unfunded credit protection has more than one reference asset, the credit risk-weighted exposure amount for the credit protection is the sum of the credit risk-weighted exposure amounts in respect of each reference asset calculated using the risk weights that are applicable to the obligors of the respective reference assets.

7.3.46 A Reporting Bank which has sold funded credit protection acquires exposure to both the reference asset and the protection buyer. If such exposures are SA(CR) exposures, the Reporting Bank shall calculate the credit risk-weighted exposure amount for the credit protection as the sum of -

(a) the credit risk-weighted exposure amount for the exposure to the reference asset calculated in accordance with paragraphs 7.3.44 and 7.3.45 above, as applicable; and

(b) the credit risk-weighted exposure amount for the exposure to the protection buyer, using -

(i) E = the carrying amount of the collateral placed with the protection buyer; and

(ii) the risk weight that is applicable to the protection buyer.

[MAS Notice 637 (Amendment) 2014]

7.3.47 The capital requirement for the credit protection calculated in accordance with paragraphs 7.3.45 and 7.3.46 shall not exceed the notional amount of the credit protection i.e. the maximum possible payout under the credit protection.

7.3.48 Where a Reporting Bank has provided credit protection (whether funded or unfunded) through a proportionate structure, i.e. where the maximum possible payout in respect of any particular reference asset is capped at a pre-determined proportion of the notional amount of the credit protection, the Reporting Bank shall divide the exposure into individual sub-exposures equal to the proportionate amount of credit protection in respect of each reference asset for the purposes of calculating the credit risk-weighted exposure amount applicable to the credit protection sold.

7.3.49 Where a Reporting Bank has provided credit protection for a basket of reference exposures through a first-to-default credit derivative, the Reporting Bank shall calculate the credit risk-weighted exposure amount applicable to the credit protection sold by aggregating the risk weights that would be assigned to the reference exposures, subject to a cap of 1250%, and multiplying the aggregate with the nominal amount of the protection provided by the credit derivative.

[MAS Notice 637 (Amendment No. 2) 2017]

7.3.49A Where a Reporting Bank has provided credit protection for a basket of reference exposures through a second-to-default credit derivative, the Reporting Bank shall calculate the credit risk-weighted exposure amount applicable to the credit protection sold by applying the treatment referred to in paragraph 7.3.49, except that in aggregating the risk weights, the risk weights assigned to the reference exposure with the lowest credit risk-weighted exposure amount may be excluded.

[MAS Notice 637 (Amendment No. 2) 2017]

Recognition of Eligible Financial Collateral under FC(SA)

7.3.50 Subject to paragraph 7.3.51 below, a Reporting Bank which has taken eligible financial collateral for an SA(CR) exposure and is using the FC(SA)[141] may recognise the effects of CRM of the eligible financial collateral as follows:

(a) break down the SA(CR) exposure into -

(i) a collateralised portion with E equal to the latest fair value of the eligible financial collateral; and

(ii) an uncollateralised portion with E equal to the E of the SA(CR) exposure less the latest fair value of the eligible financial collateral; and

(b) for the purposes of calculating the credit risk-weighted exposure amount pursuant to Sub-division 3 of Division 1 of this Part, use -

(i) for the collateralised portion, the risk weight that is applicable to the eligible financial collateral as though the Reporting Bank had a direct exposure to that collateral; and

(ii) for the uncollateralised portion, the risk weight that is applicable to the obligor.

7.3.51 If the risk weight determined in accordance with paragraph 7.3.50(b)(i) above is less than 20%, a Reporting Bank shall apply a risk weight of 20% to the collateralised portion of the SA(CR) exposure, except in the following cases:

(a) a qualifying SFT where the counterparty in the transaction is a core market participant, in which case the Reporting Bank may apply a risk weight of 0%;

(b) a qualifying SFT where the counterparty in the transaction is not a core market participant, in which case the Reporting Bank may apply a risk weight of 10%;

(c) an OTC derivative transaction subject to daily mark-to-market that is collateralised by cash, and where there is no currency mismatch, in which case the Reporting Bank may apply a risk weight of 0%;

[141] The Reporting Bank shall mark-to-market and revalue the collateral at least on a six monthly basis or more frequently if specified by the Authority. A Reporting Bank which is using FC(SA) shall not recognise the effects of CRM of any collateral with a maturity mismatch.

(d) an OTC derivative transaction subject to daily mark-to-market that is collateralised by exposures to central governments, central banks or PSE or a combination thereof qualifying for a 0% risk weight under the SA(CR), and where there is no currency mismatch, in which case the Reporting Bank may apply a risk weight of 10%; and

(e) a transaction where there is no currency mismatch and the collateral comprises -

(i) cash on deposit as set out in paragraph 2.2(a) of Annex 7F of this Part; or

(ii) exposures in the central government and central bank asset class or in the PSE asset class or a combination thereof qualifying for a 0% risk weight under the SA(CR), and the latest fair value of such collateral has been discounted by 20% for the purposes of determining the value of the collateralised portion of the SA(CR) exposure in accordance with paragraph 7.3.50(a)(i) above,

in which case the Reporting Bank may apply a risk weight of 0%.

Treatment of Pools of CRM

7.3.52 A Reporting Bank which is using multiple CRM to cover a single SA(CR) exposure (e.g. the Reporting Bank has both eligible financial collateral and eligible credit protection partially covering the exposure) shall sub-divide the exposure into portions covered by each type of CRM (e.g. a portion covered by eligible financial collateral and a portion covered by eligible credit protection) and calculate the credit risk-weighted exposure amount of each portion separately by applying paragraphs 7.3.41, 7.3.42, 7.3.43, 7.3.50 and 7.3.51, whichever is applicable. A Reporting Bank shall apply the same approach when recognising eligible credit protection by a single protection provider with differing maturities.

**Sub-division 5: Recognised ECAIs**

Recognition of an ECAI

7.3.53 The Authority may recognise an ECAI if the Authority –

(a) is satisfied that the ECAI meets the recognition criteria set out in paragraphs 7.3.56 to 7.3.61 below[141A]; and

(b) has received a letter of support from a Reporting Bank stating that it intends to use the external credit assessments of that ECAI for the purposes of calculating regulatory capital requirements pursuant to this Notice.

[141A] For this purpose, the Authority will consider, among others, the ECAI's adherence to the "Code of Conduct Fundamentals for Credit Rating Agencies" issued by IOSCO (revised May 2008).

7.3.54 The recognition of an ECAI by the Authority shall be for the sole purpose of calculating regulatory capital requirements by a Reporting Bank pursuant to this Notice, and shall not be taken as regulation of the ECAI or licensing or approval of the ECAI to do business in Singapore.

7.3.55 The Authority may revoke its recognition of an ECAI if the ECAI no longer meets the criteria set out in paragraphs 7.3.56 to 7.3.61 below.

7.3.55A The list of recognised ECAIs is set out at Annex 7RA.

[MAS Notice 637 (Amendment) 2014]

Recognition Criteria

7.3.56 *Objectivity:* The methodology for assigning credit assessments of a recognised ECAI shall be rigorous, systematic and subject to validation based on historical experience. Credit assessments shall be subject to ongoing review and responsive to changes in financial condition of the entity assessed. An assessment methodology for each market segment, including rigorous backtesting, shall have been established for at least one year, and preferably at least three years. In this regard –

(a) the ECAI shall document and have procedures in place to ensure that its assessment methodologies are applied consistently in the formulation of all credit assessments in a given asset class, industry sector or region[142];

(b) the ECAI shall establish a credit assessment committee with formalised terms of reference to approve credit assessments that have been recommended by credit assessment analysts. The ECAI shall also have an independent internal audit function (or a function that plays a similar role and carries out similar tasks) to assess the compliance of the ECAI with its internal policies and procedures;

(c) the assessment methodologies of the ECAI shall incorporate factors that are relevant in determining an entity's creditworthiness. To the extent possible, the ECAI shall be able to demonstrate that its assessment methodologies have produced accurate credit assessments in the past;

(d) the assessment methodologies of the ECAI shall be based on both qualitative and quantitative approaches;

(e) the assessment methodologies of the ECAI are subject to robust and quantitative backtesting based on at least one year of historical data, and preferably three years. Other statistical studies such as transition and default matrices shall be carried out periodically by the ECAI to validate its assessment methodologies over time and across different asset classes. Any systematic assessment errors identified through backtesting and other statistical reviews shall be incorporated in the assessment methodologies; and

142 "Asset class" refers to categories such as loans, asset-backed securities, collateralised debt obligations, etc., "industry sector" refers to categories such as utilities, financial institutions, telecommunications, etc., and "region" refers to categories such as emerging markets, Asia ex-Japan, Europe, etc.

(f) the ECAI shall have procedures that are written and implemented to ensure that its credit assessments are reviewed and updated at least annually or upon the occurrence of material events.

7.3.57 *Independence:* A recognised ECAI should not be subject to economic, political and any other pressures that may influence its credit assessments. The credit assessment process should be as free as possible from any constraints which could arise in situations where the composition of the board of directors or the shareholder structure of the ECAI may be seen as creating a conflict of interest. In this regard -

(a) the ECAI should have in place and implement adequate processes and safeguards to ensure that its ownership structure and board composition do not prejudice the objectivity of its credit assessments;

(b) the ECAI should not conduct any business transactions with any of the entities it assesses that could undermine the objectivity of its credit assessments;

(c) the ECAI should be able to demonstrate that its businesses, other than those incidental or synergistic to the issuance of credit assessments, are operationally separated from its credit assessment business;

(d) the ECAI should be able to demonstrate that its financial viability is not dependent on revenue generated from a few key customers;

(e) the ECAI should provide adequate disclosure of its pricing policy and any fee charged should not be dependent on the credit assessment issued;

(f) credit assessments should be made by a credit assessment committee composed of adequately qualified and experienced individuals, in accordance with the established criteria and methodology of the ECAI; and

(g) employees of the ECAI should not be in an executive position in any of the entities assessed by the ECAI and should not be compensated in a way that could lead a compromise in the objectivity of the credit assessments.

7.3.58 *International Access and Transparency:* The individual credit assessments of a recognised ECAI, the key elements underlying the assessments and whether the issuer participated in the assessment process shall be publicly available on a non-selective basis, unless they are private assessments. In addition, the general procedures, methodologies and assumptions for arriving at assessments used by a recognised ECAI shall be publicly disclosed. In this regard, the individual credit assessments of the ECAI shall be accessible to any Reporting Bank which intends to use them for regulatory capital calculations pursuant to this Notice and included in the ECAI's transition matrix.

7.3.59 *Disclosure:* A recognised ECAI should publicly disclose its code of conduct, the general nature of its compensation arrangements with assessed entities, its assessment methodologies (including the definition of default, the time horizon and the meaning of each credit assessment), the actual default rates experienced in each credit assessment category, and the transitions of the assessments, for example, the likelihood of "AA" ratings becoming "A" over time. In this regard -

(a) the ECAI should make public the principles of its assessment methodologies;

(b) the ECAI should publicly disclose in a timely manner, any material changes made to its assessment methodologies or any significant event that could affect its performance on any of the criteria set out in paragraphs 7.3.56 to 7.3.61;

(c) the ECAI should publicly disclose information regarding the meaning of each credit assessment category, actual default rates, transition matrices, definition of default and the time horizon for which a default is considered. For credit assessments of securitisations, loss and cash-flow analysis as well as sensitivity of ratings to changes in the underlying ratings assumptions should be made publicly available; and

(d) the ECAI should publicly disclose whether a credit assessment was solicited or unsolicited. For the latter, the ECAI should make public its definition of an unsolicited credit assessment.

7.3.60 *Resources:* A recognised ECAI should have sufficient resources to carry out credit assessments properly. These resources should allow for sufficient ongoing contact with senior and operational levels within the entities assessed in order to add value to the credit assessments. In this regard -

(a) the ECAI should possess a sufficient number of staff members with the requisite level of analytical skills and professional experience necessary for them to perform credit assessments competently;

(b) the ECAI should be financially sound and have enough resources to invest in the necessary infrastructure required for the efficient processing of data and timely release of reliable credit assessments; and

(c) the ECAI should establish recruitment and training policies for each level of analysts under its employment.

7.3.61 *Credibility:* To some extent, credibility is derived from the criteria above. In addition, the reliance on an ECAI's external credit assessments by independent parties (e.g. investors, insurers, trading partners) would be evidence of the credibility of the assessments of the ECAI. The credibility of an ECAI is also underpinned by the existence of internal procedures to prevent the misuse of confidential information. Considerations assessed by the Authority to determine if the ECAI satisfies this criterion include:

(a) the financial viability and market share of the ECAI, especially in the market for which the ECAI is operating and is to be recognised;

(b) the level of market acceptance and reliance on the credit assessments of the ECAI;

(c) statistical data that demonstrates market reliance on the credit assessments of the ECAI (e.g. market movements in response to changes in credit assessments); and

(d) the presence of internal procedures to detect misuse or unauthorised disclosure or leakage of confidential information.

Mapping Process

7.3.62 The Authority shall map the external credit assessments of a recognised ECAI to the credit quality grades set out in Annex 7R of this Part, taking into account the quantitative and qualitative factors set out in paragraphs 7.3.63 to 7.3.66 below.

7.3.63 In determining the credit quality grades to which the external credit assessments of a recognised ECAI are mapped, information considered by the Authority includes –

(a) the two most recent three-year CDRs; and

(b) the ten-year average of the three-year CDRs,[143]

of the ECAI for each of its credit assessment categories (eg. AAA, AA, A, BBB and so on), against the benchmarks recommended by BCBS set out in Tables 7-12 and 7-13 respectively.

Table 7-12: BCBS Benchmark for Comparing Two Most Recent Three-year CDRs

| **S&P Credit Ratings**<br>**Moody's Credit Ratings** | AAA-AA<br>Aaa-Aa | A<br>A | BBB<br>Baa | BB<br>Ba | B<br>B |
|---|---|---|---|---|---|
| **Monitoring Level** | 0.8% | 1.0% | 2.4% | 11.0% | 28.6% |
| **Trigger Level** | 1.2% | 1.3% | 3.0% | 12.4% | 35.0% |

Table 7-13: BCBS Benchmark for Comparing Ten-year Average of Three-year CDRs

| **S&P Credit Ratings**<br>**Moody's Credit Ratings** | AAA-AA<br>Aaa-Aa | A<br>A | BBB<br>Baa | BB<br>Ba | B<br>B |
|---|---|---|---|---|---|
| **20-Year Average of Three-Year CDR** | 0.10% | 0.25% | 1.00% | 7.50% | 20.00% |

7.3.64 Where any of the two most recent three-year CDRs exceed the 'monitoring' level set out in Table 7-12, this implies that the ECAI's current default experience is higher than the international default experience. The Authority may consult with the relevant ECAI to understand the reason behind the higher default rates experienced by the ECAI, and may adjust the mapping to the credit quality grades set out in Annex 7R of this Part if the Authority considers it appropriate to do so.

[143] The three-year CDR refers to the sum of all defaults that have occurred in a given three-year period for all entities that have been assessed by the ECAI as belonging to the same credit assessment category. For example, in 2008, the two most recent three-year CDRs will be for the periods 2004-2006 and 2005-2007, and the ten-year average of the three-year CDRs will be the average of the three-year CDRs for the three-year periods ending on each of the ten years from 1998-2007. For newly established ECAIs, the Authority may consider information on three-year CDRs for whatever number of years the ECAI has been in operation and the ECAI's projection of its long-run average of three-year CDRs.

7.3.65 Where any of the two most recent three-year CDRs exceed the 'trigger' level set out in Table 7-12, this implies that the ECAI's current default experience is significantly higher than the international default experience. In such cases, there would be a presumption that the ECAI's credit assessment standards are weak or inappropriately applied and the Authority will generally adjust the mapping to the credit quality grades set out in Annex 7R of this Part. However, the Authority may maintain the existing mapping set out in Annex 7R of this Part if it is assessed that the higher CDRs experienced by the ECAI is not due to weak credit assessment standards. In such cases, the Authority may require a Reporting Bank to maintain additional capital under Part X.

7.3.66 While the above comparisons form the central basis for the mapping process, qualitative factors considered by the Authority that affect the comparability of CDRs include -

(a) the pool of issuers covered by the ECAI;

(b) the range of credit assessments assigned by the ECAI;

(c) the definition of each credit assessment category;

(d) the definition of default used by the ECAI;

(e) the dynamic properties and characteristics of the rating system or methodology; and

(f) the geographical coverage (i.e. use of regional or global data).

**Division 4: IRBA**

**Sub-division 1: Application to Adopt the IRBA**

7.4.1 A Reporting Bank which intends to adopt the IRBA, shall apply in writing to the Authority for approval to do so -

(a) if the Reporting Bank is adopting the F-IRBA or IRBA for the IRBA retail asset class, no less than 18 months prior to its IRBA adoption date; and

(b) if the Reporting Bank is adopting the A-IRBA, no less than 18 months prior to its A-IRBA adoption date,

or such other shorter time as may be permitted by the Authority after taking into account the IRBA rollout plan of the Reporting Bank.

7.4.2 The application pursuant to paragraph 7.4.1 above shall contain the following:

(a) a written confirmation from the executive officer responsible for risk management in the Reporting Bank that -

(i) the use of rating systems and -

(A) in the case of IRBA exposures for which the Reporting Bank is using the F-IRBA to calculate the credit risk-weighted exposure amounts, internal estimates of PD; and

(B) in the case of IRBA exposures for which the Reporting Bank is using the IRBA for the IRBA retail asset class or A-IRBA to calculate the credit risk-weighted exposure amounts, internal estimates of PD, LGD and EAD,

form an integral part of the systems and processes of the Reporting Bank for managing credit risk;

(ii) the Reporting Bank has a process for managing the potential variability of its credit RWA over the business cycles of the respective industries and geographic regions which it is exposed to, to help ensure ongoing compliance with the minimum capital requirements specified in this Notice and bank-specific capital requirements set by the Authority pursuant to section 10(3) of the Banking Act. The Reporting Bank shall have carefully considered the implications of its IRBA systems on credit risk assessment and capital management. If the Reporting Bank uses IRBA systems that would result in changes in its assessment of credit risk over a business cycle, it shall ensure that its process for capital management is designed to address potential capital shortfalls in economic downturns;

(iii) the Reporting Bank has a process for continually determining the suitability of its credit risk management strategy and framework as well as IRBA systems, taking into account such regulations, Notices

and guidelines that the Authority may issue from time to time, including Annex 7AB of this Part[144] hereto;

(iv) the Reporting Bank has systems, processes and controls to calculate credit RWA under the IRBA accurately and that those systems, processes and controls are subject to internal audit at least on an annual basis;

(v) the Reporting Bank has a process to calculate the credit risk-weighted exposure amount for any IRBA exposure using the SA(CR) or the requirements under MAS Notice 637 in force immediately before 1 Jan 2008 within a reasonable timeframe[145] if required by the Authority; and

(vi) the IRBA rollout plan of the Reporting Bank is in accordance with Annex 7AC of this Part[146];

(b) a written confirmation from the executive officer responsible for internal audit of the Reporting Bank that -

(i) he agrees with the confirmation by the executive officer responsible for risk management pursuant to sub-paragraph (a) above; and

(ii) the Reporting Bank has conducted an internal validation pursuant to Annex 7AB of this Part and has ascertained that it has the systems, processes and controls necessary for adopting the IRBA[147]; and

(c) a report on the latest internal validation conducted by the Reporting Bank prior to the application and any relevant supporting documentation relating to the adoption of the IRBA.

**Sub-division 2: Recognised Parallel Run**

7.4.3 A Reporting Bank intending to adopt the IRBA shall conduct a parallel run recognised by the Authority prior to its IRBA adoption date.

7.4.4 The Authority will recognise a parallel run only if it is based on IRBA systems assessed by the Authority to be sufficiently satisfactory for the parallel run.[148] The Authority may grant approval for a Reporting Bank to commence a recognised parallel run subject to such conditions or restrictions as the Authority may impose.

[144] Annex 7AB of this Part sets out the requirements of the Authority for a Reporting Bank adopting the IRBA.

[145] In general, the Authority would expect the Reporting Bank to be able to calculate the credit risk-weighted exposure amount for any IRBA exposure using the SA(CR) or MAS Notice 637 in force immediately before 1 Jan 2008 within a three-month period.

[146] Unless the Reporting Bank demonstrates to the satisfaction of the Authority that it faces exigencies that are material and relevant.

[147] In areas where a Reporting Bank does not fully meet the expectations of the Authority, it shall conduct self-assessments to identify the key shortcomings and develop comprehensive action plans to address them before supervisory validation begins. Such action plans shall include identifying the personnel responsible for specific actions, resource needs and a schedule for completion.

[148] Where there are outstanding issues, the Reporting Bank shall satisfy the Authority that it would be able to address them within a reasonable time so that the results of the parallel run would remain meaningful.

7.4.5 A Reporting Bank intending to adopt the F-IRBA, the A-IRBA or the IRBA for the IRBA retail asset class shall conduct a recognised parallel run immediately prior to its IRBA adoption date for at least one year or such other shorter period as the Authority may approve. A Reporting Bank which has adopted F-IRBA and intends to adopt the A-IRBA shall conduct a recognised parallel run immediately prior to its A-IRBA adoption date, for at least one year or such other shorter period as the Authority may approve.

7.4.6 During the recognised parallel run, the Reporting Bank shall calculate its CET1 CAR, Tier 1 CAR and Total CAR using both the IRBA and the prevailing capital requirements that are applicable to the Reporting Bank (whether under MAS Notice 637 in force immediately before 1 Jan 2008 or under this Notice).

[MAS Notice 637 (Amendment No. 2) 2014]

7.4.7 A Reporting Bank shall submit to the Authority the CET1 CAR, Tier 1 CAR and Total CAR calculations under paragraph 7.4.6 at both the Solo and Group levels as at the end of each quarter during the recognised parallel run, no later than the 30$^{th}$ of the following month.

[MAS Notice 637 (Amendment No. 2) 2014]

7.4.8 If a Reporting Bank becomes aware during the recognised parallel run that the confirmations made pursuant to paragraph 7.4.2(a) and (b) above are no longer valid or that it no longer complies with any of the conditions or restrictions imposed by the Authority pursuant to paragraph 7.4.4 above, it shall –

(a) inform the Authority as soon as practicable;

(b) assess the effect of the situation in terms of the risk posed to the Reporting Bank;

(c) prepare a plan to rectify the situation and inform the Authority of its plan as soon as practicable; and

(d) undertake prompt corrective action within a reasonable time in accordance with the plan prepared pursuant to sub-paragraph (c) above.

7.4.9 During the recognised parallel run, the Authority will continue to evaluate the readiness of the Reporting Bank to adopt the IRBA in order to reach a decision, towards the end of the recognised parallel run, on whether to grant or withhold approval for the Reporting Bank to adopt the IRBA. The Authority may withhold such approval if, during the recognised parallel run, it becomes aware of information that materially affects its assessment of the readiness of the Reporting Bank to adopt the IRBA or if any outstanding issue identified prior to the start of the recognised parallel run has not been addressed. The Authority may also require the Reporting Bank to extend the parallel run to allow more time for the Reporting Bank to take corrective actions.

**Sub-division 3: Approval to Adopt the IRBA**

7.4.10 The Authority may grant approval for a Reporting Bank to adopt the IRBA, subject to such conditions or restrictions as the Authority may impose.

7.4.10A A Reporting Bank shall comply with the public disclosure requirements set out in Part XI of this Notice to be eligible to adopt the IRBA.

7.4.11 If a Reporting Bank becomes aware after it has received approval to adopt the IRBA that any of the confirmations made pursuant to paragraph 7.4.2(a) and (b) above are no longer valid or that it no longer complies with any of the conditions or restrictions imposed by the Authority pursuant to paragraph 7.4.10 or 7.4.10A above, it shall -

(a) inform the Authority as soon as practicable;

(b) assess the effect of the situation in terms of the risk posed to the Reporting Bank;

(c) prepare a plan to rectify the situation, inform and seek approval from the Authority of its plan as soon as practicable; and

(d) undertake prompt corrective action within a reasonable time in accordance with the plan prepared pursuant to sub-paragraph (c) above.

7.4.12 The Authority may suspend or revoke its approval for a Reporting Bank to adopt the IRBA, subject the Reporting Bank to higher bank-specific capital requirements pursuant to section 10(3) of the Banking Act, or take any other actions if -

(a) the Reporting Bank has not fulfilled any of the conditions or restrictions imposed by the Authority pursuant to paragraph 7.4.10 or 7.4.10A;

(b) the Reporting Bank fails to comply with paragraph 7.4.11;

(c) the Authority subsequently becomes aware that the Reporting Bank has furnished information that is false or misleading in a material manner to the Authority in connection with its application for approval to adopt the IRBA;

(d) the Reporting Bank has not executed its IRBA rollout in accordance with the rollout parameters in Annex 7AC of this Part; or

(e) the Authority is not satisfied that the Reporting Bank is in compliance with the requirements in Annex 7AB of this Part, or that the risk management process and system of the Reporting Bank are adequate to support the IRBA.

7.4.13 A Reporting Bank shall inform the Authority no less than 3 months prior to the expected date of implementation of any significant change to its IRBA systems subsequent to the commencement of a recognised parallel run or the Authority granting approval for the Reporting Bank to adopt the IRBA, unless the Authority has directed that the Reporting Bank seeks prior approval for any such change.

7.4.13A A Reporting Bank that has adopted the IRBA is expected to continue to adopt the IRBA. If the Reporting Bank intends to adopt the SA(CR) or F-IRBA instead, it may be allowed to do so only in exceptional circumstances, such as divestiture of a large fraction of the Reporting Bank's credit-related business, subject to the approval by the Authority.

**Sub-division 4: Categorisation of IRBA Exposures**

7.4.14 A Reporting Bank shall categorise any IRBA exposure into an asset sub-class belonging to the IRBA wholesale asset class, the IRBA retail asset class or the IRBA eligible purchased receivables asset class[149] as defined in paragraphs 7.4.15 to 7.4.18 below.[149A] A Reporting Bank shall treat any exposure that does not fall within any of the IRBA wholesale asset class, the IRBA retail asset class or the IRBA eligible purchased receivables asset class as an SA(CR) exposure under the Other Exposures Asset Class, except where a 0% risk weight applies, in accordance with Division 3 of this Part. This includes any exposure to the residual value of leased assets as calculated in accordance with paragraph 7.2.4A which shall be categorised in accordance with paragraph 7.3.1(j).

7.4.15 The IRBA wholesale asset class consists of the following asset sub-classes:

(a) corporate asset sub-class, which consists of -

(i) any IRBA exposure to a corporation, partnership, limited liability partnership, sole proprietorship or trustee in respect of a trust, other than an exposure belonging to an asset sub-class set out in sub-paragraphs (b), (c), (d), (e) or (f) of this paragraph, sub-paragraph (c) of paragraph 7.4.16 or sub-paragraphs (a), (b) or (c) of paragraph 7.4.18; and

[MAS Notice 637 (Amendment) 2012]

(ii) any IRBA exposure to an individual, other than an exposure belonging to an asset sub-class set out in sub-paragraphs (b), (c), (d), (e) or (f) of this paragraph, sub-paragraphs (a), (b) or (c) of

[149] The categorisation of exposures into various asset sub-classes as set out in this Sub-division is intended to be consistent with established industry practice. However, the Authority recognises that a Reporting Bank may use different definitions and methodology for purposes of internal reporting and risk measurement. While it is not the intention of the Authority to require a Reporting Bank to change the way in which it manages its businesses and risks, a Reporting Bank shall apply the specified treatment to each of its exposures for the purposes of deriving its minimum capital adequacy requirements in order to ensure consistency across Reporting Banks. Where the Authority deems that the definitions and methodology used by the Reporting Bank are no longer appropriate or may not result in broadly consistent categorisation, the Authority may require the Reporting Bank to re-categorise any exposure or class of exposures into asset sub-classes as set out in this Sub-division.

[149A] This includes an IRBA exposure to lessee equivalent to the discounted lease payment as calculated in accordance with paragraph 7.2.4.

paragraphs 7.4.16 or sub-paragraphs (a), (b) or (c) of paragraph 7.4.18;

[MAS Notice 637 (Amendment No. 2) 2014]

(b) corporate small business asset sub-class, which consists of any IRBA exposure to a small business, other than an exposure belonging to an asset sub-class set out in sub-paragraphs (c), (d), (e) or (f) of this paragraph, sub-paragraph (c) of paragraph 7.4.16 or sub-paragraphs (a), (b) or (c) of paragraph 7.4.18. For the purposes of determining whether the $100 million reported annual sales threshold is met, the Reporting Bank shall -

(i) if the small business is part of a group of companies as defined in section 209A of the Companies Act, use the reported annual consolidated sales of the group of companies;

(ii) have in place rigorous information gathering and timely updating processes to help ensure that the reported annual sales figure used is timely and relevant;

(iii) use an audited reported annual sales figure, except in the case of –

(A) companies incorporated in Singapore or partnerships, limited liability partnerships, sole proprietorships or trusts registered in Singapore which are not required under the relevant legislation to maintain audited financial statements; or

(B) companies incorporated outside Singapore or partnerships, limited liability partnerships, sole proprietorships or trusts registered outside Singapore which are not required under the relevant legislation to maintain audited financial statements,

whereupon the unaudited accounts may be used to ascertain the reported annual sales figure. All exemptions from the use of audited financial statements under (B) above shall be subject to an internal or external independent verification conducted on an annual basis;

[MAS Notice 637 (Amendment) 2013]

(iv) use a reported annual sales figure taken from the most recent full-year financial statements, which should be for a financial period ending not more than 18 months before the time when the credit risk-weighted exposure amount for that IRBA exposure is calculated[150].

Subsequent to the Reporting Bank's initial categorisation of an IRBA exposure into the corporate small business asset sub-class, a

[150] For example, the sales figure for the 12 months ending 31 Dec 2004 may not be used for calculating credit risk-weighted exposure amounts after 30 Jun 2006. Audited figures which are not more than 24 months old are admissible only under exceptional circumstances.

Reporting Bank which is unable to obtain updated financial statements may use a reported annual sales figure taken from full-year financial statements which are for a financial period ending more than 18 months before the time when the credit risk-weighted exposure amount for that IRBA exposure is calculated. In such a case, the Reporting Bank may continue to categorise such exposures under the corporate small business asset sub-class but shall not be permitted to use the total reported annual sales of the obligor in the $K_{sm}$ formulas stated in paragraph 7.4.22; and

[MAS Notice 637 (Amendment) 2013]

(v) not categorise an exposure as a corporate small business asset sub-class if it becomes aware of any event after the date of the financial statements referred to in sub-paragraph (iv) above that would reasonably cause the $100 million reported annual sales threshold to be breached;

[MAS Notice 637 (Amendment) 2013]

(c) sovereign asset sub-class, which consists of any IRBA exposure to a central government, a central bank, a qualifying MDB or an international organisation listed in paragraph 7.3.20;

(d) bank asset sub-class, which consists of any IRBA exposure to a banking institution, a PSE or an MDB not listed in Annex 7S of this Part;

(e) SL asset sub-class, which consists of any IRBA exposure that meets the characteristics set out in Annex 7U of this Part, other than an exposure belonging to the asset sub-class set out in sub-paragraph (f) of this paragraph; and

(f) HVCRE asset sub-class, which consists of any IRBA exposure that meets the characteristics set out in Annex 7U of this Part.

7.4.16 The IRBA retail asset class[151, 151A] consists of the following asset sub-classes:

(a) residential mortgage asset sub-class, which consists of any IRBA exposure, other than an exposure belonging to the asset sub-class set out in sub-paragraph (c) of paragraph 7.4.18, that meets all of the following conditions:

(i) the exposure is extended to an individual or a group of individuals[151B];

(ii) the exposure is managed by the Reporting Bank as part of a large pool of similar loans; and

(iii) the exposure is secured against a mortgage of a residential property;

(b) QRRE asset sub-class, which consists of any IRBA exposure, other than an exposure belonging to the asset sub-class set out in sub-paragraph (c) of paragraph 7.4.18, which meets all of the following conditions[152]:

(i) the exposure is to an individual;

(ii) the exposure is managed by the Reporting Bank as part of a large pool of similar exposures;

(iii) the exposure is revolving, unsecured, and uncommitted both contractually and in practice. In this context, a revolving exposure is defined as one where the customer's outstanding balance is permitted to fluctuate based on his decisions to borrow and repay, up to a limit established by the Reporting Bank;

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[151] The purpose of the definition of IRBA retail asset class is to separate a portfolio from other business so that a separate capital formula may be applied to the retail portfolio. Where exposures in the IRBA retail asset class are assigned to pools, it is the statistical characteristics of these pools which are used to derive the estimates of IRBA parameters. Therefore, pools shall be reasonably homogenous and subject to consistent risk management practices. A Reporting Bank shall have sufficient controls to help ensure that any inadvertent assignment of exposures that do not meet any of the conditions in paragraph 7.4.16 to the IRBA retail asset class would be sufficiently immaterial that it would not result in any significant distortion of the overall statistical characteristics of the pools. Cost considerations do not justify inclusion of exposures that do not meet any of the conditions in paragraph 7.4.16 if the effect on the statistical characteristics of the pools would be material. Sample testing could be one method of demonstrating that such impact would be immaterial.

[151A] For example, exposures to individuals granted revolving credits and lines of credit (e.g. credit cards, overdrafts, and retail facilities secured by financial instruments) as well as personal term loans and leases (e.g. installment loans, auto loans and leases, student and educational loans, personal finance, and other exposures with similar characteristics) are eligible for retail treatment. A Reporting Bank shall establish rigorous internal policies to ensure the granularity and homogeneity of its retail pools.

[151B] The Reporting Bank shall ensure that exposures included in the residential mortgage asset sub-class are originated and managed on a pooled basis by reference to standards that would be applied by the Reporting Bank to an individual that is an owner-occupier of the property. The credit assessment of such loans to individuals shall be based on the borrowers' independent capacity. Mortgages that meet the criteria of the SL asset sub-class specified in Annex 7U shall be categorised as IPRE exposures.

[152] The Reporting Bank shall comply with these requirements for all exposures in any sub-portfolio, consistent with the Reporting Bank's segmentation of its retail activities, categorised under the QRRE asset sub-class at the country or self-administrative jurisdiction level or more granular segment level.

(iv) the exposure, together with other exposures[153] in the QRRE asset sub-class to the same individual, is not more than $200,000;

(v) the Reporting Bank demonstrates to the satisfaction of the Authority that the exposures categorised under this asset sub-class, taken in aggregate as well as on a sub-portfolio basis, exhibit a low volatility of loss rates, relative to their average level of loss rates, especially within the low PD bands;

[MAS Notice 637 (Amendment) 2012]

(vi) the Reporting Bank retains data on the loss rates for purposes of analysis of loss volatilities; and

(vii) the Reporting Bank is able to demonstrate to the satisfaction of the Authority that treatment as a QRRE is consistent with the underlying risk characteristics of the QRRE asset sub-class; and

(c) other retail exposures asset sub-class, which consists of any IRBA exposure, other than an exposure belonging to the asset sub-classes set out in sub-paragraphs (a) or (b) of this paragraph, or sub-paragraph (c) of paragraph 7.4.18, that meets the following conditions:

(i) the exposure is to an individual and the exposure is managed as part of a large pool of similar exposures; or

(ii) the exposure is to a small business and -

(A) the total exposure[155] of the Reporting Bank to the small business (on a consolidated basis[156] where applicable) is not more than $2 million.[157] For the purposes of determining whether the $2 million threshold is met, the Reporting Bank

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153 This includes any exposure in the QRRE asset sub-class to the same individual that is classified as in default in accordance with the definition of default in Annex 7X of this Part.

154 *[This footnote has been intentionally left blank.]*

155 This includes any exposure to the same small business that is classified as in default in accordance with the definition of default in Annex 7X of this Part, but does not include any IRBA exposure in the residential mortgage asset sub-class.

156 The basis of aggregation for small business exposures of not more than $2 million that are treated as retail exposures shall be (a) the definition of an obligor group used by the Reporting Bank for its risk management purposes, with the proviso that exposures to related corporations and associates of the obligor, and the sole proprietors or partners in any of the entities in the obligor group are to be included in the aggregation; and (b) based on all banking group entities that fall within the scope of application of this Notice. However, the Reporting Bank may dis-aggregate certain exposures if the dis-aggregated obligors have sufficient financial resources to fully service their liabilities and do not need to depend on any other entity within the obligor group for financial assistance in meeting their liabilities. A simplistic dis-aggregation based on product type alone would not be acceptable.

157 When an IRBA exposure categorised under the other retail exposures asset sub-class pursuant to this provision exceeds the $2 million threshold, a Reporting Bank should re-categorise the exposure under the corporate asset sub-class or corporate small business asset sub-class. The Authority will be flexible if the need for re-categorisation arises solely from short-term exchange rate fluctuations, for example, exchange rate fluctuations of non-Singapore dollar-denominated assets. In such cases, the Authority would expect the Reporting Bank to establish appropriate policies and procedures to determine when the threshold is exceeded in a more permanent way, for example, through the extension of increased credit or a major currency revaluation, and to re-categorise the exposures if necessary.

shall aggregate exposures to the same small business, even if they are extended through or guaranteed by an individual; and

(B) the exposure qualifies as a small business exposure within the documented policy of the Reporting Bank on the types of exposures, and is managed by the Reporting Bank as part of a pool of similar exposures consistently over time and in the same manner as other exposures categorised under the IRBA retail asset class. This means that the exposure is originated in a similar manner to other exposures categorised under the IRBA retail asset class, and is not managed individually in a way comparable to exposures categorised under the corporate asset sub-class, but rather as part of a segment or pool of exposures with similar risk characteristics for purposes of risk assessment and quantification.

7.4.17 For purposes of paragraph 7.4.16(c)(ii)(B) above, an exposure to small business will not normally be considered to be individually managed in a way comparable to exposures categorised under the corporate asset sub-class if management of that exposure -

(a) is sufficiently insignificant so as not to disrupt the homogeneity of the pool;

(b) is consistent with the management of other exposures in the same pool; and

(c) is significantly different in extent from the individual management that occurs for exposures categorised under the corporate asset sub-class, looked at as a whole.

7.4.18 The IRBA eligible purchased receivables asset class consists of the following asset sub-classes:

(a) purchased corporate receivables asset sub-class, which consists of purchased receivables that meet the criteria for categorisation under the corporate asset sub-class;

(b) purchased corporate small business receivables asset sub-class, which consists of purchased receivables that meet the criteria for categorisation under the corporate small business asset sub-class; and

(c) purchased retail receivables asset sub-class, which consists of purchased receivables that meet the criteria for categorisation under the IRBA retail asset class.

**Sub-division 5: Calculation of Capital Requirements, K, under the IRBA**

7.4.19 Subject to paragraph 7.4.20, a Reporting Bank using the IRBA shall -

(a) for an IRBA exposure not classified as in default in accordance with the definition of default in Annex 7X of this Part, calculate K for that exposure in accordance with Sub-divisions 7, 8, 9, and 10 of this Division, whichever is applicable; and

(b) for an IRBA exposure that is classified as in default in accordance with the definition of default in Annex 7X of this Part, calculate K for that exposure in accordance with Sub-division 11.[158]

**Sub-division 6: Calculation of Capital Requirements, K, and Determination of Risk Weights, $RW_{slot}$, for Exposures in the SL Asset Sub-Class and HVCRE Asset Sub-Class under the IRBA**

7.4.20 For any IRBA exposure belonging to the SL asset sub-class or HVCRE asset sub-class, a Reporting Bank shall -

(a) if the Reporting Bank complies with the requirements for wholesale exposures under the F-IRBA in Annex 7AB of this Part for deriving estimates of PD for such exposures, or the requirements for wholesale exposures under the A-IRBA in Annex 7AB of this Part for deriving estimates of PD, LGD and EAD for such exposures, calculate K for that exposure in accordance with paragraph 7.4.19; and

(b) in all other cases, determine $RW_{slot}$ for that exposure in accordance with the supervisory slotting criteria set out in Sub-division 12 of this Division.

[158] The credit RWA under the IRBA has been calibrated to cover only the unexpected losses that could arise from the credit and investment related risks of a Reporting Bank for exposures in the banking book. A Reporting Bank should consider whether it has set aside sufficient allowances to cover the expected losses that could arise from such exposures. Paragraph 6.1.3(e) of Part VI provides for the appropriate deduction in the calculation of CET1 Capital in the event that a Reporting Bank has not set aside sufficient allowances to cover the expected losses that could arise.

**Sub-division 7: Calculation of K for IRBA Wholesale Asset Class**

Calculation of $K_{corp}$, $K_{sov}$, $K_{bank}$ and $K_{sl}$

7.4.21 A Reporting Bank shall calculate $K_{corp}$, $K_{sov}$, $K_{bank}$ and $K_{sl}$ using the following formula: [159,160]

| Correlation (R) = 0.12 × (1 – EXP(-50 × PD)) / (1 – EXP(-50)) + 0.24 × [1 - (1 - EXP(-50 × PD))/(1 - EXP(-50))]<br><br>Maturity adjustment (b) = (0.11852 – 0.05478 × ln(PD))^2<br><br>Capital requirement ($K_{corp}$, $K_{sov}$, $K_{bank}$ or $K_{sl}$)<br>= [LGD × N[(1 - R)^-0.5 × G(PD) + (R/(1 - R))^0.5 × G(0.999)] – PD x LGD] x (1 - 1.5 x b)^ -1 × (1 + (M - 2.5) × b) |
|---|

7.4.21A Notwithstanding paragraph 7.4.21 above, for all IRBA exposures to financial institutions[160A] subject to minimum prudential standards and supervision by a regulatory agency ("regulated financial institutions") with total assets greater than or equal to USD 100 billion (or equivalent) and financial institutions[160A] which are not subject to minimum prudential standards and supervision by a regulatory agency ("unregulated financial institutions")[160B], a Reporting Bank shall calculate $K_{corp}$, $K_{sov}$, $K_{bank}$ and $K_{sl}$ using the following formula:

| Correlation (R_FI) = 1.25 x [0.12 × (1 – EXP(-50 × PD)) / (1 – EXP(-50)) + 0.24 × [1 - (1 - EXP(-50 × PD))/(1 - EXP(-50))]]<br><br>Maturity adjustment (b) = (0.11852 – 0.05478 × ln(PD))^2<br><br>Capital requirement ($K_{corp}$, $K_{sov}$, $K_{bank}$ or $K_{sl}$)<br>= [LGD × N[(1 – R_FI)^-0.5 × G(PD) + (R_FI/(1 – R_FI))^0.5 × G(0.999)] – PD x LGD] x (1 - 1.5 x b)^ -1 × (1 + (M - 2.5) × b) |
|---|

For the purpose of determining whether the USD 100 billion (or equivalent) total asset threshold is met, the Reporting Bank shall use the reported total assets of the consolidated group of companies which include the regulated financial institution. The reported total assets figure shall be taken from the most recent audited financial statements.

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[159] Ln denotes the natural logarithm.

[160] N(x) denotes the cumulative distribution function for a standard normal random variable (i.e. the probability that a normal random variable with mean zero and variance of one is less than or equal to x). G(z) denotes the inverse cumulative distribution function for a standard normal random variable (i.e. the value of x such that N(x) = z). The normal cumulative distribution function and the inverse of the normal cumulative distribution function are, for example, available in Excel as the functions NORMSDIST and NORMSINV.

[160A] For the purpose of this paragraph, "financial institutions" refers to the entities specified in Annex 2A of Part II, collective investment schemes and closed-end funds.

[MAS Notice 637 (Amendment) 2018]

[160B] For the purpose of this paragraph, the Authority may from time to time specify any entity or group of entities as unregulated financial institutions.

Calculation of $K_{sm}$

7.4.22 A Reporting Bank shall calculate $K_{sm}$ using the following formula:

Correlation (R) = 0.12 × (1 – EXP(-50 × PD)) / (1 - EXP(-50)) + 0.24 × [1 - (1 - EXP(-50 × PD))/(1 - EXP(-50))] – 0.04 × (1 – (S-10)/90)

Maturity adjustment (b) = (0.11852 – 0.05478 × ln(PD))^2

Capital Requirement ($K_{sm}$)
= [LGD × N[(1 - R)^-0.5 × G(PD) + (R/(1 - R))^0.5 × G(0.999)] – PD x LGD] x (1 - 1.5 x b)^ -1 × (1 + (M - 2.5) × b)

where "S" refers to total reported annual sales of the obligor (calculated in millions of Singapore dollars), or if the obligor is part of a consolidated group, of the consolidated group. Where the reported annual sales figure is less than $10 million, the Reporting Bank shall apply S = 10 for the purposes of calculating $K_{sm}$. Where the Reporting Bank is not permitted to use the total reported annual sales of the obligor in the $K_{sm}$ formula as specified in paragraph 7.4.15(b)(iv), the Reporting Bank shall apply S = 100 for the purposes of calculating $K_{sm}$.

[MAS Notice 637 (Amendment) 2013]

7.4.22A Notwithstanding paragraph 7.4.22 above, for all IRBA exposures to regulated financial institutions[160A] with total assets greater than or equal to USD 100 billion (or equivalent) and unregulated financial institutions[160A,160B], a Reporting Bank shall calculate $K_{sm}$ using the following formula:

[MAS Notice 637 (Amendment) 2012]

Correlation (R_FI) = 1.25 x [0.12 × (1 – EXP(-50 × PD)) / (1 – EXP(-50)) + 0.24 × [1 - (1 - EXP(-50 × PD))/(1 - EXP(-50))]]

Maturity adjustment (b) = (0.11852 – 0.05478 × ln(PD))^2

Capital requirement ($K_{sm}$)
= [LGD × N[(1 – R_FI)^-0.5 × G(PD) + (R_FI/(1 – R_FI))^0.5 × G(0.999)] – PD x LGD] x (1 - 1.5 x b)^ -1 × (1 + (M - 2.5) × b)

For the purpose of determining whether the USD 100 billion (or equivalent) total asset threshold is met, the Reporting Bank shall use the reported total assets of the consolidated group of companies which include the regulated financial institution. The reported total assets figure shall be taken from the most recent audited financial statements.

Calculation of $K_{hv}$

7.4.23 A Reporting Bank shall calculate $K_{hv}$ using the following formula:

Correlation (R) = 0.12 × (1 – EXP(-50 × PD)) / (1 – EXP(-50)) + 0.30 × [1 - (1 - EXP(-50 × PD))/(1 - EXP(-50))]

Maturity adjustment (b) = (0.11852 – 0.05478 × ln(PD))^2

Capital requirement ($K_{hv}$)
= [LGD × N[(1 - R)^-0.5 × G(PD) + (R/(1 - R))^0.5 × G(0.999)] – PD x LGD] x (1 - 1.5 x b)^ -1 × (1 + (M - 2.5) × b)

7.4.24 Where $K_{corp}$, $K_{sm}$, $K_{sov}$, $K_{bank}$, $K_{sl}$ or $K_{hv}$ for any IRBA exposure calculated in accordance with paragraphs 7.4.21 to 7.4.23 above is less than zero, the Reporting Bank shall apply K = 0 for the purposes of calculating the credit risk-weighted exposure amount for that IRBA exposure pursuant to Sub-division 4 of Division 1 of this Part.

Probability of Default, PD

7.4.25 For the purposes of paragraphs 7.4.21 to 7.4.23 above, PD refers to the PD associated with the obligor grade to which the IRBA exposure is assigned and estimated in accordance with Annex 7AB of this Part. PD is measured as a decimal.

7.4.26 For the purposes of calculating $K_{corp}$, $K_{sm}$, $K_{bank}$, $K_{sl}$ and $K_{hv}$ pursuant to paragraphs 7.4.21 to 7.4.23 above, the Reporting Bank shall apply PD = 0.0003 where the PD is less than 0.0003.

Loss Given Default, LGD

7.4.27 For the purposes of paragraphs 7.4.21 to 7.4.23 above, LGD refers to the LGD associated with the facility grade to which the IRBA exposure is assigned and estimated in accordance with Annex 7AB of this Part, or where applicable LGD* calculated in accordance with paragraphs 7.4.29 to 7.4.33 below. LGD, or where applicable LGD*, is measured as a decimal.

7.4.28 Notwithstanding paragraph 7.4.27 above and unless otherwise provided for in this Sub-division, LGD for an IRBA exposure categorised under the IRBA wholesale asset class for which the Reporting Bank is using the F-IRBA to calculate the credit risk-weighted exposure amount shall be -

(a) if the exposure is expressly subordinated to another facility, 0.75; and

(b) in any other case, 0.45.

7.4.29 Where a Reporting Bank has taken eligible financial collateral for an IRBA exposure (other than an exposure that is expressly subordinated to another facility) categorised under the IRBA wholesale asset class for which it is using the F-IRBA to

calculate the credit risk-weighted exposure amount, the Reporting Bank may calculate LGD*, the LGD adjusted for eligible financial collateral, as follows:

$$LGD^* = LGD \times (EAD_{adj} / EAD)$$

where -

(a) LGD = 0.45;

(b) EAD = EAD calculated in accordance with Division 2 of this Part; and

(c) $EAD_{adj}$ = $EAD_{adj}$ calculated in accordance with Division 2 of this Part.

7.4.30 Where a Reporting Bank has taken eligible IRBA collateral for an IRBA exposure (other than an exposure that is expressly subordinated to another facility) categorised under the IRBA wholesale asset class for which it is using the F-IRBA to calculate the credit risk-weighted exposure amount, the Reporting Bank may recognise the effects of CRM of the eligible IRBA collateral as follows:

(a) if the ratio of the latest fair value of the eligible IRBA collateral received (C) to the EAD calculated in accordance with Division 2 of this Part (EAD) is below the threshold C* specified in Table 7-14 for the type of eligible IRBA collateral received, the LGD adjusted for eligible IRBA collateral, LGD* = 0.45;

(b) if the ratio of C to EAD exceeds the threshold C** specified in Table 7-14 for the type of eligible IRBA collateral received, the LGD adjusted for eligible IRBA collateral, LGD* = the minimum LGD* specified in Table 7-14 for that type of eligible IRBA collateral; and

(c) if the ratio of C to EAD is more than or equal to C* but less than or equal to C**, as specified in Table 7-14 for the type of eligible IRBA collateral received, the IRBA exposure shall be broken down into -

   (i) a fully collateralised portion with EAD = C/C** x EAD, and LGD* = the minimum LGD* specified in Table 7-14 for that type of eligible IRBA collateral; and

   (ii) an uncollateralised portion with EAD = EAD – (C/C** x EAD), and LGD* = 0.45.

   For avoidance of doubt, the Reporting Bank shall calculate the credit risk-weighted exposure amount for each portion separately in this instance.

Table 7-14: Minimum LGD* for Secured Portion of IRBA Exposures[160C]

| Eligible IRBA Collateral | Minimum LGD* | Required minimum level of collateralisation (C*) | Required level of over-collateralisation for full adjustment of LGD (C**) |
|---|---|---|---|
| Eligible receivables | 0.35 | 0 | 1.25 |
| Eligible CRE or eligible RRE | 0.35 | 0.30 | 1.40 |
| Eligible physical collateral | 0.40 | 0.30 | 1.40 |

7.4.31 A Reporting Bank shall not recognise the effects of CRM of a junior charge on an eligible CRE or eligible RRE unless -

(a) all the senior charges are held by the Reporting Bank or CPF, as the case may be;

(b) the Reporting Bank deducts the first charge[161] held by the CPF from the value of the eligible RRE, in the case where the CPF holds the first charge; and

(c) there is no doubt that the junior charge is legally enforceable and constitutes an efficient credit risk mitigant.

[MAS Notice 637 (Amendment) 2013]

7.4.32 A Reporting Bank which recognises the effects of CRM of a junior charge on an eligible CRE or eligible RRE, taken for an IRBA exposure (other than an exposure that is expressly subordinated to another facility) categorised under the IRBA wholesale asset class for which the Reporting Bank is using the F-IRBA to calculate the credit risk-weighted exposure amount, shall use the following values of C and EAD for the purposes of calculating LGD* in accordance with paragraph 7.4.30 above:

(a) C = fair value of the eligible CRE or eligible RRE, subject to paragraph 7.4.31(b); and

(b) EAD = sum of all the exposures secured by all the junior and senior charges held by the Reporting Bank on the eligible CRE or eligible RRE.

[MAS Notice 637 (Amendment) 2013]

7.4.33 Where a Reporting Bank has taken different types of eligible IRBA collateral or a mix of eligible financial collateral and eligible IRBA collateral for an IRBA exposure (other than an exposure that is expressly subordinated to another facility) categorised under the IRBA wholesale asset class for which it is using the F-IRBA to calculate the credit risk-weighted exposure amount, the Reporting Bank may recognise the effects of CRM of the eligible IRBA collateral, and where applicable eligible financial collateral, as follows:

[160C] For the purposes of Table 7-14, eligible physical collateral excludes physical assets acquired by a Reporting Bank as a result of a loan default.

[161] This includes principal and accrued interest.

(a) calculate $EAD_{adj}$ in accordance with Division 2 of this Part;

(b) break down the IRBA exposure into -

(i) a portion collateralised by eligible financial collateral with EAD = EAD – $EAD_{adj}$, and LGD* = 0;

(ii) a portion collateralised by eligible receivables with EAD = $C_{er}/1.25$[162], and LGD* = 0.35;

(iii) a portion collateralised by eligible CRE, eligible RRE or both with EAD = $C_{ecr}/1.4$[163], and LGD* = 0.35[164];

(iv) a portion collateralised by eligible physical collateral with EAD = $C_{ep}/1.4$[165], and LGD* = 0.40; and

(v) an uncollateralised portion with EAD = $EAD_{adj} - C_{er}/1.25 - C_{ecr}/1.4 - C_{ep}/1.4$, and LGD* = 0.45; and

(c) calculate the credit risk-weighted exposure amount for each portion in sub-paragraph (b) above separately in accordance with Sub-division 4 of Division 1 of this Part.

Effective Maturity, M

7.4.34 M shall be calculated in accordance with Annex 7Z of this Part.

**Sub-division 8: Calculation of K for IRBA Retail Asset Class**

Calculation of $K_{mort}$

7.4.35 A Reporting Bank shall calculate $K_{mort}$ using the following formula:

| Correlation (R) = 0.15<br><br>Capital requirement ($K_{mort}$)<br>= LGD × N[(1 - R)^-0.5 × G(PD) + (R/(1 - R))^0.5 × G(0.999)] – PD x LGD |
|---|

162 $C_{er}$ refers to the latest fair value of the eligible receivables.

163 $C_{ecr}$ refers to the latest fair value of the eligible CRE, eligible RRE or both.

164 A Reporting Bank may apply the minimum LGD*s of 0.35 for eligible CRE and eligible RRE and 0.40 for eligible physical collateral only if $(C_{ecr} + C_{ep})/[EAD_{adj} - C_{er}/1.25] \geq 0.30$. In all other cases, the applicable LGD* is 0.45.

165 $C_{ep}$ refers to the latest fair value of the eligible physical collateral.

Calculation of $K_{qrre}$

7.4.36 A Reporting Bank shall calculate $K_{qrre}$ using the following formula:

Correlation (R) = 0.04

Capital requirement ($K_{qrre}$)
= LGD × N[(1 - R)^-0.5 × G(PD) + (R/(1 - R))^0.5 × G(0.999)] – PD x LGD

Calculation of $K_{oret}$

7.4.37 A Reporting Bank shall calculate $K_{oret}$ using the following formula:

Correlation (R) = 0.03 × (1 - EXP(-35 × PD)) / (1 - EXP(-35)) + 0.16 × [1 - (1 - EXP(-35 × PD))/(1 - EXP(-35))]

Capital requirement ($K_{oret}$)
= LGD × N[(1 - R)^-0.5 × G(PD) + (R/(1 - R))^0.5 × G(0.999)] – PD x LGD

Probability of Default, PD

7.4.38 For the purposes of paragraphs 7.4.35 to 7.4.37 above, PD refers to the PD associated with the pool of exposures to which the IRBA exposure is assigned and estimated in accordance with Annex 7AB of this Part. PD is measured as a decimal.

7.4.39 For the purposes of calculating $K_{mort}$, $K_{qrre}$ and $K_{oret}$ pursuant to paragraphs 7.4.35 to 7.4.37 above, the Reporting Bank shall apply PD = 0.0003 where the PD is less than 0.0003.

Loss Given Default, LGD

7.4.40 For the purposes of paragraphs 7.4.35 to 7.4.37 above, LGD refers to the LGD associated with the pool (i.e. sub-segment) of exposures to which the IRBA exposure is assigned and estimated in accordance with Annex 7AB of this Part. LGD is measured as a decimal.

7.4.41 For the purposes of calculating $K_{mort}$ pursuant to paragraph 7.4.35 above, the Reporting Bank shall apply LGD = 0.1 where the LGD is less than 0.1.[165A]

[165A] The application of the LGD floor does not imply any waiver of requirements of LGD estimation as set out in Annex 7AB of this Part.

**Sub-division 9: Calculation of K for Eligible Purchased Receivables Asset Class**

7.4.42 A Reporting Bank shall calculate $K_{cp}$ using the following formula:

$$K_{cp} = [K_{df,\ cp} + K_{dil,\ cp}]$$

where "$K_{df,\ cp}$" refers to the capital requirement for the default risk of purchased corporate receivables and "$K_{dil,\ cp}$" refers to the capital requirement for the dilution risk[166] of purchased corporate receivables. A Reporting Bank need not calculate $K_{dil,\ cp}$ if the Reporting Bank demonstrates to the satisfaction of the Authority that dilution risk is immaterial.

7.4.43 A Reporting Bank shall calculate $K_{sp}$ using the following formula:

$$K_{sp} = [K_{df,\ sp} + K_{dil,\ sp}]$$

where "$K_{df,\ sp}$" refers to the capital requirement for the default risk of purchased corporate small business receivables and "$K_{dil,\ sp}$" refers to the capital requirement for the dilution risk of purchased corporate small business receivables. A Reporting Bank need not calculate $K_{dil,\ sp}$ if the Reporting Bank demonstrates to the satisfaction of the Authority that dilution risk is immaterial.

7.4.44 A Reporting Bank shall calculate $K_{rp}$ using the following formula:

$$K_{rp} = [K_{df,\ rp} + K_{dil,\ rp}]$$

where "$K_{df,\ rp}$" refers to the capital requirement for the default risk of purchased retail receivables and "$K_{dil,\ rp}$" refers to the capital requirement for the dilution risk of purchased retail receivables. A Reporting Bank need not calculate $K_{dil,\ rp}$ if the Reporting Bank demonstrates to the satisfaction of the Authority that dilution risk is immaterial.

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[166] In addition to default risk, a purchased receivable is also exposed to dilution risk which refers to the possibility that the receivable amount is reduced through cash or non-cash credits to the obligor of the receivable. Examples include offsets or allowances arising from returns of goods sold, disputes regarding product quality, possible debts of the borrower to an obligor of the receivables, and any payment or promotional discounts offered by the borrower (e.g. a credit for cash payments within 30 days).

Calculation of Capital Requirements for Default Risk, $K_{df}$

7.4.45 Subject to paragraph 7.4.46, a Reporting Bank shall calculate[167] -

(a) $K_{df, cp}$ by applying the formula set out in paragraph 7.4.21 or 7.4.21A as appropriate, subject to the Reporting Bank receiving approval to adopt the IRBA for the corporate asset sub-class;

(b) $K_{df, sp}$ by applying the formula set out in paragraph 7.4.22 or 7.4.22A as appropriate, subject to the Reporting Bank receiving approval to adopt the IRBA for the corporate small business asset sub-class; and

(c) $K_{df, rp}$ by applying the formula[168] set out in paragraphs 7.4.35, 7.4.36 or 7.4.37 (depending on whether the purchased receivables meet the criteria for categorisation under the residential mortgage asset sub-class, QRRE asset sub-class or other retail exposures asset sub-class), subject to the Reporting Bank receiving approval to adopt the IRBA for the applicable retail asset sub-class. If the purchased receivables meet the criteria for categorisation under the residential mortgage asset sub-class or QRRE asset sub-class but the Reporting Bank has not received approval to adopt the IRBA for those asset sub-classes, the Reporting Bank shall calculate $K_{df, rp}$ by applying the formula set out in paragraph 7.4.37, subject to the Reporting Bank receiving approval to adopt the IRBA for the other retail exposures asset sub-class.

7.4.46 Subject to approval by the Authority, a Reporting Bank may calculate $K_{df, cp}$ and $K_{df, sp}$ using a top-down approach as set out in Annex 7W of this Part. The top-down approach allows the Reporting Bank to derive estimates of IRBA parameters on a pooled basis. A Reporting Bank seeking approval from the Authority to use the top-down approach shall satisfy the following conditions:

(a) the receivables are purchased from third party sellers, and not from related corporations or affiliates of the Reporting Bank, and as such the Reporting Bank has not originated the receivables either directly or indirectly;

[MAS Notice 637 (Amendment No. 2) 2014]

(b) the receivables are generated on an arm's-length basis between the seller and the obligor. Inter-company accounts receivable and receivables

[167] For a hybrid pool containing a mix of purchased receivables that can be categorised under two or more asset sub-classes and where the Reporting Bank cannot separate the purchased receivables by asset sub-class, the Reporting Bank shall apply the formula for the asset sub-class that results in the highest $K_{df}$ for the purpose of calculating the credit risk-weighted exposure amount for the pool pursuant to Sub-division 4 of Division 1 of this Part.

[168] The estimates of PD and LGD shall be derived without regard to any assumption of recourse or other support (e.g. guarantees) from the seller or other parties.

subject to contra-accounts[169] between firms that buy and sell to each other are not eligible for the top-down treatment;

(c) the Reporting Bank has a claim on all proceeds from the pool of receivables or a pro-rata interest in the proceeds.[170] The existence of full or partial recourse to the seller is allowed as long as the cash flows from the purchased receivables are the primary protection against default risk as determined in accordance with paragraphs 2.10 to 2.15 of Annex 7W of this Part and the Reporting Bank meets the eligibility criteria in this Sub-division and Annex 7W of this Part, and the operational requirements in Section 2 of Annex 7W of this Part;

(d) the Reporting Bank demonstrates to the satisfaction of the Authority that the pool of receivables is sufficiently diversified[170A];

(e) the Reporting Bank has earmarked the purchased receivables for securitisation or sale to be completed within six months from the date of purchase; and

(f) the Reporting Bank meets the requirements in Annex 7W of this Part.

7.4.47 If a Reporting Bank fails to comply with the conditions set out in paragraph 7.4.46 after approval has been granted for it to adopt the top-down approach, the Authority may revoke its approval for the Reporting Bank to use the top-down approach, in which case the Reporting Bank shall calculate $K_{df,\ cp}$, $K_{df,\ sp}$ or both in accordance with paragraph 7.4.45. Actions taken by the Authority may include subjecting the Reporting Bank to higher bank-specific capital requirements pursuant to section 10(3) of the Banking Act.

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169 Contra-accounts involve a customer buying from and selling to the same firm. The risk is that debts may be settled through payments in kind rather than cash. Invoices between the companies may be offset against each other instead of being paid. This practice can defeat a security interest when challenged in court.

170 Claims on tranches of the proceeds (first loss position, second loss position, etc.) shall be regarded as securitisation.

170A In assessing whether to grant approval for a Reporting Bank to use the top-down approach as set out in Annex 7W of this Part to calculate $K_{df,cp}$ and $K_{df,sp}$ in accordance with paragraphs 7.4.42 to 7.4.45, a criteria considered by the Authority is whether there is concentration in any single receivable or group of receivables (to a group of underlying obligors or guaranteed by the same seller) that is more than 3.5% of the EAD of the pool of purchased corporate receivables or purchased corporate small business receivables. This does not preclude the Authority from applying additional concentration limits.

Calculation of Capital Requirements for Dilution Risk, $K_{dil}$

7.4.48 A Reporting Bank shall calculate $K_{dil, cp}$, $K_{dil, sp}$ and $K_{dil, rp}$, regardless of whether it is using the top-down approach, using the following formula:

$$\text{Correlation } (R_{dil}) = 0.12 \times (1 - EXP(-50 \times PD_{dil})) / (1 - EXP(-50)) + 0.24 \times [1 - (1 - EXP(-50 \times PD_{dil}))/(1 - EXP(-50))]$$

$$\text{Maturity adjustment } (b) = (0.11852 - 0.05478 \times \ln(PD_{dil}))^2$$

$$\text{Capital requirement } (K_{dil, cp}, K_{dil, sp} \text{ or } K_{dil, rp}) = [LGD_{dil} \times N[(1 - R_{dil})^{-0.5} \times G(PD_{dil}) + (R_{dil}/(1 - R_{dil}))^{0.5} \times G(0.999)] - PD_{dil} \times LGD_{dil}] \times (1 - 1.5 \times b)^{-1} \times (1 + (M_{dil} - 2.5) \times b)$$

where -

(a) "$PD_{dil}$" refers to the estimated one-year EL arising from dilution risk expressed as a percentage of the amount of receivables in the relevant pool. This estimate shall be calculated without regard to any assumption of recourse or other support (e.g. guarantees) from the seller or third-party guarantors;

(b) $LGD_{dil}$ = 100%; and

(c) "$M_{dil}$" is -

(i) the average effective maturity calculated in accordance with Annex 7Z of this Part for the relevant pool of receivables; or

(ii) one year if the Reporting Bank demonstrates to the satisfaction of the Authority that the Reporting Bank is able to monitor the dilution risk and has a track record of resolving incidents of dilution or dilution events within one year.

7.4.49 Where $K_{dil, cp}$, $K_{dil, sp}$ or $K_{dil, rp}$ for any IRBA exposure calculated in accordance with paragraph 7.4.48 above is less than 0, the Reporting Bank shall apply $K_{dil}$ = 0 for the purposes of calculating $K_{cp}$, $K_{sp}$ or $K_{rp}$, as the case may be, for that IRBA exposure pursuant to paragraphs 7.4.42, 7.4.43 or 7.4.44.

7.4.50 Subject to approval by the Authority, a Reporting Bank may calculate $K_{dil, cp}$, $K_{dil, sp}$ and $K_{dil, rp}$ using a top-down approach which allows the Reporting Bank to derive estimates of IRBA parameters on a pooled basis. A Reporting Bank seeking approval from the Authority to use the top-down approach shall satisfy the conditions set out in paragraph 7.4.46.

7.4.51 If a Reporting Bank fails to comply with the conditions set out in paragraph 7.4.50 after approval has been granted for it to adopt the top-down approach, the Authority may revoke its approval for the Reporting Bank to use the top-down approach. The Reporting Bank may also be subjected to higher bank-specific capital requirements pursuant to section 10(3) of the Banking Act, or other actions by the Authority.

Treatment of purchase price discounts for receivables

7.4.51A Where the purchase price of the purchased receivables reflect a discount that provides first loss protection for default losses, dilution losses or both, and a portion of such a purchase price discount is to be refunded to the seller based on the performance of the receivables –

(a) a Reporting Bank which has purchased the receivables may treat the amount to be refunded as first loss protection and may calculate the capital requirements for the purchased receivables in accordance with Sub-division 4 of Division 6 of this Part; and

(b) a Reporting Bank which has sold the receivables and provided the refundable purchase price discount shall treat the refundable amount as a first loss position and shall calculate the capital requirements for the purchase price discount in accordance with Sub-division 4 of Division 6 of this Part.

[MAS Notice 637 (Amendment No. 2) 2017]

7.4.51AA Non-refundable purchase price discounts for receivables do not affect either the EL provision calculation in Sub-division 14 of this Division or the calculation of risk-weighted exposures.

[MAS Notice 637 (Amendment No. 2) 2017]

7.4.51B Where collateral or partial guarantees obtained on the purchased receivables provide first loss protection, and these collateral or partial guarantees cover default losses, dilution losses or both, a Reporting Bank may treat them as first loss protection, and may calculate the capital requirements for the purchased receivables in accordance with Sub-division 4 of Division 6 of this Part. When the collateral or partial guarantees cover both default losses and dilution losses, a Reporting Bank using the SEC-IRBA shall calculate the exposure-weighted average LGD in accordance with paragraph 7.6.37.

[MAS Notice 637 (Amendment No. 2) 2017]

**Sub-division 10: Treatment of Credit Protection**

Treatment of Eligible Credit Protection Bought

7.4.52 A Reporting Bank which has bought eligible credit protection for an IRBA exposure categorised under the IRBA wholesale asset class for which it is using the F-IRBA to calculate the credit risk-weighted exposure amount may recognise the effects of CRM of the eligible credit protection as follows:

(a) break down the IRBA exposure into -

(i) a protected portion with EAD equal to the notional amount of the eligible credit protection[171]; and

[171] A Reporting Bank shall treat the protection portion of an IRBA exposure which has a currency mismatch or a maturity mismatch in accordance with Annex 7F of this Part.

(ii) an unprotected portion with EAD equal to the EAD of the IRBA exposure less the notional amount of the eligible credit protection; and

(b) calculate the credit risk-weighted exposure amount pursuant to Sub-division 4 of Division 1 of this Part as follows:

(i) for the protected portion -

(A) use the double default framework in accordance with the requirements set out in Annex 7G of this Part[172];

(B) use the following:

(I) the formula for calculating K that is applicable to the eligible protection provider;

(II) the PD associated with the obligor grade to which the eligible protection provider is assigned or some grade between the obligor grades to which the underlying obligor and the eligible protection provider are assigned if the Reporting Bank considers appropriate, that is estimated in accordance with Annex 7AB of this Part;

(III) the LGD of the underlying transaction or the LGD applicable to the credit protection taking into account seniority and any collateralisation of the credit protection; or

(C) in the case where the Reporting Bank has bought from an eligible protection provider a credit default swap which is an eligible credit protection and cleared through a CCP, apply a risk weight of 2% if the credit default swap constitutes a CCP trade exposure in accordance with paragraphs 2.1 or 2.5 of Annex 7AJ, or 4% if the credit default swap constitutes a CCP trade exposure in accordance with paragraph 2.6 of Annex 7AJ; and

(ii) for the unprotected portion, use the following:

(A) the formula for calculating K that is applicable to the underlying obligor;

(B) the PD associated with the obligor grade to which the underlying obligor is assigned and estimated in accordance with Annex 7AB of this Part;

(C) the LGD of the underlying transaction.

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[172] Where a Reporting Bank has bought eligible credit protection to hedge dilution risk arising from an IRBA exposure within the IRBA eligible purchased receivables asset class, it may also recognise the effects of CRM under the double default framework provided the requirements in Annex 7G of this Part are complied with.

7.4.53 Notwithstanding paragraph 7.4.52(b), a Reporting Bank shall apply a 1250% risk weight to any materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure as such threshold is equivalent to a retained first loss position.

7.4.54 A Reporting Bank which has eligible credit protection for an IRBA exposure for which it is using the A-IRBA or IRBA for the IRBA retail asset class to calculate the credit risk-weighted exposure amount may recognise the effects of CRM of the eligible credit protection by -

(a) adopting the treatment set out in paragraph 7.4.52 above; or

(b) adjusting either its estimates of PD or LGD. Any adjustment to estimates of PD or LGD shall -

(i) be done in a consistent manner for a given type of credit protection; and

(ii) not recognise the effect of double default, i.e. the adjusted credit risk-weighted exposure amount shall not be less than that of a comparable direct exposure to the eligible protection provider.

7.4.55 A Reporting Bank shall apply the relevant provisions in Annex 7H of this Part for the purpose of determining the protected portion in cases of proportional cover, principal-only cover, partially eligible credit derivatives, tranched cover and basket credit derivatives.

7.4.56 In the case of an IRBA exposure within the IRBA eligible purchased receivables asset class, a Reporting Bank shall consider the availability of credit protection for default risk and dilution risk separately.[173]

Treatment of Credit Protection Sold

7.4.57 A Reporting Bank which has sold unfunded credit protection acquires exposure to the reference asset. If such exposure is an IRBA exposure, the Reporting Bank shall calculate the credit risk-weighted exposure amount for the exposure pursuant to Sub-division 4 of Division 1 of this Part using the formula for calculating K that is applicable to the obligor of the reference asset.

[173] For this purpose -

(a) if a guarantee covers both default risk and dilution risk, a Reporting Bank shall substitute the capital requirement for an exposure to the guarantor in place of the total capital requirement for default risk and dilution risk applicable to the pool of receivables.

(b) if a guarantee covers only default risk or dilution risk, but not both, a Reporting Bank shall substitute the capital requirement for an exposure to the guarantor in place of the capital requirement for the corresponding risk component that is covered (default risk or dilution risk). The capital requirement for the other component shall then be added.

(c) if a guarantee covers only a portion of the default risk or dilution risk, the capital requirements of the uncovered portion shall be added to the capital requirement of the covered portion.

7.4.58 If the unfunded credit protection has more than one reference asset, the credit risk-weighted exposure amount for the credit protection is the sum of the credit risk-weighted exposure amounts in respect of each reference asset calculated using the relevant formulae for calculating K that are applicable to the obligors of the respective reference assets.

7.4.59 A Reporting Bank which has sold funded credit protection acquires exposure to both the reference asset and the protection buyer. If such exposures are IRBA exposures, the Reporting Bank shall calculate the credit risk-weighted exposure amount for the credit protection as the sum of -

(a) the credit risk-weighted exposure amount for the exposure to the reference asset calculated in accordance with paragraphs 7.4.57 and 7.4.58 above, as applicable; and

(b) the credit risk-weighted exposure amount for the exposure to the protection buyer, using -

(i) EAD = the carrying amount of the collateral placed with the protection buyer; and

(ii) the formula for calculating K that is applicable to the protection buyer.

[MAS Notice 637 (Amendment) 2014]

7.4.60 The capital requirement for the credit protection calculated in accordance with paragraphs 7.4.58 and 7.4.59 shall not exceed the notional amount of the credit protection, i.e. the maximum possible payout under the credit protection.

7.4.61 Where a Reporting Bank has provided credit protection (whether funded or unfunded) through a proportionate structure, i.e. where the maximum possible payout in respect of any particular reference asset is capped at a pre-determined proportion of the notional amount of the credit protection, the Reporting Bank shall distinguish individual sub-exposures equal to the proportionate amount of credit protection in respect of each reference asset for the purposes of calculating the credit risk-weighted exposure amount applicable to the credit protection sold.

7.4.62 Where a Reporting Bank has provided credit protection for a basket of reference exposures through a first-to-default credit derivative, the Reporting Bank shall calculate the credit risk-weighted exposure amount applicable to the credit protection sold by aggregating the risk weights that would be assigned to the reference exposures, subject to a cap of 1250%, and multiplying the aggregate with the nominal amount of the protection provided by the credit derivative.

[MAS Notice 637 (Amendment No. 2) 2017]

7.4.62A Where a Reporting Bank has provided credit protection for a basket of reference exposures through a second-to-default credit derivative, the Reporting Bank shall calculate the credit risk-weighted exposure amount applicable to the credit protection sold by applying the treatment referred to in paragraph 7.4.62, except that in aggregating the risk weights, the risk weights assigned to the reference exposure with the lowest credit risk-weighted exposure amount may be excluded.

[MAS Notice 637 (Amendment No. 2) 2017]

### Sub-division 11: Calculation of K for Defaulted Assets

7.4.63 A Reporting Bank shall calculate $K_{def}$ using the following formula[173A]:

$$\text{Capital requirement } (K_{def}) = LGD - EL_{est}$$

where -

(a) "LGD" refers to the LGD for the IRBA exposure; and

(b) "$EL_{est}$" refers to the best estimate of expected loss for that IRBA exposure by the Reporting Bank.

In the case where a Reporting Bank is using the F-IRBA for its IRBA exposures under the IRBA wholesale asset class, $EL_{est}$ = LGD for the IRBA exposure i.e. $K_{def}$ = 0.

7.4.64 Where $K_{def}$ for any IRBA exposure calculated in accordance with paragraph 7.4.63 above is less than 0, the Reporting Bank shall apply K = 0 for the purposes of calculating the credit risk-weighted exposure amount for that IRBA exposure pursuant to Sub-division 4 of Division 1 of this Part.

### Sub-division 12: Supervisory Slotting Criteria

7.4.65 A Reporting Bank using the supervisory slotting criteria for IRBA exposures belonging to the SL asset sub-class or HVCRE asset sub-class or both shall assign such exposures to internal borrower grades based on its own criteria, systems and processes. The Reporting Bank shall then map these internal borrower grades into the five supervisory rating categories in Annex 7V of this Part according to the general assessment factors and characteristics exhibited by the exposures.

7.4.66 Subject to paragraph 7.4.67, a Reporting Bank using the supervisory slotting criteria for IRBA exposures belonging to the SL asset sub-class shall risk-weight those exposures in accordance with Table 7-15.

Table 7-15: Risk Weight for Exposures in SL Asset Sub-Class

| **Category** | Strong | Good | Satisfactory | Weak | Default |
|---|---|---|---|---|---|
| **$RW_{slot}$** | 70% | 90% | 115% | 250% | 0% |

7.4.67 A Reporting Bank may apply a risk weight of 50% to any IRBA exposure belonging to the SL asset sub-class that is categorised as "strong" and a risk weight of 70% to any IRBA exposure belonging to the SL asset sub-class that is categorised as "good", provided such exposures have a remaining maturity of less than 2.5 years.

[173A] The PD of obligors assigned to a default grade is 1.

7.4.68 Subject to paragraph 7.4.69, a Reporting Bank using the supervisory slotting criteria for IRBA exposures belonging to the HVCRE asset sub-class shall risk-weight those exposures in accordance with Table 7-16.

Table 7-16: Risk Weight for Exposures in HVCRE Asset Sub-Class

| **Category** | Strong | Good | Satisfactory | Weak | Default |
|---|---|---|---|---|---|
| **$RW_{slot}$** | 95% | 120% | 140% | 250% | 0% |

7.4.69 A Reporting Bank may apply a risk weight of 70% to any IRBA exposure belonging to the HVCRE asset sub-class that is categorised as "strong" and a risk weight of 95% to any IRBA exposure belonging to the HVCRE asset sub-class that is categorised as "good", provided such exposures have a remaining maturity of less than 2.5 years.

7.4.69A A Reporting Bank should ensure that each supervisory rating category for IRBA exposures belonging to the SL asset sub-class or the HVCRE asset sub-class broadly corresponds to a range of external credit assessments by recognised ECAIs in accordance with Table 7-16A.

Table 7-16A: Corresponding External Credit Assessments to Supervisory Rating Categories for Exposures in SL Asset Sub-Class or HVCRE Asset Sub-Class

| **Category** | Strong | Good | Satisfactory | Weak | Default |
|---|---|---|---|---|---|
| **External credit assessments** | BBB-/Baa3 or better | BB+/Ba1 to BB/Ba2 | BB-/Ba3 to B+/B1 | B/B2 to C- | Not applicable |

**Sub-division 13: Unsettled Transactions**

7.4.70 A Reporting Bank shall comply with the requirements set out in this Sub-division to calculate K [174] for any unsettled transaction [175] on securities, foreign exchange instruments and commodities (other than an SFT).

7.4.71 A Reporting Bank shall apply a risk weight to any IRBA exposure arising from receivables[176] that remain unpaid or undelivered in respect of an unsettled DvP transaction in accordance with Table 7-17.

174 An exposure arising from a transaction that meets the requirements in paragraph 8.1.10 of Part VIII would generally be considered a trading book position and will also be subject to the relevant market risk capital requirements.

175 This includes any transaction, through a settlement and clearing system recognised by the Authority or a CCP, that – (a) is subject to daily mark-to-market and payment of daily variation margins and; (b) involves a mismatched trade. An exposure value of zero for CCR can be attributed to payment transactions (for example, funds transfer transactions) and other spot transactions that are outstanding with a CCP, when the CCP's CCR exposures with all participants in its arrangements are fully collateralised on a daily basis. [MAS Notice 637 (Amendment) 2012]

176 Such an exposure should be treated as a loan to the counterparty.

Table 7-17: Risk Weights for Unsettled DvP Transactions

| Number of Business Days after Agreed Settlement Date | Risk Weight |
|---|---|
| From 0 to 4 | 0% |
| From 5 to 15 | 100% |
| From 16 to 30 | 625% |
| From 31 to 45 | 937.5% |
| 46 or more | 1,250% |

7.4.72 A Reporting Bank which has fulfilled its obligations under the first contractual payment or delivery leg of a non-DvP transaction shall regard any outstanding receivables after the end of the first contractual payment or delivery date as a loan exposure to its counterparty[177]. The Reporting Bank shall calculate the credit risk-weighted exposure amount for any IRBA exposure arising from receivables that remain unpaid or undelivered up to and including the fourth business day after the second contractual payment or delivery date by -

(a) applying the risk weights in accordance with the applicable asset classes under SA(CR) set out in Sub-division 3 of Division 3 of this Part[178];

(b) applying the treatment for an equivalent exposure to the counterparty in accordance with the categories set out in Sub-divisions 6 to 9 of this Division[179]; or

(c) where such IRBA exposures are not material in aggregate, assigning a 100% risk weight[180].

7.4.73 If the receivables arising from the non-DvP transaction remain unpaid or undelivered on or after the fifth business day after the second contractual payment or delivery date, the Reporting Bank shall apply a 1250% risk weight to such receivables and replacement cost, if any. This treatment shall continue until the second payment or delivery leg is effectively made.

7.4.74 The Authority may exempt the Reporting Bank from the applicable capital treatment in paragraphs 7.4.71 and 7.4.73 above if there has been a system-wide failure of a settlement system, clearing system or CCP that causes significant disruption to normal settlement and clearing processes. The Authority may grant such exemption subject to such conditions or restrictions as the Authority may impose.

[MAS Notice 637 (Amendment) 2012]

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177 If the dates when two payment legs are made are the same according to the time zones where each payment is made, they are deemed to have been settled on the same day.

178 A Reporting Bank adopting IRBA but choosing to apply risk weights in accordance with the applicable asset classes under SA(CR) to calculate capital requirements arising from free deliveries pursuant to this sub-paragraph shall consistently do so for all such exposures.

179 In the event that a Reporting Bank has no other banking book exposure to the counterparty, it may assign a PD on the basis of the counterparty's external credit assessment by recognised ECAIs. A Reporting Bank adopting A-IRBA may use an LGD of 45% in estimating the LGD for unsettled transactions pursuant to this Sub-division as long as this is applied consistently to all A-IRBA exposures arising from unsettled transactions.

180 A Reporting Bank shall apply a uniform 100% risk weight to all IRBA exposures pursuant to this sub-paragraph.

**Sub-division 14: Calculation of EL Amount**

7.4.75 Subject to paragraph 7.4.77, the EL amount for an IRBA exposure belonging to the IRBA wholesale asset class (other than an exposure belonging to the SL asset sub-class or HVCRE asset sub-class for which the Reporting Bank is using the supervisory slotting criteria) or IRBA retail asset class that is in default in accordance with the definition of default in Annex 7X of this Part shall be equal to the best estimate of expected loss by the Reporting Bank.

7.4.76 A Reporting Bank shall calculate the EL amount for an IRBA exposure belonging to the IRBA wholesale asset class (other than an exposure belonging to the SL asset sub-class or HVCRE asset sub-class for which the Reporting Bank is using the supervisory slotting criteria) or IRBA retail asset class that is not in default in accordance with the definition of default in Annex 7X of this Part and not treated as a hedged exposure under the double default framework set out in Annex 7G of this Part using the following formula[180A]:

EL amount = PD x LGD x EAD

where -

(a) PD = PD associated with the obligor grade or segment to which the IRBA exposure is assigned and estimated in accordance with Annex 7AB of this Part;

(b) LGD = LGD associated with the facility grade or segment to which the IRBA exposure is assigned and estimated in accordance with Annex 7AB of this Part; and

(c) EAD = EAD for the IRBA exposure calculated in accordance with the exposure measurement requirements in Division 2 of this Part.

7.4.77 For a Reporting Bank using the F-IRBA, the EL amount for an IRBA exposure belonging to the IRBA wholesale asset class (other than an exposure belonging to the SL asset sub-class or HVCRE asset sub-class for which the Reporting Bank is using the supervisory slotting criteria) that is in default in accordance with the definition of default in Annex 7X of this Part shall be equal to the supervisory LGD set out in paragraph 7.4.28 multiplied by the EAD of the IRBA exposure calculated in accordance with the exposure measurement requirements in Division 2 of this Part.

7.4.78 Subject to paragraph 7.4.79, a Reporting Bank using the supervisory slotting criteria for IRBA exposures belonging to the SL asset sub-class or HVCRE asset sub-class shall calculate the EL amount for an IRBA exposure belonging to either of these sub-classes using the following formula:

[180A] For all other exposures, including hedged exposures under the double default framework set out in Annex 7G of this Part, the Reporting Bank shall apply a EL of zero. For the avoidance of doubt, this does not include equity exposures and securitisation exposures.

EL amount = 8% x RW x EAD

where -

(a) RW = risk weight determined in accordance with Table 7-18 for an exposure belonging to the SL asset sub-class and Table 7-19 for an exposure belonging to the HVCRE asset sub-class; and

(b) EAD = EAD, or where applicable EAD*, for the exposure calculated in accordance with Division 2 of this Part.

Table 7-18: Risk Weight for Calculating the EL Amount of Exposures in SL Asset Sub-Class

| **Category** | Strong | Good | Satisfactory | Weak | Default |
|---|---|---|---|---|---|
| **$RW_{slot}$** | 5% | 10% | 35% | 100% | 625% |

Table 7-19: Risk Weight for Calculating the EL Amount of Exposures in HVCRE Asset Sub-Class

| **Category** | Strong | Good | Satisfactory | Weak | Default |
|---|---|---|---|---|---|
| **$RW_{slot}$** | 5% | 5% | 35% | 100% | 625% |

7.4.79 A Reporting Bank may apply a risk weight of 0% to any IRBA exposure belonging to the SL asset sub-class that is categorised as "strong" and a risk weight of 5% to any IRBA exposure belonging to the SL asset sub-class that is categorised as "good", provided such exposures have a remaining maturity of less than 2.5 years.

**Division 5: Equity Exposures**

**Sub-division 1: Definition of Equity Exposures**

7.5.1 A Reporting Bank shall categorise an instrument as an equity exposure if -

(a) it is irredeemable and the return of invested funds can be achieved only by the sale of the investment or sale of the rights to the investment or by the liquidation of the issuer of the instrument;

(b) it does not in substance amount to an obligation on the part of the issuer of the instrument; and

(c) it conveys a residual claim on the assets or income of the issuer of the instrument.

7.5.1A A Reporting Bank shall include as an equity exposure, any ownership interests[181], whether voting or non-voting, in the assets or income of a corporation and any derivative instruments tied to ownership interests.

7.5.2 A Reporting Bank shall treat any instrument[182] structured with the intent of conveying the economic substance of an equity exposure as defined in paragraph 7.5.1 as an equity exposure.[183]

7.5.3 Subject to paragraphs 7.5.4 to 7.5.10, a Reporting Bank shall not treat any instrument structured with the intent of conveying the economic substance of a debt holding or securitisation exposure as an equity exposure.[184]

7.5.4 Notwithstanding paragraphs 7.5.1 to 7.5.3 above, a Reporting Bank shall categorise the following instruments and investments as equity exposures:

(a) an instrument with the same structure as one approved for inclusion as Tier 1 Capital under Part VI or equivalent regulatory requirements of a bank regulatory agency other than the Authority;

(b) an instrument that in substance amounts to an obligation on the part of the issuer of the instrument and where one or more of the following requirements are complied with:

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[181] Indirect equity interests include holdings in corporations, partnerships, limited liability companies or other types of enterprises that issue ownership interests and are engaged principally in the business of investing in equity instruments.

[182] This includes any debt, security, partnership, derivative or vehicle.

[183] Any perpetual instrument which is irredeemable or redeemable at the issuer’s option shall be categorised as an equity exposure. For example, irredeemable perpetual preference shares or perpetual preference shares redeemable at the issuer’s option shall be characterised as equity exposures. Any debt instrument which is convertible into equity at the option of the issuer or automatically by the terms of the instruments shall also be characterised as an equity exposure. A short position in equity securities shall also be characterised as an equity exposure.

[184] For example, perpetual preference shares redeemable at holder’s option and non-convertible term preference shares would be treated as debt exposures.

(i) the issuer may defer the settlement of the obligation indefinitely;

(ii) the obligation requires or permits, at the discretion of the issuer, settlement by issuance of a fixed number of the equity shares of the issuer;

(iii) the obligation requires or permits, at the discretion of the issuer, settlement by issuance of a variable number of the equity shares of the issuer and ceteris paribus any change in the value of the obligation is attributable to, comparable to, and in the same direction as, the change in the value of a fixed number of the equity shares of the issuer[185]; or

(iv) the holder has the option to require that the obligation be settled in equity shares, unless the Reporting Bank is able to demonstrate to the satisfaction of the Authority that the instrument should be treated as a debt exposure. In the case of a traded instrument, the Reporting Bank shall demonstrate to the satisfaction of the Authority that the instrument is traded more like the debt of the issuer than its equity; and

(c) its equity investments in all types of funds held in its banking book.[186]

[MAS Notice 637 (Amendment) 2016]

7.5.5 In the case stated in paragraph 7.5.4(b)(iv), subject to approval by the Authority, a Reporting Bank may break down the risks associated with the instrument into an equity position and a debt position for the purposes of calculating regulatory capital requirements under the Notice. The Reporting Bank shall, if required by the Authority, be able to demonstrate how it breaks down the risks into an equity exposure and a debt exposure.

7.5.6 A Reporting Bank shall categorise any equity exposure arising from a debt to equity swap made as part of the orderly realisation or restructuring of the debt as an equity exposure. Such instruments shall not attract a lower regulatory capital requirement than would apply if they had remained in the debt portfolio.

7.5.7 A Reporting Bank shall categorise any instrument with a return linked to that of equities as an equity exposure. However, such an instrument need not be included as

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[185] For certain obligations that require or permit settlement by issuance of a variable number of the issuer's equity shares, the change in the monetary value of the obligation is equal to the change in the fair value of a fixed number of equity shares multiplied by a specified factor. Those obligations meet the conditions of paragraph 7.5.4(b)(iii) if both the factor and the referenced number of shares are fixed. For example, an issuer may be required to settle an obligation by issuing shares with a value equal to three times the appreciation in the fair value of 1,000 equity shares. That obligation is considered to be the same as an obligation that requires settlement by issuance of shares equal to the appreciation in the fair value of 3,000 equity shares.

[186] This includes off-balance sheet exposures to the fund e.g. unfunded commitments to subscribe to a fund's future capital calls.

[MAS Notice 637 (Amendment) 2016]

an equity exposure if it is directly hedged by another equity exposure and the net position does not involve material risk.[187]

7.5.8 The Authority may, on a case-by-case basis, require a Reporting Bank to re-characterise a debt holding as an equity exposure for the purposes of calculating regulatory capital requirements.

**Sub-division 2: Overview of Calculation of Credit RWA for Equity Exposures**

7.5.9 A Reporting Bank shall not include the following in its calculation of SA(EQ) RWA or IRBA(EQ) RWA:

(a) any equity exposure held in the trading book;

(b) any equity exposure that is not consolidated in the consolidated financial statements of the Reporting Bank in accordance with Part III; or

(c) any equity exposure that is required to be deducted in the calculation of CET1 Capital, AT1 Capital or Tier 2 Capital or risk weighted at 250% pursuant to Part VI.

7.5.10 A Reporting Bank which has received approval from the Authority to adopt the IRBA pursuant to Division 4 of this Part shall not calculate the credit risk-weighted exposure amount for its equity exposures using the SA(EQ) unless its equity exposures fall below the materiality threshold set out in Annex 7AC of this Part.

**Sub-division 3: Calculation of Credit Risk-Weighted Exposure Amount for Equity Exposures Using SA(EQ)**

7.5.11 A Reporting Bank using the SA(EQ) to calculate the credit risk-weighted exposure amount for its equity exposures (excluding equity investments in funds held in the banking book), shall apply a risk weight of 100% to E, being the value of the equity exposure measured in accordance with Division 2 of this Part.[187A]

[MAS Notice 637 (Amendment) 2016]
[MAS Notice 637 (Amendment No. 3) 2017]

7.5.12 A Reporting Bank shall treat short positions as if they are long positions, and apply a risk weight of 100% to the value of each position as measured in accordance with Division 2 of this Part.

7.5.12A The Authority may require a Reporting Bank to use the IRBA(EQ) pursuant to Sub-division 4 of this Division to calculate the credit risk-weighted exposure amount of its equity exposures, if the Authority is of the view that the equity exposures of the Reporting Bank are a significant part of the Reporting Bank's business, even though the Reporting Bank does not adopt the IRBA pursuant to Division 4 of this Part.

[187] A Reporting Bank shall, if required by the Authority, be able to demonstrate that the net position of hedged equity exposures does not involve material risk.

[187A] The Authority may from time to time specify a higher risk weight for a particular exposure or group of exposures, taking into account, among other things, the risks of this type of exposures.

Treatment of Credit Protection Bought

7.5.13 A Reporting Bank which has bought eligible credit protection for an SA(EQ) exposure may recognise the effects of CRM of the eligible credit protection as follows:

(a) break down the SA(EQ) exposure into -

(i) a protected portion with E equal to the notional amount of the eligible credit protection[188]; and

(ii) an unprotected portion with E equal to the E of the SA(EQ) exposure less the notional amount of the eligible credit protection; and

(b) for the purposes of calculating the credit risk-weighted exposure amount pursuant to Sub-division 5 of Division 1 of this Part, use -

(i) for the protected portion, the risk weight that is applicable to the eligible protection provider[188A]; and

(ii) for the unprotected portion, the treatment applicable to the SA(EQ) exposure in this Division.

[MAS Notice 637 (Amendment No. 2) 2014]
[MAS Notice 637 (Amendment No. 3) 2017]

7.5.14 Notwithstanding paragraph 7.5.13(b), a Reporting Bank shall apply a 1250% risk weight to any materiality threshold below which no payment will be made by the protection provider in the event of loss on an SA(EQ) exposure as such threshold is equivalent to a retained first loss position.

7.5.15 A Reporting Bank shall apply the relevant provisions in Annex 7H of this Part for the purpose of determining the protected portion in cases of proportional cover, principal-only cover, partially eligible credit derivatives, tranched cover and basket credit derivatives.

Treatment of Credit Protection Sold

7.5.16 A Reporting Bank which has sold unfunded credit protection acquires exposure to the reference asset. If such exposure is an SA(EQ) exposure, the Reporting Bank shall calculate the credit risk-weighted exposure amount for the exposure using the treatment applicable to the SA(EQ) exposure in this Division.

[MAS Notice 637 (Amendment No. 3) 2017]

188 A Reporting Bank shall treat the protected portion of an SA(EQ) exposure which has a currency mismatch or a maturity mismatch in accordance with Annex 7F of this Part.

188A Where a Reporting Bank has bought from an eligible protection provider a credit default swap which is an eligible credit protection and cleared through a CCP, the Reporting Bank may apply a risk weight of 2% if the credit default swap constitutes a CCP trade exposure in accordance with paragraphs 2.1 or 2.5 of Annex 7AJ, or 4% if the credit default swap constitutes a CCP trade exposure in accordance with paragraph 2.6 of Annex 7AJ.

[MAS Notice 637 (Amendment No. 2) 2014]

7.5.17 If the unfunded credit protection has more than one reference asset, the credit risk-weighted exposure amount for the credit protection is the sum of the credit risk-weighted exposure amounts in respect of each reference asset calculated using the risk weights that are applicable to the obligors of the respective reference assets.

7.5.18 A Reporting Bank which has sold funded credit protection acquires exposure to both the reference asset and the protection buyer. Where the exposure to the reference asset is an SA(EQ) exposure, the Reporting Bank shall calculate the credit risk-weighted exposure amount for the credit protection as the sum of -

(a) the credit risk-weighted exposure amount for the exposure to the reference asset calculated using the treatment applicable to the SA(EQ) exposure in this Division; and

(b) the credit risk-weighted exposure amount for the exposure to the protection buyer, using -

(i) E = the carrying amount of the collateral placed with the protection buyer; and

(ii) the risk weight that is applicable to the protection buyer.

[MAS Notice 637 (Amendment) 2014]
[MAS Notice 637 (Amendment No. 3) 2017]

7.5.19 The capital requirement for the credit protection calculated in accordance with paragraphs 7.5.17 and 7.5.18 shall not exceed the notional amount of the credit protection, i.e. the maximum possible payout under the credit protection.

7.5.20 Where a Reporting Bank has provided credit protection (whether funded or unfunded) through a proportionate structure, i.e. where the maximum possible payout in respect of any particular reference asset is capped at a pre-determined proportion of the notional amount of the credit protection, the Reporting Bank shall divide the exposure into individual sub-exposures equal to the proportionate amount of credit protection in respect of each reference asset for the purposes of calculating the credit risk-weighted exposure amount applicable to the credit protection sold.

[189] [Deleted by MAS Notice 637 (Amendment No. 3) 2017]

**Sub-division 4: Calculation of Credit Risk-Weighted Exposure Amount for Equity Exposures Using IRBA(EQ)**

7.5.21 A Reporting Bank using the IRBA(EQ) to calculate the credit risk-weighted exposure amount for its equity exposures (excluding equity investments in funds held in the banking book) shall use one of the following methods:

(a) the simple risk weight method;

(b) the IMM; or

(c) the PD/LGD method.

[MAS Notice 637 (Amendment No. 3) 2017]

7.5.22 A Reporting Bank may use different methods for different portfolios of equity exposures. The approach used shall -

(a) address the risks faced by the equity portfolio[190];

(b) be consistent with the amount and complexity of the equity holdings of the Reporting Bank; and

(c) be commensurate with the overall size and sophistication of the Reporting Bank.

7.5.23 A Reporting Bank shall be consistent[191] in its choice of methods for different portfolios of equity exposures under paragraph 7.5.22, and shall demonstrate to the satisfaction of the Authority, if so required, that its choice under paragraph 7.5.22 is not intended to avoid or reduce regulatory capital which the Reporting Bank would otherwise be required to maintain.

7.5.23A [Deleted by MAS Notice 637 (Amendment No. 3) 2017]

Simple Risk Weight Method

7.5.24 A Reporting Bank using the simple risk weight method to calculate the credit risk-weighted exposure amount of its equity exposures shall do so using the following formula:

$$\text{Credit RWE} = \sum [\text{RW} \times \text{EAD}]$$

where -

(a) "Credit RWE" refers to the credit risk-weighted exposure amount for the equity exposure;

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190 The PD/LGD method aims to capture risks arising from credit-related losses while the simple risk weight method and the IMM aims to capture both systematic and idiosyncratic risks arising from various factors that can affect the volatility in value of and total return on an equity exposure.

191 The Reporting Bank shall establish clear and documented policies and procedures for determining the approach to be used. Justifications for changes in approaches shall be clearly documented.

(b) "RW" is -

 (i) 300% for equity exposures that are listed or traded on any regulated exchange; and

 (ii) 400% for all other equity exposures; and

(c) "EAD" is the value of an equity exposure measured in accordance with Division 2 of this Part.

7.5.25 A Reporting Bank may offset short cash positions and derivative instruments held in the banking book against long positions in the same individual stocks if these instruments have been explicitly designated as hedges of specific equity holdings and they have residual maturities of at least one year. A Reporting Bank should conduct a review of the effectiveness of the hedge at least quarterly. A Reporting Bank shall treat other short positions as if they are long positions with the relevant risk weights in paragraph 7.5.24(b) applied to the value of each position as measured in accordance with Division 2 of this Part.

7.5.26 A Reporting Bank using the simple risk weight method shall recognise the effects of credit protection bought and credit protection sold in accordance with paragraphs 7.5.13 to 7.5.20 in Sub-division 3 of this Division, except that the risk weight applicable to an IRBA(EQ) exposure shall be 300% or 400%, as the case may be, instead of 100%.

IMM

7.5.27 A Reporting Bank which intends to adopt the IMM to calculate the credit risk-weighted exposure amount of its equity exposures shall apply in writing to the Authority for approval. The application shall contain the following:

(a) a written confirmation from the executive officer responsible for risk management in the Reporting Bank that the Reporting Bank has conducted an internal assessment and has ascertained that it fulfils the requirements for the adoption of the IMM; and

(b) a written confirmation from the executive officer responsible for internal audit of the Reporting Bank that -

 (i) he agrees with the confirmation by the executive officer responsible for risk management pursuant to sub-paragraph (a) above; and

 (ii) the Reporting Bank has conducted an internal audit and has ascertained that it has the systems, processes and controls necessary for adopting the IMM.

7.5.28 The Authority may grant approval for a Reporting Bank to adopt the IMM, subject to such conditions or restrictions as the Authority may impose.

7.5.29 If a Reporting Bank becomes aware after it has received approval to adopt the IMM that any of the confirmations made pursuant to paragraph 7.5.27 above are no longer valid or that it no longer complies with any of the conditions or restrictions imposed by the Authority pursuant to paragraph 7.5.28 above, it shall -

(a) inform the Authority as soon as practicable;

(b) assess the effect of the situation in terms of the risk posed to the Reporting Bank;

(c) prepare a plan to rectify the situation and inform the Authority of its plan as soon as practicable and undertake prompt corrective action in accordance with the plan; and

(d) in the interim, calculate the credit risk-weighted exposure amount of its equity exposures using the simple risk weight method.

7.5.30 A Reporting Bank shall comply with the following requirements and should meet the following guidelines for the purpose of calculating its credit risk-weighted exposure amount of its equity exposures under the IMM:

(a) the regulatory capital requirement shall be no less than the potential loss on the equity exposures of the Reporting Bank derived using internal VaR models assuming an instantaneous shock equivalent to the 99$^{th}$ percentile, one-tailed confidence interval of the difference between quarterly returns and an appropriate risk-free rate computed over a long term sample period;

(b) the estimated losses used in deriving K pursuant to paragraph 7.5.36 should be robust to adverse market movements relevant to the long-term risk profile of the equity exposures of the Reporting Bank. The data used to represent return distributions should reflect the longest sample period for which data are available and meaningful in representing the risk profile of the Reporting Bank's equity exposures. The data used should be sufficient to provide conservative, statistically reliable and robust loss estimates that are not based purely on subjective or judgemental considerations. The Reporting Bank shall demonstrate to the satisfaction of the Authority that the shock employed provides a conservative estimate of potential losses over a relevant long-term market or business cycle;

(c) the Reporting Bank shall combine empirical analysis of available data with adjustments based on a variety of factors in order to attain model outputs that achieve appropriate realism and conservatism. In constructing VaR models estimating potential quarterly losses, the Reporting Bank may use quarterly data or convert shorter horizon period data to a quarterly equivalent using an analytically appropriate method supported by empirical evidence. Such adjustments shall be applied through a well-developed and well-documented thought process and analysis and in a conservative and consistent manner over time. Where only limited data are available, or where technical limitations are such that estimates from any single method will be of uncertain quality, the Reporting Bank shall add appropriate margins of conservatism;

(d) the internal model of the Reporting Bank shall capture adequately all material risks embodied in equity returns including both the general market risk and specific risk exposure of the institution's equity exposures. Internal models shall adequately explain historical price variation, capture both the magnitude and changes in the composition of potential concentrations, and be robust to adverse market environments. The population of risk exposures represented in the data used for estimation shall be closely matched to or at least comparable with those of the equity exposures of the Reporting Bank;

(e) where the Reporting Bank uses modelling techniques such as historical scenario analysis, the Reporting Bank shall demonstrate to the satisfaction of the Authority that the methodology and its output can be quantified in the form of the loss percentile specified under sub-paragraph (a);

(f) the Reporting Bank shall use an internal model that is appropriate for the risk profile and complexity of its equity exposures. A Reporting Bank with material holdings in equity exposures with values that are highly non-linear in nature shall employ an internal model designed to capture appropriately the risks associated with such instruments;

(g) the Reporting Bank shall ensure that the mapping of individual positions to proxies, market indices, and risk factors is plausible, intuitive, and conceptually sound. The Reporting Bank shall demonstrate to the satisfaction of the Authority with both theoretical and empirical evidence that its mapping techniques and processes are appropriate for its equity exposures. Where professional judgement is combined with quantitative techniques in estimating the return volatility of an equity exposure, the judgement made shall take into account the relevant and material information not considered by the other techniques utilised;

(h) where factor models are used, the Reporting Bank shall ensure that the factors are sufficient to capture the risks inherent in the equity portfolio. Risk factors should correspond to the appropriate equity market characteristics (for example, public, private, market capitalisation, industry sectors and sub-sectors, operational characteristics) in which the Reporting Bank holds significant positions. The Reporting Bank shall demonstrate to the satisfaction of the Authority through empirical analyses the appropriateness of those factors, including their ability to cover both general and specific risk;

(i) the Reporting Bank shall ensure that estimates of the return volatility of equity exposures incorporate relevant and material available data, information and methods. The number of risk exposures in the sample, and the data period used for quantification shall be sufficient to provide the Reporting Bank with confidence in the accuracy and robustness of its estimates. A Reporting Bank shall take appropriate measures to limit the potential of both sampling bias and survivorship bias in estimating return volatilities; and

(j) the Reporting Bank shall have a rigorous and comprehensive stress-testing programme in place. The Reporting Bank shall subject its internal model and estimation procedures, including volatility computations, to either hypothetical or historical scenarios that reflect worst-case losses given underlying positions in both public and private equities. At a minimum, the Reporting Bank shall employ stress tests to provide information about the effect of tail events beyond the level of confidence assumed in sub-paragraph (a).

7.5.31 A Reporting Bank using the IMM shall have established policies, procedures and controls to ensure the integrity of the model and modelling process. These policies, procedures and controls shall include -

(a) full integration of the internal model of the Reporting Bank with its overall management information systems and in the management of its equity portfolio, and its risk management infrastructure including use in -

(i) establishing investment hurdle rates and evaluating alternative investments;

(ii) measuring and assessing equity portfolio performance (including the risk-adjusted performance); and

(iii) allocating capital to equity holdings and evaluating overall capital adequacy as required under Pillar 2.

The Reporting Bank shall, if required by the Authority, demonstrate that internal model output plays an essential role in the investment management process;

(b) established management systems, procedures and control functions for ensuring the periodic and independent review of all elements of the internal modeling process, including approval of model revisions, vetting of model inputs, and review of model results, such as direct verification of risk computations. Proxy and mapping techniques and other critical model components should receive special attention. These reviews should assess the accuracy, completeness, and appropriateness of model inputs and results and focus on both finding and limiting potential errors associated with known weaknesses and identifying unknown model weaknesses. Such reviews may be conducted as part of internal or external audit programmes, by an independent risk management unit, or by an external third party;

(c) adequate systems and procedures for monitoring investment limits and the risk exposures of its equity portfolio;

(d) the units responsible for the design and application of the model shall be functionally independent from the units responsible for managing individual equity exposures; and

(e) parties responsible for any aspect of the modelling process shall be adequately qualified. The Reporting Bank shall ensure that senior

management allocate sufficient skilled and competent resources to the modelling function.

7.5.32 A Reporting Bank using the IMM shall have a robust system in place to validate the accuracy and consistency of its internal models and modelling processes. The Reporting Bank shall demonstrate to the satisfaction of the Authority that the internal validation process enables it to assess the performance of its internal model and processes consistently and meaningfully. At a minimum, the Reporting Bank shall ensure that the internal validation process comprises the following:

(a) regular backtesting by comparing actual return performance, computed using realised and unrealised gains and losses, with modelled estimates. The Reporting Bank shall, if required by the Authority demonstrate that actual returns are within the expected range for the equity portfolio and individual equity exposures. Such comparisons shall make use of historical data over as long a period as possible. The Reporting Bank shall clearly document the methods and data used in such comparisons. This analysis and documentation shall be updated at least annually;

(b) well-articulated model review standards for situations where actual results deviate significantly from expectations and where the validity of an internal model is called into question. These standards shall take account of business cycles and similar systematic variability in equity returns; and

(c) the construction and maintenance of appropriate databases on the actual quarterly performance of the equity exposures of the Reporting Bank as well as the estimates derived using its internal models to facilitate model validation through backtesting on an ongoing basis. A Reporting Bank shall also backtest the volatility estimates used within their internal models and the appropriateness of the proxies used in the model. The Authority may require the Reporting Bank to scale its quarterly forecasts to a different time horizon, store performance data for this time horizon and perform backtests on this basis.

7.5.33 A Reporting Bank using the IMM shall also make use of other quantitative validation tools and comparisons with external data sources. The Reporting Bank shall base its validation on data that is appropriate to the equity portfolio, that is updated regularly and that covers a relevant observation period. The Reporting Bank shall base its internal assessments of the performance of its internal models on long data histories, covering a range of economic conditions and where possible, one or more complete business cycles.

7.5.34 A Reporting Bank using the IMM shall demonstrate to the satisfaction of the Authority that its quantitative validation methods and data are consistent through time. The Reporting Bank shall clearly and thoroughly document any changes in estimation methods and data (both data sources and periods covered).

7.5.35 A Reporting Bank using the IMM shall ensure that all critical elements of an internal model and the modelling process, including the model design and operational details, are fully and adequately documented. The Reporting Bank shall ensure that the documentation demonstrates its compliance with the minimum quantitative and qualitative standards. The Reporting Bank should also address topics such as the

application of the model to different segments of the portfolio, estimation methodologies, responsibilities of parties involved in the modelling, and the model approval and model review processes in its documentation. In particular, the Reporting Bank shall ensure that the documentation addresses the following:

(a) the rationale for its choice of internal modelling methodology and analyses demonstrating that the model and modeling procedures are likely to result in estimates that meaningfully identify the risk of its equity exposures. Internal models and procedures shall be periodically reviewed to determine whether they remain fully applicable to the current portfolio and to external conditions. In addition, the Reporting Bank shall document a history of major changes in the model over time and changes made to the modelling process subsequent to the last supervisory review. If changes have been made in response to the internal review standards of the Reporting Bank, it shall document these changes and ensure that they are consistent with its internal model review standards;

(b) in relation to its internal models -

(i) provide a detailed outline of the theory, assumptions and mathematical and empirical basis of the parameters, variables, and data sources used to estimate the model;

(ii) establish a rigorous statistical process (including out-of-time and out-of-sample performance tests) for validating the selection of explanatory variables; and

(iii) indicate circumstances under which the model does not work effectively; and

(c) where proxies and mapping are employed, analyses demonstrating that all chosen proxies and mappings are sufficiently representative of the risk of the equity exposures to which they correspond[192]. The documentation shall show, for instance, the relevant and material factors (e.g. business lines, balance sheet characteristics, geographic location, company age, industry sector and sub-sector, operating characteristics) used in mapping individual equity exposures into proxies.

7.5.36 A Reporting Bank using the IMM to calculate the credit risk-weighted exposure amount of its equity exposures shall do so using the following formula:

$$\text{Credit Risk-Weighted Exposure Amount} = \sum [K \times 12.5]$$

where "K" represents the potential loss on its equity exposures as derived using internal VaR models subject to the 99th percentile, one-tailed confidence interval of the difference

[192] A Reporting Bank shall demonstrate to the satisfaction of the Authority that the proxies and mappings employed -

(a) are adequately comparable to the underlying equity exposure or portfolio;
(b) are derived using historical economic and market conditions that are relevant and material to the underlying equity exposures or, where not, that an appropriate adjustment has been made; and
(c) are robust estimates of the potential risk of the underlying equity exposure.

between quarterly returns and an appropriate risk-free rate computed over a long-term sample period.

7.5.37 At the individual exposure level, the credit risk-weighted exposure amount of an equity exposure for a Reporting Bank using the IMM shall be the higher of the credit risk-weighted exposure amount calculated under the IMM and the credit risk-weighted exposure amount that would have been calculated under the simple risk weight method using a 200% risk weight for equity exposures that meet the conditions in paragraph 7.5.24(b)(i) and 300% risk weight for all other equity exposures.

7.5.38 A Reporting Bank using the IMM which has bought eligible credit protection for an IRBA(EQ) exposure may recognise the effects of CRM of the eligible credit protection as follows:

(a) break down the IRBA(EQ) exposure into -

(i) a protected portion with E equal to the notional amount of the eligible credit protection[193]; and

(ii) an unprotected portion with E equal to the E of the IRBA(EQ) exposure less the notional amount of the eligible credit protection; and

(b) for the purposes of calculating the credit risk-weighted exposure amount pursuant to Sub-division 5 of Division 1 of this Part, use -

(i) for the protected portion, the risk weight that is applicable to the eligible protection provider[193A]; and

(ii) for the unprotected portion, the formula set out in paragraphs 7.5.36 and 7.5.37 above.

[MAS Notice 637 (Amendment No. 2) 2014]

7.5.39 Notwithstanding paragraph 7.5.38(b), a Reporting Bank shall apply a 1250% risk weight to any materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA(EQ) exposure as such threshold is equivalent to a retained first loss position.

7.5.40 A Reporting Bank shall apply the relevant provisions in Annex 7H of this Part for the purpose of determining the protected portion in cases of proportional cover, principal-only cover, partially eligible credit derivatives, tranched cover and basket credit derivatives.

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[193] A Reporting Bank shall treat the protected portion of an IRBA(EQ) exposure which has a currency mismatch or a maturity mismatch in accordance with Annex 7F of this Part.

[193A] Where a Reporting Bank has bought from an eligible protection provider a credit default swap which is an eligible credit protection and cleared through a CCP, the Reporting Bank may apply a risk weight of 2% if the credit default swap constitutes a CCP trade exposure in accordance with paragraph 2.1 or 2.5 of Annex 7AJ, or 4% if the credit default swap constitutes a CCP trade exposure in accordance with paragraph 2.6 of Annex 7AJ.

[MAS Notice 637 (Amendment No. 2) 2014]

7.5.41 A Reporting Bank which has sold unfunded credit protection acquires exposure to the reference asset. If such exposure is an IRBA(EQ) exposure, the Reporting Bank shall calculate the credit risk-weighted exposure amount for the exposure pursuant to paragraphs 7.5.36 and 7.5.37 above.

7.5.42 If the unfunded credit protection has more than one reference asset, the credit risk-weighted exposure amount for the credit protection is the sum of the credit risk-weighted exposure amounts in respect of each reference asset calculated pursuant to paragraphs 7.5.36 and 7.5.37 above that are applicable to the obligors of the respective reference assets.

7.5.43 A Reporting Bank which has sold funded credit protection acquires exposure to both the reference asset and the protection buyer. Where the exposure to the reference asset is an IRBA(EQ) exposure, the Reporting Bank shall calculate the credit risk-weighted exposure amount for the credit protection as the sum of -

(a) the credit risk-weighted exposure amount for the exposure to the reference asset calculated in accordance with paragraphs 7.5.36 and 7.5.37 above; and

(b) the credit risk-weighted exposure amount for the exposure to the protection buyer, using -

(i) E = the carrying amount of the collateral placed with the protection buyer; and

(ii) the risk weight that is applicable to the protection buyer.

[MAS Notice 637 (Amendment) 2014]

7.5.44 The capital requirement for the credit protection calculated in accordance with paragraphs 7.5.42 and 7.5.43 shall not exceed the notional amount of the credit protection, i.e. the maximum possible payout under the credit protection.

7.5.45 Where a Reporting Bank has provided credit protection (whether funded or unfunded) through a proportionate structure, i.e. where the maximum possible payout in respect of any particular reference asset is capped at a pre-determined proportion of the notional amount of the credit protection, the Reporting Bank shall divide the exposure into individual sub-exposures equal to the proportionate amount of credit protection in respect of each reference asset for the purposes of calculating the credit risk-weighted exposure amount applicable to the credit protection sold.

PD/LGD Method

7.5.46 A Reporting Bank shall not use the PD/LGD method to calculate the credit risk-weighted exposure amount of its equity exposures (including equity exposures to companies that are included in the IRBA retail asset class) unless it has obtained approval from the Authority to use the IRBA for the corporate asset class. A Reporting Bank using the PD/LGD method shall comply with the requirements and should meet the guidelines in

Annex 7AA and Annex 7AB of this Part that are applicable to the F-IRBA[194] for the wholesale asset class in respect of those equity exposures for which it is using the PD/LGD method.

7.5.47 A Reporting Bank using the PD/LGD method to calculate the credit risk-weighted exposure amount of its equity exposures shall do so using the following formula:

$$\text{Credit Risk-Weighted Exposure Amount} = \sum [K_{eq} \times 12.5 \times EAD]$$

$$\text{Correlation (R)} = 0.12 \times (1 - EXP(-50 \times PD)) / (1 - EXP(-50)) + 0.24 \times [1 - (1 - EXP(-50 \times PD))/(1 - EXP(-50))]$$

$$\text{Maturity adjustment (b)} = (0.11852 - 0.05478 \times \ln(PD))^2$$

$$\text{Capital requirement } (K_{eq}) = [LGD \times N[(1 - R)^{-0.5} \times G(PD) + (R / (1 - R))^{0.5} \times G(0.999)] - PD \times LGD] \times (1 - 1.5 \times b)^{-1} \times (1 + (M - 2.5) \times b)$$

where -

(a) LGD = 90%;

(b) M = 5;

(c) "$K_{eq}$" represents the capital requirement for an equity exposure calculated in accordance with the formula above; and

(d) "EAD" is the value of an equity exposure measured in accordance with Division 2 of this Part.

7.5.47A For equity exposures to financial institutions that meet the criteria set out in paragraphs 7.4.21A and 7.4.22A, a Reporting Bank using the PD/LGD method to calculate the credit risk-weighted exposure amount of its equity exposures shall do so by using the formula in paragraph 7.5.47, but substituting the formula for calculating Correlation (R) in paragraph 7.5.47 with the following formula:

$$\text{Correlation (R_FI)} = 1.25 \times [0.12 \times (1 - EXP(-50 \times PD)) / (1 - EXP(-50)) + 0.24 \times [1 - (1 - EXP(-50 \times PD))/(1 - EXP(-50))]]$$

7.5.48 Where a Reporting Bank does not hold debt of the corporation in whose equity it has invested, and does not have sufficient information on the position of that corporation to be able to use the applicable definition of default in Annex 7X of this Part, the Reporting Bank shall apply a 1.5 scaling factor to the calculation of $K_{eq}$, given the PD set by the Reporting Bank.

7.5.49 At the individual exposure level, the Reporting Bank shall ensure that the sum of the credit risk-weighted exposure amount calculated in accordance with paragraphs 7.5.47, 7.5.47A and 7.5.48 above and the EL amount[195] multiplied by 12.5 is -

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[194] There is no advanced approach for equity exposures.

[195] The EL amount is calculated using the following formula: PD x LGD x EAD.

(a) no less than the credit risk-weighted exposure amount that would have been calculated under the simple risk weight method using the minimum risk weights in paragraphs 7.5.50 and 7.5.51 below; and

(b) no more than the credit risk-weighted exposure amount that would have been calculated under the simple risk weight method using a risk weight of 1250%.

7.5.50 A Reporting Bank shall apply a minimum risk weight of 100% to -

(a) any equity exposure that meets the conditions in paragraph 7.5.24(b)(i) and where the investment is part of a long term customer-relationship, any capital gains are not expected to be realised in the short term and there is no anticipation of (above trend) capital gains in the long term. In general, it is expected that the Reporting Bank will hold the equity over the long term (at least five years); or

(b) any other equity exposure where the returns on the investment are based on regular and periodic cash flows not derived from capital gains and there is no expectation of future (above trend) capital gain or of realising any existing gain.

7.5.51 For all other equity exposures, including net short positions, a Reporting Bank shall apply a minimum risk weight of 200% for any equity exposure that meets the conditions in paragraph 7.5.24(b)(i) and a minimum risk weight of 300% for all other equity exposures.

7.5.52 As an alternative to calculating the credit risk-weighted exposure amount of an equity exposure, a Reporting Bank using the PD/LGD method may apply a 1250% risk weight to an equity exposure measured in accordance with Division 2 of this Part, provided the value of the equity exposure is equal to or exceeds the EL amount multiplied by 12.5.

7.5.53 A Reporting Bank which uses the PD/LGD method for its equity exposures shall apply a 1250% risk weight to the EL amount of those equity exposures. If the minimum risk weight set out in paragraphs 7.5.50 and 7.5.51 or the maximum risk weight set out in paragraph 7.5.49(b) is applied, then the EL amount of that equity exposure shall be zero.

7.5.54 A Reporting Bank using the PD/LGD method which has bought eligible credit protection for an IRBA(EQ) exposure may recognise the effects of CRM of the eligible credit protection as follows:

(a) break down the IRBA(EQ) exposure into -

(i) a protected portion with EAD equal to the notional amount of the eligible credit protection[195AA]; and

[195AA] A Reporting Bank shall treat the protected portion of an IRBA(EQ) exposure which has a currency mismatch or a maturity mismatch in accordance with Annex 7F of this Part.

[MAS Notice 637 (Amendment) 2012]

(ii) an unprotected portion with EAD equal to the EAD of the IRBA(EQ) exposure less the notional amount of the eligible credit protection; and

(b) calculate the credit risk-weighted exposure amount pursuant to Sub-division 4 of Division 1 of this Part as follows:

(i) for the protected portion–

(A) use the following:

(I) the formula for calculating K that is applicable to the eligible protection provider;

(II) the PD associated with the obligor grade to which the eligible protection provider is assigned or some grade between the obligor grades to which the underlying obligor and the eligible protection provider are assigned if the Reporting Bank considers appropriate, that is estimated in accordance with Annex 7AB of this Part; and

(III) an LGD of 90%; or

(B) in the case where the Reporting Bank has bought from an eligible protection provider a credit default swap which is an eligible credit protection and cleared through a CCP, apply a risk weight of 2% if the credit default swap constitutes a CCP trade exposure in accordance with paragraphs 2.1 or 2.5 of Annex 7AJ, or 4% if the credit default swap constitutes a CCP trade exposure in accordance with paragraph 2.6 of Annex 7AJ; and

[MAS Notice 637 (Amendment No. 2) 2014]

(ii) for the unprotected portion, use -

(A) the formula for calculating K in paragraph 7.5.47 above; and

(B) the PD associated with the obligor grade to which the underlying obligor is assigned and estimated in accordance with Annex 7AB of this Part.

7.5.55 Notwithstanding paragraph 7.5.54(b), a Reporting Bank shall apply a 1250% risk weight to any materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA(EQ) exposure as such threshold is equivalent to a retained first loss position.

7.5.56 A Reporting Bank shall apply the relevant provisions in Annex 7H of this Part for the purpose of determining the protected portion in cases of proportional cover, principal-only cover, partially eligible credit derivatives, tranched cover and basket credit derivatives.

7.5.57 A Reporting Bank which has sold unfunded credit protection acquires exposure to the reference asset. If such exposure is an IRBA(EQ) exposure, the Reporting Bank shall calculate the credit risk-weighted exposure amount for the exposure pursuant to paragraphs 7.5.47, 7.5.47A, 7.5.48, 7.5.49, 7.5.52 and 7.5.53 above.

7.5.58 If the unfunded credit protection has more than one reference asset, the credit risk-weighted exposure amount for the credit protection is the sum of the credit risk-weighted exposure amounts in respect of each reference asset that are applicable to the obligors of the respective reference assets calculated pursuant to paragraphs 7.5.47, 7.5.47A, 7.5.48, 7.5.49, 7.5.52 and 7.5.53.

7.5.59 A Reporting Bank which has sold funded credit protection acquires exposure to both the reference asset and the protection buyer. If the reference asset is an IRBA(EQ) exposure, the Reporting Bank shall calculate the credit risk-weighted exposure amount for the credit protection as the sum of -

(a) the credit risk-weighted exposure amount for the exposure to the reference asset calculated in accordance with paragraph 7.5.47, 7.5.47A, 7.5.48, 7.5.49, 7.5.52 and 7.5.53 above; and

(b) the credit risk-weighted exposure amount for the exposure to the protection buyer, using -

(i) EAD = the carrying amount of the collateral placed with the protection buyer; and

(ii) the formula for calculating K that is applicable to the protection buyer,

subject to the condition that the sum of the credit risk-weighted exposure amounts shall not exceed the credit risk-weighted exposure amount calculated applying a risk weight of 1250% to the notional amount of the credit protection.

[MAS Notice 637 (Amendment) 2014]

7.5.60 Where a Reporting Bank has provided credit protection (whether funded or unfunded) through a proportionate structure, i.e. where the maximum possible payout in respect of any particular reference asset is capped at a pre-determined proportion of the notional amount of the credit protection, the Reporting Bank shall divide the exposure into individual sub-exposures equal to the proportionate amount of credit protection in respect of each reference asset for the purposes of calculating the credit risk-weighted exposure amount applicable to the credit protection sold.

**Sub-division 5: Equity Investments in Funds**

7.5.61 A Reporting Bank shall calculate the credit risk-weighted exposure amount of its equity investments in funds held in the banking book using the methods set out in paragraphs 7.5.62 to 7.5.70, which vary in their risk sensitivity and conservatism, and in accordance with the following hierarchy:

(a) the look-through approach ("LTA");

(b) the mandate-based approach ("MBA"); or

(c) the fall-back approach ("FBA").

7.5.61A For the purpose of this Sub-division, "funds" includes collective investment schemes and closed-end funds, except for real estate investment trusts as defined under section 2 of the Securities and Futures Act (Cap. 289) and business trusts as defined under the Business Trust Act (Cap. 31A). A Reporting Bank's holdings of units in real estate investment trusts as defined under section 2 of the Securities and Futures Act (Cap. 289) and business trusts as defined under the Business Trust Act (Cap. 31A) shall be treated as holdings in a single equity security for the purpose of risk-weighting.

[MAS Notice 637 (Amendment) 2018]

<u>LTA</u>

7.5.62 A Reporting Bank shall use the LTA to calculate the credit risk-weighted exposure amount of its equity investments in funds held in the banking book if the following conditions are satisfied:

(a) the Reporting Bank is provided sufficient and frequent information regarding the underlying exposures of the fund[195AB]; and

(b) the Reporting Bank has ensured that such information is verified by an independent third party, such as the depository or custodian bank, or where applicable, the management company.

7.5.63 A Reporting Bank using the LTA shall risk-weight all underlying exposures of a fund as if the exposures were directly held by the Reporting Bank in accordance with Divisions 2, 3, 4, 5 and 6 of this Part, whichever is applicable. This includes any underlying exposure arising from the fund's derivative transactions, where the underlying exposure is assigned a risk weight in accordance with Divisions 3, 4, 5 and 6 of this Part and Part VIII, whichever is applicable, and the associated pre-settlement counterparty exposures. For the exposure arising from a fund's derivative transactions, the Reporting Bank is not required to calculate the CVA risk capital requirements as set out in Annex 7AI. The Reporting Bank shall multiply the pre-settlement counterparty exposure amounts arising from a fund's derivative transactions by a factor of 1.5 before applying the risk weight assigned to the counterparty in accordance with Divisions 3, 4, 5 and 6 of this Part, except where the Reporting Bank is not required to calculate the CVA risk capital requirements as set out in Section 1 of Annex 7AI. An example of the calculation of the credit risk-weighted exposure amount of its equity investments in funds held in the banking book using the LTA is set out in Section 1 of Annex 7AK.

7.5.64 Where a Reporting Bank uses the SA(CR), SA(EQ), SEC-ERBA or SEC-SA to calculate the credit risk-weighted exposure amount for the underlying exposures of funds if the exposures were directly held by the Reporting Bank, the Reporting Bank using the

[195AB] The Reporting Bank shall ensure that the frequency of financial reporting of the fund is the same as, or more frequent than the frequency of financial reporting of the Reporting Bank and the granularity of the financial information of the fund is sufficient for the Reporting Bank to calculate the corresponding risk weights. For the purposes of this paragraph, an external audit of the information is not required.

LTA shall calculate the credit risk-weighted exposure amount of its equity investments in funds held in the banking book using the SA(CR), SA(EQ), SEC-ERBA or SEC-SA in accordance with Divisions 2, 3, 5 and 6 of this Part, whichever is applicable.

[MAS Notice 637 (Amendment No. 2) 2017]

7.5.65 Where a Reporting Bank uses the IRBA, IRBA(EQ) or SEC-IRBA to calculate the credit risk-weighted exposure amount for the underlying exposures of funds if the exposures were directly held by the Reporting Bank, the Reporting Bank using the LTA shall:

(a) calculate the IRBA parameters i.e. PD and, where applicable, LGD and EAD, associated with the underlying exposures of funds and shall calculate the credit risk-weighted exposure amount of its equity investments in funds held in the banking book using the IRBA, IRBA(EQ), or SEC-IRBA in accordance with Divisions 2, 4, 5 and 6 of this Part[195AC], whichever is applicable;

(b) where the Reporting Bank is unable to calculate the IRBA parameters i.e. PD and, where applicable, LGD and EAD, associated with the underlying exposures of funds (e.g. where the Reporting Bank is unable to assign the necessary IRBA parameters to the underlying exposures in a manner consistent with its own underwriting criteria) -

   (i) calculate the credit risk-weighted exposure amount of such underlying exposures in its equity investments in funds held in the banking book using the SA(CR) in accordance with Divisions 2 and 3 of this Part;

   (ii) for underlying equity exposures of funds, calculate the credit risk-weighted exposure amount for such exposures using the simple risk weight method set out in paragraphs 7.5.24 to 7.5.26; and

   (iii) for underlying securitisation exposures of funds, calculate the credit risk-weighted exposure amount for such exposures in accordance with the SEC-ERBA or SEC-SA, according to the hierarchy of approaches determined by paragraphs 7.6.14 to 7.6.16; or

(c) with the approval of the Authority, use the SA(CR), SA(EQ), SEC-ERBA or SEC-SA to calculate the credit risk-weighted exposure amounts for certain exposures in accordance with paragraphs 4.1 to 4.8 of Annex 7AC. For such underlying exposures in the fund, the Reporting Bank shall calculate the credit risk-weighted exposure amount using the SA(CR), SA(EQ), SEC-ERBA or SEC-SA in accordance with Divisions 2, 3, 5 and 6 of this Part, whichever is applicable.

[MAS Notice 637 (Amendment No. 2) 2017]

7.5.66 A Reporting Bank may rely on third party calculations for determining the risk weights to be applied to its equity investments in funds held in the banking book, if it does not have adequate data or information to perform its own calculations, subject to the following conditions:

[195AC] [Deleted by MAS Notice 637 (Amendment No. 2) 2017]

(a) the Reporting Bank shall ensure that the third party applies the risk weights under the SA(CR), SA(EQ), SEC-ERBA or SEC-SA in accordance with Divisions 3, 5 and 6 of this Part, whichever is applicable, to the underlying exposures of the funds;

(b) where the Reporting Bank is using the IRBA(EQ) to calculate the credit risk-weighted exposure amount for its equity exposures, the Reporting Bank shall ensure that the third party applies the credit risk-weighted exposure amount calculated in accordance with the simple risk weight method set out in paragraphs 7.5.24 to 7.5.26 to the underlying equity exposures of the funds;

(c) where the Reporting Bank is using the SEC-IRBA to calculate the credit risk-weighted exposure amounts for its securitisation exposures, the Reporting Bank shall ensure that the third party applies the credit risk-weighted exposure amount calculated in accordance with Sub-division 4 of Division 6 of this Part to the underlying securitisation exposures of the funds; and

(d) the Reporting Bank shall ensure that, in all cases, the applicable risk weights applied by the third party are 1.2 times higher than the risk weights that would have been applicable if the exposures of the funds were held directly by the Reporting Bank.[195AD]

[MAS Notice 637 (Amendment No. 2) 2017]

MBA

7.5.67 Where a Reporting Bank does not satisfy the conditions under paragraph 7.5.62 for the use of the LTA, the Reporting Bank may use the MBA to calculate the credit risk-weighted exposure amount of its equity investments in funds held in the banking book if it is able to determine the credit risk-weighted exposure amount in the manner set out in paragraph 7.5.68 below.

7.5.68 Under the MBA, the Reporting Bank shall determine the credit risk-weighted exposure amount for its equity investments in the fund by using the information contained in a fund's mandate, in the national regulations[195AE] governing such investment funds or in other disclosures of the fund.

7.5.69 A Reporting Bank using the MBA[195AF] shall calculate the credit risk-weighted exposure amount for its equity investment in a fund as the sum of –

[195AD] For instance, where the LTA is performed by a third party, the applicable risk weight applied by the third party to an exposure that is subject to a 20% risk weight under the SA(CR) if the exposures were held directly by the Reporting Bank, is 24% (i.e. 1.2*20%).

[195AE] For the purpose of this Sub-Division, "national regulations" refers to laws, regulations, rulings and treaties of a country.

[195AF] To ensure that all underlying risks, including counterparty credit risk, are taken into account, and that the credit risk-weighted exposure amount calculated for the Reporting Bank's equity investments in funds held in the banking book using the MBA is not less than the credit risk-weighted exposure amount calculated using the LTA, the credit risk-weighted exposure amount for its equity investment in a fund calculated using the MBA is the sum of items in paragraphs 7.5.69 (a) to (e).

(a) the credit risk-weighted exposure amount for the balance sheet exposures of the fund using the SA(CR), SA(EQ), SEC-ERBA or SEC-SA in accordance with Divisions 2, 3, 5 and 6 of this Part, whichever is applicable. The Reporting Bank shall assume that the fund first invests, to the maximum extent allowed under the fund's mandate, in the asset class attracting the highest capital requirement, and then continues making investments in descending order until the maximum total investment level is reached. If more than one risk weight can be applied to a given exposure, the Reporting Bank shall apply the maximum risk weight[195AG];

(b) the credit risk-weighted exposure amount for the exposures arising from the fund's derivative transactions or off-balance sheet exposures of the fund, calculated by applying the risk weights associated with the underlying of the fund's derivative transaction positions or the off-balance sheet exposures to their notional amounts, where the underlying risk of the fund's derivative transaction or off-balance sheet item receives a risk-weighting treatment in accordance with Divisions 3, 4, 5 and 6 of this Part and Part VIII[195AH], whichever is applicable;

(c) the credit risk-weighted exposure amount for the pre-settlement counterparty exposures associated with the fund's derivative transactions calculated in accordance with the SA-CCR set out in Annex 7O and by applying the risk weights under SA(CR) assigned for the counterparty in accordance with Division 3 of this Part. Where the replacement cost is unknown, the Reporting Bank shall calculate the pre-settlement counterparty exposure amount in a conservative manner by using the notional amount as a proxy for the replacement cost. Where the supervisory factor for the calculation of the amount for potential future exposure is unknown, the Reporting Bank shall apply the maximum supervisory factor set out in Annex 7O.[195AI,195AJ] The Reporting Bank shall apply the risk weight under SA(CR) assigned for the counterparty to the sum of the replacement cost and the amount for potential future exposure. For the underlying exposure arising from a fund's derivative transactions, the Reporting Bank is not required to calculate the CVA risk capital requirements as set out in Annex 7AI. The Reporting Bank shall multiply the pre-settlement counterparty exposure amounts arising from a fund's derivative transactions by a factor of 1.5 before applying the risk weight assigned to the counterparty in accordance with Divisions 3, 4, 5 and 6 of this Part, whichever is applicable, except where the Reporting Bank is not required to calculate the CVA risk capital requirements as set out in Section 1 of Annex 7AI;

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[195AG] For instance, a Reporting Bank shall apply a risk weight of 150% for underlying exposures of funds in corporate bonds, in the case where there are no ratings restrictions in the fund's mandate.

[195AH] The Reporting Bank shall use the full notional amount of the derivative position if the underlying is unknown. The Reporting Bank shall use the maximum notional amount of derivatives allowed under the mandate if the notional amount of the derivative position is unknown.

[195AI] This corresponds to the highest supervisory factor specified in Table 7O-1 of Annex 7O.

[195AJ] If both the replacement cost and add-on components are unknown, the Reporting Bank shall apply a total multiplication factor of 1.15 to the notional amount for the calculation of the pre-settlement counterparty exposures associated with the fund's derivative transactions.

(d) where the Reporting Bank is using the IRBA(EQ) to calculate the credit risk-weighted exposure amount for its equity exposures, the Reporting Bank shall calculate the credit-risk weighted exposure amount by applying the simple risk weight method set out in paragraphs 7.5.24 to 7.5.26 to the underlying equity exposures of the fund; and

(e) where the Reporting Bank is using the SEC-IRBA to calculate the credit risk-weighted exposure amounts for its securitisation exposures, the Reporting Bank shall calculate the credit risk-weighted exposure amount of the underlying securitisation exposures of the fund in accordance with Sub-division 4 of Division 6 of this Part.

An example of the calculation of the credit risk-weighted exposure amount of its equity investments in funds held in the banking book using the MBA is set out in Section 2 of Annex 7AK.

[MAS Notice 637 (Amendment No. 2) 2017]

FBA

7.5.70 Where a Reporting Bank is unable to use the LTA or MBA, the Reporting Bank shall use the FBA. Under the FBA, the Reporting Bank shall apply a 1250% risk weight to the amount of its equity investments in funds held in the banking book.

7.5.70A For the purpose of paragraph 7.5.70, "the amount of its equity investments in funds held in the banking book" refers to the E or EAD for the Reporting Bank's equity investments in funds calculated in accordance with Division 2 of this Part.

[MAS Notice 637 (Amendment No. 3) 2017]

Treatment of funds that invest in other funds

7.5.71 Where a Reporting Bank has an investment in a fund (for example, Fund A), which it has identified using either the LTA or MBA, and that fund (that is, Fund A) itself has an investment in another fund (for example, Fund B), the Reporting Bank may apply the LTA, MBA or FBA to determine the credit risk-weighted exposure amount for the investment of the first fund in the other fund (that is, Fund A's investment in Fund B). For all subsequent layers (for example, Fund B's investments in Fund C and so forth), the Reporting Bank shall use the LTA to determine the credit risk-weighted exposure amount for the investment in the other funds (for example, Fund C), subject to the condition that the Reporting Bank also used the LTA to determine the credit risk-weighted exposure amount for its equity investment in the fund at the previous layer (for example, Fund B). In all other cases, the Reporting Bank shall use the FBA.

Partial use of an approach

7.5.72 A Reporting Bank may use any combination of the three methods i.e. LTA, MBA or FBA, when determining the credit risk-weighted exposure amount for an equity investment in an individual fund, provided that the conditions set out in paragraphs 7.5.61 to 7.5.71 are satisfied.

Leverage adjustment

7.5.73 Where the Reporting Bank uses the LTA or MBA to calculate the credit risk-weighted exposure amount of its equity investments in funds, the Reporting Bank shall apply a leverage adjustment to the average risk weight of each fund, subject to a cap of 1250%, using the following formula[195AK]:

$$\text{Credit } RWE_{investment} = \min[\text{Avg } RW_{fund} * Lvg, 1250\%] * \text{Equity Investment}$$

where –

(a) "Credit $RWE_{investment}$" refers to the credit risk-weighted exposure amount for the equity investment in the fund;

(b) "Avg $RW_{fund}$" refers to the average risk weight of the fund, which is calculated by dividing the total credit risk-weighted exposure amount of the fund by the total assets of the fund;

(c) "Lvg" refers to the leverage of the fund, which is defined as the ratio of total assets to total equity, except in the case of a Reporting Bank using the MBA, where leverage will be taken into account by using the maximum financial leverage permitted in the fund's mandate or in the national regulation governing the fund; and

(d) "Equity Investment" –

(i) in the case of LTA, refers to the proportion of shares held by the Reporting Bank in the fund, multiplied by the total equity of the fund (as reported in the balance sheet of the fund); or

(ii) in the case of MBA, refers to the E or EAD for the Reporting Bank's equity investment in funds calculated in accordance with Division 2 of this Part.

[MAS Notice 637 (Amendment) 2016]
[MAS Notice 637 (Amendment No. 3) 2017]

[195AK] The effect of the leverage adjustments depends on the underlying riskiness of the portfolio (i.e. the average risk weight of the fund). The formula can therefore be re-written as: RWAinvestment = RWEfund * percentage of shares. An example of the calculation of the leverage adjustment is set out in Section 3 of Annex 7AK.

## Division 6: Securitisation

[MAS Notice 637 (Amendment No. 2) 2017 (Replacement of this Division in its entirety)]

### Sub-division 1: Introduction

7.6.1 A Reporting Bank shall apply the provisions of this Division for determining regulatory capital requirements on exposures relating to traditional and synthetic securitisation or similar structures that contain features common to both. As securitisations may be structured in many different ways, the Reporting Bank shall determine the capital treatment of a securitisation on the basis of its economic substance rather than its legal form.

7.6.2 A Reporting Bank shall consult the Authority if it is uncertain whether a given transaction should be considered a securitisation, and whether a given exposure should be considered a securitisation exposure or a resecuritisation exposure.

### Sub-division 2: Requirements for the Recognition of Risk Transference

7.6.3 This Sub-division is applicable only to securitised exposures held in the banking book.

Requirements for Traditional Securitisation

7.6.4 A Reporting Bank which is an ABCP programme sponsor or originator in a traditional securitisation may exclude securitised exposures from the calculation of credit RWA only if all of the requirements in Section 1 of Annex 7AD of this Part have been complied with. A Reporting Bank meeting these requirements shall still hold regulatory capital against any securitisation exposures it retains.

Requirements for Synthetic Securitisation

7.6.5 Subject to paragraphs 7.6.86 and 7.6.87, a Reporting Bank which is an ABCP programme sponsor or originator in a synthetic securitisation may recognise the effects of CRM of the synthetic securitisation in its calculation of credit RWA only if –

(a) all of the requirements in Section 2 of Annex 7AD of this Part have been complied with; and

(b) the effects of CRM are obtained through eligible credit protection or eligible financial collateral, or both, in accordance with Annex 7F of this Part.

7.6.6 A Reporting Bank meeting the conditions in paragraph 7.6.5 shall still hold regulatory capital against any securitisation exposures it retains.

**Sub-division 3: Treatment of Securitisation Exposures**

7.6.7 A Reporting Bank shall include in its calculation of credit RWA all of its securitisation exposures held in the banking book.

7.6.8 For a Reporting Bank to apply the SEC-IRBA, SEC-ERBA or SEC-SA to its securitisation exposures held in the banking book, the Reporting Bank shall –

(a) have, on an on-going basis, a comprehensive understanding of the risk characteristics of its individual securitisation exposures, whether on- or off-balance sheet, as well as the risk characteristics of the pools underlying its securitisation exposures;

(b) be able to access performance information on the pools underlying its securitisation exposures on an on-going basis and in a timely manner. Such information may include exposure type, percentage of loans 30, 60 and 90 days past due, default rates, prepayment rates, loans in foreclosure, property type, occupancy, average credit score or other measures of creditworthiness, average loan-to-value ratio, and industry and geographic diversification. For resecuritisations, the Reporting Bank shall have information on the underlying securitisation tranches such as the issuers' names and credit quality and the characteristics and performance of the pools underlying the securitisation tranches; and

(c) have a thorough understanding of all structural features of a securitisation transaction that would materially impact the performance of the Reporting Bank's exposures to the transaction, such as the contractual waterfall and waterfall-related triggers, credit enhancements, liquidity enhancements, market value triggers, and deal-specific definitions of default.

7.6.9 A Reporting Bank which is an originator may offset a securitisation exposure risk-weighted at 1250% by reducing the securitisation exposure amount by the amount of their specific allowances on underlying assets of that transaction and non-refundable purchase price discounts on such underlying assets.

7.6.10 A Reporting Bank shall deduct any increase in equity resulting from a securitisation, such as that associated with expected future margin income resulting in a gain-on-sale that is recognised as equity, and any credit-enhancing interest-only strips in the calculation of CET1 Capital, in accordance with paragraph 6.1.3(f) and 6.1.3(fa) of Part VI.

Treatment of Overlapping Exposures

7.6.11 Notwithstanding paragraph 7.6.7 above, where a Reporting Bank is able to verify that it can preclude any loss for a securitisation exposure (exposure B) under all circumstances by fulfilling its obligations with respect to another securitisation exposure (exposure A), i.e. exposure A overlaps exposure B in all circumstances[195AL], the Reporting

[195AL] For example, where a Reporting Bank provides full credit support to some notes and holds a portion of these notes, its full credit support obligation precludes any loss from its exposure to the notes.

Bank may exclude exposure B from the calculation of credit RWA. A Reporting Bank may split or expand its exposures[195B] to arrive at an overlap for the purpose of calculation of credit RWA. The Reporting Bank may also recognise overlap between specific risk capital charges for exposures in the trading book and capital charges for exposures in the banking book, provided that the Reporting Bank is able to calculate and compare the capital charges for the relevant exposures.

Hierarchy of Approaches

7.6.12 Subject to Sub-division 7 of this Division and paragraph 7.6.13, a Reporting Bank shall use the SEC-IRBA to calculate the credit risk-weighted exposure amount for a securitisation exposure of an IRB pool.

7.6.13 Where the Authority prohibits a Reporting Bank from using the SEC-IRBA for a particular IRB pool in the case of particular structures and transactions, such as transactions with highly complex loss allocations, tranches whose credit enhancement could be eroded for reasons other than portfolio losses, and tranches of portfolios with high internal correlations, a Reporting Bank must not use the SEC-IRBA to calculate the credit risk-weighted exposure amount for a securitisation exposure of that IRB pool.

7.6.14 A Reporting Bank shall use the SEC-ERBA to calculate the credit risk-weighted exposure amount for a securitisation exposure of an SA pool if –

(a) the exposure has an external credit assessment that meets the operational requirements for the use of external credit assessments in Annex 7AE;

(b) the exposure has an inferred rating that meets the operational requirements for the use of inferred ratings in Annex 7AE; or

(c) in the case of an unrated securitisation exposure within an ABCP programme, the Reporting Bank uses the IAA set out in Annex 7AF, as provided in paragraph 7.6.15.

7.6.15 Subject to the approval of the Authority, a Reporting Bank may use the IAA set out in Annex 7AF to calculate the credit risk-weighted exposure amount in accordance with the SEC-ERBA for an unrated securitisation exposure of an SA pool within an ABCP programme.

7.6.16 A Reporting Bank which is not able to or not permitted to use the SEC-ERBA set out in paragraph 7.6.14 to calculate the credit risk-weighted exposure amount for a securitisation exposure of an SA pool, shall use the SEC-SA to do so.

7.6.17 A Reporting Bank shall apply a risk weight of 1250% to a securitisation exposure to which the SEC-IRBA, SEC-ERBA and SEC-SA cannot be applied.

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[195B] That is, splitting exposures into portions that overlap with another exposure held by the Reporting Bank and other portions that do not overlap; and expanding exposures where for capital purposes, assuming that obligations with respect to one of the overlapping exposures are larger than those established contractually, for instance, by expanding either the trigger events to exercise the facility and/or the extent of the obligation.

**Sub-division 4: Internal Ratings-Based Approach (SEC-IRBA)**

7.6.18 A Reporting Bank using the SEC-IRBA to calculate capital requirements for a securitisation exposure to an IRB pool shall calculate the following inputs: $K_{IRB}$, tranche attachment point and detachment point, effective number of exposures and loss-given-default of the pool, in accordance with paragraphs 7.6.19 to 7.6.39.

$\underline{K_{IRB}}$

7.6.19 A Reporting Bank shall calculate $K_{IRB}$ as the ratio of (a) the IRB capital requirement for the underlying exposures in the pool as if the exposures were held directly by the Reporting Bank, to (b) the exposure amount of the underlying pool, expressed as a decimal between zero and one. The IRB capital requirement includes the unexpected loss and expected loss of underlying exposures, including defaulted exposures, and where applicable, dilution risk in accordance with in paragraph 7.6.29. A Reporting Bank shall apply the scaling factor of 1.06 referenced in paragraph 7.1.1(b) to the unexpected loss portion of the calculation of $K_{IRB}$.

7.6.20 A Reporting Bank shall reflect the effects of CRM that is applied to the underlying exposures (either individually or to the entire pool), and hence benefits all of the securitisation exposures, in its calculation of $K_{IRB}$ in paragraph 7.6.19.

7.6.21 For structures involving an SPE, a Reporting Bank shall treat all of the SPE's exposures related to the securitisation as exposures in the pool[195C]. Such exposures related to the securitisation include reserve accounts, such as cash collateral accounts, and claims against counterparties resulting from interest swaps or currency swaps[195D].

7.6.22 In the case of swaps other than credit derivatives, the Reporting Bank shall include, in the computation of the IRB capital requirement of the underlying pool used in calculating $K_{IRB}$, the positive current market value multiplied by the risk weight of the swap provider and by 8%. The Reporting Bank shall not include such swaps in the computation of the exposure amount of the underlying pool used in calculating $K_{IRB}$.

7.6.23 Notwithstanding paragraph 7.6.21, the Reporting Bank may exclude the SPE's exposures from the pool for capital calculation purposes if the Reporting Bank can demonstrate to the Authority that the risk associated with the exposures does not affect its particular securitisation exposure or that the risk is immaterial, for example, because it has been mitigated.

7.6.24 For funded synthetic securitisations, a Reporting Bank shall include in the calculation of $K_{IRB}$ any proceeds of the issuances of credit-linked notes or any other funded

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[195C] The Reporting Bank may exclude the SPE's exposures from the pool for capital calculation purposes if the Reporting Bank can demonstrate to the Authority that the risk associated with the exposures does not affect its particular securitisation exposure or that the risk is immaterial, for example, because it has been mitigated.

[195D] In particular, in the case of swaps other than credit derivatives, the IRB capital requirement of the underlying pool used in calculating $K_{IRB}$ shall include the positive current market value multiplied by the risk weight of the swap provider multiplied by 8%. In contrast, the sum of the exposure amounts of underlying exposures shall not take into account such a swap, as such a swap would not provide a credit enhancement to any tranche.

obligations of the SPE which serve as collateral for the repayment of the securitisation exposure if -

(a) the Reporting Bank cannot demonstrate to the Authority that these are immaterial; and

(b) the default risk of such collateral is subject to the tranched loss allocation in the securitisation transaction.

7.6.25 The Reporting Bank shall include, in the computation of the IRB capital requirement of the underlying pool used in calculating $K_{IRB}$, the exposure amount of the collateral multiplied by its risk weight and 8%. The Reporting Bank shall not include such collateral in the computation of the exposure amount of the underlying pool used in calculating $K_{IRB}$.

7.6.26 A Reporting Bank shall meet all minimum requirements for the use of IRBA to calculate $K_{IRB}$ for a securitisation exposure. Notwithstanding, a Reporting Bank may, subject to the Authority's approval, use the top-down approach as set out in Sub-division 9 of Division 4 of this Part, subject to the modifications set out in paragraph 7.6.27 to calculate $K_{IRB}$ for a securitisation exposure if –

(a) for non-retail assets, it would be an undue burden on the Reporting Bank to assess the default risk of individual obligors; and

(b) for retail assets, the Reporting Bank is unable to primarily rely on internal data.

7.6.27 A Reporting Bank when applying the requirements in Sub-division 9 of Division 4 of this Part and Annex 7W to securitisation exposures using a top-down approach shall apply the requirements with the following modifications –

(a) "eligible purchased receivables" in Sub-division 9 of Division 4 of this Part and Annex 7W, is read as referring to securitised exposures;

(b) the requirement in paragraph 7.4.46(c) for the Reporting Bank to have a claim on all proceeds from the pool of receivables or a pro-rata interest in the proceeds does not apply. Instead, the Reporting Bank shall have a claim on all proceeds from the pool of securitised exposures that have been allocated to the Reporting Bank's exposure in the securitisation in accordance with the terms of the related securitisation documentation; and

(c) if the Reporting Bank cannot itself meet the requirements in paragraphs 2.2 to 2.9 of Annex 7W, it shall instead ensure that it meets these requirements through a party to the securitisation acting for and in the interest of the investors in the securitisation, in accordance with the terms of the related securitisation documents. In particular, the Reporting Bank shall ensure that requirements for effective control and ownership are met for all proceeds from the pool of securitised exposures that have been allocated to the Reporting Bank's exposure to the securitisation. The Reporting Bank shall ensure the securitisation itself (rather than the Reporting Bank) has the relevant policies, procedures, and where applicable, information systems referred to in paragraph 2.7(a) of Annex 7W.

7.6.28 Where a Reporting Bank has set aside a specific allowance or has a non-refundable purchase price discount on an exposure in the underlying pool, the Reporting Bank shall calculate $K_{IRB}$ using the gross amount of the exposure without taking into account the specific allowance or the non-refundable purchase price discount.

[MAS Notice 637 (Amendment No. 3) 2017]

7.6.29 A Reporting Bank shall recognise dilution risk[195E] in a securitisation in the calculation of $K_{IRB}$ if the Reporting Bank is unable to demonstrate to the Authority that such dilution risk is immaterial.

7.6.30 Where default risk and dilution risk are treated in an aggregate manner (for example, where an identical reserve or overcollateralisation is available to cover losses for both risks), the Reporting Bank shall determine $K_{IRB}$ for dilution risk and default risk respectively, and combine them into a single $K_{IRB}$ prior to applying the SEC-IRBA. Where credit risk and dilution risk are subject to separate waterfalls, the Reporting Bank shall consult the Authority as to how $K_{IRB}$ should be calculated.

Tranche Attachment Point and Detachment Point

7.6.31 The tranche attachment point, A, represents the threshold at which losses within the underlying pool are first allocated to securitisation exposures in that tranche, and is a decimal value between zero and one. A Reporting Bank shall calculate A as the greater of –

(a) zero; and

(b) the ratio of –

(i) the outstanding balance of all underlying assets in the securitisation minus the outstanding balance of all tranches in the securitisation that rank senior or pari passu to the tranche that contains the securitisation exposure of the Reporting Bank (including the exposure itself); to

(ii) the outstanding balance of all underlying assets in the securitisation.

[195E] Dilution risk is defined in footnote 166.

7.6.32 The tranche detachment point, D, represents the threshold at which losses within the underlying pool result in a total loss of principal for securitisation exposures in that tranche, and is a decimal value between zero and one. A Reporting Bank shall calculate D as the greater of –

(a) zero; and

(b) the ratio of –

(i) the outstanding balance of all underlying assets in the securitisation minus the outstanding balance of all tranches in the securitisation that rank senior to the tranche that contains the securitisation exposure of the Reporting Bank; to

(ii) the outstanding balance of all underlying assets in the securitisation.

7.6.33 In a Reporting Bank's calculation of A and D –

(a) overcollateralisation and the loss-absorbing part of funded reserve accounts that provide credit enhancement shall be recognised as tranches; and

(b) the assets forming the loss-absorbing part of such funded reserve accounts that provide credit enhancement shall be recognised as underlying assets.

7.6.34 A Reporting Bank shall not include in its calculation of A and D –

(a) unfunded reserve accounts (such as those to be funded from future receipts from the underlying exposures);

(b) assets that do not provide credit enhancement (such as pure liquidity support, currency or interest rate swaps); or

(c) cash collateral accounts related to instruments listed in sub-paragraphs (a) and (b) above.

7.6.35 In applying paragraphs 7.6.33 and 7.6.34, a Reporting Bank shall consider the economic substance of the credit enhancement provided by an asset or reserve account within the securitisation transaction to a tranche, for the purpose of determining whether the asset or reserve account should be included in the calculation of A and D for that tranche. Where the credit enhancement provided by an asset or reserve account referred to in paragraphs 7.6.33 and 7.6.34 to a tranche is uncertain, the Reporting Bank shall exclude the asset or reserve account in the calculation of A and D for that tranche.

N and LGD

7.6.36 A Reporting Bank shall calculate the effective number of exposures in the underlying pool, N, as –

$$N = \frac{(\sum_i EAD_i)^2}{\sum_i EAD_i^2}$$

where $EAD_i$ represents the exposure-at-default associated with the $i^{th}$ instrument in the pool. Multiple exposures to the same obligor shall be consolidated and treated as a single instrument.

7.6.37 A Reporting Bank shall calculate the exposure-weighted average loss-given-default of the underlying pool ("LGD") as –

$$LGD = \frac{\sum_i (LGD_i \cdot EAD_i)}{\sum_i EAD_i}$$

where $LGD_i$ represents the average LGD associated with all exposures to the $i^{th}$ obligor represented in the underlying pool. Where default risk and dilution risk are treated in an aggregate manner (for example, where an identical reserve or overcollateralisation is available to cover losses for both risks) within a securitisation transaction, the LGD input shall be calculated as a weighted average of the LGD for default risk and the 100% LGD for dilution risk. The weights to be applied are the stand-alone IRB capital requirements for default risk and dilution risk respectively.

7.6.38 If the largest exposure in the underlying pool constitutes not more than 3% of the underlying exposures, a Reporting Bank may, for the purposes of the SEC-IRBA, apply a simplified method for computing N and LGD as follows –

$$N = \left( C_1 \cdot C_m + \left( \frac{C_m - C_1}{m - 1} \right) \cdot \max\{1 - m \cdot C_1, 0\} \right)^{-1}$$

$$LGD = 0.5$$

where $C_m$ is the proportion of the underlying exposures constituted by the sum of the largest m exposures in the underlying pool, with the value of m determined by the Reporting Bank, and $C_1$ is the proportion of the underlying exposures constituted by the largest exposure in the underlying pool.

7.6.39 For the purpose of paragraph 7.6.38, if only $C_1$ is available and this amount is no more than 0.03, a Reporting Bank may compute N as $1/C_1$ and LGD as 0.5.

Supervisory Parameter

7.6.40 A Reporting Bank shall calculate the supervisory parameter p under the SEC-IRBA as –

$p = \max [0.3, (A + B*(1/N) + C*K_{IRB} + D*LGD + E*M_T)]$

where –

(a) 0.3 is the floor of the supervisory parameter p;

(b) N is the effective number of exposures in the underlying pool calculated in accordance with paragraphs 7.6.36, 7.6.38 and 7.6.39;

(c) $K_{IRB}$ is the IRB capital requirement of the entire portfolio of underlying exposures per dollar value of exposure calculated in accordance with paragraphs 7.6.19 to 7.6.30;

(d) LGD is the exposure-weighted average loss-given-default of the underlying pool calculated in accordance with paragraphs 7.6.37 to 7.6.39;

(e) $M_T$ is the tranche maturity calculated in accordance with Section 6 of Annex 7Z; and

(f) the parameters A, B, C, D and E are determined according to Table 7-20.

Table 7-20: Parameters for Calculation of Supervisory Parameter under SEC-IRBA

| **Characteristics of Securitisation Exposure and Underlying Pool** | | **A** | **B** | **C** | **D** | **E** |
|---|---|---|---|---|---|---|
| Wholesale | Senior, granular (N ≥ 25) | 0 | 3.56 | -1.85 | 0.55 | 0.07 |
| | Senior, non-granular (N < 25) | 0.11 | 2.61 | -2.91 | 0.68 | 0.07 |
| | Non-senior, granular (N ≥ 25) | 0.16 | 2.87 | -1.03 | 0.21 | 0.07 |
| | Non-senior, non-granular (N < 25) | 0.22 | 2.35 | -2.46 | 0.48 | 0.07 |
| Retail | Senior | 0 | 0 | -7.48 | 0.71 | 0.24 |
| | Non-senior | 0 | 0 | -5.78 | 0.55 | 0.27 |

7.6.41 If the underlying pool consists of both retail and wholesale exposures, a Reporting Bank shall divide the pool into one retail sub-pool and one wholesale sub-pool, and calculate a separate p-parameter for each sub-pool. Subsequently, the Reporting Bank shall calculate a weighted average p-parameter for the transaction based on the p-parameters of each sub-pool and the exposure amount in each sub-pool.

7.6.42 If a Reporting Bank applies the SEC-IRBA to a mixed pool as described in Sub-division 7 of this Division, the Reporting Bank shall calculate the p-parameter based on the IRB underlying assets only.

Capital Requirements and Risk Weights under SEC-IRBA

7.6.43 A Reporting Bank using the SEC-IRBA shall calculate the capital requirement per dollar value of securitisation exposure using the following formula –

$$K_{SSFA(K_{IRB})} = \frac{e^{a \cdot u} - e^{a \cdot l}}{a(u - l)}$$

where e is the base of the natural logarithms (approximately equal to 2.71828) and the variables a, u, and l are defined as follows –

(a) $a = -(1 / (p*K_{IRB}))$;

(b) $u = D - K_{IRB}$; and

(c) $l = \max(A - K_{IRB}; 0)$.

7.6.44 A Reporting Bank using the SEC-IRBA shall calculate the risk weight assigned to a securitisation exposure as follows, subject to a floor of 15% for the resultant risk weight and paragraph 7.6.45 -

(a) When the tranche detachment point, D, for a securitisation exposure is less than or equal to $K_{IRB}$, the risk weight is 1,250%;

(b) When the tranche attachment point, A, for a securitisation exposure is greater than or equal to $K_{IRB}$, the risk weight of the exposure, expressed as a percentage, is $\boldsymbol{K_{SSFA(K_{IRB})}}$ multiplied by 12.5;

(c) When $K_{IRB}$ is more than A but less than D, the risk weight is the weighted average of 1,250% and $\boldsymbol{K_{SSFA(K_{IRB})}}$ multiplied by 12.5 according to the following formula –

$$RW = \left[\left(\frac{K_{IRB} - A}{D - A}\right) \times 12.5\right] + \left[\left(\frac{D - K_{IRB}}{D - A}\right) \times 12.5 \times K_{SSFA(K_{IRB})}\right]$$

7.6.45 A Reporting Bank shall infer the risk weight for market risk hedges such as currency or interest rate swaps from a securitisation exposure that is pari passu to the hedge instrument or, if such an exposure does not exist, from the next subordinated tranche.

**Sub-division 5: External Ratings-Based Approach (SEC-ERBA)**

Short-Term Ratings

7.6.46 A Reporting Bank using the SEC-ERBA shall assign a securitisation exposure for which a short-term rating, an inferred rating based on a short-term rating or an IAA internal rating derived in accordance with Annex 7AF is available, to a credit quality grade in accordance with Table 7R-4 in Annex 7R. Subject to paragraph 7.6.51, the Reporting Bank shall risk-weight the securitisation exposure in accordance with Table 7-21 and paragraph 7.6.50. The Reporting Bank shall subject the resulting risk weight to a floor of 15%.

Table 7-21: SEC-ERBA Risk Weights for Short-Term Ratings

| Credit Quality Grade | I | II | III | All other ratings |
|---|---|---|---|---|
| Risk weight | 15% | 50% | 100% | 1250% |

Long-Term Ratings

7.6.47 A Reporting Bank using the SEC-ERBA shall assign a securitisation exposure for which a long-term rating, an inferred rating based on a long-term rating, or an IAA internal rating derived in accordance with Annex 7AF, is available, to a credit quality grade in accordance with Table 7R-3 in Annex 7R. Subject to paragraph 7.6.51, the Reporting Bank shall risk-weight the securitisation exposure in accordance with Table 7-22 and paragraph 7.6.50, with the risk weight adjusted for tranche maturity and tranche thickness (for non-senior tranches) in accordance with paragraphs 7.6.48 and 7.6.49. The Reporting Bank shall subject the resulting risk weight to a floor of 15%.

Table 7-22: SEC-ERBA Risk Weights for Long-Term Ratings

| Credit Quality Grade | Senior Tranche | | Non-Senior Tranche | |
|---|---|---|---|---|
| | Tranche Maturity ($M_T$) | | Tranche Maturity ($M_T$) | |
| | 1 Year | 5 Year | 1 Year | 5 Year |
| 1 | 15% | 20% | 15% | 70% |
| 2 | 15% | 30% | 15% | 90% |
| 3 | 25% | 40% | 30% | 120% |
| 4 | 30% | 45% | 40% | 140% |
| 5 | 40% | 50% | 60% | 160% |
| 6 | 50% | 65% | 80% | 180% |
| 7 | 60% | 70% | 120% | 210% |
| 8 | 75% | 90% | 170% | 260% |
| 9 | 90% | 105% | 220% | 310% |
| 10 | 120% | 140% | 330% | 420% |
| 11 | 140% | 160% | 470% | 580% |
| 12 | 160% | 180% | 620% | 760% |
| 13 | 200% | 225% | 750% | 860% |
| 14 | 250% | 280% | 900% | 950% |
| 15 | 310% | 340% | 1050% | 1050% |
| 16 | 380% | 420% | 1130% | 1130% |
| 17 | 460% | 505% | 1250% | 1250% |
| 18 | 1250% | 1250% | 1250% | 1250% |

7.6.48 To account for the tranche maturity of a securitisation exposure, the Reporting Bank shall use linear interpolation between the appropriate risk weights provided in Table 7-22 for a one year maturity and a five year maturity, as follows –

$$RW_{M\ adj.} = RW_{(M=1)} + \left(RW_{(M=5)} - RW_{(M=1)}\right) \cdot \left(\frac{M_T - 1}{5 - 1}\right)$$

The Reporting Bank shall calculate the risk weight of a senior securitisation exposure as –

$$RW = RW_{M\ adj.}$$

where –

(a) $RW_{M\ adj.}$ is the risk weight of the securitisation exposure after accounting for tranche maturity;

(b) $M_T$ is the tranche maturity of the securitisation exposure calculated in accordance with Section 6 of Annex 7Z; and

(c) RW is the risk weight of the securitisation exposure assigned under the SEC-ERBA.

7.6.49 To account for the tranche thickness of a non-senior securitisation exposure, the Reporting Bank shall calculate the risk weight of a non-senior tranche as follows –

$$RW = RW_{M\,adj.} \cdot [1 - \min(T, 0.5)]$$

where –

(a) T is the thickness of the tranche where the securitisation exposure resides, and is calculated as (D – A), as D and A are defined in paragraphs 7.6.31 to 7.6.35; and

(b) $RW_{M\ adj.}$ is the risk weight as determined in accordance with paragraph 7.6.48.

7.6.50 A Reporting Bank shall infer the risk weight for market risk hedges such as currency or interest rate swaps from a securitisation exposure that is pari passu to the hedge instrument or, if such an exposure does not exist, from the next subordinated tranche.

7.6.51 When a Reporting Bank applies the SEC-ERBA to an unrated non-senior exposure in a transaction where the relatively more senior exposures (i.e. securitisation exposures with precedence in claims on the cash flows from the underlying exposures) are rated, the Reporting Bank shall not apply a risk weight under the SEC-ERBA for the non-senior exposure which is lower than the risk weight for an exposure to the immediately preceding more senior rated exposure.

**Sub-division 6: Standardised Approach (SEC-SA)**

7.6.52 A Reporting Bank using the SEC-SA to calculate capital requirements for a securitisation exposure to an SA pool shall calculate the following inputs: $K_{SA}$, ratio of total delinquent underlying exposures to total underlying exposures in the pool (W), and tranche attachment point (A) and detachment point (D), in accordance with paragraphs 7.6.53 to 7.6.69.

$\underline{K_{SA}}$

7.6.53 $K_{SA}$ is the weighted-average capital requirement of the entire portfolio of underlying exposures per dollar value of exposure, calculated by applying the SA(CR) as if the underlying exposures had not been securitised, multiplied by 8%.

7.6.54 A Reporting Bank shall calculate $K_{SA}$ according to the following formula, expressed as a decimal between zero and one –

$$K_{SA} = \frac{SA(CR)\ RWA_{\ Underlying}}{SA(CR)\ Exposure_{\ Underlying}} \cdot 8\%$$

The SA(CR) RWA is calculated according to paragraph 7.1.3.

7.6.55 The Reporting Bank shall reflect the effects of CRM that is applied to the underlying exposures (either individually or to the entire pool) in its calculation of $K_{SA}$.

7.6.56 For structures involving an SPE, a Reporting Bank shall treat all of the SPE's exposures related to the securitisation as exposures in the pool. Exposures related to the securitisation include reserve accounts, cash collateral accounts and claims against counterparties resulting from interest rate swaps or currency swaps. In the case of swaps other than credit derivatives, the Reporting Bank shall include, in the computation of $\boldsymbol{SA(CR)\ RWA_{Underlying}}$ used in calculating $K_{SA}$, the positive current market value multiplied by the risk weight of the swap provider and by 8%. The Reporting Bank shall not include such swaps in the computation of $\boldsymbol{SA(CR)\ Exposure_{Underlying}}$ used in calculating $K_{SA}$, as such a swap would not provide a credit enhancement to any tranche. The Reporting Bank may exclude the SPE's exposures from the pool for capital calculation purposes if the Reporting Bank can demonstrate to the Authority that the risk associated with the exposures does not affect its particular securitisation exposure or that the risk is not material, for example, because it has been mitigated.

7.6.57 For funded synthetic securitisations, a Reporting Bank shall include in the calculation of $K_{SA}$ any proceeds of the issuances of credit-linked notes or other funded obligations of the SPE which serve as collateral for the repayment of the securitisation exposure if –

(a) the Reporting Bank cannot demonstrate to the Authority that these are not material; and

(b) the default risk of the collateral is subject to the tranched loss allocation in the securitisation transaction.

7.6.58 For the purposes of paragraph 7.6.54, the Reporting Bank shall include in the computation of $\boldsymbol{SA(CR)\ RWA_{Underlying}}$ used in calculating $K_{SA}$ the exposure amount of the collateral multiplied by its risk weight and by 8%. The Reporting Bank shall not include such collateral in the computation of $\boldsymbol{SA(CR)\ Exposure_{Underlying}}$ used in calculating $K_{SA}$.

7.6.59 Where a Reporting Bank has set aside a specific allowance or has a non-refundable purchase price discount on an exposure in the underlying pool, the Reporting Bank shall calculate $K_{SA}$ using the gross amount of the exposure without taking into account the specific allowance or the non-refundable purchase price discount.

[MAS Notice 637 (Amendment No. 3) 2017]

W

7.6.60 A Reporting Bank shall calculate W, the ratio of the sum of the nominal amount of delinquent underlying exposures to the total nominal amount of underlying exposures in the pool. Delinquent underlying exposures are underlying exposures that are 90 days or more past due, subject to bankruptcy or insolvency proceedings, in the process of foreclosure, held as real estate owned or in default, where default is defined within the securitisation deal documents.

Tranche Attachment Point and Detachment Point

7.6.61 A Reporting Bank shall calculate the tranche attachment point, A, and the tranche attachment point, D, in accordance with paragraphs 7.6.31 to 7.6.35.

7.6.62 Where the only difference between exposures to a transaction is related to maturity, A and D are the same.

Capital Requirements and Risk Weights under SEC-SA

7.6.63 A Reporting Bank shall calculate $K_A$, using the inputs $K_{SA}$ and W, as follows –

$$K_A = (1 - W) \times K_{SA} + W \times 0.5$$

7.6.64 If a Reporting Bank does not know the delinquency status, as defined in paragraph 7.6.60, for no more than 5% of underlying exposures in the pool (calculated by E, as defined in Division 2 of this Part), the Reporting Bank may use the SEC-SA by adjusting its calculation of $K_A$ as follows –

$$K_A = \left(\frac{E_{Subpool\ 1\ where\ W\ is\ known}}{E_{Total}} \times K_A^{Subpool\ 1\ where\ W\ is\ known}\right) + \frac{E_{Subpool\ 2\ where\ W\ is\ unknown}}{E_{Total}}$$

If a Reporting Bank does not know the delinquency status for more than 5% of underlying exposures in the pool (calculated by E, as defined in Division 2 of this Part), the Reporting Bank shall risk-weight the securitisation exposure at 1250%.

7.6.65 A Reporting Bank using the SEC-SA shall calculate the capital requirement per dollar value of securitisation exposure using the following formula –

$$K_{SSFA(K_A)} = \frac{e^{a \cdot u} - e^{a \cdot l}}{a(u - l)}$$

where e is the base of the natural logarithms (approximately equal to 2.71828) and the variables a, u, and l are defined as follows –

(a) $a = -(1 / (p*K_A))$;

(b) $u = D - K_A$; and

(c) $l = \max(A - K_A; 0)$.

7.6.66 The supervisory parameter p under the SEC-SA is 1 for a securitisation exposure that is not a resecuritisation exposure.

7.6.67 Subject to paragraph 7.6.69, a Reporting Bank shall risk-weight any securitisation exposure for which it is using the SEC-SA in accordance with sub-paragraphs (a), (b), and (c), and paragraph 7.6.68. The Reporting Bank shall subject the resulting risk weight to a floor of 15%.

(a) when the tranche detachment point, D for a securitisation exposure is less than or equal to $K_A$, the risk weight is 1250%;

(b) when the tranche attachment point, A for a securitisation exposure is greater than or equal to $K_A$, the risk weight of the exposure, expressed as a percentage, is $K_{SSFA(K_A)}$ multiplied by 12.5;

(c) when $K_A$ is more than A but less than D, the risk weight is the weighted average of 1250% and $K_{SSFA(K_A)}$ multiplied by 12.5 according to the following formula –

$$RW = \left[\left(\frac{K_A - A}{D - A}\right) \times 12.5\right] + \left[\left(\frac{D - K_A}{D - A}\right) \times 12.5 \times K_{SSFA(K_A)}\right]$$

7.6.68 A Reporting Bank shall infer the risk weight for market risk hedges such as currency or interest rate swaps from a securitisation exposure that is pari passu to the hedge instrument or, if such an exposure does not exist, from the next subordinated tranche.

7.6.69 When a Reporting Bank applies the SEC-SA to an unrated non-senior exposure in a transaction where the relatively more senior exposures (i.e. securitisation exposures with precedence in claims on the cash flows from the underlying exposures) are rated, the Reporting Bank shall not apply a risk weight under SEC-SA for the unrated non-senior exposure which is lower than the risk weight for the immediately preceding more senior rated exposure.

**Sub-division 7: Treatment of Mixed Pools**

7.6.70 Where a Reporting Bank is able to calculate $K_{IRB}$ on at least 95% of the underlying exposure amounts of a securitisation, the Reporting Bank shall apply the SEC-IRBA calculating the capital requirement for the underlying pool as –

$$d*K_{IRB} + (1-d)*K_{SA}$$

where d is the percentage of the exposure amount of underlying exposures for which the Reporting Bank is able to calculate $K_{IRB}$ over the exposure amount of all underlying exposures, $K_{IRB}$ is defined in paragraphs 7.6.19 to 7.6.30, and $K_{SA}$ is defined in paragraphs 7.6.53 to 7.6.59.

7.6.71 Where the Reporting Bank is not able to calculate $K_{IRB}$ on at least 95% of the underlying amounts of a securitisation, the Reporting Bank shall use the hierarchy for securitisation exposures of SA pools as set out in paragraphs 7.6.14 to 7.6.17.

**Sub-division 8: Treatment of Resecuritisation Exposures**

7.6.72 A Reporting Bank shall risk-weight any resecuritisation exposure by applying the SEC-SA specified in Sub-division 6 of this Division, with the following adjustments and subject the resulting risk weight to a floor of 100% –

(a) the capital requirement of the resecuritisation's underlying securitisation exposures ($K_{SA}$) is calculated using the securitisation framework in this Division instead of the SA(CR);

(b) delinquencies (W) are set to zero for any exposure to a securitisation tranche in the underlying pool; and

(c) the supervisory parameter p is set equal to 1.5, rather than 1.

7.6.73 If the underlying portfolio of a resecuritisation consists of a pool with exposures to securitisation tranches and exposures to other non-securitised assets, a Reporting Bank shall separate the portfolio into two subsets, one consisting of securitisation tranches, and one consisting of exposures to other non-securitised assets. The Reporting Bank shall calculate $K_A$ separately for each subset, with separate $K_{SA}$ and W parameters. The Reporting Bank shall calculate W in accordance with paragraph 7.6.60 in the subset where the exposures are to non-securitised assets, and set W to zero where the exposures are to securitisation tranches. The Reporting Bank shall then calculate $K_A$ for the resecuritisation exposure as the nominal exposure weighted-average of the $K_A$ for each subset.

**Sub-division 9: Treatment of Simple, Transparent and Comparable ("STC") Securitisations**

Scope and Identification of STC Securitisations

7.6.74 A Reporting Bank may apply the provisions in paragraphs 7.6.78 and 7.6.79 for securitisation exposures only if the following requirements are met –

(a) the securitisation exposures do not arise from ABCP programmes;

(b) the securitisation exposures arise from traditional securitisations; and

(c) the Reporting Bank has assessed that the securitisation exposures arise from a securitisation which meets all the criteria in Annex 7AG ("STC Criteria") on an ongoing basis, in accordance with paragraph 7.6.75.

7.6.75 In assessing that the securitisation meets all the STC Criteria, a Reporting Bank shall –

(a) if it is an investor in the securitisation, make its own assessment based on the information provided by the originator of the securitisation; and

(b) if it is an originator in the securitisation, make its own assessment.

7.6.76 A Reporting Bank that is an originator of a securitisation shall disclose to investors all necessary information at the transaction level to allow investors to determine whether the securitisation meets all the STC criteria.

7.6.77 A Reporting Bank shall assess that the securitisation meets the STC Criteria on an ongoing basis and take into account developments that may invalidate its previous assessment, including deficiencies in the frequency and content of the investor reports, in the alignment of interest, or changes in the transaction documentation which are relevant to the STC Criteria. In cases where the STC Criteria refer to the underlying assets of the securitisation, including but not limited to paragraphs 4.1 and 4.2 of Annex 7AG, and the

pool is dynamic, the Reporting Bank shall conduct checks every time that assets are added to such pool to assess compliance with the STC criteria.

Overview of Alternative Capital Treatment for STC Securitisations

7.6.78 A Reporting Bank, in respect of a securitisation exposure which meets the requirements of paragraph 7.6.74, may calculate the credit risk-weighted exposure amount for a securitisation exposure –

(a) when the SEC-IRBA is used, by applying the provisions in paragraph 7.6.80 instead of paragraph 7.6.40;

(b) when the SEC-ERBA is used, by applying the provisions in paragraphs 7.6.81 and 7.6.82 instead of paragraphs 7.6.46 and 7.6.47 respectively; and

(c) when the SEC-SA is used, by applying the provisions in paragraphs 7.6.83 and 7.6.84 instead of paragraphs 7.6.66 and 7.6.67 respectively.

7.6.79 Under the SEC-IRBA, SEC-ERBA, and SEC-SA, the resulting risk weight is subject to a minimum risk weight of 10% for senior securitisation tranches, and 15% for non-senior securitisation tranches.

Alternative Capital Treatment for STC Securitisations under the SEC-IRBA

7.6.80 A Reporting Bank shall calculate the supervisory parameter p for a securitisation exposure which meets the requirements of paragraph 7.6.74 under the SEC-IRBA as –

$$p = \max [0.3; (A + B*(1/N) + C*K_{IRB} + D*LGD + E*M_T)*0.5]$$

where –

(a) 0.3 denotes the floor of the supervisory parameter p;

(b) N is the effective number of exposures in the underlying pool calculated in accordance with paragraphs 7.6.36, 7.6.38 and 7.6.39;

(c) $K_{IRB}$ is the IRB capital requirement of the entire portfolio of underlying exposures per dollar value of exposure calculated in accordance with paragraphs 7.6.19 to 7.6.30;

(d) LGD is the exposure-weighted average loss-given-default of the underlying pool calculated in accordance with paragraphs 7.6.37 to 7.6.39;

(e) $M_T$ is the tranche maturity calculated in accordance with Section 6 of Annex 7Z; and

(f) The parameters A, B, C, D and E are determined according to Table 7-23 –

Table 7-23: Parameters for Calculation of Supervisory Parameter for STC Securitisations under SEC-IRBA

| Characteristics of Securitisation Exposure and Underlying Pool | | A | B | C | D | E |
|---|---|---|---|---|---|---|
| Wholesale | Senior, granular (N ≥ 25) | 0 | 3.56 | -1.85 | 0.55 | 0.07 |
| | Senior, non-granular (N < 25) | 0.11 | 2.61 | -2.91 | 0.68 | 0.07 |
| | Non-senior, granular (N ≥ 25) | 0.16 | 2.87 | -1.03 | 0.21 | 0.07 |
| | Non-senior, non-granular (N < 25) | 0.22 | 2.35 | -2.46 | 0.48 | 0.07 |
| Retail | Senior | 0 | 0 | -7.48 | 0.71 | 0.24 |
| | Non-senior | 0 | 0 | -5.78 | 0.55 | 0.27 |

Alternative Capital Treatment for STC Securitisations under the SEC-ERBA

Short-Term Ratings

7.6.81 A Reporting Bank using the SEC-ERBA for a securitisation exposure which meets the requirements of paragraph 7.6.74 shall assign a securitisation exposure for which a short-term rating, an inferred rating based on a short-term rating, or an IAA internal rating derived in accordance with Annex 7AF is available, to a credit quality grade in accordance with Table 7R-4 in Annex 7R. Subject to paragraph 7.6.51, the Reporting Bank shall risk-weight the securitisation exposure in accordance with Table 7-24 and paragraph 7.6.50. The Reporting Bank shall subject the resulting risk weight to a floor of 10% for senior securitisation tranches, and 15% for non-senior securitisation tranches.

Table 7-24: SEC-ERBA Risk Weights for STC Securitisations with Short-Term Ratings

| Credit Quality Grade | I | II | III | All other ratings |
|---|---|---|---|---|
| Risk weight | 10% | 30% | 60% | 1250% |

Long-Term Ratings

7.6.82 A Reporting Bank using the SEC-ERBA for a securitisation exposure which meets the requirements of paragraph 7.6.74 shall assign a securitisation exposure for which a long-term rating, an inferred rating based on a long-term rating, or an IAA internal rating derived in accordance with Annex 7AF, is available, to a credit quality grade in accordance with Table 7R-3 in Annex 7R. Subject to paragraph 7.6.51, the Reporting Bank shall risk-weight the securitisation exposure in accordance with Table 7-25 and paragraph 7.6.50, with the risk weight adjusted for tranche maturity and tranche thickness (for non-senior tranches) in accordance with paragraphs 7.6.48 and 7.6.49. The Reporting Bank shall subject the resulting risk weight to a floor of 10% for senior securitisation tranches, and 15% for non-senior securitisation tranches.

Table 7-25: SEC-ERBA Risk Weights for STC Securitisations with Long-Term Ratings

| Credit Quality Grade | Senior Tranche | | Non-Senior Tranche | |
|---|---|---|---|---|
| | Tranche Maturity ($M_T$) | | Tranche Maturity ($M_T$) | |
| | 1 Year | 5 Year | 1 Year | 5 Year |
| 1 | 10% | 10% | 15% | 40% |
| 2 | 10% | 15% | 15% | 55% |
| 3 | 15% | 20% | 15% | 70% |
| 4 | 15% | 25% | 25% | 80% |
| 5 | 20% | 30% | 35% | 95% |
| 6 | 30% | 40% | 60% | 135% |
| 7 | 35% | 40% | 95% | 170% |
| 8 | 45% | 55% | 150% | 225% |
| 9 | 55% | 65% | 180% | 255% |
| 10 | 70% | 85% | 270% | 345% |
| 11 | 120% | 135% | 405% | 500% |
| 12 | 135% | 155% | 535% | 655% |
| 13 | 170% | 195% | 645% | 740% |
| 14 | 225% | 250% | 810% | 855% |
| 15 | 280% | 305% | 945% | 945% |
| 16 | 340% | 380% | 1015% | 1015% |
| 17 | 415% | 455% | 1250% | 1250% |
| 18 | 1250% | 1250% | 1250% | 1250% |

Alternative Capital Treatment for STC Securitisations under the SEC-SA

7.6.83 For the purpose of paragraph 7.6.78, the supervisory parameter p for a securitisation exposure which meets the requirements of paragraph 7.6.74 under the SEC-SA is 0.5.

7.6.84 Subject to paragraph 7.6.69, a Reporting Bank shall risk-weight any securitisation exposure for which it is using the SEC-SA in accordance with sub-paragraphs (a), (b), and (c), and paragraph 7.6.68. The Reporting Bank shall subject the resulting risk weight to a floor of 10% for senior securitisation tranches, and 15% for non-senior securitisation tranches.

(a) when the tranche detachment point, D for a securitisation exposure is less than or equal to $K_A$, the risk weight is 1250%;

(b) when the tranche attachment point, A for a securitisation exposure is greater than or equal to $K_A$, the risk weight of the exposure, expressed as a percentage, is $K_{SSFA(K_A)}$ multiplied by 12.5;

(c) when $K_A$ is more than A but less than D, the risk weight is the weighted average of 1250% and $K_{SSFA(K_A)}$ multiplied by 12.5 according to the following formula –

$$RW = \left[\left(\frac{K_A - A}{D - A}\right) \times 12.5\right] + \left[\left(\frac{D - K_A}{D - A}\right) \times 12.5 \times K_{SSFA(K_A)}\right]$$

**Sub-division 10: Implicit Support**

7.6.85 When a Reporting Bank provides implicit support to a securitisation, it shall –

(a) include all the underlying exposures of the securitisation in its calculation of credit RWA as if those exposures had not been securitised;

(b) deduct from CET1 capital any increase in equity capital due to a gain on sale, in accordance with paragraph 6.1.3(f); and

(c) publicly disclose that it has provided non-contractual support and the capital impact of doing so.

**Sub-division 11: Treatment of Credit Risk Mitigation**

7.6.86 A Reporting Bank may recognise the effects of CRM of eligible financial collateral pledged by any SPE, but it shall not recognise any SPE which is an issuer of securitisation exposures as an eligible protection provider.

7.6.87 Subject to paragraph 7.6.88, a Reporting Bank shall treat a currency mismatch or a maturity mismatch[196] between the underlying exposure being hedged and the CRM obtained through the synthetic securitisation in accordance with Annex 7F of this Part. In the case where the exposures in the underlying pool have different maturities, the Reporting Bank shall use the longest maturity as the maturity of the pool.

7.6.88 A Reporting Bank which is an ABCP programme sponsor or originator in a synthetic securitisation shall not take into account maturity mismatches for the securitisation exposures it retains if a 1250% risk weight is applied to such securitisation exposures.

Recognition of Eligible Financial Collateral under FC(SA)

7.6.89 A Reporting Bank which has taken eligible financial collateral for an SEC-ERBA or SEC-SA exposure and is using the FC(SA) may recognise the effects of CRM of the eligible financial collateral in the following manner –

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[196] For example, maturity mismatches may arise when a Reporting Bank uses credit derivatives to transfer part or all of the credit risk of a specific pool of assets to third parties. When the credit derivatives unwind, the transaction terminates. This implies that the effective maturity of the tranches of the synthetic securitisation may differ from that of the underlying exposures.

(a) break down the securitisation exposure into –

(i) a collateralised portion with E equal to the latest fair market value of the eligible financial collateral; and

(ii) an uncollateralised portion with E equal to the E of the securitisation exposure less the latest fair market value of the eligible financial collateral;

(b) apply the risk weight that is applicable to the eligible financial collateral, to the collateralised portion calculated in accordance with sub-paragraph (a)(i) above to calculate the credit risk-weighted exposure amount of the collateralised portion as though the Reporting Bank had a direct exposure to the eligible financial collateral; and

(c) apply the risk weight that is applicable to the securitisation exposure, calculated in accordance with this Division, to the uncollateralised portion calculated in accordance with subparagraph (a)(ii) above to calculate the credit risk-weighted exposure amount of the uncollateralised portion.

7.6.90 A Reporting Bank which is using FC(SA) shall not recognise the effects of CRM of any collateral with a maturity mismatch.

Treatment of Eligible Credit Protection Bought

7.6.91 Subject to paragraph 7.6.92, A Reporting Bank which has bought eligible credit protection for a securitisation exposure may recognise the effects of CRM of the eligible credit protection in the following manner –

(a) break down the securitisation exposure into –

(i) a protected portion with E or EAD equal to the notional amount of the eligible credit protection; and

(ii) an unprotected portion with E or EAD equal to the value of the securitisation exposure measured in accordance with Division 2 of this Part less the notional amount of the eligible credit protection;

(b) apply the risk weight that is applicable to the eligible protection provider[197] to the protected portion calculated in accordance with sub-paragraph (a)(i) above to calculate the credit risk-weighted exposure amount of the protected portion; and

(c) apply the risk weight, calculated in accordance with this Division, that is applicable to the securitisation exposure to the unprotected portion

[197] Where a Reporting Bank has bought from an eligible protection provider a credit default swap which is an eligible credit protection and cleared through a CCP, the Reporting Bank may apply a risk weight of 2% if the credit default swap constitutes a CCP trade exposure in accordance with paragraph 2.1 or 2.5 of Annex 7AJ, or 4% if the credit default swap constitutes a CCP trade exposure in accordance with paragraph 2.6 of Annex 7AJ.

calculated in accordance with sub-paragraph (a)(ii) above to calculate the credit risk-weighted exposure amount of the unprotected portion.

7.6.92 A Reporting Bank shall use the sum of the credit risk-weighted exposure amounts of the protected and unprotected portions as the credit risk-weighted exposure amount of the securitisation exposure referred to in paragraph 7.1.8(b), subject to the maximum risk weights applicable for senior exposures, calculated in accordance with paragraphs 7.1.9 to 7.1.11.

7.6.93 A Reporting Bank shall apply a 1250% risk weight to exposures below any materiality threshold[198] below which no payment will be made by the protection provider in the event of loss on a securitisation exposure.

7.6.94 For the purposes of paragraph 7.6.91, a Reporting Bank shall apply the relevant provisions in Annex 7H for the purpose of determining the protected portion and capital requirement in cases of proportional cover, principal-only cover, partially eligible credit derivatives, tranched cover and basket credit derivatives.

7.6.95 For the purposes of paragraph 7.6.91, a Reporting Bank shall treat the protected portion of a securitisation exposure which has a currency mismatch or a maturity mismatch in accordance with Annex 7F of this Part. In the case where the underlying exposure in the protected portion of a securitisation has different maturities, the Reporting Bank shall use the longest maturity as the maturity of the protected portion.

Maturity Mismatches

7.6.96 When a Reporting Bank buys protection on securitised assets underlying a securitisation, maturity mismatches may arise in the context of synthetic securitisations[198A] . When the credit derivatives unwind, the securitisation will terminate. This implies that the effective maturity of all the tranches of the synthetic securitisation may differ from that of the underlying exposures.

7.6.97 A Reporting Bank that synthetically securitises exposures held on its balance sheet by purchasing tranched credit protection shall treat maturity mismatches between the synthetic securitisation and the underlying exposures in the following manner –

(a) for securitisation exposures that are assigned a risk weight of 1250%, maturity mismatches are not taken into account; and

(b) for all other securitisation exposures, the bank shall determine its capital requirements as described in this Sub-division, after adjusting the value of credit protection for any maturity mismatches in accordance with Section 6 of Annex 7F.

[198] An exposure below such threshold is equivalent to a retained first loss position.

[198A] For example, when the Reporting Bank uses credit derivatives to transfer part or all of the credit risk of a specific pool of assets to third parties.

Treatment of Credit Protection Sold

7.6.98 Where a Reporting Bank provides full (or pro rata) unfunded credit protection to a securitisation exposure, the Reporting Bank shall calculate the credit risk-weighted exposure amount for the covered portion of the securitisation exposure as if it were directly holding that portion of the exposure. Where a Reporting Bank provides tranched cover to a securitisation exposure, the Reporting Bank shall calculate the credit risk-weighted exposure amount for the covered portion of the securitisation exposure in accordance with paragraphs 1.4A-1.4F of Annex 7H.

7.6.99 Where a Reporting Bank provides funded credit protection to a securitisation exposure, the Reporting Bank shall calculate the credit risk-weighted exposure amount for the credit protection as the sum of –

(a) the credit risk-weighted exposure amount for the covered securitisation exposure calculated in accordance with paragraph 7.6.98; and

(b) the credit risk-weighted exposure amount for the exposure to the protection buyer calculated using the risk weight which is applicable to the protection buyer,

subject to the condition that the sum of the credit risk-weighted exposure amounts shall not exceed the credit risk-weighted exposure amount calculated by applying a risk weight of 1250% to the covered securitisation exposure.

**Annex 7A**

## CCFs FOR OFF-BALANCE SHEET ITEMS UNDER THE SA(CR)[199]

| | Description of Off-balance Sheet Item[199A] | CCF |
|---|---|---|
| (a) | Direct credit substitutes[200] | 100% |
| (b) | Certain transaction-related contingent items[201] | 50% |
| (c) | Short-term self-liquidating trade-related contingent items[202] (applicable to both issuing and confirming banks), and commitments with an original maturity of one year or less, to underwrite debt and equity securities [MAS Notice 637 (Amendment) 2012] | 20% |
| (d) | Note issuance facilities and revolving underwriting facilities | 50% |
| (e) | Transactions, other than SFTs, involving the posting of securities held by the Reporting Bank as collateral[202A] | 100% |
| (f) | Sale and repurchase agreements and asset sales with recourse, where the credit risk remains with the Reporting Bank[203] | 100% |
| (g) | Other commitments with certain drawdown[204] | 100% |
| (h) | Other commitments[205] | |
| | (i) with an original maturity of more than one year | 50%[205A] |
| | (ii) with an original maturity of one year or less | 20% |
| | (iii) which are unconditionally cancellable at any time by the Reporting Bank without prior notice, or that effectively provide for automatic cancellation due to deterioration in an obligor's creditworthiness[206] | 0% |

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199 Where there is an undertaking to provide a commitment on another off-balance sheet exposure, a Reporting Bank using the SA(CR) shall apply the lower of the applicable CCFs.
[MAS Notice 637 (Amendment) 2014]

199A Commitments should be recognised by a Reporting Bank, and recorded as an exposure for regulatory capital purposes, on the date at which the loan contract or agreement is entered into by the Reporting Bank.
[MAS Notice 637 (Amendment No. 2) 2014]

200 For example, general guarantees of indebtedness, standby letters of credit serving as financial guarantees for loans and securities, and acceptances (including endorsements with the character of acceptances).

201 For example, performance bonds, bid bonds, warranties and standby letters of credit related to particular transactions.

202 For example, documentary credits collateralised by the underlying shipments.

202A This shall not apply to posted collateral that is treated under either the SA-CCR set out in Annex 7O or the CCR internal models method set out in Annex 7Q.
[MAS Notice 637 (Amendment) 2016]

203 The terms of the agreement are such that there is no substantial transfer of all risks and rewards of ownership to the counterparty. The Reporting Bank shall risk-weight these items according to the type of asset and not according to the type of counterparty with whom the transaction has been entered into.

204 These would include forward purchases, forward deposits and partly paid securities. The Reporting Bank shall risk-weight forward purchases, forward deposits and partly paid securities according to the type of asset and not according to the type of counterparty with whom the transaction has been entered into.
[MAS Notice 637 (Amendment) 2014]

205 For example, formal standby facilities and credit lines.

205A This shall apply in the case where the Reporting Bank makes a commitment to provide a loan that is to be drawn down in a number of tranches, and it shall apply to the full undisbursed portion of the loan.
[MAS Notice 637 (Amendment No. 2) 2014]

206 The Reporting Bank shall be able to demonstrate to the satisfaction of the Authority that it actively monitors the financial condition of the obligor, and that its internal control systems are such that it is able to cancel the facility upon evidence of a deterioration in the credit quality of the obligor.

**CCFs FOR OFF-BALANCE SHEET ITEMS[207] UNDER THE IRBA[208]**

| | Description of Off-balance Sheet Item[208A] | CCF | |
|---|---|---|---|
| | | F-IRBA | A-IRBA |
| (a) | Direct credit substitutes[209] | 100% | 100% |
| (b) | Certain transaction-related contingent items[210] | 50% | Internal estimates |
| (c) | Short-term self-liquidating trade-related contingent items[211] (applicable to both issuing and confirming banks) | 20% | Internal estimates |
| (d) | Note issuance facilities and revolving underwriting facilities | 75% | Internal estimates |
| (e) | Transactions, other than SFTs, involving the posting of securities held by the Reporting Bank as collateral[211A] | 100% | 100% |
| (f) | Sale and repurchase agreements and asset sales with recourse, where the credit risk remains with the Reporting Bank[212] | 100% | 100% |
| (g) | Other commitments with certain drawdown[213] | 100% | 100% |
| (h) | Other commitments[214] | | |
| | (i) with an original maturity of more than one year | 75%[214A] | Internal estimates[214A] |
| | (ii) with an original maturity of one year or less | 75% | Internal estimates |
| | (iii) which are unconditionally cancellable at any time by the Reporting Bank without prior notice, or that effectively provide for automatic cancellation due to deterioration in an obligor's creditworthiness[215] | 0% | Internal estimates |

[207] For retail off-balance sheet items, Reporting Banks shall use their own estimates of CCFs subject to the requirements and guidelines in Annex 7AB of Part VII.

[208] Where there is an undertaking to provide a commitment on another off-balance sheet exposure, a Reporting Bank adopting the F-IRBA should apply the lower of the applicable CCFs.

[208A] Commitments should be recognised by a Reporting Bank, and recorded as an exposure for regulatory capital purposes, on the date at which the loan contract or agreement is entered into by the Reporting Bank.
[MAS Notice 637 (Amendment No. 2) 2014]

[209] For example, general guarantees of indebtedness, standby letters of credit serving as financial guarantees for loans and securities, and acceptances (including endorsements with the character of acceptances).

[210] For example, performance bonds, bid bonds, warranties and standby letters of credit related to particular transactions.

[211] For example, documentary credits collateralised by the underlying shipments.

[211A] This shall not apply to posted collateral that is treated under either the SA-CCR set out in Annex 7O or the CCR internal models method set out in Annex 7Q.
[MAS Notice 637 (Amendment) 2016]

[212] The terms of the agreement are such that there is no substantial transfer of all risks and rewards of ownership to the counterparty. The Reporting Bank shall risk-weight these items according to the type of asset and not according to the type of counterparty with whom the transaction has been entered into.

[213] These would include forward purchase, forward deposits and partly paid securities. The Reporting Bank shall risk-weight forward purchases, forward deposits and partly paid securities according to the type of asset and not according to the type of counterparty with whom the transaction has been entered into.

[214] For example, formal standby facilities and credit lines.

[214A] This shall apply in the case where the Reporting Bank makes a commitment to provide a loan that is to be drawn down in a number of tranches, and it shall apply to the full undisbursed portion of the loan.
[MAS Notice 637 (Amendment No. 2) 2014]

[215] The Reporting Bank shall be able to demonstrate to the satisfaction of the Authority that it actively monitors the financial condition of the obligor, and that its internal control systems are such that it is able to cancel the facility upon evidence of a deterioration in the credit quality of the obligor.

## CCFS FOR OFF-BALANCE SHEET SECURITISATION EXPOSURES

[MAS Notice 637 (Amendment No. 2) 2017 (Replacement of this Annex in its entirety)]

| | Description of Off-balance Sheet Item | CCF |
|---|---|---|
| (a) | Undrawn portion of servicer cash advances or facilities, that are unconditionally cancellable without prior notice [216] | 0% [217] |
| (b) | Undrawn portion of other servicer cash advances or facilities | 100% |
| (c) | Other facilities which are not credit risk mitigants | 100% |

[216] This refers to undrawn servicer cash advances or facilities that are contractually provided for and unconditionally cancellable without prior notice, so long as the servicer is entitled to full reimbursement and this right is senior to other claims on cash flows from the underlying exposures.

[MAS Notice 637 (Amendment No. 2) 2017]

[217] A Reporting Bank shall notify the Authority if it intends to provide such cash advance facilities and when there is a drawdown.

[MAS Notice 637 (Amendment No. 2) 2017]

*[Footnotes 218 to 225 have been deleted by MAS Notice 637 (Amendment No. 2) 2017]*

**Annex 7D**

[Deleted by MAS Notice 637 (Amendment No. 2) 2017]

**Annex 7E**

[Deleted by MAS Notice 637 (Amendment No. 2) 2017]

**CRM**

**Section 1: General Requirements**

1.1 A Reporting Bank may recognise the effects of CRM only if –

(a) all documentation relating to that CRM is binding on all relevant parties and legally enforceable in all relevant jurisdictions[226];

(b) the Reporting Bank complies with the requirements and meets the guidelines set out in Sections 2 to 7, as applicable; and

(c) the Reporting Bank complies with the public disclosure requirements in Part XI.

1.2 Where a Reporting Bank uses multiple CRM for a single exposure (e.g. the exposure is partially covered by both collateral and guarantee), the Reporting Bank shall sub-divide the exposure into portions covered by each CRM (e.g. portion covered by collateral, portion covered by guarantee) and shall calculate the credit risk-weighted exposure amount of each portion separately. A Reporting Bank shall apply the same approach when recognising eligible credit protection by a single protection provider where the eligible credit protection has differing maturities.

1.3 If the Authority is not satisfied that paragraph 1.1 has been complied with, or with the robustness, suitability or application of a Reporting Bank's CRM management policies and procedures, or where residual risks are not adequately controlled, the Authority may take certain actions, including the following:

(a) requiring the Reporting Bank to make adjustments to the assumptions on holding periods, supervisory haircuts, or volatility for a Reporting Bank using own-estimate haircuts under Annex 7J;

(b) prohibiting the Reporting Bank from fully recognising the effects of CRM, either on the entire credit portfolio or by specific asset classes or product lines; or

(c) requiring the Reporting Bank to maintain additional capital.

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[226] A Reporting Bank shall conduct sufficient legal review to verify this and have a well-founded legal basis to reach this conclusion, and undertake such further review as necessary to ensure continuing enforceability. The review should cover relevant jurisdictions such as the jurisdiction whose law governs the credit protection or collateral agreement and the jurisdiction whose law governs the transaction subject to the credit protection or collateral agreement. There should be sufficient written documentary evidence to adequately support the conclusion drawn and rebut any legal challenge. While a Reporting Bank may use either in-house or external legal counsel, it should consider whether or not in-house counsel opinion is appropriate. An officer of the Reporting Bank who is legally qualified and independent of the parties originating the transaction should review the legal opinion and confirm that he is satisfied that an adequate review has been completed and that he agrees with the conclusions drawn. A record of these reviews should be kept and made available at the request of the Authority.

1.3A A Reporting Bank shall not double count the effects of CRM. The Reporting Bank shall not recognise the effects of CRM if such CRM is already reflected in the issue-specific external credit assessment of the exposure. The Reporting Bank shall not use a principal-only external credit assessment (i.e. an external credit assessment that does not reflect the entire amount of credit risk exposure that the Reporting Bank has with regard to all payments owed to it) for the recognition of the effects of CRM.

**Section 2: Recognition of Collateral**

Types of Collateral

2.1 A Reporting Bank shall ensure that the relevant requirements in paragraphs 2.6 to 2.11 below are complied with before it recognises the effects of CRM of the types of collateral set out in paragraphs 2.2 to 2.5 below.

2.2 For a Reporting Bank using the FC(SA), eligible financial collateral comprises[226A] –

(a) cash (as well as certificates of deposit or other similar instruments[226B] issued by the Reporting Bank)[227] on deposit with the Reporting Bank;[228]

(b) gold;

(c) any debt security[228A] –

(i) with an original maturity of one year or less that has a credit quality grade of "III" or better as set out in Table 7R-2 of Annex 7R of Part VII; or

(ii) with an original maturity of more than one year that has a credit quality grade of "4" or better as set out in Table 7R-1 of Annex 7R of Part VII if it is issued by a central government or central bank, or a credit quality grade of "3" or better as set out in Table 7R-1 of Annex 7R of Part VII if it is issued by any other entity;

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226A This shall exclude any CET1 capital instrument, AT1 capital instrument or Tier 2 capital instrument issued by the Reporting Bank which is held by the Reporting Bank or any of its banking group entities as collateral. Please also note section 29(3) of the Banking Act which prohibits a Reporting Bank from granting any credit facility against the security of its own shares.

[MAS Notice 637 (Amendment) 2014]

226B This shall not include any structured deposits. Structured deposit has the same meaning as in Regulation 2 of the Financial Advisers (Structured Deposits – Prescribed Investment Product and Exemption) Regulations 2005.

[MAS Notice 637 (Amendment No. 2) 2014]

227 Cash-funded credit-linked notes issued by a Reporting Bank against exposures in the banking book which fulfill the criteria for eligible credit derivatives shall be treated as cash collateralised transactions.

228 When cash on deposit, certificates of deposit or other similar instruments issued by the lending Reporting Bank are held as collateral at a third-party banking institution in a non-custodial arrangement and are pledged or assigned to the lending Reporting Bank, the Reporting Bank shall apply the risk weight of the third-party banking institution to the exposure covered by such collateral (after any necessary haircuts for currency risk). This is subject to the pledge or assignment being unconditional and irrevocable.

228A This includes any structured note.

(d) any equity security (including convertible bonds) that is included in a main index; and

(e) any unit in a collective investment scheme where –

(i) a price for the units is publicly quoted daily; and

(ii) the collective investment scheme is limited to investing in the instruments listed in this paragraph.[229]

[MAS Notice 637 (Amendment No. 2) 2014]
[MAS Notice 637 (Amendment) 2018]
[MAS Notice 637 (Amendment No. 2) 2018]

2.2A Resecuritisations, irrespective of any credit ratings, are not eligible financial collateral. This prohibition applies whether the Reporting Bank is using the supervisory haircuts method, the own estimates of haircuts method, the repo VaR method or the internal model method.

2.3 For a Reporting Bank using the FC(CA), eligible financial collateral comprises[226A] –

(a) any instrument listed in paragraph 2.2 above;

(b) any equity security (including convertible bonds) that is listed on any approved exchange or overseas exchange; and

(c) any unit in a collective investment scheme where a price for the units is publicly quoted daily and the collective investment scheme is limited to investing in instruments listed in paragraph 2.2 and in this paragraph.[230]

[MAS Notice 637 (Amendment) 2018]
[MAS Notice 637 (Amendment No. 2) 2018]

2.4 Notwithstanding paragraphs 2.2 and 2.3 above, in the case of any pre-settlement counterparty exposures arising from a repo-style transaction (i.e. repo, reverse repo, securities lending or securities borrowing transaction) which is included in the trading book, eligible financial collateral[226A] includes all instruments which a Reporting Bank may include in the trading book (except resecuritisation exposures).

[MAS Notice 637 (Amendment) 2012]

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229 The use or potential use by a collective investment scheme of derivative instruments solely to hedge investments listed in paragraph 2.2 shall not prevent units in that collective investment scheme from being recognised as eligible financial collateral for a Reporting Bank using FC(SA).

230 The use or potential use by a collective investment scheme of derivative instruments solely to hedge investments listed in paragraph 2.3 shall not prevent units in that collective investment scheme from being recognised as eligible financial collateral for a Reporting Bank using FC(CA).

2.5 For a Reporting Bank adopting the IRBA, eligible IRBA collateral comprises -

(a) eligible CRE and eligible RRE;

(b) eligible receivables; and

(c) eligible physical collateral comprising -

(i) all industrial properties in Singapore;

(ii) land in Singapore;

(iii) land in another jurisdiction where the bank regulatory agency has recognised such land as eligible physical collateral;

(iv) ships;

(v) aircraft;

(vi) commodities; and

(vii) such other collateral which is approved by the Authority.

[MAS Notice 637 (Amendment No. 2) 2018]

2.5A For the purpose of paragraph 2.5, "commodity" means –

(a) any produce, item, good or article; or

(b) any index, right or interest in any produce, item, good or article.

[MAS Notice 637 (Amendment No. 2) 2018]

<u>Requirements for Recognition of Collateral</u>

2.6 A Reporting Bank shall ensure that the following requirements are complied with before it recognises the effects of CRM of any collateral:

(a) the legal mechanism by which collateral is pledged, assigned or transferred shall confer on the Reporting Bank the right to liquidate or take legal possession of the collateral, in a timely manner, in the event of the default, insolvency or bankruptcy (or one or more otherwise-defined credit events set out in the transaction documentation) of the counterparty (and, where applicable, of the custodian holding the collateral);

(b) the Reporting Bank has taken all steps necessary to fulfill those requirements under the law applicable to the Reporting Bank's interest in the collateral for obtaining and maintaining an enforceable security interest[231] or for exercising a right to net or set off in relation to title transfer collateral;

(c) the credit quality of the counterparty and the value of the collateral do not have a material positive correlation[232];

(d) the Reporting Bank has implemented clear and robust procedures for the timely liquidation of collateral to ensure that any legal conditions required for declaring default of counterparty and liquidating the collateral are observed, and that the collateral can be liquidated promptly; and

(e) where the collateral is held by a custodian, the Reporting Bank has taken reasonable steps to ensure that the custodian segregates the collateral from its own assets.

2.7 In addition to the requirements in paragraph 2.6 above, a Reporting Bank shall ensure that the following requirements are complied with before it recognises CRE or RRE held as collateral as eligible CRE or eligible RRE:

(a) the repayment of the facility is not materially dependent on any cash flow generated by the CRE or RRE[233];

(b) the value of the CRE or RRE that is pledged is not materially dependent on the performance of the obligor[234];

(c) any claim on collateral shall be properly filed on a timely basis;

(d) collateral interests shall reflect a perfected charge wherein all legal requirements for establishing the claim are fulfilled;

[MAS Notice 637 (Amendment) 2013]

(e) the collateral agreement and the process for enforcement of the agreement allow the Reporting Bank to realise the value of such collateral within a reasonable timeframe;

(f) the CRE or RRE shall be valued at or less than the fair value at which the property could be sold under a private contract between a willing seller and an arm's-length buyer on the date of valuation;

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231 For example, by registering it with a registrar.

232 For example, securities issued by the counterparty or a related group entity would be ineligible.

233 IPRE that is part of the SL asset sub-class will not be recognised as eligible CRE or eligible RRE.

234 This requirement is not intended to preclude situations where purely macro-economic factors affect both the value of the CRE or RRE held as collateral and the performance of the obligor.

(g) the value of the CRE or RRE is monitored at least on an annual basis[235]. More frequent monitoring should be conducted whenever there are significant changes in market conditions;

(h) where the Reporting Bank has a junior charge over the CRE or RRE, the conditions under paragraph 7.4.31 of Part VII are satisfied;

[MAS Notice 637 (Amendment) 2013]

(i) the types of CRE or RRE accepted by the Reporting Bank as collateral and lending policies (e.g. advance rates) when such collateral may be taken is clearly documented;

(j) the CRE or RRE is adequately insured against damage or deterioration;

(k) the extent of any permissible prior claims, such as tax, on the CRE or RRE is monitored on an ongoing basis; and

(l) environmental liability arising in respect of the CRE or RRE, such as the presence of toxic material on a property, is appropriately monitored.

2.8 In addition to the requirements in paragraph 2.6 above, a Reporting Bank shall ensure that the following requirements are complied with before it recognises any financial receivables as eligible receivables:

(a) the financial receivables have an original maturity of one year or less;

(b) the repayment occurs through the commercial or financial flows related to the underlying assets of the obligor which include both self-liquidating debt arising from the sale of goods or services linked to a commercial transaction and general amounts owed by buyers, suppliers, renters, national and local governmental authorities, or other non-affiliated parties not related to the sale of goods or services linked to a commercial transaction, but excludes receivables associated with securitisation, sub-participations or credit derivatives;

(c) the legal mechanism by which collateral is given is robust and ensures that the Reporting Bank has clear rights over the proceeds from the collateral;

(d) framework, policies and procedures to ensure that the Reporting Bank has a perfected first charge over the collateral is in place;

[MAS Notice 637 (Amendment) 2013]

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235 Statistical methods of evaluation (e.g. reference to house price indices, sampling) may be used to update estimates or to identify collateral that may have declined in value and that may need re-appraisal. A Reporting Bank shall obtain a qualified professional evaluation on the value of the CRE or RRE if information indicates that the value of the collateral may have declined materially relative to general market prices or when a credit event, such as default, occurs.

236 *[This footnote has been intentionally left blank.]*

(e) collateral arrangements are properly documented, and clear and robust procedures for the timely collection of collateral proceeds[237] are in place[238];

(f) a sound process for determining the credit risk in the receivables is in place[239]. Where the Reporting Bank relies on the obligor to ascertain the credit risk of the customers, it shall review the obligor's credit policy to ascertain its soundness and credibility;

(g) the margin between the amount of the exposure and the value of the receivables reflects all appropriate factors, including the cost of collection, concentration within the receivables pool pledged by an individual obligor, and potential concentration risk within the total exposures of the Reporting Bank;

(h) a continuous monitoring process[240] that is appropriate for the specific exposures (either immediate or contingent) attributable to the collateral is in place; and

(i) the receivables pledged by an obligor are diversified and are not unduly correlated[241] with the obligor[242].

2.9 In addition to the requirements in paragraph 2.6, paragraphs 2.7(c) to 2.7(g) and paragraphs 2.7(i) to 2.7(k)[242A] above, a Reporting Bank shall ensure that the following requirements are complied with before it recognises any physical collateral as eligible physical collateral:

[MAS Notice 637 (Amendment No. 2) 2018]

(a) the Reporting Bank has first charge over the collateral;

237 A Reporting Bank should have procedures in place to ensure that all legal conditions required for declaring the default of the customer and timely collection of collateral are observed. In the event of the financial distress or default of the obligor, the Reporting Bank should have legal authority to sell or assign the receivables to other parties without the consent of the receivables' obligors.

238 A Reporting Bank should have a documented process for collecting receivable payments in distressed situations. The requisite facilities for collection should be in place, even when the Reporting Bank normally looks to the obligor for collections.

239 Such a process should include analyses of the obligor's business and industry (e.g. effects of the business cycle) and the types of customers with whom the obligor does business.

240 This process may include, as appropriate and relevant, ageing reports, control of trade documents, borrowing base certificates, frequent audits of collateral, confirmation of accounts, control of the proceeds of accounts paid, analyses of dilution (credits given by the obligor to the issuers) and regular financial analysis of both the obligor and the issuers of the receivables, especially in the case when a small number of large-sized receivables are taken as collateral. A Reporting Bank should monitor whether its overall concentration limits are being observed. A Reporting Bank should also review on a regular basis the compliance with loan covenants, environmental restrictions and other legal requirements.

241 Where the correlation is high, such as where some issuers of the receivables are reliant on the obligor for their viability or the obligor and the issuers belong to a common industry, the attendant risks should be taken into account in the setting of margins for the collateral pool as a whole.

242 Receivables from related corporations and associates, officers and employees of the obligor shall not be recognised as credit risk mitigants.

242A References to CRE or RRE in paragraphs 2.7(c) to 2.7(g) and paragraphs 2.7(i) to 2.7(k) shall be read as being applicable to physical collateral.

[MAS Notice 637 (Amendment No. 2) 2018]

(b) the facility agreement includes detailed descriptions of the collateral and detailed specifications of the manner and frequency of revaluation;

(c) the types of physical collateral accepted by the Reporting Bank and policies and practices in respect of the appropriate amount of each type of collateral relative to the exposure amount is clearly documented in its internal credit policies and procedures, and available for examination and audit review;

(d) the credit policies of a Reporting Bank with regard to the transaction structure addresses appropriate collateral requirements relative to the exposure amount, the ability to liquidate the collateral readily, the ability to establish objectively a price or market value, the frequency with which the value can readily be obtained (including a professional appraisal or valuation), and the volatility of the value of the collateral;

(e) the periodic revaluation process involves a review of "fashion-sensitive" collateral to ensure that valuations are appropriately adjusted downward for fashion or model-year obsolescence as well as physical obsolescence or deterioration, and includes physical inspection of the collateral where inventories (e.g. raw materials, work-in-progress, finished goods, dealers' inventories of automobiles) and equipment are involved;

(f) there exists liquid markets for the disposal of the collateral in an expeditious and economically efficient manner;

(g) there exists publicly available market prices for the collateral which are generally relied upon by the market; and

(h) steps are taken to adequately insure the collateral against damage or deterioration[243].

2.10 A Reporting Bank shall treat the CRM of any leased asset that does not expose the Reporting Bank to residual value risk, in the same manner as exposures collaterialised by the same type of collateral and comply with the minimum requirements for the collateral type. In addition to the requirements in paragraph 2.6 above, a Reporting Bank shall ensure that the following requirements are complied with before it recognises the effects of CRM of any leased asset, that does not expose the Reporting Bank to residual value risk, pledged as collateral in respect of lease payments due to a Reporting Bank as a lessor:

(a) the requirements in paragraph 2.7 or paragraph 2.9, as the case may be, are complied with;

(b) the Reporting Bank exercises robust risk management with respect to the location of the leased asset, the use to which it is put, its age, and planned obsolescence;

[243] Where a Reporting Bank has recognised ships as eligible physical collateral, the insurance taken out on such assets shall be assigned to the Reporting Bank. Where a Reporting Bank has recognised aircrafts as eligible physical collateral, the insurance taken out on such assets shall name the Reporting Bank as the sole loss payee.

(c) there is a robust legal framework to establish the legal ownership of the leased asset by the Reporting Bank and its ability to exercise its rights as owner in a timely fashion; and

(d) the difference between the rate of depreciation of the leased asset and the rate of amortisation of the lease payments is not so large as to overstate the effects of CRM attributed to the leased assets.

2.11 In addition to the requirements in paragraph 2.6 above, a Reporting Bank shall ensure that the following requirements are complied with before it recognises the effects of CRM of any collateral for OTC derivative transactions and SFTs:

(a) a Reporting Bank shall ensure that sufficient resources are devoted to the orderly operation of margin agreements with counterparties in OTC derivative transactions and SFTs, as measured by the timeliness and accuracy of its outgoing calls and response time to incoming calls; and

(b) a Reporting Bank shall have collateral management policies in place to control, monitor and report:

(i) the risk to which margin agreements expose them, such as the volatility and liquidity of the securities exchanged as collateral;

(ii) the concentration risk to particular types of collateral;

(iii) the reuse of collateral (both cash and non-cash), including the potential liquidity shortfalls resulting from the reuse of collateral received from counterparties; and

(iv) the surrender of rights on collateral posted to counterparties.

**Section 3: Recognition of Guarantees**

3.1 A Reporting Bank shall ensure that the following requirements are complied with before it recognises the effects of CRM of a guarantee:

(a) the guarantee is an explicitly documented obligation assumed by the guarantor;

(b) the guarantee represents a direct claim on the guarantor;

(c) explicitly referenced to specific exposure or pool of exposures so that the extent of the credit protection cover is clearly defined and incontrovertible;

(d) other than in the event of non-payment by the Reporting Bank of money due in respect of the guarantee if applicable, there is an irrevocable obligation on the part of the guarantor to pay out a pre-determined amount upon the occurrence of a credit event, as defined under the guarantee;

(e) the guarantee does not contain any clause, the fulfillment of which is outside the direct control of the Reporting Bank, that -

(i) would allow the guarantor to unilaterally cancel the guarantee[244];

(ii) would increase the effective cost of the guarantee as a result of deteriorating credit quality of the underlying exposure;

(iii) could prevent the guarantor from being obliged to pay out in a timely manner in the event that the underlying obligor fails to make any payment due; or

(iv) could allow the maturity of the guarantee agreed ex-ante to be reduced ex-post by the guarantor;

(f) the Reporting Bank is able in a timely manner to pursue the guarantor for any monies outstanding under the documentation governing the transaction on the default of, or non-payment by, the underlying obligor[245], and has the right to receive such payments from the guarantor without first having to take legal actions to pursue the obligor for payment; and

(g) the guarantee covers all types of payments that the underlying obligor is expected to make under the documentation governing the transaction, for example, notional amounts, margin payments etc. Where a guarantee covers payment of principal only, a Reporting Bank shall treat interests and other uncovered payments as an unsecured amount in accordance with paragraph 1.1 of Annex 7H of this Part.

[MAS Notice 637 (Amendment No. 2) 2014]

3.2 In addition to the requirements in paragraph 3.1 above, where a Reporting Bank has an exposure that is protected by a guarantee which is counter-guaranteed by a central government or central bank, a Reporting Bank may treat the exposure as being protected by a direct guarantee from the central government or central bank in question, provided the following requirements are complied with:

(a) the counter-guarantee covers all credit risk elements of the exposure;

(b) both the original guarantee and the counter-guarantee comply with all the requirements for guarantees set out in this Annex, except that the counter-guarantee need not be direct and explicit with respect to the original exposure;

(c) the Reporting Bank demonstrates to the satisfaction of the Authority that the cover is robust and that there is no evidence to suggest that the coverage of the counter-guarantee is less than equivalent in effect to that of a direct guarantee from the central government or central bank in question.

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244 This does not include any guarantee with a cancellation clause where it is provided that any obligation incurred or transaction entered into prior to any cancellation, unilateral or otherwise, continues to be guaranteed by the guarantor.

245 The guarantee payments may be in the form of the guarantor making a lump sum payment of all monies to the Reporting Bank or the guarantor assuming the future payment obligations of the counterparty covered by the guarantee, as specified in the relevant documentation governing the guarantee.

**Section 4: Recognition of Credit Derivatives**

Types of Credit Derivatives

4.1 A Reporting Bank may recognise the effects of CRM of only the following types of credit derivatives that provide credit protection equivalent to guarantees:

(a) credit default swaps;

(b) total return swaps[246]; and

(c) instruments that are composed of, or are similar in economic substance, to one or more of the credit derivatives in sub-paragraphs (a) and (b) above.

Requirements for Recognition of Credit Derivatives

4.2 A Reporting Bank shall ensure that the following requirements are complied with before it recognises the effects of CRM of any credit derivative:

(a) the terms and conditions of any credit protection obtained via a credit derivative shall be set out in writing by both the Reporting Bank and the provider of credit protection;

(b) the credit derivative shall represent a direct claim on the provider of credit protection;

(c) explicitly referenced to specific exposure or pool of exposures so that the extent of the credit protection cover is clearly defined and incontrovertible;

(d) other than in the event of non-payment by the Reporting Bank of money due in respect of the credit derivative, there is an irrevocable obligation on the part of the provider of the credit protection to pay out a pre-determined amount upon the occurrence of a credit event, as defined under the credit derivative contract;

(e) the credit derivative contract shall not contain any clause, the fulfillment of which is outside the direct control of the Reporting Bank, that -

(i) would allow the provider of credit protection to unilaterally cancel the credit protection cover;

(ii) would increase the effective cost of the credit protection cover as a result of deteriorating credit quality of the underlying exposure;

[246] A Reporting Bank shall not recognise the effects of CRM of a total return swap if it purchases credit protection through a total return swap and records the net payments received on the swap as net income, but does not record offsetting deterioration in the value of the underlying asset that is protected (either through reductions in its marked-to-market value or by an addition to reserves).

(iii) could prevent the provider of credit protection from being obliged to pay out in a timely manner in the event that the underlying obligor fails to make any payment due[247]; or

(iv) could allow the maturity of the credit protection agreed ex-ante to be reduced ex-post by the provider of credit protection;

(f) the credit events specified by the contracting parties shall at a minimum cover -

(i) failure to pay the amounts due under terms of the underlying exposure that are in effect at the time of such failure (with a grace period, if any, that is closely in line with the grace period in the underlying exposure);

(ii) bankruptcy, insolvency or inability of the underlying obligor to pay its debts, or its failure or admission in writing of its inability generally to pay its debts as they become due, and analogous events; and

(iii) restructuring of the underlying exposure involving forgiveness or postponement of principal, interest or fees that results in a credit loss event (i.e. charge-off, specific allowance or other similar debit to the profit and loss account);

(g) the credit derivative shall not terminate prior to the maturity of the underlying exposure or expiration of any grace period required for a default on the underlying exposure to occur as a result of a failure to pay, subject to paragraph 6.2 of this Annex;

(h) a robust valuation process shall be in place in order to estimate loss reliably for any credit derivative that allows for cash settlement. There shall be a clearly specified period for obtaining post-credit event valuations of the underlying obligation[249];

(i) where the right or ability of the Reporting Bank to transfer the underlying exposure to the credit protection provider is required for settlement, the terms of the underlying exposure shall provide that any required consent to such transfer may not be unreasonably withheld;

(j) the identity of the parties responsible for determining whether a credit event has occurred shall be clearly defined. This determination shall not be the sole responsibility of the credit protection provider. The Reporting Bank shall have the right or ability to inform the credit protection provider of the occurrence of a credit event;

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[247] This does not preclude an obligation by the buyer of credit protection to satisfy requirements relating to providing a Notice of Publicly Available Information, as is the case for the triggering of credit protection under standard credit default swap contracts.

[248] *[This footnote has been intentionally left blank.]*

[249] The Authority would generally consider the cash settlement methodology provided in the ISDA Credit Derivatives Definitions as satisfying this requirement.

(k) the underlying obligation and the reference obligation specified in the credit derivative contract for the purpose of determining the cash settlement value or the deliverable obligation or for the purpose of determining whether a credit event has occurred may be different only if -

(i) the reference obligation ranks *pari passu* with or is junior to the underlying obligation; and

(ii) the underlying obligation and reference obligation share the same obligor (i.e. the same legal entity) and legally enforceable cross-default or cross-acceleration clauses are in place; and

(l) the credit derivative shall not expose the Reporting Bank to specific wrong-way risk.

[MAS Notice 637 (Amendment No. 3) 2017]

**Section 5: Currency Mismatches**

5.1 In the case where there is a currency mismatch between the credit protection and the underlying exposure, a Reporting Bank shall reduce the amount of the exposure deemed to be protected by applying a haircut, where -

Protected portion $G_A$ = $G \times (1-H_{FX})$

where -

(a) $G$ = notional amount of the credit protection; and

(b) $H_{FX}$ = haircut appropriate for currency mismatch between the credit protection and underlying obligation exposure based on a ten-business day holding period, assuming daily mark-to-market.

5.2 A Reporting Bank shall determine $H_{FX}$ in the following manner:

(a) if the Reporting Bank uses standard supervisory haircuts, $H_{FX}$ is 8%; and

(b) if the Reporting Bank uses own-estimate haircuts, it shall estimate $H_{FX}$ according to Annex 7J of Part VII based on a ten-business day holding period, assuming daily mark-to-market.

5.3 If the credit protection is not marked-to-market daily, $H_{FX}$ shall be scaled in accordance with paragraph 4.2 of Annex 7J of Part VII.

**Section 6: Maturity Mismatches**

6.1 A Reporting Bank may recognise the effects of CRM for an exposure where there is a maturity mismatch only if the credit risk mitigant has an original maturity of at least one year and a residual maturity of more than three months. For the purposes of calculating

credit RWA, a maturity mismatch occurs when the residual maturity of the credit risk mitigant is less than that of the underlying exposure.

6.2 A Reporting Bank shall determine the maturity of the underlying exposure and the maturity of the credit risk mitigant conservatively. The residual maturity of the underlying exposure shall be gauged as the longest possible remaining time before the counterparty is scheduled to fulfill its obligation, taking into account any applicable grace period. For the credit risk mitigant, embedded options which may reduce the term of the credit protection shall be taken into account so that the shortest possible residual maturity is used. Where a call is at the discretion of the protection seller, the residual maturity will be at the first call date. If the call is at the discretion of the Reporting Bank but the terms of the arrangement at origination of the credit derivative contain a positive incentive for the Reporting Bank to call the transaction before contractual maturity[250], the remaining time to the first call date will be deemed to be the residual maturity.

6.3 A Reporting Bank shall calculate the value of the CRM adjusted for any maturity mismatch, $P_A$, using the following formula:

$$P_A = [P \times (t-0.25)]/(T-0.25)$$

where -

(a) P = value of the credit protection (e.g. collateral amount, guarantee amount) adjusted for any haircuts;

(b) t = min (T, residual maturity of the credit risk mitigant) expressed in years; and

(c) T = min (5, residual maturity of the exposure[251]) expressed in years.

## Section 7: Residual Risks

7.1 While a Reporting Bank may reduce or transfer credit risk by using CRM, the use of such techniques may simultaneously increase other risks (residual risks). Residual risks include legal, operational, liquidity and market risks. Therefore, a Reporting Bank shall employ robust methods to control these risks, including -

(a) strategy;[252]

(b) consideration of the underlying credit;[253]

[250] For example. where there is a step-up in cost in conjunction with a call feature or where the effective cost of cover remains the same even if credit quality remains the same or increases.

[251] In the case of a basket of exposures with different maturities, a Reporting Bank shall use the longest maturity of any of the exposures as the maturity of all the exposures being hedged.

[252] The Reporting Bank should ensure that a clearly articulated strategy for the use of CRM forms an intrinsic part of the general credit strategy of a Reporting Bank.

[253] Where an exposure is collateralised, the Reporting Bank should ensure that credit managers should continue to assess the exposure on the basis of the obligor's creditworthiness. The Reporting Bank should ensure that credit managers should obtain and analyse sufficient financial information to determine the obligor's risk profile and its management and operational capabilities.

(c) valuation;[254]

(d) policies and procedures;[255]

(e) systems;[256]

(f) control of roll-off risks;[257] and

(g) management of concentration risk arising from the use of CRM and the interaction of such concentration risk with the overall credit risk profile of the Reporting Bank[258].

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[254] The Reporting Bank should ensure that collateral should be revalued frequently, and the unsecured exposure should also be monitored frequently. Frequent revaluation is prudent, and the Reporting Bank should ensure that revaluation of marketable securities should occur on at least a daily basis. Furthermore, measures of the potential unsecured exposure under collateralised transactions should be calculated under stressed and normal conditions. One such measure would take account of the time and cost involved if the obligor or counterparty were to default and the collateral had to be liquidated. Furthermore, the Reporting Bank should ensure that the setting of limits for collateralised counterparties take account of the potential unsecured exposure. The Reporting Bank should ensure that the stress tests and scenario analysis are conducted to enable the Reporting Bank to understand the behaviour of its portfolio of collateral arrangements under unusual market conditions. The Reporting Bank should ensure that the unusual or disproportionate risk identified should be managed and controlled.

[255] The Reporting Bank should ensure that the clear policies and procedures should be established in respect of collateral management, including - (a) the terms of collateral agreements; (b) the types of collateral and enforcement of collateral terms (e.g. waivers of posting deadlines); (c) the management of legal risks; (d) the administration of agreement (e.g. detailed plans for determining default and liquidating collateral); and (e) the prompt resolution of disputes, such as valuation of collateral or positions, acceptability of collateral, fulfilment of legal obligations and the interpretation of contract terms.

[256] The Reporting Bank should ensure that its the policies and procedures referred to under paragraph 7.1(d) is supported by collateral management systems capable of tracking the location and status of posted collateral (including re-hypothecated collateral), outstanding collateral calls and settlement problems.

[257] Where a Reporting Bank obtains credit protection that differs in maturity from the underlying credit exposure, the Reporting Bank should monitor and control its roll-off risks, i.e. the fact that the Reporting Bank will be fully exposed when the protection expires, and the risk that it will be unable to purchase credit protection or ensure its capital adequacy when the credit protection expires.

[258] Taking as collateral large quantities of instruments issued by one obligor creates concentration risk. A Reporting Bank should have a clearly defined policy with respect to the amount of concentration risk it is prepared to run. Such a policy might, for example, include a cap on the amount of collateral it would be prepared to take from a particular issuer or market. The Reporting Bank should also take collateral and purchased credit protection into account when assessing the potential concentrations in its overall credit profile.

**Annex 7G**

## RECOGNITION OF CREDIT PROTECTION UNDER THE DOUBLE DEFAULT FRAMEWORK

### Section 1: Eligibility of Underlying Obligors

1.1 A Reporting Bank may recognise the effects of CRM under the double default framework when the underlying obligor is not -

(a) a financial institution approved, licensed, registered or otherwise regulated by the Authority or a regulatory agency responsible for regulating that financial institution; or

(b) a member of the same single counterparty group[259]as the eligible protection provider[260].

### Section 2: Eligibility of Underlying Obligations

2.1 A Reporting Bank may recognise the effects of CRM under the double default framework if the underlying obligation is -

(a) an exposure in the corporate asset sub-class or corporate small business asset sub-class, as defined in Sub-division 4 of Division 4 of Part VII;

(b) an exposure in the SL asset sub-class or HVCRE asset sub-class, as defined in Sub-division 4 of Division 4 of Part VII[261];

(c) an exposure to a PSE in the bank asset sub-class as defined in Sub-division 4 of Division 4 of Part VII; or

(d) an exposure to a small business in the other retail exposures asset sub-class as defined in Sub-division 4 of Division 4 of Part VII[262].

### Section 3: Eligibility of Protection Providers

3.1 A Reporting Bank may recognise the effects of CRM under the double default framework if the eligible protection provider is a banking institution[262A] or insurance entity

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[259] Has the same meaning as in MAS Notice 639.

[260] In the case of protection against dilution risk, the seller of purchased receivables shall not be a member of the same single counterparty group as the eligible protection provider.

[261] A Reporting Bank shall not recognise the effects of CRM under the double default framework if it is using the supervisory slotting criteria for IRBA exposures belonging to the SL asset sub-class or HVCRE asset sub-class.

[262] For avoidance of doubt, all other exposures to the same obligor, including unprotected portions of exposures for which the protected portion is subject to the double default framework, shall continue to be calculated pursuant to the requirements in Sub-division 8 of Division 4 of Part VII.

[262A] For the avoidance of doubt, this does not include PSEs and MDBs.

[MAS Notice 637 (Amendment) 2012]

carrying on the business of providing credit protection[262B] and complies with the following requirements:

(a) the eligible protection provider -

(i) is approved, licensed, registered or otherwise regulated by the Authority or a regulatory agency responsible for regulating that banking institution or insurance entity; or

(ii) had, at the time the credit protection was provided, a credit quality grade of "3" or better as set out in Table 7R-1 of Annex 7R of Part VII;

(b) the eligible protection provider had, at the time the credit protection was provided, or acquires at any point in time thereafter, an internal rating with a PD equivalent to or lower than that associated with a credit quality grade of "2" as set out in Table 7R-1 of Annex 7R of Part VII; and

(c) the eligible protection provider has an internal rating with a PD equivalent to or lower than that associated with a credit quality grade of "3" as set out in Table 7R-1 of Annex 7R of Part VII during the period of recognition.

[MAS Notice 637 (Amendment) 2012]

**Section 4: Eligibility of Credit Protection**

4.1 A Reporting Bank may recognise the effects of CRM under the double default framework only if credit protection is obtained through the following instruments:

(a) single-name, unfunded credit derivatives or single-name guarantees;

(b) first-to-default credit derivatives[263]; or

(c) nth-to-default credit derivatives[264],

and the instruments comply with the requirements set out in paragraph 4.2 below.

4.2 A Reporting Bank shall ensure that the following requirements are complied with before it recognises the effects of CRM under the double default framework:

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[262B] This includes mono-lines, re-insurers, and non-sovereign credit export agencies. By non-sovereign, it is meant that credit protection in question does not benefit from any explicit sovereign counter-guarantee.
[MAS Notice 637 (Amendment) 2012]

[263] A Reporting Bank shall recognise the effects of CRM under the double default framework only be in respect of the asset within the basket of reference entities with the lowest risk-weighted exposure amount.

[264] A Reporting Bank shall not recognise the effects of CRM under the double default framework unless it has also obtained eligible credit protection for (n–1) of the assets within the basket of reference entities or if (n–1) of the assets within the basket of reference entities have already defaulted.

(a) the Reporting Bank complies with the requirements and meets the guidelines for the recognition of guarantees and credit derivatives set out in Annex 7F of Part VII[264A];

(b) the credit protection shall absorb all credit losses incurred on the hedged portion of an exposure that arise due to the credit events outlined in the contract;

(c) there is legal certainty with respect to the deliverability of a loan, bond, or contingent liability in the event the payout structure of the eligible credit protection provides for physical settlement. If a Reporting Bank intends to deliver an obligation other than the underlying exposure, it shall ensure that the deliverable obligation is sufficiently liquid so that it would have the ability to purchase it for delivery in accordance with the contract;

(d) the risk weight or risk estimates associated with the exposure to the underlying obligor prior to the application of the double default framework does not already factor in any aspect of the credit protection; and

(e) there shall not be excessive correlation[265] between the creditworthiness of the protection provider and the obligor of the underlying exposure due to their performance being dependent on common factors beyond the systematic risk factor. The Reporting Bank shall have processes in place to detect such excessive correlation.

**Section 5: Treatment of Eligible Credit Protection Bought**

5.1 A Reporting Bank which has bought eligible credit protection for an IRBA exposure categorised as an exposure in any of the asset sub-classes specified in paragraph 2.1 above may recognise the effects of CRM of the eligible credit protection under the double default framework by calculating -

(a) $K_{dd}$ and $K_o$, the capital requirement for a hedged exposure subject to the double default framework and the capital requirement that is applicable to the eligible protection provider respectively[266], using the following formulas:

$$K_{dd} = K_o \times (0.15 + 160 \times PD_g)$$

Capital requirement ($K_o$)

$$= [LGD_g \times N[(1 - R_{dd})\text{^}{-0.5} \times G(PD_o) + (R_{dd}/(1 - R_{dd}))\text{^}0.5 \times G(0.999)] - PD_o \times LGD_g] \times (1 - 1.5 \times b)\text{^}{-1} \times (1 + (M - 2.5) \times b)$$

$$\text{Maturity adjustment } (b) = (0.11852 - 0.05478 \times \ln(PD))\text{^}2$$

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[264A] The Reporting Bank shall have the right to receive payments from the credit protection provider without first having to take legal actions to pursue the obligor for payment. The Reporting Bank should take steps to satisfy itself that the protection provider is willing to pay promptly if a credit event should occur.

[265] One example of excessive correlation between an obligor and a protection provider would be if the obligor derives a high proportion of its income or revenue from transactions with the protection provider.

[266] For the purposes of calculating $K_o$ and $K_{dd}$, a Reporting Bank shall apply PD = 0.03% where the PD is less than 0.03%.

where –

(i) "$LGD_g$" refers to the LGD associated with the facility grade to which the eligible protection provider or the underlying obligor[267] is assigned and which is estimated in accordance with Annex 7AB of Part VII, taking into account seniority and any collateralisation of the credit protection;

(ii) "$PD_g$" refers to the PD associated with the obligor grade to which the eligible protection provider is assigned which is estimated in accordance with Annex 7AB of Part VII[268];

(iii) "$PD_o$" refers to the PD associated with the obligor grade to which the underlying obligor is assigned and which is estimated in accordance with Annex 7AB of Part VII;

(iv) "M" refers to the effective maturity of the eligible credit protection calculated in accordance with Annex 7Z of Part VII, subject to a floor of one year[269];

(v) "b" shall be calculated using a value for PD that is the lower of $PD_o$ and $PD_g$; and

(vi) "$R_{dd}$" refers to the Correlation (R or R_FI) calculated in accordance with paragraph 7.4.21, 7.4.21A, 7.4.22 or 7.4.22A, as applicable, under Sub-division 7 of Division 4 of this Part, with PD equal to $PD_o$.

5.2 Pursuant to paragraph 5.1 above, the credit risk-weighted exposure amount calculated under the double default framework (Credit $RWE_{dd}$) is as follows:

$$\text{Credit } RWE_{dd} = K_{dd} \times 12.5 \times EAD_g$$

where "$EAD_g$" is the EAD of the eligible protection provider.

5.3 A Reporting Bank which has bought eligible credit protection to hedge dilution risk arising from an IRBA exposure within the IRBA eligible purchased receivables asset class may recognise the effects of CRM of the eligible credit protection under the double default framework by applying the formulae set out in paragraphs 5.1 and 5.2 above, where -

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[267] This shall either be the LGD associated with an unhedged facility to the eligible protection provider or an unhedged facility of the obligor, depending on whether in the event both the eligible protection provider and the obligor default during the life of the hedged exposure available evidence and the structure of the credit protection indicate that the amount recovered would depend on the financial condition of the eligible protection provider or obligor, respectively. There shall be no consideration of double recovery in the LGD estimate.

[268] This could also be the PD associated with some obligor grade between the obligor grades to which the underlying obligor and the eligible protection provider are assigned if the Reporting Bank considers such treatment to be appropriate, which is estimated in accordance with Annex 7AB of Part VII.

[269] For avoidance of doubt, the exceptions from the one year maturity floor described in Section 4 of Annex 7Z of Part VII do not apply when determining M under the double default framework.

(a) $PD_o$ = estimated one-year EL arising from dilution risk;

(b) $LGD_g$ = 100%; and

(c) “M” is -

(i) the average effective maturity calculated in accordance with Annex 7Z of Part VII for the relevant pool of receivables; or

(ii) one year if it can be demonstrated to the satisfaction of the Authority that the Reporting Bank is able to monitor the dilution risk and has a track record of resolving incidents of dilution or dilution events within one year.

**Annex 7H**

## TREATMENT FOR SPECIFIC TYPES OF CREDIT PROTECTION BOUGHT

Proportional Cover

1.1 Where the amount guaranteed, or against which the eligible credit protection is held, is less than the amount of the exposure and the protected and unprotected portions are of equal seniority, i.e. the Reporting Bank and the eligible credit protection provider share losses on a pro-rata basis, a Reporting Bank shall recognise the eligible credit protection on a proportional basis, i.e. by applying to the protected portion of the exposure the treatment applicable to eligible credit protection, and by treating the remainder of the exposure as unprotected.

Principal-only Cover

1.2 Where the amount guaranteed, or against which an eligible credit protection is held, offers principal-only cover, a Reporting Bank shall treat the principal amount as the protected portion and interest and other uncovered payments as the unprotected portion.

Partially Eligible Credit Derivatives

1.3 Where a Reporting Bank recognises credit protection through a credit derivative which meets all the requirements in Annex 7F of Part VII other than paragraph 4.2(f)(iii) of that Annex, it shall treat as the protected portion –

(a) 60% of the amount of the credit derivative; or

(b) 60% of the amount of the underlying exposure,

whichever is lower.

Tranched cover for Non-Securitisation Exposures

1.4 Where a Reporting Bank transfers a portion of the risk of an exposure or a pool of exposures in one or more tranches to a protection seller or sellers and the risk transferred and the risk retained are of different seniority, the Reporting Bank may recognise credit protection for either the senior tranches (e.g. second loss portion) or the junior tranches (e.g. first loss portion) only if the requirements for the recognition of risk transference for synthetic securitisation as set out in Sub-division 2 of Division 6 of Part VII are complied with.

[MAS Notice 637 (Amendment No. 2) 2017]

Tranched Cover for Securitisation Exposures

1.4A In the case of tranched cover for a securitisation exposure, a Reporting Bank shall decompose the original securitisation tranche into protected and unprotected sub-tranches[269A].

[MAS Notice 637 (Amendment No. 2) 2017]

1.4B Subject to paragraphs 1.4D to 1.4F, where a Reporting Bank provides tranched cover to a securitisation exposure, it shall calculate its capital requirement as if it is directly exposed to the particular sub-tranche of the securitisation exposure on which it is providing protection, applying the approach as determined by paragraphs 7.6.12 to 7.6.17.

[MAS Notice 637 (Amendment No. 2) 2017]

1.4C A Reporting Bank which has bought eligible credit protection shall calculate its capital requirements for the unprotected and protected sub-tranches separately in the following manner –

(a) subject to paragraphs 1.4D to 1.4F, by applying the risk weight that is applicable to the unprotected portion, and using the approach as determined by paragraphs 7.6.12 to 7.6.17 to calculate the credit risk-weighted exposure amount of the unprotected portion; and

(b) by applying the risk weight that is applicable to the eligible protection provider[269B] to the protected portion to calculate the credit risk-weighted exposure amount of the protected portion. A Reporting Bank shall perform these calculations in accordance with the method of calculation of tranche maturity in Section 6 of Annex 7Z.

[MAS Notice 637 (Amendment No. 2) 2017]

1.4D If, according to the hierarchy of approaches determined by paragraphs 7.6.12 to 7.6.17, a Reporting Bank shall use the SEC-IRBA or SEC-SA for the original securitisation exposure, the Reporting Bank shall calculate the parameters A and D separately for each of the sub-tranches as if the sub-tranches have been directly issued as separate tranches at the inception of the transaction. A Reporting Bank shall compute the value for $K_{IRB}$ or $K_{SA,}$ as the case may be on the underlying portfolio of the original transaction.

[MAS Notice 637 (Amendment No. 2) 2017]

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269A The envisioned decomposition is theoretical and it should not be viewed as a new securitisation transaction. The resulting sub-tranches are not considered resecuritisations solely due to the presence of the credit protection.

[MAS Notice 637 (Amendment No. 2) 2017]

269B Where a Reporting Bank has bought from an eligible protection provider a credit default swap which is an eligible credit protection and cleared through a CCP, the Reporting Bank may apply a risk weight of 2% if the credit default swap constitutes a CCP trade exposure in accordance with paragraph 2.1 or 2.5 of Annex 7AJ, or 4% if the credit default swap constitutes a CCP trade exposure in accordance with paragraph 2.6 of Annex 7AJ.

[MAS Notice 637 (Amendment No. 2) 2017]

1.4E If, according to the hierarchy of approaches determined by paragraphs 7.6.12 to 7.6.17, a Reporting Bank shall use the SEC-ERBA for the original securitisation exposure, the Reporting Bank shall calculate the relevant risk weights for the different sub-tranches as follows –

(a) for the sub-tranche of highest priority[269C], the Reporting Bank shall use the risk weight of the original securitisation exposure; and

(b) for a sub-tranche of lower priority –

(i) the Reporting Bank shall infer a rating from one of the tranches in the original transaction which is subordinated to the original securitisation tranche for which tranched protection is being provided. The Reporting Bank shall then apply the inferred rating to the SEC-ERBA to determine the risk weight of the sub-tranche of lower priority. The Reporting Bank shall compute tranche thickness, T, as the thickness of the sub-tranche of lower priority only; or

(ii) if it is not possible to infer a rating, the Reporting Bank shall compute the risk weight for the sub-tranche of lower priority using the SEC-SA, applying the adjustments to the determination of the parameters A and D described in paragraph 1.4D of this Annex. The risk weight for this sub-tranche shall be the greater of –

(A) the risk weight determined through the application of the SEC-SA with the adjusted A and D points; and

(B) the SEC-ERBA risk weight of the original securitisation exposure before any effects of CRM are recognised.

[MAS Notice 637 (Amendment No. 2) 2017]

1.4F Under all approaches, a Reporting Bank shall treat a lower-priority sub-tranche as a non-senior securitisation exposure even if the original securitisation exposure prior to protection is a senior securitisation exposure.

[MAS Notice 637 (Amendment No. 2) 2017]

Basket Credit Derivatives

1.5 Where a Reporting Bank recognises credit protection through an eligible first-to-default credit derivative, it shall treat as the protected portion -

(a) the notional amount of the asset in the basket of reference credits with the lowest risk-weighted exposure amount; or

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269C ‘Sub-tranche of highest priority’ only describes the relative priority of the decomposed tranche. The calculation of the risk weight of each sub-tranche is independent of whether the sub-tranche is protected (ie risk is taken by the protection provider) or unprotected (i.e. risk is taken by the protection buyer).

[MAS Notice 637 (Amendment No. 2) 2017]

(b) the notional amount of the credit protection,

whichever is lower.

1.6 Where a Reporting Bank recognises credit protection through an eligible second-to-default credit derivative and –

(a) it also has first-to-default credit protection, it shall treat as the protected portion -

(i) the notional amount of the asset in the basket of reference credits with the second lowest risk weighted exposure amount; or

(ii) the notional amount of the credit protection,

whichever is lower; or

(b) one of the reference credits has already defaulted, it shall treat as the protected portion –

(i) the notional amount of the asset in the basket of reference credits remaining with the lowest risk-weighted exposure amount; or

(ii) the notional amount of the credit protection,

whichever is lower.

**Annex 7I**

**CALCULATION OF E*, EAD* OR $EAD_{adj}$ FOR COLLATERALISED TRANSACTIONS OTHER THAN OTC DERIVATIVE TRANSACTIONS AND LONG SETTLEMENT TRANSACTIONS**

1.1 A Reporting Bank using the FC(CA) to calculate E*, EAD* or $EAD_{adj}$ shall adjust both the amount of the exposure to the counterparty[269D] and the value of any collateral received in support of that counterparty to take into account possible future fluctuations in the value of either due to market movements, by using the methods and haircuts set out in Annex 7J of Part VII.

[MAS Notice 637 (Amendment No. 2) 2017]

1.2 A Reporting Bank shall calculate the appropriate haircuts to be applied using one of the following methods:

(a) standard supervisory haircuts; or

(b) own-estimate haircuts.

1.3 A Reporting Bank which chooses to use own-estimate haircuts shall do so for the full range of instrument types for which it is eligible to use own-estimates, the exception being immaterial portfolios where it may use the standard supervisory haircuts.

1.4 As an alternative to the use of standard supervisory haircuts or own-estimate haircuts, a Reporting Bank that has received approval from the Authority to use the IMA for calculating market RWA may use VaR models to reflect the price volatility of the exposure and collateral for SFTs which are covered by a qualifying bilateral netting agreement. The requirements relating to the use of this approach are set out in Annex 7M of Part VII.

[269D] The amount of the exposure may vary where, for example, securities are being lent.

[MAS Notice 637 (Amendment No. 2) 2017]

**METHODS AND HAIRCUTS FOR RECOGNISING COLLATERAL**

**Section 1: Calculation of E*, EAD* or $EAD_{adj}$**

1.1 A Reporting Bank using standard supervisory haircuts or own-estimate haircuts under the FC(CA) shall calculate E* (or EAD* or $EAD_{adj}$), the exposure amount adjusted for eligible financial collateral, for any collateralised transaction not covered by a qualifying bilateral netting agreement or a qualifying cross-product netting agreement other than OTC derivative transactions or long settlement transactions, using the following formula:

$$E^*(\text{or } EAD^* \text{ or } EAD_{adj}) = \max\{0, [E\,(\text{or } EAD)(1 + H_E) - C(1 - H_C - H_{FX})]\}$$

where -

| | | | |
|---|---|---|---|
| (a) | $E^*$ (or $EAD^*$ or $EAD_{adj}$) | = | exposure value after risk mitigation; |
| (b) | E (or EAD) | = | fair value of the exposure calculated in accordance with Division 2 of Part VII; |
| (c) | $H_E$ | = | haircut appropriate to the exposure; |
| (d) | C | = | fair value of the eligible financial collateral received[270]; |
| (e) | $H_C$ | = | haircut appropriate to the collateral, or if the collateral is a basket of assets, the weighted sum of the haircuts appropriate to the assets in the basket where each weight is the proportion of the asset in the basket in units of currency; and |
| (f) | $H_{FX}$ | = | haircut appropriate for currency mismatch between the collateral and exposure. |

1.2 A Reporting Bank using standard supervisory haircuts or own-estimate haircuts under the FC(CA) shall calculate E* or EAD*, whichever is applicable, for any collateralised transaction covered by a qualifying bilateral netting agreement or qualifying cross-product netting agreement other than OTC derivative transactions or long settlement transactions, using the following formula:

$$E^*(\text{or } EAD^*) = \max\ \{0, [\sum(E(\text{or } EAD)) - \sum(C) + \text{add} - \text{on}]\}$$

where –

(a) $E^*$ (or $EAD^*$) = exposure value after risk mitigation;

[270] Where the residual maturity of the collateral is shorter than the residual maturity of the exposure, the Reporting Bank shall substitute $P_A$ calculated in accordance with Annex 7F of Part VII for $C(1 - H_C - H_{FX})$.

(b) E (or EAD) = fair value of the exposure calculated in accordance with Division 2 of Part VII;

(c) C = fair value of the eligible financial collateral received; and

(d) add-on = the add-on amount to reflect the market price volatility and foreign exchange volatility, calculated in accordance with paragraph 1.3 below.

1.3 A Reporting Bank shall calculate the add-on using one of the following approaches:

(a) add on = $\sum((E_S)(H_S)) + \sum((E_{FX})(H_{FX}))$

where –

(i) $E_S$ = absolute value of the net position in a given security;

(ii) $H_S$ = haircut appropriate to $E_S$;

(iii) $E_{FX}$ = absolute value of the net position in a currency different from the settlement currency; and

(iv) $H_{FX}$ = haircut appropriate for currency mismatch between the collateral and exposure; or

(b) using VaR models in accordance with Annex 7M of Part VII, provided it has received approval from the Authority to use the IMA for calculating market RWA.

1.4 Subject to paragraphs 1.5 to 1.7, a Reporting Bank shall determine $H_E$, $H_C$, $H_S$ and $H_{FX}$ referred to in paragraphs 1.1 to 1.3 above, in accordance with the standard supervisory haircuts in Section 2 of this Annex.

1.5 A Reporting Bank may calculate $H_E$, $H_C$, $H_S$ and $H_{FX}$ using own-estimate haircuts in accordance with Section 3 of this Annex if it has received approval from the Authority to use the IMA for calculating market RWA. If the Reporting Bank chooses to use own-estimate haircuts, it shall do so consistently for determining haircuts for all eligible financial collateral and all portfolios, except that it may, with the approval of the Authority, use the standard supervisory haircuts in Section 2 of this Annex for any portfolio which is immaterial in size and risk profile.

1.6 A Reporting Bank may apply a value of zero to $H_E$, $H_C$ and $H_S$[271] in the case of a qualifying SFT with a core market participant.

1.7 A Reporting Bank may apply a value of zero to $H_E$, $H_C$ and Hs in the case of an SFT where both the exposure and collateral are securities issued by the Government, or by other central governments where a value of zero has been prescribed by the bank regulatory agency of that jurisdiction and exposures to the central government of that

[271] This approach is not available to a Reporting Bank using VaR models in accordance with Annex 7M of Part VII to calculate E* or EAD*, whichever is applicable.

jurisdiction have a credit quality grade of "1" as set out Table 7R-1 of Annex 7R of Part VII.

**Section 2: Standard Supervisory Haircuts**

2.1 The standard supervisory haircuts, $H_E$, $H_C$ and $H_S$ (assuming daily remargining and daily revaluation (i.e. mark-to-market) and a ten-business day holding period), are as follows:

**Table 7J-1 - Standard Supervisory Haircuts**

| Eligible Financial Collateral | | Standard Supervisory Haircuts | | |
|---|---|---|---|---|
| **Issue Rating for Debt Securities** | **Residual Maturity** | **Central Governments or Central Banks** | **Other Issuers** | **Securitisation Exposures** |
| Any debt security with a credit quality grade of "1" or short-term credit quality grade of "I" | ≤ 1 year | 0.005 | 0.01 | 0.02 |
| | > 1 year, ≤ 5 years | 0.02 | 0.04 | 0.08 |
| | > 5 years | 0.04 | 0.08 | 0.16 |
| Any debt security with a credit quality grade of "2" and "3" or short-term credit quality grade of "II" and "III" | ≤ 1 year | 0.01 | 0.02 | 0.04 |
| | > 1 year, ≤ 5 years | 0.03 | 0.06 | 0.12 |
| | > 5 years | 0.06 | 0.12 | 0.24 |
| Any debt security with a credit quality grade of "4" | All | 0.15 | NA | NA |
| Gold | | 0.15 | | |
| Any equity (including a convertible bond) in a main index | | 0.15 | | |
| Any other equity (including a convertible bond) listed on an approved exchange or an overseas exchange | | 0.25 | | |
| Any unit in a collective investment scheme | | 0.25 or highest haircut applicable to any security in which the fund can invest | | |
| Cash in the same currency as the underlying exposure | | 0 | | |
| Instruments in the trading book other than those listed above (for pre-settlement counterparty exposures arising from repo-style transactions, i.e. repo, reverse repo, securities lending or securities borrowing transactions, included in the trading book) | | 0.25 | | |

[MAS Notice 637 (Amendment) 2014]
[MAS Notice 637 (Amendment No. 2) 2014]
[MAS Notice 637 (Amendment) 2018]
[MAS Notice 637 (Amendment No. 2) 2018]

2.2 Notwithstanding paragraph 2.1 above, the standard supervisory haircut, $H_{E,}$ for transactions in which a Reporting Bank lends instruments that do not qualify as eligible financial collateral (e.g. corporate debt securities with a credit quality of “4” or worse) is 0.25.

2.3 The standard supervisory haircut, $H_{FX}$, for currency mismatch where exposure and collateral are denominated in different currencies based on a ten-business day holding period and daily revaluation is 0.08.

2.4 Where the minimum holding period, frequency of remargining or revaluation assumptions set out in paragraph 2.1 differ from those of the Reporting Bank, the Reporting Bank shall adjust $H_{E,}$ $H_C$, $H_{FX}$ and $H_S$ using the formulae in Section 4 of this Annex.

[MAS Notice 637 (Amendment No. 2) 2014]

**Section 3: Own-estimate Haircuts**

Application to Use Own-estimate Haircuts

3.1 A Reporting Bank shall apply for approval from the Authority if it intends to use own-estimate haircuts. A Reporting Bank shall not use own-estimate haircuts unless it has received approval to adopt the IMA to calculate market RWA.

3.2 The Authority may grant approval for a Reporting Bank to use own-estimate haircuts subject to such conditions or restrictions as the Authority may impose.

3.3 If a Reporting Bank becomes aware after it has received approval to use own-estimate haircuts that it no longer complies with any of the requirements in this Annex or any of the conditions or restrictions imposed by the Authority pursuant to paragraph 3.2 above or no longer meets the guidelines in this Annex, it shall -

(a) inform the Authority as soon as practicable;

(b) assess the effect of the situation in terms of the risk posed to the Reporting Bank;

(c) prepare a plan to rectify the situation and inform the Authority of its plan as soon as practicable; and

(d) undertake prompt corrective action within a reasonable time in accordance with the plan prepared pursuant to sub-paragraph (c) above.

3.4 If a Reporting Bank fails to comply with paragraph 3.3, the Authority may revoke its approval for the Reporting Bank to use own-estimate haircuts. The Reporting Bank may also be required to revise its estimates for the purpose of calculating regulatory capital requirements if its estimates of E*, EAD* or $EAD_{adj}$, whichever is applicable, does not adequately reflect its exposure to CCR.

Requirements for Use of Own-estimate Haircuts

3.5 A Reporting Bank using own-estimate haircuts shall estimate the volatility for each individual instrument that is taken as eligible financial collateral. In estimating such volatility, the Reporting Bank shall not take into account the correlations between unsecured exposures, collateral and exchange rates. Where there are maturity mismatches, the Reporting Bank shall apply Section 6 of Annex 7F of Part VII.

3.6 A Reporting Bank shall ensure that the model used to estimate volatilities captures all the material risks run by it.

3.7 In calculating the haircuts using internal estimates of volatilities, a Reporting Bank shall -

(a) use a 99th percentile, one-tailed confidence interval;

(b) use the minimum holding period and remargining or revaluation conditions according to the type of transaction as set out in Table 7J-2 in Section 4 of this Annex. Where the minimum holding period, remargining or revaluation conditions used by a Reporting Bank differ from those set out above, it shall adjust the haircuts using the formulae in paragraphs 4.2 and 4.3 of this Annex[272];

(c) use a historical observation period (i.e. sample period) of at least one year. Where the Reporting Bank uses a weighting scheme or other methods for the historical observation period, the "effective" observation period shall be at least one year (i.e. the weighted average time lag of the individual observations shall not be less than six months);

(d) update its data sets at least once every three months and whenever there are material changes to the market prices of the collateral. The Reporting Bank shall recalculate haircuts at least once every three months. The Authority may require more frequent updates or require a Reporting Bank to calculate the haircuts using a shorter observation period whenever there is an increase in volatility in market prices of the collateral[273]; and

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272 Notwithstanding the minimum holding periods set out in this Annex, a Reporting Bank shall take into account the illiquidity of lower quality collateral. A Reporting Bank should adjust the holding period upwards in cases where such a holding period would be inappropriate given the liquidity of the collateral; and identify where historical data may understate potential volatility (e.g. a pegged currency). A Reporting Bank shall deal with such cases by subjecting the data to stress testing. A Reporting Bank, when considering the market liquidity of a collateral, should consider four dimensions: (i) immediacy, which refers to the speed with which a trade of a given size at a given cost is completed; (ii) depth, which refers to the maximum size of a trade for any given bid-ask spread; (iii) tightness, which refers to the difference between buy and sell prices; and (iv) resiliency, which refers to how quickly prices revert to original or fundamental levels after a large transaction. The Reporting Bank should have experienced persons familiar with the relevant market for the collateral to judge the market liquidity of the collateral and determine if the minimum holding period is sufficient for any given collateral. The holding period should be deemed to be insufficient if the value of the collateral would move by more than 1% should the collateral be liquidated within the minimum holding period in this Annex, taking into account the immediacy, depth, tightness and resiliency of the market. In such a situation, the holding period should be adjusted upwards, such that the collateral can be safely liquidated within the period, without causing a price movement of more than 1% relative to the value after the haircut.

273 A Reporting Bank should aim to update its data sets daily in line with industry practice. In addition, where the updating of data sets is less frequent, the Authority will normally expect compensating controls in the form of stress testing.

(e) use the estimated volatility data in the day-to-day risk management process of the Reporting Bank and if the Reporting Bank is using a longer holding period for risk management compared to the ones prescribed in Section 4 of this Annex, then the longer holding period shall also be applied for the calculation of haircuts.

3.8 A Reporting Bank shall have robust processes in place for ensuring compliance with documented internal policies, controls and procedures concerning the operation of the risk measurement system to support the use of own-estimate haircuts. The risk measurement system shall be used in conjunction with internal exposure limits.

3.9 A Reporting Bank shall ensure that its risk management processes relating to the use of own-estimate haircuts are subject to internal audit at least once a year, covering, at a minimum, the following areas:

(a) the integration of risk measures into daily risk management;

(b) the validation of any significant change in the risk management process;

(c) the accuracy and completeness of position data;

(d) the verification of the consistency, timeliness and reliability of data sources used to run internal models, including the independence of such data sources; and

(e) the accuracy and appropriateness of volatility assumptions.

3.10 A Reporting Bank shall not confuse such internal audits with an internal validation of the risk management systems surrounding the use of own-estimate haircuts. All significant risk models employed to support the use of own-estimate haircuts shall be validated at least once a year. The internal audits serve as an independent process check to help ensure that the validation is sufficiently robust and effective.

**Section 4: Minimum Holding Periods, Remargining or Revaluation Conditions**

4.1 The following table sets out the minimum holding periods and remargining or revaluation conditions for different types of transactions:

[MAS Notice 637 (Amendment No. 2) 2014]

**Table 7J-2 - Minimum Holding Periods and Remargining/Revaluation Conditions**

| Transaction type | Minimum holding period[273A] | Remargining/Revaluation Condition |
|---|---|---|
| Repos, reverse repos, securities lending or securities borrowing transactions | 5 business days | daily remargining |
| OTC derivative transactions and margin lending transactions | 10 business days | daily remargining |
| Secured lending | 20 business days | daily revaluation |

[MAS Notice 637 (Amendment) 2012]

4.2 Where the assumed minimum holding period is not met or remargining or revaluation conditions are not fulfilled, a Reporting Bank shall calculate the applicable haircut using the following formula:

$$H = H_M \sqrt{[N_R + (T_M - 1)]/ T_M}$$

where -

(a) "H" refers to the haircut;

(b) "$H_M$" refers to the haircut under the minimum holding period;

(c) "$T_M$" refers to the minimum holding period for the type of transaction; and

(d) "$N_R$" refers to the actual number of business days between remargining or revaluation, as the case may be.

[MAS Notice 637 (Amendment No. 2) 2014]

4.3 When a Reporting Bank calculates the volatility on a $T_N$ day holding period which is different from the specified minimum holding period, $T_M$, the Reporting Bank shall calculate $H_M$ using the following formula:

$$H_M = H_N \sqrt{(T_M/T_N)}$$

where -

(a) "$T_N$" refers to the holding period used by the Reporting Bank for deriving $H_N$; and

(b) "$H_N$" refers to the haircut based on the holding period $T_N$.

[MAS Notice 637 (Amendment No. 2) 2014]

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273A Where the Reporting Bank has a transaction or netting set which meets the criteria set out in paragraph 6.5(a) of Annex 7Q, the minimum holding period shall be the margin period of risk that applies under that paragraph.

274 [Deleted by MAS Notice 637 (Amendment No. 2) 2014]

4.4 For example, for a Reporting Bank using the standard supervisory haircuts, the ten-business day haircuts provided in paragraph 2.1 of this Annex shall be the basis and this haircut shall be scaled up or down depending on the type of transaction and the frequency of remargining or revaluation using the formula below:

$$H = H_{10} \sqrt{[N_R + (T_M - 1)]/ 10}$$

where -

(a) "H" refers to the haircut;

(b) "$H_{10}$" refers to ten-business day standard supervisory haircut for the eligible financial collateral;

(c) "$T_M$" refers to the minimum holding period for the type of transaction; and

(d) "$N_R$" refers to the actual number of business days between remargining or revaluation, as the case may be.

[MAS Notice 637 (Amendment No. 2) 2014]

**QUALIFYING SFTs**

A qualifying SFT shall comply with the following requirements:

(a) both the exposure and the collateral are cash, or a security issued by a central government or central bank qualifying for a 0% risk weight under the SA(CR);[275]

(b) both the exposure and the collateral are denominated in the same currency;

(c) either the transaction is overnight or both the exposure and the collateral are marked-to-market daily and are subject to daily remargining;

(d) following a counterparty's failure to remargin, the time that is required between the last mark-to-market before the failure to remargin and the liquidation[276] of the collateral is considered to be no more than four business days;

(e) the transaction is settled across a recognised settlement system for that type of transaction;

(f) the documentation covering the agreement is standard market documentation for repos, reverse repos, securities lending transactions or securities borrowing transactions in the securities concerned;

(g) the transaction is governed by documentation specifying that if the counterparty fails to satisfy an obligation to deliver cash or securities or to deliver margin, or otherwise defaults, then the transaction may be terminated immediately; and

(h) upon any event of default, regardless of whether the counterparty is insolvent or bankrupt, the Reporting Bank has the unfettered, legally enforceable right to immediately seize and liquidate the collateral for the benefit of the Reporting Bank.

[275] This requirement would be satisfied for domestic-currency claims if a bank regulatory agency designates domestic-currency claims on its central government or central bank to be eligible for a 0% risk weight under the SA(CR).

[276] A Reporting Bank is not required to liquidate the collateral, but rather shall have the capability to do so within the given time frame.

## CORE MARKET PARTICIPANTS

"Core market participant" means -

(a) any central government or central bank;

(b) any PSE;

(c) any qualifying MDB;

(d) any banking institution;

(e) any financial institution eligible for a 20% risk weight under the SA(CR); or

(f) an approved clearing house in respect of a clearing facility as defined in the Securities and Futures Act (Cap. 289) which is regulated by the Authority, or a clearing house utilised by an exchange referred to in the Securities and Futures (Recognised Securities Exchange) Order 2005 in respect of a clearing facility which is regulated by a financial services regulatory authority of a country or territory other than Singapore.

[MAS Notice 637 (Amendment) 2012]
[MAS Notice 637 (Amendment) 2013]

**REQUIREMENTS FOR USE OF VAR MODELS**

A Reporting Bank using VaR models shall -

(a) use a minimum holding period of 10-business days except in the case of repos, reverse repos, securities lending or securities borrowing transactions, for which it shall use a minimum holding period of five business days[277];

[MAS Notice 637 (Amendment) 2012]

(b) backtest its output by -

(i) identifying a sample of 20 counterparties, on an annual basis, which shall include the ten largest counterparties as determined by the bank according to its own exposure measurement approach and ten others selected at random;

(ii) comparing, for each day and for the sample of 20 counterparties, the VaR estimate of the previous day for the counterparty portfolio to the difference between the net value of the previous day's portfolio using today's market prices and the net value of that portfolio using the previous day's market prices; and

(iii) counting it as an exception, where this difference exceeds the previous day's VaR estimate; and

(c) calculate the add-on for the purposes of paragraph 1.3(b) of Annex 7J of Part VII as follows:

Add-on = (VaR output) x (VaR multiplier),

where the VaR multiplier is determined by the number of exceptions in the observations for a sample of 20 counterparties over the most recent 250 days (encompassing 5,000 observations) using the table below[278]:

[277] A Reporting Bank should adjust the minimum holding period upwards for any financial instrument where the specified holding period would be inappropriate given the liquidity of the instrument concerned. At a minimum, where the Reporting Bank has a transaction or netting set which meets the criteria set out in paragraph 6.5 of Annex 7Q, the minimum holding period shall be the margin period of risk that applies under that paragraph.

[278] When the outcome of the model consistently results in a large number of exceptions, either overall or for one significant counterparty, the Reporting Bank is expected to review the model assumptions and make modifications as appropriate.

**Table 7M-1 - VaR multiplier**

| Zone | Number of exceptions | Multiplier |
|---|---|---|
| Green | 0-19 | 1.00 |
| | 20-39 | 1.00 |
| | 40-59 | 1.00 |
| | 60-79 | 1.00 |
| | 80-99 | 1.00 |
| Yellow | 100-119 | 1.13 |
| | 120-139 | 1.17 |
| | 140-159 | 1.22 |
| | 160-179 | 1.25 |
| | 180-199 | 1.28 |
| Red | 200 or more | 1.33 |

**Annex 7N**

## QUALIFYING BILATERAL NETTING AGREEMENTS AND QUALIFYING CROSS-PRODUCT NETTING AGREEMENTS

### Section 1: Introduction

1.1 A qualifying bilateral netting agreement is a bilateral netting agreement in respect of which the requirements set out in Sections 3 to 5 below are complied with.

1.2 A qualifying cross-product netting agreement is a cross-product netting agreement in respect of which the requirements set out in Sections 3 to 6 below are complied with.

### Section 2: Scope of Application

2.1 A qualifying bilateral netting agreement involves a group of transactions between a Reporting Bank and a counterparty containing transactions in only one of the following product categories (collectively "Transactions"):

(a) OTC derivative transaction;

(b) repo, reverse repo, securities or commodities lending transaction and securities or commodities borrowing transaction; or

(c) margin lending transaction.

2.2 A qualifying cross-product netting agreement involves a group of transactions between a Reporting Bank and a counterparty containing transactions in two or more of the product categories set out in paragraph 2.1 above.

### Section 3: Requirements for Netting Agreements

3.1 Subject to this Section and Sections 4 and 5, a Reporting Bank shall –

(a) obtain a written independent legal opinion confirming that the netting agreement is valid, effective and enforceable for each of the following jurisdictions:

(i) the jurisdiction in which the counterparty is incorporated or established;

(ii) if a foreign branch of the Reporting Bank or the counterparty has entered or will be entering into the Transaction, the jurisdiction in which the branch of the Reporting Bank or the counterparty, as the case may be, is located;

(iii) the jurisdiction whose law governs the netting agreement; and

(iv) the jurisdiction whose law governs any Transaction subject to the netting agreement if different from sub-paragraph (iii),

(referred to as "relevant jurisdictions" in this Annex) and which satisfies the requirements set out in Section 4;

(b) in relation to a netting agreement containing transactions in paragraph 2.1(b) and (c) above, ensure that -

(i) the netting agreement –

(A) provides the non-defaulting party the right to terminate and close out in a timely manner all transactions upon the occurrence of a termination event as defined in the netting agreement, including the default or insolvency of the defaulting party; and

(B) allows for the prompt liquidation or set-off of collateral upon the event of default; and

(ii) where the netting agreement covers transactions in both the banking book and trading book, –

(A) the transactions are marked-to-market daily[278A]; and

(B) the collateral in the transactions are recognised as eligible financial collateral in the banking book in accordance with Annex 7F of Part VII; and

(c) provide to the Authority the information and documents set out in paragraphs 3.2 and 3.3.

3.2 A Reporting Bank shall provide to the Authority a summary listing[279] of the source and date of each legal opinion obtained for the purposes of paragraph 3.1(a), stating in each case, whether such legal opinion was commissioned specifically by the Reporting Bank, by the Reporting Bank collectively with any other party, or by some other third party. The summary listing should be provided at least once every 12 months, but in any case shall be provided no later than 15 months from the previous submission.

3.3 The Authority may, where it considers it necessary, require a Reporting Bank to provide copies of, or access to, the netting agreement and the legal opinions obtained for the purposes of paragraph 3.1(a).

[278A] The holding period for the haircuts will depend on the frequency of margining.

[279] This can be prepared by either the external or internal legal adviser of the Reporting Bank.

**Section 4: Legal Opinions obtained for purposes of paragraph 3.1(a)**

4.1 A legal opinion shall —

(a) be in the form of a memorandum of law and addressed directly to the Reporting Bank or the sponsors of a particular netting agreement or form of netting agreement[280]; or

(b) be the product of a number of parties (including the Reporting Bank) pooling together to seek a collective opinion on a particular netting agreement.

4.2 Each legal opinion shall confirm that in an event of default as defined under the netting agreement, including liquidation, bankruptcy or other similar circumstance of either the counterparty or the Reporting Bank, the courts and administrative authorities[281] of the relevant jurisdiction will find that the claims and obligations of the Reporting Bank pursuant to the relevant Transactions would be limited to a net sum calculated in accordance with the netting agreement under the law of the relevant jurisdiction.

4.3 In addition, each legal opinion shall[282] -

(a) highlight the material clauses in the netting agreement that provide for the netting of Transactions ("material netting clauses");

(b) confirm that the unenforceability or illegality of any clause (other than a material netting clause) in the netting agreement is unlikely to undermine the material netting clauses referred to in sub-paragraph (a) above;

(c) state the circumstances under which the netting agreement may be relied upon, including -

(i) the legal form of, or activities conducted by, the counterparty; and

(ii) whether certain counterparties (such as banks, insurance companies or local authorities) may be subject to special rules relating to insolvency as a result of the legal form of, or activities conducted by, the counterparties;

(d) state whether the netting or other default provisions in the netting agreement are enforceable or enforceable differently (and if so, the extent of the difference) in a non-liquidation event, such as administration, judicial management, receivership, voluntary arrangement and a scheme of arrangement;

(e) state to what extent, if at all, the netting needs to be reflected in the records of the counterparties in order for it to be valid, effective and enforceable;

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[280] The Authority would normally consider independent legal opinions commissioned and collated by ISDA as complying with the requirements set out in paragraphs 4.1 to 4.6 of this Annex.

[281] This includes a court-appointed administrator and an administrator appointed by a regulatory authority.

[282] This is not intended to be an exhaustive list of all the matters that should be covered in a legal opinion obtained for the purposes of paragraph 3.1(a).

(f) state whether a court or administrative authority in the jurisdiction covered by the legal opinion would uphold the rate chosen for the conversion of foreign currency obligations for the purpose of calculating the close-out amount and whether there are any statutory or other applicable rules that may affect this aspect of the netting agreement;

(g) state whether, under the law of the jurisdiction covered by the legal opinion, it is necessary for the enforceability of the netting that all Transactions be regarded as part of a single agreement, and if so, whether there is anything in the close-out methodology which may be held to be inconsistent with the treatment of all Transactions as part of a single agreement and the effect it may have on the netting;

(h) state whether there is any reason to believe that the netting agreement would be unenforceable because of the law of another jurisdiction;

(i) state whether there is any preference specified in the netting agreement for automatic rather than optional close-out, and if so, whether such preference would affect the enforceability of the netting agreement;

(j) state whether there are legal problems in exercising any discretion or flexibility provided for in the netting agreement, and if so, whether such problems affect the enforceability of the netting agreement; and

(k) if other clauses are added to a standard form agreement, confirm that such additional clauses do not throw any reasonable doubt or affect the overall validity, effectiveness or enforceability of the netting agreement.

4.4 The Authority is aware that it may not be possible for a Reporting Bank to obtain a legal opinion that provides a definitive view on the validity, effectiveness and enforceability of the netting agreement without certain assumptions or qualifications. The presence *per se* of assumptions and qualifications within the legal opinion will not render the legal opinion unsatisfactory for the purposes of this Notice. However, the assumptions underlying the legal opinion shall not be unduly restrictive. They shall be specific, be of a factual nature and be adequately explained within the legal opinion. Where qualifications are made, these shall be specific and their effect shall be adequately explained within the legal opinion. A Reporting Bank shall examine and assess the assumptions and qualifications in the legal opinion.

4.5 If the Reporting Bank determines that —

(a) the absence of any of the information listed in paragraph 4.3; or

(b) any of the assumptions or qualifications in the legal opinion,

gives rise to reasonable doubt as to the validity, effectiveness or enforceability of the netting agreement, the Reporting Bank shall not treat the netting agreement as a qualifying bilateral netting agreement or a qualifying cross-product netting agreement, as the case may be.

4.6 In this regard, where there is more than one relevant jurisdiction in relation to a netting agreement, the Reporting Bank shall not treat the netting agreement as a

qualifying bilateral netting agreement or a qualifying cross-product netting agreement, as the case may be, if the Reporting Bank has any reasonable doubt, based on its own evaluation of the legal opinions, as to whether the netting agreement is valid, effective and enforceable in any relevant jurisdiction considering the potential for conflicts of laws and whether action may be taken by insolvency officials in other jurisdictions.

4.7 The Reporting Bank shall review each legal opinion and obtain updates thereto, either in the form of a fresh legal opinion or a letter from an external firm of lawyers confirming that the opinion on the validity, effectiveness and enforceability of the netting agreement remains unchanged. Each legal opinion should be reviewed at least once every 12 months, but in any case shall be reviewed no later than 15 months from the previous review. The Reporting Bank shall also document the sources of the legal opinions, and the expertise of the persons giving the legal opinions.

4.8 Notwithstanding paragraph 3.1(a), where any relevant jurisdiction does not recognise netting or recognises netting only in a limited form, the Reporting Bank shall report Transactions for which that jurisdiction is a relevant jurisdiction on a gross basis. All other Transactions under the same netting agreement may be reported on a net basis.

4.9 The Reporting Bank shall alert the Authority when it becomes aware of any relevant jurisdiction that does not recognise netting or recognises netting only in a limited form (whether as to certain products, or with counterparties of certain legal forms or counterparties performing certain activities).

4.10 Where a Reporting Bank is aware that a supervisory authority of the counterparty of the Reporting Bank (whether the supervisory authority is the home or host supervisor) is not satisfied that a netting agreement is legally valid, effective or enforceable under the law of the jurisdiction of that supervisory authority, the Reporting Bank shall not treat the netting agreement as a qualifying bilateral netting agreement or a qualifying cross-product netting agreement, as the case may be, notwithstanding any legal opinion obtained by the Reporting Bank.

**Section 5: Policies, Systems and Controls**

5.1 A Reporting Bank shall have in place a netting policy that sets out, as a minimum, the following:

(a) the person responsible for setting and reviewing the policy on netting;

(b) the frequency of review of the netting policy;

(c) the person responsible for approving the application of a netting agreement to any Transaction (including determining whether the netting agreement is covered by an existing legal opinion or whether separate legal opinions are required);

(d) how the Reporting Bank monitors legal developments affecting its netting agreements and the need to obtain additional legal opinions;

(e) what the Reporting Bank is to include in its netting agreements to ensure that its interests, rights and obligations are duly reflected; and

(f) the processes for determining and reporting net exposures to individual counterparties.

5.2 The Reporting Bank shall also have in place adequate systems and controls to monitor the Transactions, including systems and controls to ensure that -

(a) only Transactions entered into by the Reporting Bank with a counterparty that are covered by a netting agreement are netted;

(b) net exposures to individual counterparties are accurately determined and reported[283];

(c) documentary evidence of the Transactions subject to netting are maintained and appropriately safeguarded and the Reporting Bank is able to produce such documentary evidence, if required by the Authority;

(d) the legal opinions are not superceded by subsequent changes in the laws of the relevant jurisdictions. The following shall be duly documented and should be updated at least once every 12 months, but in any case, shall be updated no later than 15 months from the previous update:

(i) the types of counterparties and Transactions covered by each netting agreement; and

(ii) the relevant jurisdictions for each netting agreement to which the Reporting Bank is a party. The Reporting Bank shall note any jurisdiction for which any doubt may exist as to the legal validity, effectiveness or enforceability of netting and what action the Reporting Bank has taken as a result;

(e) counterparty limits are monitored in terms of such net exposures; and

(f) potential roll-off exposures, which occur upon maturity of short-dated obligations that are netted against longer dated claims, are monitored.

5.3 A Reporting Bank shall maintain all necessary documentation in relation to meeting the requirements in Sections 3 and 4 of this Annex at all times.

[MAS Notice 637 (Amendment No. 2) 2014]

**Section 6: Qualifying Cross-Product Netting Agreement**

6.1 A Reporting Bank may recognise the effect of a qualifying cross-product netting agreement only if it has received approval to use the CCR internal models method for estimating its pre-settlement counterparty exposures.

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283 A Reporting Bank should have systems in place which are capable of aggregating net exposures to each counterparty on a global basis including each branch of the Reporting Bank against each branch of the counterparty.

6.2 A Reporting Bank shall have a legally valid, effective and enforceable cross-product netting agreement in place with its counterparty in respect of which the requirements set out in Sections 3 and 4 above are complied with.

6.3 A Reporting Bank shall also have in place adequate policies, systems and controls to monitor the Transactions under a cross-product netting agreement and shall comply with the requirements in Section 5 above.

6.4 In addition to Sections 3 to 5 above, a Reporting Bank shall ensure the following:

(a) the cross-product netting agreement clearly specifies all included bilateral master agreements and Transactions;

(b) the cross-product netting agreement provides that in the event of default including liquidation, bankruptcy and other similar circumstances of either counterparty or upon the occurrence of a termination event as defined in the cross-product netting agreement, the values of all included Transactions shall be combined and reduced to a single payable sum;

(c) the legal opinion referred to in Section 4 addresses the validity, effectiveness and enforceability of the entire cross-product netting agreement under its terms and the impact of the cross-product netting agreement on the material provisions of any included bilateral master agreement;

(d) the net sum referred to in paragraph 4.2 is the net sum of the positive and negative close-out values of any included individual bilateral master agreement and of the positive and negative marked-to-market value of the individual Transactions;

(e) procedures are put in place pursuant to paragraph 5.2(d) to verify that any included Transaction is covered by a legal opinion which complies with the requirements set out in Sections 3, 4 and 6 of this Annex; and

(f) all included bilateral master agreements and transactions comply with the requirements set out in Sections 3 and 4 of this Annex, or paragraph 1.1 of Annex 7F of this Part..

6.5 A Reporting Bank shall manage its CCR by factoring the effects of netting in its measurement of the aggregate credit risk exposure of each counterparty.

6.6 A Reporting Bank shall aggregate exposures to each counterparty to arrive at a single exposure across Transactions and to factor this aggregation into its internal credit limit setting and monitoring processes for each counterparty. A Reporting Bank shall also incorporate the aggregated exposure for each counterparty into its internal economic capital process.

**STANDARDISED APPROACH FOR COUNTERPARTY CREDIT RISK (SA-CCR)**

**Section 1: Overview**

1.1 Subject to Section 4 of this Annex, a Reporting Bank using the SA-CCR shall calculate E or EAD, whichever is applicable, for the pre-settlement counterparty exposure to a single counterparty arising from OTC derivative or exchange-traded derivative transactions, or long settlement transactions[284] separately for margined and unmargined netting sets as follows[285]:

$$E\ or\ EAD = alpha \times (RC + PFE)$$

where -

(a) $alpha$ = 1.4;

(b) $RC$ = the replacement cost calculated in accordance with Section 2 of this Annex; and

(c) $PFE$ = the amount for potential future exposure calculated in accordance with Section 3 of this Annex.

1.2 A Reporting Bank shall calculate RC and PFE differently for margined and unmargined netting sets in accordance with Sections 2 to 4 of this Annex. A Reporting Bank may cap the E or EAD, whichever is applicable, for a margined netting set, at the E or EAD, whichever is applicable of the same netting set, calculated based on the formulas for unmargined transactions.

**Section 2: Replacement Cost**

2.1 For unmargined transactions (that is, where variation margin is not exchanged, but collateral other than variation margin may be present), a Reporting Bank shall calculate RC using the following formula:

$$RC = max\{V - C; 0\}$$

where -

(a) $V$ is the value of the derivative transactions in the netting set; and

(b) $C$ is the haircut value of net collateral held, which in the case of unmargined transactions, is NICA adjusted by applying the supervisory haircuts or own-estimate haircuts such that the value of collateral posted by the Reporting Bank

[284] A Reporting Bank shall calculate the pre-settlement counterparty exposure arising from a long settlement transaction using the SA-CCR if the Reporting Bank does not have approval to apply the CCR internal models method. In such a case, this Annex shall be read with reference to a long settlement transaction.

[285] The Reporting Bank may set E or EAD, whichever is applicable, to zero only for sold options that are not under a qualifying bilateral netting agreement and margin agreement.

to its counterparty is increased, and the value of collateral received by the Reporting Bank from its counterparty is decreased.

2.2 A Reporting Bank shall treat bilateral transactions with a one-way margining agreement in favour of the Reporting Bank's counterparty (that is, where the Reporting Bank posts but does not collect collateral under the margining agreement) as unmargined transactions.

2.3 For margined transactions, a Reporting Bank shall calculate RC using the following formula:

$$RC = max\{V - C; TH + MTA - NICA; 0\}$$

where –

(a) $V$ is the value of the derivative transactions in the netting set;

(b) $C$ is the haircut value of net collateral held, including both variation margin and NICA;

(c) $TH$ is the positive margin threshold where the counterparty would post collateral to the Reporting Bank;

(d) $MTA$ is the minimum transfer amount applicable to the counterparty; and

(e) $NICA$ is the net independent collateral amount.

**Section 3: Potential Future Exposure**

3.1 A Reporting Bank shall calculate PFE using the following formula:

$$PFE = multiplier \times AddOn^{aggregate}$$

where –

(a) $AddOn^{aggregate}$ is the aggregate add-on calculated in accordance with paragraph 3.2 of this Annex; and

(b) multiplier is calculated using the following formula:

$$multiplier = min\left\{1; Floor + (1 - Floor) \times exp\left(\frac{V - C}{2 \times (1 - Floor) \times AddOn^{aggregate}}\right)\right\}$$

where –

(i) $exp(\ldots)$ is the exponential function;

(ii) $Floor$ = 5%; and

(iii) $V$ and $C$ are calculated as set out in paragraph 2.1 for unmargined netting sets or paragraph 2.3 of this Annex for margined netting sets, whichever is applicable.

Aggregate add-on across asset classes

3.2 A Reporting Bank shall calculate the aggregate add-on, $AddOn^{aggregate}$, using the following formula:

$$AddOn^{aggregate} = \sum_{asset\ class} AddOn^{asset\ class}$$

where $AddOn^{asset\ class}$ is the respective add-on for each asset class calculated in accordance with paragraphs 3.9 to 3.14 of this Annex.[286]

Allocation of transactions to one or more asset classes

3.3 Subject to paragraph 3.5 of this Annex, a Reporting Bank shall allocate each transaction to one of the five asset classes (that is, interest rate, foreign exchange, credit, equity, commodity) on the basis of the primary risk factor of the transaction, defined by the transaction's underlying instrument[287].

3.4 For more complex transactions that have more than one risk factor[288], a Reporting Bank shall take sensitivities and volatilities of the underlying instrument into account for determining the primary risk factor.

3.5 The Authority may, by notice in writing, require a Reporting Bank to allocate more complex transactions to more than one asset class, resulting in the same position being included in multiple asset classes. Where the Authority requires a Reporting Bank to allocate a transaction to more than one asset class, the Reporting Bank shall determine appropriately the sign and supervisory delta adjustment of the relevant risk factor for each asset class to which the transaction is allocated.

Hedging sets within each asset class

3.6 Subject to paragraphs 3.7 and 3.8 of this Annex, a Reporting Bank shall group transactions into hedging sets within each asset class as follows:

(a) Interest rate derivatives into separate hedging sets for each currency;

(b) Foreign exchange derivatives into separate hedging sets for each currency pair;

(c) Credit derivatives into a single hedging set;

(d) Equity derivatives into a single hedging set; and

(e) Commodity derivatives into four separate hedging sets according to the following categories of commodity derivatives:

(i) Energy;

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[286] For the avoidance of doubt, diversification benefits across asset classes are not recognised.

[287] For example, an interest rate curve for an interest rate swap, a reference entity for a credit default swap, a foreign exchange rate for a foreign exchange call option, etc.

[288] For example, multi-asset or hybrid derivatives.

(ii) Metals;

(iii) Agricultural commodities; and

(iv) Other commodities.

3.7 A Reporting Bank shall group transactions that reference the basis between two risk factors and are denominated in a single currency (that is, basis transactions) into separate hedging sets within the corresponding asset class[289]. The Reporting Bank shall treat derivatives with two floating legs that are denominated in different currencies (such as cross-currency swaps) as non-basis foreign exchange transactions, rather than basis transactions.

3.8 A Reporting Bank shall group transactions that reference the volatility of a risk factor (that is, volatility transactions) into separate hedging sets within the corresponding asset class. The Reporting Bank shall apply the same hedging set construction set out in paragraph 3.6 of this Annex to volatility hedging sets, for example, all equity volatility transactions form a single hedging set[290].

Add-on for interest rate derivatives

3.9 A Reporting Bank shall calculate the add-on for interest rate derivatives, $AddOn^{IR}$, as the sum of the add-ons for each hedging set of interest rate derivatives transacted with a counterparty in a netting set, as follows:

$$AddOn^{IR} = \sum_{j} AddOn_j^{IR}$$

where $AddOn_j^{IR}$ is the hedging set-level add-on for hedging set 'j' calculated using the following formula:

$$AddOn_j^{IR} = SF_j^{IR} \times EffectiveNotional_j^{IR}$$

where -

(a) $SF_j^{IR}$ is the interest rate supervisory factor specified in Table 7O-1; and

289 There is a separate hedging set for each pair of risk factors (that is, for each specific basis). Within the hedging set, long and short positions are determined with respect to the basis. Examples of specific bases include three-month Libor versus six-month Libor, three-month Libor versus three-month T-Bill, one-month Libor versus OIS rate, Brent Crude oil versus Henry Hub gas.

290 Examples of volatility transactions include variance and volatility swaps, options on realised or implied volatility.

(b) $EffectiveNotional_j^{IR}$ is the hedging set-level effective notional for hedging set 'j' calculated by aggregating across maturity buckets for each hedging set[291] using one of the following formulas:

(i) Formula 1:

$$EffectiveNotional_j^{IR} =$$

$$\left[\left(D_{j1}^{IR}\right)^2 + \left(D_{j2}^{IR}\right)^2 + \left(D_{j3}^{IR}\right)^2 + 1.4 \times D_{j1}^{IR} \times D_{j2}^{IR} + 1.4 \times D_{j2}^{IR} \times D_{j3}^{IR} + 0.6 \times D_{j1}^{IR} \times D_{j3}^{IR}\right]^{\frac{1}{2}}; \text{ or}$$

(ii) In the case where the Reporting Bank chooses not to recognise offset across maturity buckets - Formula 2:

$$EffectiveNotional_j^{IR} = \left|D_{j1}^{IR}\right| + \left|D_{j2}^{IR}\right| + \left|D_{j3}^{IR}\right|$$

where $D_{jk}^{IR}$ is the effective notional for currency 'j' and maturity bucket 'k' calculated using the following formula:

$$D_{jk}^{IR} = \sum_{i \epsilon \{Currency_j, Maturity\ Bucket_k\}} \delta_i \times d_i^{IR} \times MF_i^{type}$$

where -

(A) $i\epsilon\{Currency_j, Maturity\ Bucket_k\}$ refers to trades of currency 'j' that belong to maturity bucket 'k';

(B) $d_i^{IR}$ is the appropriate trade-level adjusted notional amount calculated in accordance with paragraph 3.15(a) of this Annex;

(C) $\delta_i$is the appropriate supervisory delta adjustment calculated in accordance with paragraph 3.17 of this Annex; and

(D) $MF_i^{type}$ is the appropriate maturity factor calculated in accordance with paragraph 3.18 of this Annex.

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291 For the purpose of calculating the hedging-set level effective notional, the Reporting Bank shall allocate each transaction in the hedging set to one of the following three maturity buckets based on the end date of the transaction:

(a) Maturity Bucket 1, for transactions of $E_i$ less than one year;

(b) Maturity Bucket 2, for transactions of $E_i$ between one year and five years; or

(c) Maturity Bucket 3, for transactions of $E_i$ greater than five years.

Add-on for foreign exchange derivatives

3.10 A Reporting Bank shall calculate the add-on for foreign exchange derivatives, $AddOn^{FX}$, as the sum of the add-ons for each hedging set of foreign exchange derivatives transacted with a counterparty in a netting set, as follows:

$$AddOn^{FX} = \sum_{j} AddOn_j^{FX}$$

where $AddOn_j^{FX}$ is the hedging set-level add-on for hedging set 'j' calculated using the following formula:

$$AddOn_j^{FX} = SF_j^{FX} \times \left| EffectiveNotional_j^{FX} \right|$$

where -

(a) $SF_j^{FX}$ is the foreign exchange supervisory factor specified in Table 7O-1; and

(b) $EffectiveNotional_j^{FX}$ is the hedging set-level effective notional for hedging set 'j' calculated using the following formula:

$$Effective\ Notional_j^{FX} = \sum_{i \epsilon Hedging\ Set_j} \delta_i \times d_i^{FX} \times MF_i^{type}$$

where -

(i) $i \epsilon Hedging\ Set_j$ refers to trades of hedging set 'j';

(ii) $d_i^{FX}$ is the appropriate trade-level adjusted notional amount calculated in accordance with paragraph 3.15(b) of this Annex;

(iii) $\delta_i$ is the appropriate supervisory delta adjustment calculated in accordance with paragraph 3.17 of this Annex; and

(iv) $MF_i^{type}$ is the appropriate maturity factor calculated in accordance with paragraph 3.18 of this Annex.

Add-on for credit derivatives

3.11 A Reporting Bank shall calculate the add-on for credit derivatives[292], $AddOn^{Credit}$, as follows[293]:

$$AddOn^{Credit} =$$

$$\left[\left(\sum_k \rho_k^{Credit} \times AddOn(Entity_k)\right)^2 + \sum_k \left(1 - \left(\rho_k^{Credit}\right)^2\right) \times (AddOn(Entity_k))^2\right]^{\frac{1}{2}}$$

where -

(a) $\rho_k^{Credit}$ is the appropriate credit correlation factor corresponding to entity 'k' specified in Table 7O-1;

(b) $AddOn(Entity_k)$ is the add-on for entity 'k' calculated using the following formula[294]:

$$AddOn(Entity_k) = SF_k^{Credit} \times EffectiveNotional_k^{Credit}$$

where -

(i) $SF_k^{Credit}$ is the appropriate credit supervisory factor specified in Table 7O-1; and

(ii) $EffectiveNotional_k^{Credit}$ is the effective notional for entity 'k' calculated using the following formula:

$$Effective\ Notional_k^{Credit} = \sum_{i \epsilon Entity_k} \delta_i \times d_i^{Credit} \times MF_i^{type}$$

where -

(A) $i \epsilon Entity_k$ refers to trades relating to entity 'k';

(B) $d_i^{Credit}$ is the appropriate trade-level adjusted notional amount calculated in accordance with paragraph 3.15(a) of this Annex;

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292 The protection seller of a credit default swap shall only be subject to the add-on factor where it is subject to closeout upon the insolvency of the protection buyer while the underlying is still solvent.

293 Only derivatives referencing the same entity (which could be either a single name or an index) are allowed to offset each other fully. Derivatives referencing different entities are only allowed partial offsetting.

294 Similar to a derivative referencing an index, a derivative referencing a basket of underlying names is to be treated as though it is a derivative referencing a separate entity with 'k' uniquely defined. The supervisory parameters applicable to a derivative referencing a basket of underlying names is the same as the supervisory parameters applicable to a derivative referencing an index, except where the derivative is a n$^{th}$-to-default transaction. Where the credit derivative is a first-to-default transaction, the add-on shall be determined by the lowest quality underlying in the basket, that is, the Reporting Bank shall apply the supervisory factor corresponding to the lowest quality underlying in the basket. For a second-to-default transaction, the add-on shall be determined by the second lowest quality underlying in the basket. For a n$^{th}$-to-default transaction, the add-on shall be determined by the n$^{th}$-lowest quality underlying in the basket.

(C) $\delta_i$ is the appropriate supervisory delta adjustment calculated in accordance with paragraph 3.17 of this Annex; and

(D) $MF_i^{type}$ is the appropriate maturity factor calculated in accordance with paragraph 3.18 of this Annex.

Add-on for equity derivatives

3.12 A Reporting Bank shall calculate the add-on for equity derivatives, $AddOn^{Equity}$, as follows[295]:

$$AddOn^{Equity} = \left[\left(\sum_k \rho_k^{Equity} \times AddOn(Entity_k)\right)^2 + \sum_k \left(1 - \left(\rho_k^{Equity}\right)^2\right) \times \left(AddOn(Entity_k)\right)^2\right]^{\frac{1}{2}}$$

where -

(a) $\rho_k^{Equity}$ is the appropriate equity correlation factor corresponding to entity 'k' specified in Table 7O-1;

(b) $AddOn(Entity_k)$ is the add-on for entity 'k' calculated using the following formula:

$$AddOn(Entity_k) = SF_k^{Equity} \times EffectiveNotional_k^{Equity}$$

where -

(i) $SF_k^{Equity}$ is the appropriate equity supervisory factor specified in Table 7O-1; and

(ii) $EffectiveNotional_k^{Equity}$ is the effective notional for entity 'k' calculated using the following formula:

$$Effective\ Notional_k^{Equity} = \sum_{i \epsilon Entity_k} \delta_i \times d_i^{Equity} \times MF_i^{type}$$

where -

(A) $i \epsilon Entity_k$ refers to trades relating to entity 'k';

(B) $d_i^{Equity}$ is the appropriate trade-level adjusted notional amount calculated in accordance with paragraph 3.15(c) of this Annex;

[295] Only derivatives referencing the same entity (which could be either a single name or an index) are allowed to offset each other fully. Derivatives referencing different entities are only allowed partial offsetting.

(C) $\delta_i$ is the appropriate supervisory delta adjustment calculated in accordance with paragraph 3.17 of this Annex; and

(D) $MF_i^{type}$ is the appropriate maturity factor calculated in accordance with paragraph 3.18 of this Annex.

Add-on for commodity derivatives

3.13 A Reporting Bank shall calculate the add-on for commodity derivatives, $AddOn^{Com}$, as the sum of the add-ons for each hedging set of commodity derivatives transacted with a counterparty in a netting set, as follows:

$$AddOn^{Com} = \sum_j AddOn_j^{Com}$$

where $AddOn_j^{Com}$ is the hedging set-level add-on for hedging set 'j' calculated using the following formula:

$$AddOn_j^{Com} = \left[\left(\rho_j^{Com} \times \sum_k AddOn(Type_k^j)\right)^2 + \left(1 - \left(\rho_j^{Com}\right)^2\right) \times \sum_k \left(AddOn(Type_k^j)\right)^2\right]^{\frac{1}{2}}$$

where -

(a) $\rho_j^{Com}$ is the appropriate commodity correlation factor corresponding to hedging set 'j' specified in Table 7O-1; and

(b) $AddOn(Type_k^j)$ refers to the add-on for commodity type 'k' in hedging set 'j' calculated using the following formula:

$$AddOn(Type_k^j) = SF_{Type_k^j}^{Com} \times EffectiveNotional_k^{Com}$$

where -

(i) $SF_{Type_k^j}^{Commodity}$ is the appropriate commodity supervisory factor specified in Table 7O-1; and

(ii) $EffectiveNotional_k^{Com}$ is the effective notional for commodity type 'k' calculated using the following formula:

$$Effective\ Notional_k^{Com} = \sum_{i \epsilon Type_k^j} \delta_i \times d_i^{Com} \times MF_i^{type}$$

where -

(A) $i\epsilon Type_k^j$ refers to trades of commodity type 'k' in hedging set 'j';

(B) $d_i^{Com}$ is the appropriate trade-level adjusted notional amount calculated in accordance with paragraph 3.15(c) of this Annex;

(C) $\delta_i$ is the appropriate supervisory delta adjustment calculated in accordance with paragraph 3.17 of this Annex; and

(D) $MF_i^{type}$ is the appropriate maturity factor calculated in accordance with paragraph 3.18 of this Annex.

3.14 The Authority may, by notice in writing, require a Reporting Bank to use more refined definitions of commodities with regard to characteristics such as location and quality, when the Reporting Bank is significantly exposed to the basis risk of different products within the commodity types[296].

Trade-level adjusted notional amount

3.15 A Reporting Bank shall calculate the trade-level adjusted notional amount for interest rate, foreign exchange, credit, equity and commodity derivatives referred to in paragraphs 3.9 to 3.13 of this Annex, as follows:

(a) For interest rate and credit derivatives, the product of the trade notional amount converted to the domestic currency of the Reporting Bank, and the supervisory duration $SD_i$, which is calculated using the following formula:

$$SD_i = \frac{\exp(-0.05 \times S_i) - \exp(-0.05 \times E_i)}{0.05}$$

where $S_i$ and $E_i$ are the start and end dates, respectively, of the time period referenced by the interest rate or credit derivative, as applicable, subject to a minimum $E_i$ of ten business days. Where the start date has occurred (for example, ongoing interest rate swap), the Reporting Bank shall set $S_i$ to zero. A Reporting Bank shall make a distinction between the time period of the underlying instrument and the remaining maturity of the derivative transaction. If the derivative transaction references the value of another interest rate or credit instrument (for example, in the case of swaption or bond option), the Reporting Bank shall determine the time period on the basis of the underlying instrument[297];

(b) For foreign exchange derivatives, the notional amount of the foreign currency leg of the contract converted to the domestic currency of the Reporting Bank, or where both legs of a foreign exchange derivative are denominated in currencies other than the domestic currency of the Reporting Bank, the higher of the notional amount of each leg converted to the domestic currency of the Reporting Bank; and

[296] For example, the energy hedging set contains commodity types such as crude oil, electricity, natural gas and coal. However, crude oil as a commodity type within the energy hedging set, could omit a substantial basis risk between different types of crude oil products such as West Texas Intemediate, Brent, Saudi Light, etc.

[297] For example, a European interest rate swaption with expiry of 1 year and the term of the underlying swap of 5 years has $S_i$ = 1 year and $E_i$ = 6 years.

(c) For equity and commodity derivatives, the product of the current price of one unit of the stock or commodity (for example, a share of equity or barrel of oil) and the number of units referenced by the trade. For equity and commodity volatility transactions, the Reporting Bank shall replace the unit price by the underlying volatility or variance referenced by the transaction, and the number of units by the contractual notional.

3.16 For the purpose of calculating the trade-level adjusted notional amount, a Reporting Bank shall use the trade notional amount stated in the contract in the case where it is stated clearly and fixed until maturity. Otherwise, the Reporting Bank shall determine the trade notional amount as follows:

(a) For transactions with multiple payoffs that are state contingent such as digital options or target redemption forwards, the Reporting Bank shall calculate the trade notional amount for each state and use the largest resulting calculation[298];

(b) For transactions where the notional is a formula of market values, the Reporting Bank shall calculate the trade notional amount by inputting current market values into the formula;

(c) For variable notional swaps such as amortising and accreting swaps, the Reporting Bank shall calculate the trade notional amount as the time-weighted average notional over the remaining life of the swap[299];

(d) For leveraged swaps, the Reporting Bank shall calculate the trade notional amount by converting the stated notional amount into the notional amount of an equivalent unleveraged swap. Where all rates in a swap are multiplied by a factor, the Reporting Bank shall calculate the trade notional amount as the product of the stated notional amount and the factor on the rates; and

(e) For transactions with multiple exchanges of principal, the Reporting Bank shall calculate the trade notional amount as the product of the stated notional amount and the remaining number of exchanges of principal in the derivative contract.

Supervisory delta adjustment

3.17 A Reporting Bank shall calculate the appropriate supervisory delta adjustment for transaction 'i', $\delta_i$, for interest rate, foreign exchange, credit, equity and commodity derivatives referred to in paragraphs 3.9 to 3.13 of this Annex, to reflect its direction and non-linearity (if applicable) as follows:

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[298] For digital options, the fixed payoff amount that is paid if certain conditions are met, effectively represents the maximum potential exposure on the trade (for example, in the case of a digital call option, the fixed amount that is owed to the buyer of the option upon exercise if the current price exceeds the strike price). The Reporting Bank shall gross up the payoff amount to a trade-level adjusted notional amount using the appropriate supervisory delta adjustment and maturity factor, resulting in a PFE equal to the payoff amount. For example, a foreign exchange digital option with a payoff of $3 million, supervisory delta adjustment of 0.6, and remaining maturity of 0.25 years would have a trade-level adjusted notional amount of $250 million (=$3 million/sqrt(0.25)/0.6/4%).

[299] For the avoidance of doubt, this treatment applies to all interest rate and credit derivatives with variable notional amounts specified by the contract. This treatment does not apply to transactions where the SA-CCR notional varies due to price changes (typically, foreign exchange, equity, and commodity derivatives).

| | Long in the primary risk factor[300] | Short in the primary risk factor[301] |
|---|---|---|
| Instruments that are not options or collateralised debt obligation ("CDO") tranches, and options or CDO tranches that are not amenable to be treated under the formulas for options and CDO tranches | $\delta_i = +1$ | $\delta_i = -1$ |

300 "Long in the primary risk factor" means that the market value of the instrument increases when the value of the primary risk factor increases.

301 "Short in the primary risk factor" means that the market value of the instrument decreases when the value of the primary risk factor increases.

| | Bought | Sold |
|---|---|---|
| Call options | $\delta_i = +\Phi\left(\frac{\ln\left(\frac{P_i}{K_i}\right) + 0.5 \times \sigma_i^2 \times T_i}{\sigma_i \times \sqrt{T_i}}\right)$ | $\delta_i = -\Phi\left(\frac{\ln\left(\frac{P_i}{K_i}\right) + 0.5 \times \sigma_i^2 \times T_i}{\sigma_i \times \sqrt{T_i}}\right)$ |
| Put options | $\delta_i = -\Phi\left(-\frac{\ln\left(\frac{P_i}{K_i}\right) + 0.5 \times \sigma_i^2 \times T_i}{\sigma_i \times \sqrt{T_i}}\right)$ | $\delta_i = +\Phi\left(-\frac{\ln\left(\frac{P_i}{K_i}\right) + 0.5 \times \sigma_i^2 \times T_i}{\sigma_i \times \sqrt{T_i}}\right)$ |
| where:<br>$\Phi$ represents the standard normal cumulative distribution function;<br>$P_i$ is the underlying price (for example, spot, forward, average, etc.)[302];<br>$K_i$ is the strike price;<br>$T_i$ is the latest contractual exercise date of the option; and<br>$\sigma_i$ is the appropriate supervisory option volatility specified in Table 7O-1. | | |

| | Purchased (long protection) | Sold (short protection) |
|---|---|---|
| CDO tranches | $\delta_i = +\frac{15}{(1 + 14 \times A_i) \times (1 + 14 \times D_i)}$ | $\delta_i = -\frac{15}{(1 + 14 \times A_i) \times (1 + 14 \times D_i)}$ |
| where:<br>$A_i$ is the attachment point of the CDO tranche; and<br>$D_i$ is the detachment point of the CDO tranche. | | |

Time risk horizon

3.18 A Reporting Bank shall calculate the appropriate maturity factor for transaction 'i', $MF_i^{type}$, reflecting the time risk horizon appropriate for the type of transaction (that is, unmargined or margined), as follows[302A]:

(a) For unmargined transactions, using the following formula:

$$MF_i^{unmargined} = \sqrt{\frac{\min\{M_i; 1\ year\}}{1\ year}}$$

[302] Where appropriate, the Reporting Bank should use the forward value instead of the spot value of the underlying in the supervisory delta adjustment formula in order to account for the risk-free rate and for possible cash flows prior to the option expiry such as dividends.

[302A] The Reporting Bank shall use consistent units of measurement of the numerator and denominator in the calculation of maturity factor. For example, if $M_i$ and $MPOR_i$ are measured in years, then the denominator is 1 year, and if $M_i$ and $MPOR_i$ are measured in business days, then the denominator is to also be expressed in business days.

where $M_i$ is the remaining maturity of transaction 'i'[302B,302C,302D], and is based on the latest date when the transaction may still be active, subject to a minimum of 10 business days.

(b) For margined transactions, using the following formula:

$$MF_i^{margined} = \frac{3}{2}\sqrt{\frac{MPOR_i}{1\ year}}$$

where $MPOR_i$ is the margin period of risk appropriate for the margin agreement containing transaction 'i', subject to the minimum margin period of risk that applies under paragraph 6.5 of Annex 7Q or paragraph 2.14 of Annex 7AJ, whichever is applicable.

Supervisory parameters

3.19 A Reporting Bank shall apply the appropriate supervisory factor in Table 7O-1, except in the following cases –

(a) a hedging set consisting of basis transactions, in which case the Reporting Bank shall adjust the appropriate supervisory factor in Table 7O-1 by multiplying it by a factor of 0.5; and

(b) a hedging set consisting of volatility transactions, in which case the Reporting Bank shall adjust the appropriate supervisory factor in Table 7O-1 by multiplying it by a factor of 5.

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[302B] For example, the remaining maturity for a one-month option on a 10-year Treasury bond is the one-month to expiration date of the derivative contract. However, the end date of the transaction is the 10-year remaining maturity on the Treasury bond.

[302C] If a derivative transaction has another derivative transaction as its underlying (for example, swaption) and may be physically exercised into the underlying derivative transaction (that is, a position in the underlying derivative transaction would be assumed by the Reporting Bank upon exercise), then the Reporting Bank shall set $M_i$ as the final settlement date of the underlying derivative transaction.

[302D] For a transaction that is structured to settle outstanding exposures on specified payment dates and where the terms are reset such that the fair value of the contract is zero on these specified dates, the remaining maturity would be equal to the time until the next reset date.

**Table 7O-1 – Supervisory Parameters**

| Asset Class | | Subclass | Supervisory factor | Correlation factor | Supervisory option volatility |
|---|---|---|---|---|---|
| Interest rate | | | 0.5% | N/A | 50% |
| Foreign exchange | | | 4% | N/A | 15% |
| Credit[302E] | Single name | Credit Quality Grade 1 | 0.38% | 50% | 100% |
| | | Credit Quality Grade 2 | 0.42% | 50% | 100% |
| | | Credit Quality Grade 3 | 0.54% | 50% | 100% |
| | | Credit Quality Grade 4 | 1.06% | 50% | 100% |
| | | Credit Quality Grade 5 | 1.6% | 50% | 100% |
| | | Credit Quality Grade 6 | 6% | 50% | 100% |
| | Index | Credit Quality Grade 1 to 3 | 0.38% | 80% | 80% |
| | | Credit Quality Grade 4 to 6 | 1.06% | 80% | 80% |
| Equity | Single name | | 32% | 50% | 120% |
| | Index | | 20% | 80% | 75% |
| Commodity | | Electricity | 40% | 40% | 150% |
| | | Oil/Gas | 18% | 40% | 70% |
| | | Metals | 18% | 40% | 70% |
| | | Agricultural commodities | 18% | 40% | 70% |
| | | Other | 18% | 40% | 70% |

[302E] A Reporting Bank shall assign a reference entity to a credit quality grade based on the external credit assessment that is applicable to the reference entity in accordance with Table 7R-1 of Annex 7R. For a reference entity which does not have an external credit assessment by a recognised ECAI, if the Reporting Bank has received approval from the Authority to adopt the IRBA pursuant to Division 4 of Part VII, it shall map the internal rating of the reference entity to the appropriate credit quality grade, and in all other cases, it shall apply a supervisory factor of 1.06%.

**Table 7O-2 – Example Transactions and Related Maturity $M_i$, Start Date $S_i$, and End Date $E_i$**

| Instrument | $M_i$ | $S_i$ | $E_i$ |
|---|---|---|---|
| Interest rate or credit default swap maturing in 10 years | 10 years | 0 | 10 years |
| 10-year interest rate swap, forward starting in 5 years | 15 years | 5 years | 15 years |
| Forward rate agreement for time period starting in 6 months and ending in 12 months | 1 year[302F] | 0.5 year | 1 year |
| Cash-settled European swaption referencing 5-year interest rate swap with exercise date in 6 months | 0.5 year | 0.5 year | 5.5 years |
| Physically-settled European swaption referencing 5-year interest rate swap with exercise date in 6 months | 5.5 years | 0.5 year | 5.5 years |
| 10-year Bermudan swaption with annual exercise dates | 10 years | 1 year | 10 years |
| Interest rate cap or floor specified for semi-annual interest rate with maturity 5 years | 5 years | 0 | 5 years |
| Option on a bond maturing in 5 years with the latest exercise date in 1 year | 1 year | 1 year | 5 years |
| 3-month Eurodollar futures that matures in 1 year | 1 year | 1 year | 1.25 years |
| Futures on 20-year treasury bond that matures in 2 years | 2 years | 2 years | 22 years |
| 6-month option on 2-year futures on 20-year treasury bond | 2 years | 2 years | 22 years |

**Section 4: Treatment of Multiple Margin Agreements and Multiple Netting Sets**

4.1 In the case where multiple margin agreements apply to a single netting set, a Reporting Bank shall divide the netting set into sub-netting sets that align with their respective margin agreements, for the purposes of calculating RC and PFE.

4.2 In the case where a single margin agreement applies to multiple netting sets, a Reporting Bank shall –

[302F] This assumes that payment is made at the end of the period (similar to vanilla interest rate swaps). If the payment is made at the beginning of the period, as is typically the case according to market convention, Mi is 0.5 years.

(a) calculate the replacement cost for the entire margin agreement, $RC_{MA}$, as follows[302G]:

$$RC_{MA} = max\left\{\sum_{NS \in MA} max\{V_{NS}; 0\} - max\{C_{MA}; 0\}; 0\right\} + max\left\{\sum_{NS \in MA} min\{V_{NS}; 0\} - min\{C_{MA}; 0\}; 0\right\}$$

where the summation $\mathrm{NS} \in \mathrm{MA}$ is across the netting sets covered by the margin agreement, $\mathrm{V_{NS}}$ is the current mark-to-market value of netting set 'NS' and $\mathrm{C_{MA}}$ is the haircut value of net collateral held under the margin agreement 'MA'; and

(b) calculate the amount for potential future exposure for the entire margin agreement, $PFE_{MA}$, as the sum of netting set-level PFEs calculated using the formulas for unmargined transactions, as follows:

$$PFE_{MA} = \sum_{NS \in MA} PFE_{NS}^{unmargined}$$

where $\mathrm{PFE_{NS}^{(unmargined)}}$ is the PFE for netting set 'NS' calculated using the formulas for unmargined transactions.

**Section 5: Transitional Arrangements**

5.1 This Annex shall not apply to a Reporting Bank for the period from 1 January 2017 to –

(a) the day set out in a notice in writing issued by the Authority informing all Reporting Banks to comply with this Annex; or

(b) the day where the Reporting Bank has pursuant to paragraph 5.3 elected to comply with this Annex,

whichever occurs first.

5.2 A Reporting Bank referred to in paragraph 5.1 shall continue to comply with Annex 7O of MAS 637, including all definitions used in Annex 7O which are set out in Part II of this Notice, in force immediately before 1 January 2017 during the period referred to in paragraph 5.1.

5.3 Notwithstanding paragraphs 5.1 and 5.2, a Reporting Bank may elect to comply with this Annex at any time before the expiry of the period referred to in paragraph 5.1. When a Reporting Bank elects to comply with this Annex, the Reporting Bank shall give

[302G] The first term is equal to the unmargined current exposure of the Reporting Bank to the counterparty aggregated across all netting sets under the margin agreement reduced by the positive current net collateral (that is, collateral is subtracted only when the Reporting Bank is a net holder of collateral). The second term is equal to the current net posted collateral (if any) reduced by the unmargined current exposure of the counterparty to the Reporting Bank aggregated across all netting sets under the margin agreement (that is, it is non-zero only when the Reporting Bank is a net poster of collateral).

the Authority notice in writing of the date from which the Reporting Bank elects to comply with this Annex (the "election date"), no less than 30 days before the election date and in that event, paragraph 5.1 shall not apply to the Reporting Bank from the election date.

5.4 For the avoidance of doubt, these transitional arrangements are intended to apply wherever Annex 7O is referenced in this Notice.

**Annex 7P**

*[This Annex has been intentionally left blank.]*

[MAS Notice 637 (Amendment) 2016]

**Annex 7Q**

## CCR INTERNAL MODELS METHOD

### Section 1: Application to Adopt CCR Internal Models Method

1.1 A Reporting Bank shall apply in writing for approval from the Authority if it intends to adopt the CCR internal models method. A Reporting Bank shall not submit such an application unless it has received approval from the Authority to adopt the IMA to calculate market RWA.

1.2 The Authority may grant approval for a Reporting Bank to adopt the CCR internal models method subject to such conditions or restrictions as the Authority may impose.[303] The Authority may require a period of initial monitoring and live testing of the Reporting Bank's models under the CCR internal models method before approving the Reporting Bank's adoption of the CCR internal models method for regulatory capital purposes.

[MAS Notice 637 (Amendment) 2012]

1.3 Subject to paragraph 1.2, a Reporting Bank may use the CCR internal models method to calculate E or EAD, whichever is applicable, for the pre-settlement counterparty exposure in any of the following transaction types:

(a) any OTC derivative transaction;

(b) any long settlement transaction; and

(c) any SFT.

1.3A A Reporting Bank which has received approval to adopt the CCR internal models method shall apply the method to all its OTC derivative transactions and SFTs.

1.4 A Reporting Bank which has received approval to adopt the CCR internal models method for a particular transaction type shall apply the method to all relevant exposures within that transaction type[303A], except those that are immaterial in size and risk or unless a phased rollout is permitted by the Authority.

[MAS Notice 637 (Amendment No. 2) 2014]

1.4A Notwithstanding paragraphs 1.3A and 1.4, the Authority may allow a phased rollout of the CCR internal models method within a particular transaction type in the initial implementation phase and allow a Reporting Bank to use the SA-CCR for a portion of its business in the initial implementation phase. The Reporting Bank shall submit a plan to

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[303] Factors considered in the Authority's assessment include the characteristics of the Reporting Bank's portfolio of exposures that give rise to CCR, in particular, the diversification and number of risk factors the portfolio is exposed to, the correlation of default across counterparties, and the number and granularity of counterparties.

[303A] For the avoidance of doubt, a Reporting Bank shall not adopt the CCR internal models method to a centrally cleared version of a transaction type for which the Reporting Bank had received approval for application of the CCR internal models method, without prior approval from the Authority.

[MAS Notice 637 (Amendment No. 2) 2014]

the Authority to bring all material exposures within the transaction type under the CCR internal models method.

[MAS Notice 637 (Amendment) 2016]

1.5 A Reporting Bank which has adopted the CCR internal models approach shall continue to adopt the CCR internal models method. The Reporting Bank shall not use the SA-CCR to calculate E or EAD, whichever is applicable, for all or part of its exposures, unless permitted by the Authority, and such permission shall be given only in exceptional circumstances or for immaterial exposures. The Authority will not normally grant such approval unless the Reporting Bank is able to demonstrate good cause for the change and that such change is not intended to avoid or reduce regulatory capital which the Reporting Bank would otherwise be required to maintain.

[MAS Notice 637 (Amendment) 2016]

1.6 The model used by a Reporting Bank within its CCR internal models method may be a simulation model, an analytical model or other forms of model. A Reporting Bank which intends to adopt a model that is not a simulation model shall be able to demonstrate to the satisfaction of the Authority, that such a model meets all relevant requirements in this Annex.

1.7 If a Reporting Bank becomes aware that it does not comply with all the requirements in this Annex or the conditions or restrictions imposed by the Authority pursuant to paragraph 1.2 above, it shall -

(a) inform the Authority as soon as practicable;

(b) assess the effect of the situation in terms of the risk posed to the Reporting Bank;

(c) prepare a plan to rectify the situation and inform the Authority of its plan as soon as practicable; and

(d) undertake prompt corrective action in accordance with the plan prepared pursuant to sub-paragraph (c) above.

1.8 If a Reporting Bank fails to comply with paragraph 1.7 or if the Authority is of the view that a Reporting Bank's estimates of E or EAD, whichever is applicable, or estimates of alpha, under the CCR internal models method does not adequately reflect its CCR exposures, the Authority shall take appropriate actions, which may include revoking its approval for the Reporting Bank to adopt the CCR internal models method. The Reporting Bank may also be required to revise its estimates or apply a higher estimate of E or EAD, whichever is applicable, or a higher estimate of alpha for the purposes of calculating regulatory capital requirements.

**Section 2: Exposure Measurement**

2.1 Under the CCR internal models method, a Reporting Bank shall calculate E or EAD, whichever is applicable, at the level of the netting set.

2.2 A Reporting Bank shall have internal procedures in place to verify that, prior to including a transaction in a netting set, the transaction is covered by a qualifying bilateral netting agreement or a qualifying cross-product netting agreement.

2.3 A Reporting Bank shall ensure that its model under the CCR internal models method specifies the forecasting distribution for changes in the market value of the netting set attributable to changes in market variables, such as interest rates and foreign exchange rates so that the Reporting Bank can compute E or EAD, whichever is applicable, for the netting set at each future date given the changes in the market variables.

2.4 A Reporting Bank which has taken eligible financial collateral for any OTC derivative transaction, SFT or long settlement transaction may recognise the effects of CRM of such collateral in accordance with paragraphs 2.5 to 2.7 below, subject to paragraphs 8.18B and 8.18C. A Reporting Bank which recognises the effects of CRM of collateral shall have internal procedures to verify that, prior to recognising the effects of CRM of collateral, the requirements in Annex 7F of Part VII are met.

2.5 A Reporting Bank may include eligible financial collateral in its forecasting distributions for changes in the fair value of the netting set, provided the quantitative, qualitative and data requirements set out in sections for the use of the CCR internal models method are met for the collateral. A Reporting Bank which recognises the effects of CRM of collateral shall have internal procedures to verify that, prior to recognising the effects of CRM of collateral, the requirements in in Annex 7F of Part VII are met.

2.6 For margined counterparties, a Reporting Bank may capture future collateral movements in its model.

2.7 If a Reporting Bank has recognised the effects of CRM of eligible financial collateral in E or EAD, whichever is applicable, through the CCR internal models method, it shall not take into account the effects of CRM of such eligible financial collateral when deriving estimates of LGD. In such instances, the LGD of an otherwise similar uncollateralised facility shall be used (i.e. the Reporting Bank shall use an LGD that does not include collateral that is already included in EAD).

2.8 A Reporting Bank which has not recognised the effect of eligible financial collateral through the CCR internal models method may do so in accordance with paragraphs 2.9 to 2.13 below.

2.9 A Reporting Bank using the SA(CR) may use either the FC(SA) or the FC(CA) to recognise the effect of eligible financial collateral for any OTC derivative transaction, long settlement transaction or SFT in the banking book. The Reporting Bank shall apply the chosen approach consistently to the entire banking group and shall not use a combination of both approaches. For any pre-settlement counterparty exposure arising from an OTC derivative transaction, long settlement transaction or SFT in the trading book, a Reporting Bank using the SA(CR) shall use only the FC(CA) to recognise the effect of eligible financial collateral.

2.10 A Reporting Bank using the SA(CR) and FC(SA) may recognise the effect of eligible financial collateral for an OTC derivative transaction in accordance with Sub-division 4 of Division 3 of Part VII.

2.11 A Reporting Bank which has taken eligible financial collateral for an OTC derivative transaction may -

(a) if it is using the SA(CR) and the FC(CA), calculate E*, the SA(CR) exposure adjusted for eligible financial collateral, in accordance with paragraph 2.12 of this Annex and substitute E* for E when calculating the credit risk-weighted exposure amount for an SA(CR) exposure; or

(b) if it is using the F-IRBA and the FC(CA)[304], calculate $EAD_{adj}$, the IRBA exposure adjusted for eligible financial collateral, for an IRBA exposure, in accordance with paragraph 2.12 of this Annex and use $EAD_{adj}$ to calculate LGD* in accordance with Sub-division 7 of Division 4 of Part VII.[305]

[MAS Notice 637 (Amendment) 2016]

2.12 A Reporting Bank using the FC(CA) shall calculate E* or $EAD_{adj}$, the exposure amount adjusted for eligible financial collateral, for any collateralised OTC derivative transaction using the following formula:

$$E^* \text{ (or } EAD_{adj}) = E \text{ (or EAD)} - C(1 - H_C - H_{FX})$$

where -

(a) "E*(or $EAD_{adj}$)" refers to the exposure value after risk mitigation;

(b) "E (or EAD)" refers to the exposure value calculated in accordance with paragraph 2.14 of this Annex, whichever is applicable;

(c) "C" refers to the fair value of the collateral received[306];

(d) "$H_C$" refers to the haircut appropriate to the collateral, or if the collateral is a basket of assets, the weighted sum of the haircuts appropriate to the assets in the basket where each weight is the weight of the asset in the basket determined in accordance with Annex 7J of Part VII; and

(e) "$H_{FX}$" refers to the haircut appropriate for the currency mismatch between the collateral and exposure determined in accordance with Annex 7J of Part VII. "$H_{FX}$" shall also be applied if there is a mismatch between the collateral currency and the settlement currency. This applies even in the case where there are more than two currencies involved in the exposure, collateral and settlement currency.

[MAS Notice 637 (Amendment) 2016]

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304 The FC(SA) is not available to a Reporting Bank using the F-IRBA.

305 For avoidance of doubt, the EAD for any IRBA exposure is not affected by this calculation of $EAD_{adj}$.

306 Where the residual maturity of the collateral is shorter than the residual maturity of the exposure, the Reporting Bank shall substitute $P_A$ calculated in accordance with Annex 7J of Part VII for $C(1 - H_C - H_{FX})$.

2.13 A Reporting Bank adopting the A-IRBA or the IRBA for the IRBA retail asset class may take collateral into account when deriving its own estimates of LGD.

2.14 A Reporting Bank shall calculate E or EAD, whichever is applicable, as follows (except for counterparties that have been identified as having explicit specific wrong-way risk, where E or EAD, whichever is applicable, shall be computed in accordance with paragraphs 8.15B, 8.15C and 8.15D):

$$E \text{ or } EAD = \alpha \times \text{effective } EPE$$

where α is set at 1.4 or any higher amount specified by the Authority[306A] and effective EPE is determined in accordance with Section 3 of this Annex.

[MAS Notice 637 (Amendment No. 2) 2014]

2.14A A Reporting Bank shall calculate the effective EPE based on current market data[306B] and the effective EPE based on a stress calibration[306C], in accordance with Section 3 of this Annex. A Reporting Bank shall apply the effective EPE which will result in a higher portfolio-level credit RWA[306D] (not including the CVA RWA) for exposures calculated using the CCR internal models method[306E].

2.15 Notwithstanding paragraphs 2.14 and 2.14A above, a Reporting Bank may use a measure that is more conservative than effective EPE to estimate E or EAD, whichever is applicable, for each counterparty, subject to the approval of the Authority. These measures include the use of peak exposure, the use of an EPE model as set out in Section 4 of this Annex or the use of VaR models as set out in Annex 7M of Part VII.

## Section 3: Effective EPE

3.1 A Reporting Bank shall compute effective EPE by estimating expected exposure ($EE_t$) as the average exposure at future date t, where the average is taken across possible future values of relevant market risk factors, such as interest rates and foreign exchange rates. The model estimates EE at a series of future dates $t_1$, $t_2$, $t_3$.

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306A The Reporting Bank shall only apply an α of 1.4 if it fully complies with the model validation requirements set out in Section 7 of this Annex. In requiring a higher α to be applied, the Authority will consider factors such as the low granularity of counterparties, high exposures to general wrong-way risk, high correlation of market values across counterparties and other factors specific to the CCR exposures of the Reporting Bank.

306AA [Deleted by MAS Notice 637 (Amendment) 2016]

306B The use test for the CCR internal models method will only apply to effective EPE based on current market data.

306C The Reporting Bank should use a single consistent stress calibration for the whole portfolio of counterparties.

306D The greater of effective EPE based on current market data and the effective EPE based on a stress calibration should be determined on a total portfolio level, and not a counterparty by counterparty basis.

306E A Reporting Bank using the IRBA for exposures calculated using the CCR internal models method should calculate the capital requirement with the full maturity adjustment as a function of PD and M set equal to 1 if it uses the IMA for the specific interest rate risk of bonds and is able to demonstrate to the satisfaction of the Authority that its approved specific market risk VaR model reflects the risk of rating migrations appropriately. The Reporting Bank shall compute the full maturity adjustment function given by the formula (1 - 1.5 x b)^-1 x (1 + (M - 2.5) x b) where the Reporting Bank is unable to demonstrate so.

3.2 A Reporting Bank shall compute effective EE recursively as –

$$\text{Effective } EE_{t_k} = \max\{\text{Effective } EE_{t_{k-1}}, EE_{t_k}\}$$

where the current date is denoted as $t_0$ and Effective $EE_{t_0}$ equals current exposure.

3.3 A Reporting Bank shall compute effective EPE as a weighted average of effective EE as follows:

$$\text{Effective EPE} = \sum_{k=1}^{\min(1\text{year}, \text{maturity})} \text{Effective } EE_{t_k} \times \Delta t_k$$

where $\Delta t_k = t_k - t_{k-1}$.

3.4 A Reporting Bank should calculate EE or any peak exposure measures based on a distribution of exposures that accounts for the possible non-normality of the distribution of exposures, including the existence of leptokurtosis, where appropriate.

**Section 4: Own estimates for α**

4.1 A Reporting Bank may seek approval from the Authority in its application to adopt the CCR internal models method, to compute internal estimates of α, subject to a floor of 1.2, where α equals the ratio of economic capital from a full simulation of counterparty exposures across counterparties (numerator) and economic capital based on EPE (denominator).

4.2 A Reporting Bank shall meet all the requirements in Section 8 of this Annex and shall be able to demonstrate that its internal estimates of α capture in the numerator the material stochastic dependency of distributions of fair values of transactions or of portfolios of transactions across counterparties (e.g. the correlation of defaults across counterparties and between market risk and default). In the denominator, the Reporting Bank shall use EPE as if it were a fixed outstanding loan amount.

4.3 A Reporting Bank shall ensure that the numerator and denominator of α are computed in a consistent fashion with respect to the modeling methodology, parameter specifications and portfolio composition. The approach used shall be based on the internal economic capital approach of the Reporting Bank, be well-documented and be subject to independent validation. In addition, the Reporting Bank shall review its estimates on at least a quarterly basis, and more frequently when the composition of the portfolio varies over time. The Reporting Bank shall also assess the model risk, including an assessment of potential significant variations in estimates of alpha that arise from mis-specification in the models used for the numerator, especially where convexity is present.

4.4 Where appropriate, a Reporting Bank should condition volatilities and correlations of market risk factors used in the joint simulation of market and credit risk on the credit risk factor to reflect potential increases in volatility or correlation in an economic downturn.

The Reporting Bank should also take into account the granularity of exposures in its internal estimates of α.

**Section 5: Maturity Adjustment**

5.1 A Reporting Bank shall apply the formula in Section 3 of Annex 7Z of Part VII to calculate M for netting sets in which the original maturity of the longest-dated contract within the set is greater than one year.

5.2 Notwithstanding paragraph 5.1, a Reporting Bank which uses an internal model to calculate a one-sided CVA[306F] may seek approval in its application to adopt the CCR internal models method, to use the effective credit duration estimated by the model as M.

5.3 A Reporting Bank shall apply the formula in Section 1 or 2 of Annex 7Z of Part VII for M for netting sets in which all contracts have an original maturity of less than one year, with the exception of short-term exposures listed in paragraph 4.2 of Annex 7Z of Part VII, in which case the Reporting Bank shall apply the formula in paragraph 4.1 or 4.4 of Annex 7Z of Part VII.

**Section 6: Margin Agreements**

6.1 Where a netting set is subject to a margin agreement and the Reporting Bank is able to capture the effects of margining when estimating EE, the model's EE measure may be used directly in the equation in paragraph 3.2, provided that approval from the Authority has been obtained for this purpose. The Reporting Bank shall ensure that the EPE model also includes transaction-specific information in order to capture the effects of margining, and takes into account both the current amount of margin and margin that would be passed between counterparties in the future. The Reporting Bank shall ensure that the EPE model accounts for the nature of margin agreements (unilateral or bilateral), the frequency of margin calls, the margin period of risk, the thresholds of unmargined exposure the Reporting Bank is willing to accept, and the minimum transfer amount. The Reporting Bank shall ensure that the EPE model either models the mark-to-market change in the value of collateral posted or applies the relevant rules on the treatment of collateral under the FC(SA), FC(CA) or IRBA.

6.2 [Deleted by MAS Notice 637 (Amendment) 2016]

6.3 [Deleted by MAS Notice 637 (Amendment) 2016]

6.4 [Deleted by MAS Notice 637 (Amendment) 2016]

6.5 For modeling EAD with margin agreements, a Reporting Bank shall –

(a) for transactions subject to daily re-margining and mark-to-market valuation:

[306F] One-sided CVA is a CVA that reflects the market value of the credit risk of the counterparty to a Reporting Bank, but does not reflect the market value of the credit risk of the Reporting Bank to the counterparty.

(i) apply a floor on the margin period of risk of each netting set in accordance with the following table:

**Table 7Q-1 – Floors on Margin Period of Risk for Netting Sets**

| Type of netting set | Floor (in business days) |
|---|---|
| Netting set consisting only of repos, reverse repos, securities lending or securities borrowing transactions | 5 |
| Netting set where the number of trades exceeds 5,000 at any point during a quarter | 20 (for the following quarter) |
| Netting set containing one or more trades involving either illiquid collateral or an OTC derivative that cannot be easily replaced, determined in the context of stressed market conditions[306H] | 20 |
| All other netting sets | 10 |

[MAS Notice 637 (Amendment) 2012]

(ii) use a margin period of risk that appropriately reflects the duration of margin call disputes over the previous two quarters, and which is at least double the floor set out in Table 7Q-1 for the subsequent two quarters for a netting set where there are more than two margin call disputes over the previous two quarters that have lasted longer than the applicable floors set out in Table 7Q-1. For the avoidance of doubt, this sub-paragraph shall apply regardless of the size of the margin call disputed;

(iii) consider whether trades or securities it holds as collateral are concentrated in a particular counterparty and if that counterparty exited the market precipitously, whether the Reporting Bank would be able to replace its trades;

(b) for transactions subject to re-margining with a periodicity of N-days, use a margin period of risk at least equal to the floor plus N days minus one day:
[MAS Notice 637 (Amendment) 2016]

Margin period of risk = F + N -1

where –

306H Stressed market conditions are characterised by the absence of continuously active markets where a counterparty would, within two or fewer days, obtain multiple price quotations that would not move the market or represent a price reflecting a market discount (in the case of collateral) or premium (in the case of an OTC derivative. Examples of situations where trades are deemed illiquid for this purpose include, but are not limited to, trades that are not marked daily and trades that are subject to specific accounting treatment for valuation purposes (e.g. transactions referencing securities whose fair value is determined by models with inputs that are not observed in the market).

(i) F is the floor; and

(ii) N is the periodicity.

6.6 A Reporting Bank using the internal models method shall not capture the effect of a reduction of E or EAD, whichever is applicable, due to any clause in a collateral agreement that requires receipt of collateral when counterparty credit quality deteriorates.

**Section 7: Model Validation Requirements**

7.1 A Reporting Bank intending to adopt an internal model for estimating EPE arising from CCR for regulatory capital purposes shall meet the minimum qualitative requirements for model validation under the IMA for market risk as set out in Sub-division 9 of Division 3 of Part VIII. In addition, the Reporting Bank shall:

(a) conduct a regular programme of backtesting, i.e. an ex-post comparison of the risk measures[306I] generated by the model against realised risk measures, as well as a comparison of hypothetical changes based on static positions with realised measures;

(b) carry out an initial validation and an ongoing periodic review, independent of the model developers, of its model and risk measures generated by the model;

(c) closely integrate its internal risk measurement exposure model into its day-to-day risk management process, where the model output forms an integral part of the process of planning, monitoring and controlling the counterparty credit risk profile of the Reporting Bank;

(d) use its risk measurement system in conjunction with internal trading and exposure limits, where exposure limits should be related to the risk measurement model in a manner that is consistent over time and that is well understood by traders, the credit function and senior management;

(e) have a routine in place for ensuring compliance with a well-documented set of internal policies, controls and procedures concerning the operation of the risk measurement system, and have a well-documented risk measurement system, for example, through a risk management manual that describes the basic principles of the risk management system and that provides an explanation of the empirical techniques used to measure counterparty credit risk;

(f) carry out an independent review of the risk measurement system and of the overall risk management process regularly as part of the internal audit process, including both the activities of the business trading units and of

[306I] Risk measures refer not only to effective EPE, but also to the other risk measures used in the calculation of effective EPE such as the exposure distribution at a series of future dates, the positive exposure distribution at a series of future dates, the market risk factors used to derive the exposures and the values of the constituent trades of a portfolio.

the independent risk control unit. The review of the overall risk management process should take place no less than once a year, and shall at least address the –

(i) adequacy of the documentation of the risk management system and process;

(ii) organisation of the risk control unit;

(iii) integration of CCR measures into daily risk management;

(iv) approval process for models used in the calculation of CCR used by front office and back office personnel;

(v) validation of any significant change in the risk measurement process;

(vi) scope of CCR captured by the risk measurement model;

(vii) integrity of the management information system;

(viii) accuracy and completeness of position data;

(ix) verification of the consistency, timeliness and reliability of data sources used to run internal models, including the independence of such data sources;

(x) accuracy and appropriateness of volatility and correlation assumptions;

(xi) accuracy of valuation and risk transformation calculations; and

(xii) verification of model accuracy as described in sub-paragraphs (g) to (k) below;

(g) document –

(i) the process for initial and ongoing validation of its model to a level of detail that would enable a third party to recreate the analysis;

(ii) the calculation of risk measures generated by the models to a level of detail that would enable a third party to recreate the risk measures;

(iii) the frequency with which backtesting analysis and any other ongoing validation will be conducted;

(iv) how the validation is conducted with respect to data flows and portfolios; and

(v) the analyses that are used;

(h) define criteria with which to assess its EPE models and the models that input into the calculation of EPE, and have a written policy in place that describes

the process by which unacceptable performance shall be determined and remedied;

(i) define how representative counterparty portfolios are constructed for the purposes of validating an EPE model and its risk measures;

(j) assess more than a single statistic of the model distribution, when validating EPE models and its risk measures that produce forecast distributions; and

(k) meet the following requirements as part of the initial and ongoing validation of its models and its risk measures:

(i) carry out backtesting using historical data on movements in market risk factors prior to supervisory approval;

(ii) in the backtesting process, consider a number of distinct prediction time horizons out to at least one year, over a range of various start dates and covering a wide range of market conditions;

(iii) backtest the performance of its EPE model and the relevant risk measures, as well as the market risk factor predictions that support EPE;

(iv) include, in the backtest for collateralised trades, prediction time horizons that reflect typical margin periods of risk applied in collateralised/margined trading, and long time horizons of at least one year;

(v) test the pricing models[306J] used to calculate CCR exposure for a given scenario of future shocks to market risk factors;

(vi) capture transaction specific information within the EPE model to aggregate exposures at the level of the netting set and verify that transactions are assigned to the appropriate netting set within the model;

(vii) include static, historical backtesting at regular intervals on representative counterparty portfolios, chosen based on their sensitivity to the material risk factors and correlations to which the Reporting Bank is exposed;

(viii) conduct backtesting that is designed to test the key assumptions of the EPE model and the relevant risk measures, for example, the modelled relationship between tenors of the same risk factor, and the modelled relationships between risk factors;

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[306J] These pricing models may be different from those used by the Reporting Bank to calculate market risk over a short horizon. Pricing models used by the Reporting Bank for options shall account for the nonlinearity of option value with respect to market risk factors.

(ix) correct any significant differences between realised exposures and the forecast distribution that are indicative of problems with the model or the underlying data[306K];

(x) subject the performance of EPE models and its risk measures to a backtesting programme that is capable of identifying poor performance in the risk measures of an EPE model;

(xi) validate its EPE models and all relevant risk measures out to time horizons commensurate with the maturity of trades for which exposure is calculated using the CCR internal models method;

(xii) regularly test the pricing models used to calculate counterparty exposure against appropriate independent benchmarks as part of the ongoing model validation process;

(xiii) include an assessment of recent performance in the ongoing validation of its EPE models and the relevant risk measures;

(xiv) assess the frequency with which parameters of an EPE model are updated;

(xv) cover all counterparties for which the models are used, in the ongoing assessment of model performance;

(xvi) assess the appropriateness of bank level and netting set exposure calculations of EPE; and

(xvii) if it uses a measure that is more conservative than alpha times effective EPE to estimate E or EAD, whichever is applicable, for each counterparty, regularly validate conservatism of this measure, and ensure that the degree of relative conservatism is to the satisfaction of the Authority.

7.2 A Reporting Bank shall ensure that the Board and senior management are actively involved in the risk control process and regard credit and counterparty credit risk control as an essential aspect of the business to which significant resources need to be devoted.

7.3 A Reporting Bank shall ensure a level of management with sufficient seniority and authority to:

(a) enforce both reduction of positions taken by individual traders and reductions in the bank's overall risk exposure;

(b) review the daily reports prepared by the independent risk control unit; and

(c) periodically review the ongoing validation of models and backtesting and decide the course of action that will be taken to address model weaknesses.

[306K] The Authority may, among other things, require additional capital to be held under such circumstances, while the problems are being solved.

**Section 8: Operational Requirements**

8.1 A Reporting Bank intending to adopt an internal model for estimating EPE arising from CCR for regulatory capital purposes shall meet the operational requirements set out in paragraphs 8.2 to 8.20 below.

[MAS Notice 637 (Amendment) 2012]

Qualifying Standards on CCR Management

8.2 A Reporting Bank shall adhere to sound practices for the management of CCR, including those set out in Annex 10A of Part X.

8.3 At a minimum, the Reporting Bank shall have a control unit which is adequately staffed, independent from the business and trading functions and reports directly to senior management, responsible for the following:

(a) the design and implementation of the CCR management framework of the Reporting Bank, including the initial and ongoing validation of the CCR internal model;

(b) the integrity of the input data; and

(c) the generation of daily reports and analysis of the output of the Reporting Bank's CCR internal model, including an evaluation of the relationship between measures of E or EAD, whichever is applicable, and credit and trading limits.

8.3A A Reporting Bank using the CCR internal models method shall have a collateral management unit which is responsible for the following:

(a) the calculation and making of margin calls;

(b) the management of margin call disputes;

(c) the generation of accurate daily reports on levels of independent amounts, initial margins and variation margins;

(d) the control of the integrity of the data used to make margin calls, ensuring that it is consistent and reconciled regularly with all relevant sources of data within the Reporting Bank;

(e) the tracking of the extent of reuse of collateral, both cash and non-cash, and the rights that the Reporting Bank gives away to its respective counterparties for the collateral that it posts;

(f) the tracking of concentration to individual collateral asset classes accepted by the Reporting Bank;

(g) the generation of reports which indicate the categories of collateral assets that are reused, and the terms of such reuse including instrument, credit quality and maturity; and

(h) the production and maintenance of appropriate collateral management information that is reported on a regular basis to senior management, including information on the type of collateral (both cash and non-cash) received and posted, the size, aging and cause for margin call disputes, and trends in these figures.

8.3B A Reporting Bank shall ensure that the senior management allocates sufficient resources to the collateral management unit to ensure an appropriate level of operational performance, as measured by the timeliness and accuracy of outgoing calls and response time to incoming calls. A Reporting Bank shall ensure that the senior management adequately staffs the collateral management unit to process calls and disputes in a timely manner, even during a severe market crisis and to enable the Reporting Bank to limit its number of large disputes caused by trade volumes.

8.3C A Reporting Bank adopting the CCR internal models method shall ensure that its cash management policies account simultaneously for the liquidity risks of potential incoming margin calls arising from the –

(a) exchanges of variation margin or other margin types, such as initial or independent margin, under adverse market shocks;

(b) potential incoming calls for the return of excess collateral posted by counterparties; and

(c) calls resulting from a potential downgrade of its own public rating.

8.3D A Reporting Bank adopting the CCR internal models method shall ensure that the nature and horizon of collateral reuse is consistent with its liquidity needs and does not jeopardise its ability to post or return collateral in a timely manner.

Use Test

8.4 A Reporting Bank shall not design and implement its models exclusively for the purpose of qualifying for the CCR internal models method.

8.5 A Reporting Bank shall ensure that the distribution of exposures generated by the model used to calculate effective EPE is closely integrated into the day-to-day CCR management process of the Reporting Bank. For example, the peak exposure from the distributions for counterparty credit limits or EPE could be used for a Reporting Bank's internal allocation of capital. A Reporting Bank shall ensure that the model's output accordingly plays an essential role in the credit approval, CCR management, internal capital allocation, and corporate governance of the Reporting Bank.

8.6 A Reporting Bank shall have a credible track record in the use of models that generate a distribution of exposures to CCR. In this regard, the Reporting Bank shall demonstrate that it has been using an internal model to calculate the distributions of

exposures upon which the EPE calculation is based that meets, broadly, the minimum requirements set out in this Annex for at least one year before applying to the Authority for approval to use its internal model for estimating EPE.

8.7 A Reporting Bank shall –

(a) ensure that the model used to generate the distribution of E or EAD, whichever is applicable, is part of a CCR management framework that includes the identification, measurement, management, approval and internal reporting of CCR;

(b) ensure that the CCR management framework includes the measurement of usage of credit lines (aggregating E or EAD relating to CCR with other credit exposures) and economic capital allocation;

(c) measure and manage current exposures in addition to EPE; and

(d) measure current exposure gross and net of collateral held, where appropriate.

8.8 The Authority will normally regard the use of other CCR measures by the Reporting Bank, such as peak exposure or potential future exposure, based on the distribution of E or EAD, whichever is applicable, that are generated by the same model used to compute EPE as having satisfied the use test.

8.9 A Reporting Bank shall have the systems capability to estimate EE daily, if necessary, unless it is able to demonstrate to the satisfaction of the Authority that its E or EAD to CCR, warrant less frequent calculation. The Reporting Bank shall compute EE along a time profile of forecasting horizons that adequately reflects the time structure of future cash flows and maturity of the contracts and that is consistent with the materiality and composition of the exposures.

8.10 A Reporting Bank shall measure, monitor and control its E or EAD relating to CCR over the life of all contracts in the netting set and not just to the one-year horizon. The Reporting Bank shall have procedures in place to identify and control the risks for counterparties where the E or EAD relating to CCR rises beyond the one-year horizon. In addition, this forecasted increase in E or EAD shall be an input into the economic capital model of the Reporting Bank.

8.10A A Reporting Bank should ensure that the work of the control unit responsible for the design and implementation of the CCR management framework is closely integrated into the day-to-day credit risk management process of the Reporting Bank, and its output is an integral part of the process of planning, monitoring and controlling the Reporting Bank's credit and overall risk profile.

Stress Test

8.11 A Reporting Bank shall have in place sound stress testing processes for use in the assessment of capital adequacy. These stress measures shall be compared against the

measure of EPE and considered by the Reporting Bank as part of its ICAAP as set out in Annex 10A of Part X.

8.12 A Reporting Bank shall ensure that its stress testing involves identifying possible events or future changes in economic conditions that could have unfavourable effects on its E or EAD and assessing its ability to withstand such changes. Examples of possible scenarios that could be used include economic or industry downturns, market place events or decreased liquidity conditions.

8.13 A Reporting Bank shall have a comprehensive stress testing programme for CCR that includes –

(a) complete trade capture and exposure aggregation across all forms of CCR, not just OTC derivatives, at the counterparty-specific level in a sufficient time frame to conduct regular stress testing;

(b) exposure stress testing for all counterparties of principal market risk factors, at least monthly, (e.g. interest rates, foreign exchange, equities, credit spreads, and commodity process) in order to proactively identify, and where necessary, reduce outsized concentrations to specific directional sensitivities;

(c) multi-factor stress testing, which may be part of bank-wide stress testing, that addresses scenarios of –

   (i) severe economic or market events;

   (ii) significant decrease in broad market liquidity; and

   (iii) the market impact of liquidating positions of a large financial intermediary;

(d) the application of multifactor stress testing and assessment of material non-directional risks (e.g. yield curve exposure, basis risks) at least quarterly;

(e) the application of stressed market movements which have an impact not only on counterparty exposures, but also on the credit quality of counterparties; and at least quarterly, the conduct of stress testing applying stressed conditions to the joint movement of exposures and counterparty creditworthiness;

(f) the application of exposure stress testing (including single factor, multi-factor and material non-directional risks) and joint stress testing of exposure and creditworthiness at the following levels:

   (i) counterparty-specific;

   (ii) counterparty group (e.g. industry, region); and

   (iii) aggregate bank-wide CCR;

(g) for the purpose of evaluating solvency under stress, the application of factor shocks which are severe enough to capture historical extreme market environments and extreme but plausible stressed market conditions, and evaluation of the impact of such shocks on capital resources, capital requirements and earnings; and for the purpose of day-to-day portfolio monitoring, hedging and management of concentrations, the application of scenarios that are of lesser severity but higher probability;

(h) reverse stress testing to identify extreme but plausible scenarios that could result in significant adverse outcomes; and

(i) stress tests and scenario analyses that are designed to identify risk factors that are positively correlated with counterparty creditworthiness and to address the possibility of severe shocks occurring when relationships between risk factors have changed.

8.13A The Reporting Bank shall integrate stress test results into regular reporting to senior management. The analysis shall capture –

(a) the largest counterparty-level impacts across the portfolio;

(b) material concentrations within segments of the portfolio (e.g. within the same industry or region); and

(c) relevant portfolio and counterparty specific trends.

8.13B The Reporting Bank shall ensure that senior management takes a lead role in the integration of stress testing into the risk management framework and risk culture of the Reporting Bank and ensure that the results are meaningful and proactively used to manage CCR. The Reporting Bank shall ensure that the results of stress testing are compared to the risk appetite of the Reporting Bank and elevated for discussion and action when excessive or concentrated risks are present.

Wrong-way Risk

8.14 A Reporting Bank shall give due consideration to E or EAD relating to CCR that give rise to a significant degree of general wrong-way risk. A Reporting Bank shall monitor general wrong-way risk by product, region, industry and other categories that are germane to the business.

8.15 A Reporting Bank shall have procedures in place to identify, monitor and control cases of specific wrong-way risk[307], beginning at the inception of a trade and continuing through the life of the transaction.

[307] A Reporting Bank is said to be exposed to specific wrong-way risk if future exposure to a specific counterparty is expected to be high when the probability of default of the counterparty is also high. For example, a company writing put options on its own shares creates wrong-way risk exposures for the buyer that is specific to the counterparty.

8.15A On a regular basis, a Reporting Bank shall provide senior management and the appropriate Board committee with reports that communicate wrong-way risks and the steps that the Reporting Bank is taking to manage that risk.

8.15B A Reporting Bank shall not consider the instruments for which there exists a legal connection between the counterparty and the underlying issuer, and for which specific wrong-way risk has been identified, to be in the same netting set as other transactions with the counterparty.

8.15C For single-name credit default swaps where there exists a legal connection between the counterparty and the underlying issuer, and where specific wrong-way risk has been identified, a Reporting Bank shall calculate E or EAD in respect of such swap counterparty exposure as the full expected loss in the remaining fair value of the underlying reference asset assuming the issuer of the underlying reference asset is in default or liquidation (i.e. assuming that the underlying reference asset has a PD of 100%). If a non-zero recovery is assumed for the underlying reference asset, a Reporting Bank using the IRBA shall set LGD as 100% for the netting set assigned to the single-name credit default swap[307A]. A Reporting Bank using the SA(CR) shall treat such transactions as unsecured.

8.15D For transactions other than single-name credit default swaps (e.g. equity derivatives, bond options or SFTs referencing a single entity), where there exists a legal connection between the counterparty and the underlying entity, and where specific wrong-way risk has been identified, a Reporting Bank shall calculate E or EAD, as the value of the transaction under the assumption of a jump-to-default of the underlying reference asset. In as much this makes use of existing market risk calculations for IRC that already contains a LGD assumption, the Reporting Bank shall ensure LGD is set as 100%.

Integrity of Modelling Process

8.16 A Reporting Bank shall ensure that it has the internal controls needed to ensure the integrity of its model inputs. At a minimum, the Reporting Bank shall comply with the requirements set out in paragraphs 8.17 to 8.19 below.

8.17 A Reporting Bank shall ensure that, in respect of its transaction data, that –

(a) the internal model reflects the transaction terms and specifications in a timely, complete and conservative manner. Such terms include, but are not limited to, contract notional amounts, maturity, reference assets, collateral thresholds, margining arrangements and netting agreements;

(b) the terms and specifications are maintained in a secure database that is subject to formal and periodic audit;

[307A] The Reporting Bank shall calculate the capital requirement for exposures to the underlying reference asset without recognising the effects of CRM of a single-name credit default swap which introduces wrong-way risk. Generally, this means that the exposure to the underlying reference asset receives the risk weight and capital treatment associated with an unsecured transaction (i.e. assuming such exposure is an unsecured credit exposure).

(c) the process for recognising netting agreements involves a signoff by legal staff verifying the legal enforceability of netting and input of transaction terms and specifications into the database by an independent unit;

(d) the transmission of transaction terms and specifications data to the model is subject to internal audit; and

(e) there are formal reconciliation processes in place between the internal model and source data systems to verify on an ongoing basis that transaction terms and specifications are being reflected in EPE correctly or at least conservatively.

8.18 A Reporting Bank shall, when calibrating its effective EPE model using historical market data –

(a) employ current market data, regardless of whether it is directly observed or implied by other observable prices as at valuation date, to compute current exposures;

(b) estimate model parameters using at least three years of either:

(i) historical market data; or

(ii) market implied data; and

(c) update such data quarterly or more frequently if market conditions warrant.

8.18A A Reporting Bank shall when calculating its effective EPE calculation using a stress calibration –

(a) use either –

(i) three years of historical market data that includes a period of stress to the credit default spreads of its counterparties; or

(ii) market implied data from a suitable period of stress;

(b) demonstrate, at least quarterly, that the stress period coincides with a period of increased credit default swap spreads or other credit spreads for a representative selection of its counterparties with traded credit spreads;

[MAS Notice 637 (Amendment No. 2) 2014]

(c) map each counterparty to specific credit spread data based on region, internal rating and business types for counterparties where there is no adequate credit spread data;

(d) for the exposure model for all counterparties, use either historic or implied data that includes the data from the stressed credit period, and in a manner consistent with the method used by the Reporting Bank for the calibration of the effective EPE model to current data; and

(e) evaluate the effectiveness of its stress calibration[307B] for effective EPE by creating several benchmark portfolios that are vulnerable to the same main risk factors to which the Reporting Bank is exposed, and calculate the exposure to these benchmark portfolios using:

(i) current positions, both at current market prices and at end of stress period market prices;

(ii) stressed volatilities;

(iii) stressed correlations; and

(iv) other relevant stressed exposure model inputs from the three-year stress period.

8.18B For OTC derivatives, if a Reporting Bank recognises in its calculations of E or EAD, whichever is applicable, the effect of collateral other than cash of the same currency as the exposure itself, and it is not able to model collateral jointly with the exposure, it shall use either haircuts that meet the standards of the FC(CA) with standard supervisory haircuts or its own-estimate haircuts.

8.18C If the models of the Reporting Bank includes the effect of collateral on changes in the market value of the netting set, the Reporting Bank shall model collateral, other than cash of the same currency as the exposure itself, jointly with the exposure in its calculations of E or EAD, whichever is applicable, for SFTs.

8.19 A Reporting Bank shall ensure that the EPE model (and modifications made to it) is subject to a validation process that –

(a) is clearly articulated in the policies and procedures of the Reporting Bank;

(b) specifies the kind of testing needed to ensure model integrity;

(c) identifies conditions under which assumptions are violated and may result in an understatement of EPE; and

(d) includes a review of the comprehensiveness of the EPE model, (e.g. whether the EPE model covers all products that have a material contribution to CCR).

8.20 A Reporting Bank shall demonstrate to the satisfaction of the Authority that it meets the minimum criteria for approval to adopt the IMA to calculate market RWA set out in paragraph 8.3.12 of Part VIII, but in the context of assessing CCR. In particular, a Reporting Bank shall ensure that-

(a) the Reporting Bank's risk management process and system for assessing CCR is conceptually sound and is implemented with integrity;

[307B] The Authority may adjust the stress calibration if the exposures of these benchmark portfolios deviate substantially.

(b) the Reporting Bank has sufficient numbers of staff skilled in the use of sophisticated models not only in the trading area but also in the risk control, audit, and if necessary, back office areas;

(c) the Reporting Bank's models have a proven track record of reasonable accuracy in measuring CCR; and

(d) the Reporting Bank regularly conducts stress tests in accordance with the requirements set out in paragraph 8.11 to 8.13B of this Annex.

[MAS Notice 637 (Amendment) 2012]

## CREDIT QUALITY GRADES

[MAS Notice 637 (Amendment) 2014]

**Table 7R-1 - Credit Quality Grades for SA(CR) Exposures**

| Credit Quality Grade | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Fitch Ratings | AAA<br>AA+<br>AA<br>AA- | A+<br>A<br>A- | BBB+<br>BBB<br>BBB- | BB+<br>BB<br>BB- | B+<br>B<br>B- | CCC+<br>CCC<br>CCC-<br>CC<br>C<br>D |
| Moody's Investors Services | Aaa<br>Aa1<br>Aa2<br>Aa3 | A1<br>A2<br>A3 | Baa1<br>Baa2<br>Baa3 | Ba1<br>Ba2<br>Ba3 | B1<br>B2<br>B3 | Caa1<br>Caa2<br>Caa3<br>Ca<br>C |
| Standard & Poor's Ratings Services | AAA<br>AA+<br>AA<br>AA- | A+<br>A<br>A- | BBB+<br>BBB<br>BBB- | BB+<br>BB<br>BB- | B+<br>B<br>B- | CCC+<br>CCC<br>CCC-<br>CC<br>C<br>D |

[MAS Notice 637 (Amendment) 2014]

**Table 7R-2 - For Credit Quality Grades for Short-term SA(CR) Exposures**

| Short-term Credit Quality Grade | I | II | III | IV |
|---|---|---|---|---|
| Fitch Ratings | F-1 | F-2 | F-3 | Others |
| Moody's Investors Services | P-1 | P-2 | P-3 | Others |
| Standard & Poor's Ratings Services | A-1 | A-2 | A-3 | Others |

[MAS Notice 637 (Amendment) 2014]

**Table 7R-3 - Credit Quality Grades for SEC-ERBA Exposures**

| Credit Quality Grade | Fitch Ratings | Moody's Investors Services | Standard & Poor's Ratings Services |
|---|---|---|---|
| 1 | AAA | Aaa | AAA |
| 2 | AA+ | Aa1 | AA+ |
| 3 | AA | Aa2 | AA |
| 4 | AA- | Aa3 | AA- |
| 5 | A+ | A1 | A+ |
| 6 | A | A2 | A |
| 7 | A- | A3 | A- |
| 8 | BBB+ | Baa1 | BBB+ |
| 9 | BBB | Baa2 | BBB |
| 10 | BBB- | Baa3 | BBB- |
| 11 | BB+ | Ba1 | BB+ |
| 12 | BB | Ba2 | BB |
| 13 | BB- | Ba3 | BB- |
| 14 | B+ | B1 | B+ |
| 15 | B | B2 | B |
| 16 | B- | B3 | B- |
| 17 | CCC+/CCC/CCC- | Caa1/Caa2/Caa3 | CCC+/CCC/CCC- |
| 18 | Below CCC- | Below CCC- | Below CCC- |

[MAS Notice 637 (Amendment) 2014]
[MAS Notice 637 (Amendment No. 2) 2017]

**Table 7R-4 - Credit Quality Grades for Short-term SEC-ERBA Exposures**

| Short-term Credit Quality Grade | I | II | III | IV |
|---|---|---|---|---|
| Fitch Ratings | F-1 | F-2 | F-3 | Others |
| Moody's Investors Services | P-1 | P-2 | P-3 | Others |
| Standard & Poor's Ratings Services | A-1 | A-2 | A-3 | Others |

[MAS Notice 637 (Amendment) 2014]
[MAS Notice 637 (Amendment No. 2) 2017]

**Table 7R-5 - Claims Paying Ability Grades for AMA Exposures**

| Claims Paying Ability Grade | 1 |
|---|---|
| Fitch Ratings | AAA, AA, A |
| Moody's Investor Services | Aaa, Aa, A1, A2 |
| Standard & Poor's Ratings Services | AAA, AA, A+,A |

[MAS Notice 637 (Amendment) 2014]

**Annex 7RA**

**RECOGNISED ECAIs**

The following entities are recognised as ECAIs by the Authority pursuant to paragraph 7.3.53:

(a) Fitch Ratings;

(b) Moody's Investor Services;

(c) Standard & Poor's Ratings Services.

[MAS Notice 637 (Amendment) 2014]

**Annex 7S**

**QUALIFYING MDBs**

"Qualifying MDBs" means:

(a) the African Development Bank;

(b) the Asian Development Bank;

(c) the Asian Infrastructure Investment Bank;

(d) the Caribbean Development Bank;

(e) the Council of Europe Development Bank;

(f) the European Bank for Reconstruction and Development;

(g) the European Investment Bank;

(h) the European Investment Fund;

(i) the Inter-American Development Bank;

(j) [Deleted by MAS Notice 637 (Amendment No. 2) 2018]

(k) the Islamic Development Bank;

(l) the Nordic Investment Bank;

(m) the International Finance Facility for Immunisation; or

(n) the World Bank Group, including the International Bank for Reconstruction and Development, the International Development Association, the International Finance Corporation and the Multilateral Investment Guarantee Agency.

[MAS Notice 637 (Amendment No. 2) 2017]
[MAS Notice 637 (Amendment No. 2) 2018]

**Annex 7T**

## QUALIFYING MORTGAGE INSURANCE

A "qualifying mortgage insurance" means a mortgage insurance in respect of which the following requirements are complied with:

(a) the coverage shall be provided by an insurer which is registered under the Insurance Act (Cap. 142) to carry on mortgage insurance business in Singapore ("mortgage insurer") and which is not a related corporation of the Reporting Bank;

(b) the mortgage insurer shall have a credit quality grade of "2" or better as set out in Table 7R-1 of Annex 7R of Part VII at the inception of the mortgage insurance coverage and a credit quality grade of "3" or better as set out in Table 7R-1 of Annex 7R of Part VII on an ongoing basis;

(c) the Reporting Bank shall employ robust procedures and processes to control residual risks such as legal, operational, liquidity and market risks;

(d) the Reporting Bank shall conduct sufficient legal review to verify and have a well founded legal basis to ensure that all documentation of the mortgage insurance ("mortgage insurance contract") is binding on all parties and legally enforceable in the relevant jurisdictions, and undertake such future review as necessary to ensure continuing enforceability; and

(e) the Reporting Bank shall ensure that the mortgage insurance coverage complies with the following:

  (i) it represents a direct claim on the mortgage insurer and is explicitly referenced to specific exposures, so that the extent of cover is clearly defined and incontrovertible;

  (ii) it is irrevocable[308], i.e. there shall be no clause in the mortgage insurance contract that would allow the mortgage insurer to unilaterally cancel the coverage or that would increase the effective cost of coverage as a result of deteriorating credit quality of the loan;

  (iii) it is unconditional, i.e. there shall be no clause in the mortgage insurance contract outside the direct control of the Reporting Bank that could prevent the mortgage insurer from being obliged to pay out in a timely manner in the event that the borrower fails to make the payments due;

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[308] Exclusions relating to the non-payment by the Reporting Bank of money due in respect of the mortgage insurance contract, and clearly defined non-credit related events (e.g. exclusions relating to bank negligence and fraud, title defects, physical damage to the collateral, acts of war and rebellion, and claims contrary to law) is not normally regarded by the Authority as a failure to meet this condition.

(iv) the definition of a qualifying default or non-payment of the borrower in the mortgage insurance contract shall be aligned with that used by the Reporting Bank;

(v) the mortgage insurance contract transaction allows the Reporting Bank to seek repayment from the mortgage insurer for any money outstanding on the qualifying default or non-payment of the borrower in a timely manner. The Reporting Bank shall have the right to receive such payments without first having to take legal action against the borrower for repayment of the mortgage loan[309];

(vi) it is an explicitly documented obligation assumed by the mortgage insurer; and

(vii) it covers all types of payments that the borrower is expected to make under the documentation governing the loan.

[309] Where a mortgage insurer is expected to pay claims only after the enforcement of collateral has taken place, the mortgage insurer should pay claims promptly once the collateral has been realised and the loss has been established. However, if this is not completed before 24 months, the Reporting Bank shall have the right to receive such payments regardless of the status of realising the collateral. In this case, the claim payment will be based on the estimated value of the collateral and a final settlement will occur upon realising the collateral.

## DEFINITION OF SL ASSET SUB-CLASS AND HVCRE ASSET SUB-CLASS

1.1 An IRBA exposure belonging to the SL asset sub-class or HVCRE asset sub-class possesses all of the following characteristics, either in legal form or economic substance:

(a) the exposure is typically to an entity (often an SPE) which was created specifically to finance or operate physical assets or both;

(b) the obligor usually has little or no other material assets or activities, and therefore little or no independent capacity to repay the obligation, apart from the income that it receives from the assets being financed;

(c) the terms of the obligation give the Reporting Bank a substantial degree of control over the assets and the income that such assets generate; and

(d) as a result of the preceding factors, the primary source of repayment of the obligation is the income generated by the assets, rather than the independent capacity of the broader commercial enterprise of the obligor.

1.2 The four types of exposures within the SL asset sub-class are PF, OF, CF and IPRE lending.

Project Finance

1.3 PF is a method of funding in which the Reporting Bank looks primarily to the revenues generated by a single project, both as the source of repayment and as security for the exposure. This type of financing is usually for large, complex and expensive installations that might include, for example, power plants, chemical processing plants, mines, transportation infrastructure, environment, and telecommunications infrastructure. PF may take the form of financing of the construction of a new capital installation, or refinancing of an existing installation, with or without improvements.

1.4 In a PF transaction, the Reporting Bank is usually paid solely or almost exclusively out of the money generated by the contracts for the facility's output, such as the electricity sold by a power plant. The obligor is usually an SPE that is not permitted to perform any function other than developing, owning, and operating the installation. The consequence is that repayment depends primarily on the project's cash flow and on the collateral value of the project's assets. In contrast, if repayment of the exposure depends primarily on a well established, diversified, credit-worthy, contractually obligated end-user for repayment, it is considered a secured exposure to that end-user.

Object Finance

1.5 OF refers to a method of funding the acquisition of physical assets (e.g. ships, aircraft, satellites, railcars, and fleets) where the repayment of the exposure is dependent on the cash flows generated by the specific assets that have been financed and pledged or assigned to the Reporting Bank. A primary source of these cash flows might be rental or lease contracts with one or several third parties. In contrast, if the exposure is to an obligor whose financial condition and debt-servicing capacity enables it to repay the debt without undue reliance on the specifically pledged assets, the exposure should be treated as a collateralised corporate exposure.

Commodities Finance

1.6 CF refers to structured short-term lending to finance reserves, inventories, or receivables of exchange-traded commodities (e.g. crude oil, metals, or crops), where the exposure will be repaid from the proceeds of the sale of the commodity and the obligor has no independent capacity to repay the exposure. This is the case when the obligor has no other activities and no other material assets on its balance sheet. The structured nature of the financing is designed to compensate for the weak credit quality of the obligor. The rating of the exposure reflects its self-liquidating nature and the skill of the Reporting Bank in structuring the transaction rather than the credit quality of the obligor.

1.7 Such lending can be distinguished from exposures financing the reserves, inventories, or receivables of other more diversified corporate obligors. Reporting Banks are able to rate the credit quality of the latter type of obligors based on their broader ongoing operations. In such cases, the value of the commodity serves as a credit risk mitigant rather than as the primary source of repayment.

IPRE Lending

1.8 IPRE lending refers to a method of providing funding to real estate (such as, office buildings to let, retail space, multifamily residential buildings, industrial or warehouse space, and hotels) where the prospects for repayment and recovery on the exposure depend primarily on the cash flows generated by the asset. The primary source of these cash flows would generally be lease or rental payments or the sale of the asset. The obligor may be, but is not required to be, an SPE, an operating company focused on real estate construction or holdings, or an operating company with sources of revenue other than real estate. The distinguishing characteristic of IPRE versus other corporate exposures that are collateralised by real estate is the strong positive correlation between the prospects for repayment of the exposure and the prospects for recovery in the event of default, with both depending primarily on the cash flows generated by a property.

HVCRE Lending

1.9 HVCRE lending refers to the financing of CRE that exhibits higher loss rate volatility (i.e. higher asset correlation) compared to an IRBA exposure belonging to the SL asset sub-class. HVCRE includes:

(a) CRE exposures secured by properties of types that are categorised by the Authority as sharing higher volatilities in portfolio default rates;[310]

(b) loans financing any of the land acquisition, development and construction ("ADC") phases for properties of those types in sub-paragraph 1.9(a); and

(c) loans financing ADC of any other properties where the source of repayment at origination of the exposure is either the future uncertain sale of the property or cash flows whose source of repayment is substantially uncertain (e.g. the property has not yet been leased to the occupancy rate prevailing in that geographic market for that type of CRE), unless the obligor has substantial equity at risk. Commercial ADC loans exempted from treatment as HVCRE loans on the basis of certainty of repayment of borrower equity are, however, ineligible for the risk weights specified in paragraph 7.4.67 of this Part.

1.9A Where a bank regulatory agency in a foreign jurisdiction has categorised certain types of CRE exposures as HVCRE in its jurisdiction, a Reporting Bank shall apply the capital treatment in accordance with Sub-division 6 of Division 4 of this Part to such HVCRE exposures in that jurisdiction.

Case Studies

1.10 Some case studies on the categorisation of IRBA exposures based on the definitions above are as follows[311]:

Project Finance

(a) A Reporting Bank finances an SPE that will build and operate a project. The SPE has an off-take contract with an end-user. The length of the off-take contract covers the full maturity of the loan, and the loan amortises fully during the length of the contract. The payments by the end-user to the SPE are based mainly on the ability of the SPE to provide the specified output or services and not on the actual demand for the output or services. If the contract is terminated, the end-user is normally required to purchase the underlying assets at a price related to the market value of the unexpired term of the contract. This should be considered as an exposure belonging to the corporate asset sub-class rather than the SL asset sub-class.

(b) A Reporting Bank finances an SPE that will build and operate a project. If the Reporting Bank is exposed to the key risks in the project – construction risk (the risk that the project will not be completed in a timely or cost effective manner), operational or technology risk (the risk that the project will not operate up to specifications), or market/price risk (the risk that the

[310] The Authority has not categorised any type of CRE exposures as HVCRE. Where the Authority categorises any type of CRE exposures as HVCRE, the Authority shall make public any such determinations.

[311] The examples are for illustrative purposes only and not intended to be definitive or exhaustive. The actual operation of the principles embodied in paragraphs 1.1 to 1.9 of this Annex may vary depending on the circumstances in each case.

demand and the price of the output will fall or that the margin between output prices and input prices and production costs will deteriorate), the project should be categorised within the SL asset sub-class. If a circular relationship exists between the financial strength of the end-user and the project, the project should be categorised under the SL asset sub-class. This would be the case when an end-user has limited resources or capacity to generate revenues apart from those generated by the project being financed, so that the ability of the end-user to honour its off-take contract depends primarily on the performance of the project.

(c) If a Reporting Bank provides a loan to finance a transatlantic fibre optic cable to an established telecommunications firm, which has an established business plan, track record and diversified revenue stream, the exposure would be considered as belonging to the corporate asset sub-class.

Object Finance

(d) A recently established charter airline finances the purchase of two aircraft. The airline does not have an established record of financial or operational performance, and the Reporting Bank would not normally extend long-term credit to the airline. An SPE owns the aircraft and leases it to the airline. The legal structure of the transaction is such that the Reporting Bank, in the event of default, can seize and re-market the aircraft without delay. Such a loan would be assigned to the SL asset sub-class given that the ability of the obligor to service the loan is unproven and the credit decision of the Reporting Bank is largely based on its ability to re-market the collateral in the event of default by the obligor. In this case, the asset-based focus is supported by a loan structure that supports this premise (e.g. the amortisation schedule mirrors the anticipated depreciation of the aircraft's fair value, the Reporting Bank has the right to quickly gain control of the aircraft in the event of default or bankruptcy, and the Reporting Bank has control over the airline's lease payments).

(e) A charter airline with an established business plan, many aircraft, and diversified service routes finances the purchase of additional aircraft to be used in its own operations. The airline establishes an SPE to own the subject aircraft. The Reporting Bank lends to the SPE and takes a security interest in the aircraft. The SPE enters into a long-term lease with the airline. The term of the lease exceeds that of the underlying loan. The lease cannot be terminated under any condition. This exposure would be placed in the corporate asset sub-class because the repayment of the loan depends on the overall operations of the airline and is not unduly dependent upon the specific aircraft as the primary source of repayment.

(f) Same example as above, except that (i) the lease term can be cancelled by the airline without penalty at some time before the end of the loan term, or (ii) even if the lease is non-cancellable, the lease payments do not fully cover the aggregate loan payments over the life of the loan. This loan should be categorised within the SL asset sub-class, given that the airline/lessee is not fully committed to a lease sufficient to repay the loan, so pass-through treatment is inappropriate.

(g) A large, well-established shipping company sets up an SPE as a subsidiary. There is no contractual recourse between the shipping company and the SPE. The SPE wishes to finance a container ship, and the income from container shipping (either by the SPE leasing the ship to third parties or doing the shipping itself) serves as the sole repayment source for the loan. Such a loan would be categorised within the SL asset sub-class because the primary source of repayment is the container ship and its income generating ability. The Reporting Bank's ability to base the transaction's rating on the shipping company's financial capacity is hampered, given that the shipping company is not contractually obligated to repay the debt or make payments to the SPE sufficient to repay the debt. Instead, the loan is structured so that the cash flow from the specified asset, and not the general financial capacity of the shipping company, serves as the primary source of repayment.

Commodities Finance

(h) The Reporting Bank extends short-term documentary trade credit to a small independent trading company ("trader") that acts as an intermediary between producers and their customers. The trader specialises in a single commodity and a single region. Each commodity shipment handled by the trader is financed and secured separately. Credit is extended upon delivery of the commodity to the trader, who has already contracted for the resale of the commodity shipment. A trust-worthy third party controls the shipment of the commodity, and the bank controls payment by the customer. This loan would be categorised as an exposure in the SL asset sub-class, since repayment depends primarily on the proceeds of the sale of the commodity.

(i) The Reporting Bank extends short-term documentary trade credit to a trader. The circumstances are the same as in the preceding case, except that the trader has not yet contracted for the resale of the commodity. In deciding whether to classify a particular commodities finance transaction as an exposure in the SL asset sub-class, a Reporting Bank should, among other things, consider the degree of control that it has over the commodities and whether the trader has any independent capacity to repay the loan other than through the proceeds from the resale of the commodities. Where the trader has not contracted for resale of the commodities because it has other possible means of repaying its obligations, notwithstanding the degree of control a Reporting Bank has over the commodities, the transaction would not qualify as an exposure in the SL asset sub-class. This loan would instead be categorised as an exposure in the corporate asset sub-class since the Reporting Bank's credit exposure is primarily to the trader that is long the commodity.

(j) The Reporting Bank provides an unsecured non-transactional working capital loan to a small trader, either separately or as part of a transactional credit facility. Such an unsecured loan would be categorised within the corporate asset sub-class, since its repayment depends on the trader rather

than on the revenues generated by the sale of any specific commodity shipment being financed.

IPRE Lending

(k) A Reporting Bank makes a loan to an SPE to finance the construction of an office building that will be let out to prospective tenants. The SPE has essentially no other assets and has been created just to manage this office building. The office building is pledged as collateral on the loan. This loan should be categorised with the SL asset sub-class, given that the prospects for repayment and recovery depend primarily on the cash flow generated by the asset.

(l) A Reporting Bank makes a loan to a large, well-diversified operating company to finance the construction of an office building that will be primarily occupied by the company. The office building is pledged as collateral on the loan, and the loan is a general obligation of the company. The loan is small relative to the overall assets and debt service capacity of the company. This loan should be categorised as an exposure within the corporate asset sub-class since repayment depends primarily on the overall condition of the operating company, which does not in turn depend significantly on the cash flow generated by the asset.

(m) A Reporting Bank makes a loan to a company to finance the construction or acquisition of an office building that will be let out to prospective tenants. The office building is pledged as collateral on the loan, and the loan is a general obligation of the company. The company has essentially no other assets. The Reporting Bank underwrites the loan using its corporate procedures. Despite the fact that the borrower is an operating company and the Reporting Bank uses its corporate underwriting procedures, this loan should be categorised within the SL asset sub-class. The motivation is that the prospects for repayment and recovery both depend primarily on the cash flow generated by the asset. Although there is legal recourse to the project sponsor, which is an operating company, the overall condition of the project sponsor depends primarily on the cash flow generated by the asset. Therefore, in the event of project failure, the sponsor will have essentially no ability to meet its general obligations.

(n) A Reporting Bank makes a loan to an SPE to finance the acquisition of an office building that will be primarily leased to a large, well-diversified operating company under a long-term lease. The SPE has essentially no other assets and has been created just to manage this office building. The lease is at least as long as the loan term and is non-cancellable, and the lease payments completely cover the cash flow needs of the obligor (debt service, capital expenditures, operating expenses, etc.). The loan is amortised fully over the term of the lease with no bullet or balloon payment at maturity. In categorising this loan the Reporting Bank may look through the SPE to the long-term tenant, treating it as an exposure within the corporate asset sub-class. This is because the prospects for repayment and

recovery depend primarily on the overall condition of the long-term tenant, which will determine the cash flow generated by the asset.

(o) Same as (n) above, except that (i) the lease term can be cancelled at some time before the end of the loan term, or (ii) even if the lease is non-cancellable, the lease payments do not fully cover the aggregate loan payments over the life of the loan. This loan should be categorised in the SL asset sub-class. This is because the tenant is not fully committed to the lease sufficient to repay the loan, so pass-through treatment is inappropriate.

**Annex 7V**

## SUPERVISORY SLOTTING CRITERIA FOR SL ASSET SUB-CLASS AND HVCRE ASSET SUB-CLASS

The following tables set out guidelines on the supervisory rating categories to be used for determining $RW_{slot}$ for any IRBA exposure belonging to the SL asset sub-class or HVCRE asset sub-class for which the Reporting Bank is using the supervisory slotting criteria to calculate the credit risk-weighted exposure amount of the exposure.

**Table 7V-1 – Guidelines on Supervisory Rating Categories for Project Finance**

| | Strong | Good | Satisfactory | Weak |
|---|---|---|---|---|
| **Financial Strength** | | | | |
| Market conditions | Few competing suppliers or substantial and durable advantage in location, cost, or technology. Demand is strong and growing | Few competing suppliers or better than average location, cost, or technology but this situation may not last. Demand is strong and stable | Project has no advantage in location, cost, or technology. Demand is adequate and stable | Project has worse than average location, cost, or technology. Demand is weak and declining |
| Financial ratios (e.g. *debt service coverage ratio (DSCR), loan life coverage ratio (LLCR), project life coverage ratio (PLCR), and debt-to-equity ratio*) | Strong financial ratios considering the level of project risk; very robust economic assumptions | Strong to acceptable financial ratios considering the level of project risk; robust project economic assumptions | Standard financial ratios considering the level of project risk | Aggressive financial ratios considering the level of project risk |
| Stress analysis | The project can meet its financial obligations under sustained, severely stressed economic or sectoral conditions | The project can meet its financial obligations under normal stressed economic or sectoral conditions. The project is only likely to default under severe economic conditions | The project is vulnerable to stresses that are not uncommon through an economic cycle, and may default in a normal downturn | The project is likely to default unless conditions improve soon |
| *Financial structure* | | | | |

| | Strong | Good | Satisfactory | Weak |
|---|---|---|---|---|
| Duration of the credit compared to the duration of the project | Useful life of the project significantly exceeds tenor of the loan | Useful life of the project exceeds tenor of the loan | Useful life of the project exceeds tenor of the loan | Useful life of the project may not exceed tenor of the loan |
| Amortisation schedule | Amortising debt | Amortising debt | Amortising debt repayments with limited bullet payment | Bullet repayment or amortising debt repayments with high bullet repayment |
| **Political and legal environment** | | | | |
| Political risk, including transfer risk, considering project type and mitigants | Very low exposure; strong mitigation instruments, if needed | Low exposure; satisfactory mitigation instruments, if needed | Moderate exposure; fair mitigation instruments | High exposure; no or weak mitigation instruments |
| Force majeure risk (war, civil unrest, etc), | Low exposure | Acceptable exposure | Standard protection | Significant risks, not fully mitigated |
| Government support and project's importance for the country over the long term | Project of strategic importance for the country (preferably export-oriented). Strong support from Government | Project considered important for the country. Good level of support from Government | Project may not be strategic but brings unquestionable benefits for the country. Support from Government may not be explicit | Project not key to the country. No or weak support from Government |
| Stability of legal and regulatory environment (risk of change in law) | Favourable and stable regulatory environment over the long term | Favourable and stable regulatory environment over the medium term | Regulatory changes can be predicted with a fair level of certainty | Current or future regulatory issues may affect the project |

| | Strong | Good | Satisfactory | Weak |
|---|---|---|---|---|
| | | | | |
| Acquisition of all necessary supports and approvals for such relief from local content laws | Strong | Satisfactory | Fair | Weak |
| Enforceability of contracts, collateral and security | Contracts, collateral and security are enforceable | Contracts, collateral and security are enforceable | Contracts, collateral and security are considered enforceable even if certain non-key issues may exist | There are unresolved key issues in respect if actual enforcement of contracts, collateral and security |
| **Transaction characteristics** | | | | |
| *Design and technology risk* | Fully proven technology and design | Fully proven technology and design | Proven technology and design – start-up issues are mitigated by a strong completion package | Unproven technology and design; technology issues exist and/or complex design |
| *Construction risk* | | | | |
| Permitting and siting | All permits have been obtained | Some permits are still outstanding but their receipt is considered very likely | Some permits are still outstanding but the permitting process is well defined and they are considered routine | Key permits still need to be obtained and are not considered routine. Significant conditions may be attached |
| Type of construction contract | Fixed-price date-certain turnkey construction | Fixed-price date-certain turnkey construction EPC | Fixed-price date-certain turnkey construction contract with one or | No or partial fixed-price turnkey contract and/or interfacing issues with |

| | Strong | Good | Satisfactory | Weak |
|---|---|---|---|---|
| | EPC (engineering and procurement contract) | | several contractors | multiple contractors |
| Completion guarantees | Substantial liquidated damages supported by financial substance and/or strong completion guarantee from sponsors with excellent financial standing | Significant liquidated damages supported by financial substance and/or completion guarantee from sponsors with good financial standing | Adequate liquidated damages supported by financial substance and/or completion guarantee from sponsors with good financial standing | Inadequate liquidated damages or not supported by financial substance or weak completion guarantees |
| Track record and financial strength of contractor in constructing similar projects. | Strong | Good | Satisfactory | Weak |
| *Operating risk* | | | | |
| Scope and nature of operations and maintenance (O & M) contracts | Strong long-term O&M contract, preferably with contractual performance incentives, and/or O&M reserve accounts | Long-term O&M contract, and/or O&M reserve accounts | Limited O&M contract or O&M reserve account | No O&M contract: risk of high operational cost overruns beyond mitigants |
| Operator's expertise, track record, and financial strength | Very strong, or committed technical assistance of the sponsors | Strong | Acceptable | Limited/weak, or local operator dependent on local authorities |

| | Strong | Good | Satisfactory | Weak |
|---|---|---|---|---|
| *Off-take risk* | | | | |
| (a) If there is a take-or-pay or fixed-price off-take contract: | Excellent creditworthiness of offtaker; strong termination clauses; tenor of contract comfortably exceeds the maturity of the debt | Good creditworthiness of off-taker; strong termination clauses; tenor of contract exceeds the maturity of the debt | Acceptable financial standing of off-taker; normal termination clauses; tenor of contract generally matches the maturity of the debt | Weak off-taker; weak termination clauses; tenor of contract does not exceed the maturity of the debt |
| (b) If there is no take-or-pay or fixed-price off-take contract: | Project produces essential services or a commodity sold widely on a world market; output can readily be absorbed at projected prices even at lower than historic market growth rates | Project produces essential services or a commodity sold widely on a regional market that will absorb it at projected prices at historical growth rates | Commodity is sold on a limited market that may absorb it only at lower than projected prices | Project output is demanded by only one or a few buyers or is not generally sold on an organised market |
| *Supply risk* | | | | |
| Price, volume and transportation risk of feed-stocks; supplier's track record and financial strength | Long-term supply contract with supplier of excellent financial standing | Long-term supply contract with supplier of good financial standing | Long-term supply contract with supplier of good financial standing – a degree of price risk may remain | Short-term supply contract or long-term supply contract with financially weak supplier – a degree of price risk definitely remains |
| Reserve risks (e.g. natural resource development) | Independently audited, proven and developed | Independently audited, proven and developed reserves in excess of | Proven reserves can supply the project adequately through the | Project relies to some extent on potential and undeveloped reserves |

| | Strong | Good | Satisfactory | Weak |
|---|---|---|---|---|
| | reserves well in excess of requirements over lifetime of the project | requirements over lifetime of the project | maturity of the debt | |
| **Strength of Sponsor** | | | | |
| Sponsor's track record, financial strength, and country/sector experience | Strong sponsor with excellent track record and high financial standing | Good sponsor with satisfactory track record and good financial standing | Adequate sponsor with adequate track record and good financial standing | Weak sponsor with no or questionable track record and/or financial weaknesses |
| Sponsor support, as evidenced by equity, ownership clause and incentive to inject additional cash if necessary | Strong. Project is highly strategic for the sponsor (core business – long-term strategy) | Good. Project is strategic for the sponsor (core business – long-term strategy) | Acceptable. Project is considered important for the sponsor (core business) | Limited. Project is not key to sponsor's long-term strategy or core business |
| **Security Package** | | | | |
| Assignment of contracts and accounts | Fully comprehensive | Comprehensive | Acceptable | Weak |
| Pledge of assets, taking into account quality, value and liquidity of assets | First perfected security interest in all project assets, contracts, permits and accounts necessary to run the project | Perfected security interest in all project assets, contracts, permits and accounts necessary to run the project | Acceptable security interest in all project assets, contracts, permits and accounts necessary to run the project | Little security or collateral for lenders; weak negative pledge clause |
| Lender's control over cash flow (e.g. cash sweeps, independent escrow accounts) | Strong | Satisfactory | Fair | Weak |

| | Strong | Good | Satisfactory | Weak |
|---|---|---|---|---|
| | | | | |
| Strength of the covenant package (mandatory prepayments, payment deferrals, payment cascade, dividend restrictions…) | Covenant package is strong for this type of project<br><br>Project may issue no additional debt | Covenant package is satisfactory for this type of project<br><br>Project may issue extremely limited additional debt | Covenant package is fair for this type of project<br><br>Project may issue limited additional debt | Covenant package is Insufficient for this type of project<br><br>Project may issue unlimited additional debt |
| Reserve funds (debt service, O&M, renewal and replacement, unforeseen events, etc) | Longer than average coverage period, all reserve funds fully funded in cash or letters of credit from highly rated bank | Average coverage period, all reserve funds fully funded | Average coverage period, all reserve funds fully funded | Shorter than average coverage period, reserve funds funded from operating cash flows |

**Table 7V-2 – Guidelines on Supervisory Rating Categories for Object Finance**

| | Strong | Good | Satisfactory | Weak |
|---|---|---|---|---|
| **Financial Strength** | | | | |
| Market conditions | Demand is strong and growing, strong entry barriers, low sensitivity to changes in technology and economic outlook | Demand is strong and stable. Some entry barriers, some sensitivity to changes in technology and economic outlook | Demand is adequate and stable, limited entry barriers, significant sensitivity to changes in technology and economic outlook | Demand is weak and declining, vulnerable to changes in technology and economic outlook, highly uncertain environment |
| Financial ratios (debt service coverage ratio and loan-to-value ratio) | Strong financial ratios considering the type of asset. Very robust economic assumptions | Strong / acceptable financial ratios considering the type of asset. Robust project economic assumptions | Standard financial ratios for the asset type | Aggressive financial ratios considering the type of asset |
| Stress analysis | Stable long-term revenues, capable of withstanding severely stressed conditions through an economic cycle | Satisfactory short-term revenues. Loan can withstand some financial adversity. Default is only likely under severe economic conditions | Uncertain short-term revenues. Cash flows are vulnerable to stresses that are not uncommon through an economic cycle. The loan may default in a normal downturn | Revenues subject to strong uncertainties; even in normal economic conditions the asset may default, unless conditions improve |
| Market liquidity | Market is structured on a worldwide basis; assets are highly liquid | Market is worldwide or regional; assets are relatively liquid | Market is regional with Limited prospects in the short term, implying lower liquidity | Local market and/or poor visibility. Low or no liquidity, particularly on niche markets |

| | Strong | Good | Satisfactory | Weak |
|---|---|---|---|---|
| **Political and legal environment** | | | | |
| Political risk, including transfer risk | Very low; strong mitigation instruments, if needed | Low; satisfactory mitigation instruments, if needed | Moderate; fair mitigation instruments | High; no or weak mitigation instruments |
| Legal and regulatory risks | Jurisdiction is favourable to repossession and enforcement of contracts | Jurisdiction is favourable to repossession and enforcement of contracts | Jurisdiction is generally favourable to repossession and enforcement of contracts, even if repossession might be long and/or difficult | Poor or unstable legal and regulatory environment. Jurisdiction may make repossession and enforcement of contracts lengthy or impossible |
| **Transaction characteristics** | | | | |
| Financing term compared to the economic life of the asset | Full payout profile/ minimum balloon. No grace period | Balloon more significant, but still at satisfactory levels | Important balloon with potentially grace periods | Repayment in fine or high balloon |
| **Operating risk** | | | | |
| Permits / licensing | All permits have been obtained; asset meets current and foreseeable safety regulations | All permits obtained or in the process of being obtained; asset meets current and foreseeable safety regulations | Most permits obtained or in process of being obtained, outstanding ones considered routine, asset meets current safety regulations | Problems in obtaining all required permits, part of the planned configuration and/or planned operations might need to be revised |

| | Strong | Good | Satisfactory | Weak |
|---|---|---|---|---|
| Scope and nature of O & M contracts | Strong long-term O&M contract, preferably with contractual performance incentives, and/or O&M reserve accounts (if needed) | Long-term O&M contract, and/or O&M reserve accounts (if needed) | Limited O&M contract or O&M reserve account (if needed) | No O&M contract: risk of high operational cost overruns beyond mitigants |
| Operator's financial strength, track record in managing the asset type and capability to re-market asset when it comes off-lease | Excellent track record and strong re-marketing capability | Satisfactory track record and remarketing capability | Weak or short track record and uncertain re-marketing capability | No or unknown track record and inability to re-market the asset |
| **Asset characteristics** | | | | |
| Configuration, size, design and maintenance (i.e. age, size for a plane) compared to other assets on the same market | Strong advantage in design and maintenance. Configuration is standard such that the object meets a liquid market | Above average design and maintenance. Standard configuration, maybe with very limited exceptions – such that the object meets a liquid market | Average design and maintenance. Configuration is somewhat specific, and thus might cause a narrower market for the object | Below average design and maintenance. Asset is near the end of its economic life. Configuration is very specific; the market for the object is very narrow |
| Resale value | Current resale value is well above debt value | Resale value is moderately above debt value | Resale value is slightly above debt value | Resale value is below debt value |
| Sensitivity of the asset value and liquidity to economic cycles | Asset value and liquidity are relatively insensitive to economic cycles | Asset value and liquidity are sensitive to economic cycles | Asset value and liquidity are quite sensitive to economic cycles | Asset value and liquidity are highly sensitive to economic cycles |
| **Strength of sponsor** | | | | |

| | Strong | Good | Satisfactory | Weak |
|---|---|---|---|---|
| Operator's financial strength, track record in managing the asset type and capability to re-market asset when it comes offlease | Excellent track record and strong re-marketing capability | Satisfactory track record and re-marketing capability | Weak or short track record and uncertain re-marketing capability | No or unknown track record and inability to remarket the asset |
| Sponsors' track record and financial strength | Sponsors with excellent track record and high financial standing | Sponsors with good track record and good financial standing | Sponsors with adequate track record and good financial standing | Sponsors with no or questionable track record and/or financial weaknesses |
| **Security Package** | | | | |
| Asset control | Legal documentation provides the lender effective control (e.g. a first perfected security interest, or a leasing structure including such security) on the asset, or on the company owning it | Legal documentation provides the lender effective control (e.g. a perfected security interest, or a leasing structure including such security) on the asset, or on the company owning it | Legal documentation provides the lender effective control (e.g. a perfected security interest, or a leasing structure including such security) on the asset, or on the company owning it | The contract provides little security to the lender and leaves room to some risk of losing control on the asset |
| Rights and means at the lender's disposal to monitor the location and condition of the asset | The lender is able to monitor the location and condition of the asset, at any time and place (regular reports, possibility to lead inspections) | The lender is able to monitor the location and condition of the asset, almost at any time and place | The lender is able to monitor the location and condition of the asset, almost at any time and place | The lender is able to monitor the location and condition of the asset are limited |

| | Strong | Good | Satisfactory | Weak |
|---|---|---|---|---|
| Insurance against damages | Strong insurance coverage including collateral damages with top quality insurance companies | Satisfactory insurance coverage (not including collateral damages) with good quality insurance companies | Fair insurance coverage (not including collateral damages) with acceptable quality insurance companies | Weak insurance coverage (not including collateral damages) or with weak quality insurance companies |

**Table 7V-3 – Guidelines on Supervisory Rating Categories for Commodities Finance**

| | Strong | Good | Satisfactory | Weak |
|---|---|---|---|---|
| **Financial Strength** | | | | |
| Degree of over-collateralisation of trade | Strong | Good | Satisfactory | Weak |
| **Political and legal environment** | | | | |
| Country risk | No country risk | Limited exposure to country risk (in particular, offshore location of reserves in an emerging country) | Exposure to country risk (in particular, offshore location of reserves in an emerging country) | Strong exposure to country risk (in particular, inland reserves in an emerging country) |
| Mitigation of country risks | Very strong mitigation:<br><br>Strong offshore Mechanisms<br><br>Strategic commodity<br><br>1st class buyer | Strong mitigation:<br><br>Offshore mechanisms<br><br>Strategic commodity<br><br>Strong buyer | Acceptable mitigation:<br><br>Offshore mechanisms<br><br>Less strategic commodity<br><br>Acceptable buyer | Only partial mitigation:<br><br>No offshore mechanisms<br><br>Non-strategic commodity<br><br>Weak buyer |
| **Asset characteristics** | | | | |
| Liquidity and susceptibility to damage | Commodity is quoted and can be hedged through futures or OTC instruments. Commodity is not susceptible to damage | Commodity is quoted and can be hedged through OTC instruments. Commodity is not susceptible to damage | Commodity is not quoted but is liquid. There is uncertainty about the possibility of hedging. Commodity is not susceptible to damage | Commodity is not quoted. Liquidity is limited given the size and depth of the market. No appropriate hedging instruments. Commodity is susceptible |

| | Strong | Good | Satisfactory | Weak |
|---|---|---|---|---|
| | | | | to damage |
| **Strength of Sponsor** | | | | |
| Financial strength of trader | Very strong, relative to trading philosophy and risks | Strong | Adequate | Weak |
| Track record, including ability to manage the logistic process | Extensive experience with the type of transaction in question. Strong record of operating success and cost efficiency | Sufficient experience with the type of transaction in question. Above average record of operating success and cost efficiency | Limited experience with the type of transaction in question. Average record of operating success and cost efficiency | Limited or uncertain track record in general. Volatile costs and profits |
| Trading controls and hedging policies | Strong standards for counterparty selection, hedging, and monitoring | Adequate standards for counterparty selection, hedging, and monitoring | Past deals have experienced no or minor problems | Trader has experienced significant losses on past deals |
| Quality of financial disclosure | Excellent | Good | Satisfactory | Financial disclosure contains some uncertainties or is insufficient |
| **Security Package** | | | | |
| Asset control | First perfected security interest provides the lender legal control of the assets at any time if needed | First perfected security interest provides the lender legal control of the assets at any time if needed | At some point in the process, there is a rupture in the control of the assets by the lender. The rupture is mitigated by knowledge of the | Contract leaves room for some risk of losing control over the assets. Recovery could be jeopardised |

| | Strong | Good | Satisfactory | Weak |
|---|---|---|---|---|
| | | | trade process or a third party undertaking as the case may be | |
| Insurance against damages | Strong insurance coverage including collateral damages with top quality insurance companies | Satisfactory insurance coverage (not including collateral damages) with good quality insurance companies | Fair insurance coverage (not including collateral damages) with acceptable quality insurance companies | Weak insurance coverage (not including collateral damages) or with weak quality insurance companies |

**Table 7V-4 – Guidelines on Supervisory Rating Categories for IPRE and HVCRE Lending**

| | Strong | Good | Satisfactory | Weak |
|---|---|---|---|---|
| **Financial Strength** | | | | |
| Market conditions | The supply and demand for the project's type and location are currently in equilibrium. The number of competitive properties coming to market is equal or lower than forecasted demand | The supply and demand for the project's type and location are currently in equilibrium. The number of competitive properties coming to market is roughly equal to forecasted demand | Market conditions are roughly in equilibrium. Competitive properties are coming on the market and others are in the planning stages. The project's design and capabilities may not be state of the art compared to new projects | Market conditions are weak. It is uncertain when conditions will improve and return to equilibrium. The project is losing tenants at lease expiration. New lease terms are less favourable compared to those expiring |
| Financial ratios and advance rate | The property's debt service coverage ratio (DSCR) is considered strong (DSCR is not relevant for the construction phase) and its loan to value ratio (LTV) is considered low given its property type. Where a secondary market exists, the transaction is underwritten to market standards | The DSCR (not relevant for development real estate) and LTV are satisfactory. Where a secondary market exists, the transaction is underwritten to market standards | The property's DSCR has deteriorated and its value has fallen, increasing its LTV | The property's DSCR has deteriorated significantly and its LTV is well above underwriting standards for new loans |
| Stress analysis | The property's resources, contingencies and liability | The property can meet its | During an economic | The property's financial |

| | Strong | Good | Satisfactory | Weak |
|---|---|---|---|---|
| | structure allow it to meet its financial obligations during a period of severe financial stress (e.g. interest rates, economic growth) | financial obligations under a sustained period of financial stress (e.g. interest rates, economic growth). The property is likely to default only under severe economic conditions | downturn, the property would suffer a decline in revenue that would limit its ability to fund capital expenditures and significantly increase the risk of default | condition is strained and is likely to default unless conditions improve in the near term |
| Cash-flow predictability | | | | |
| (a) For complete and stablilised property | The property's leases are long-term with creditworthy tenants and their maturity dates are scattered. The property has a track record of tenant retention upon lease expiration. Its vacancy rate is low. Expenses (maintenance, insurance, security, and property taxes) are predictable | Most of the property's leases are long-term, with tenants that range in creditworthiness. The property experiences a normal level of tenant turnover upon lease expiration. Its vacancy rate is low. Expenses are predictable | Most of the property's leases are medium rather than long-term with tenants that range in creditworthiness. The property experiences a moderate level of tenant turnover upon lease expiration. Its vacancy rate is moderate. Expenses are relatively predictable but vary in relation to revenue | The property's leases are of various terms with tenants that range in creditworthiness. The property experiences a very high level of tenant turnover upon lease expiration. Its vacancy rate is high. Significant expenses are incurred preparing space for new tenants |
| (b) For complete but not stabilised property | Leasing activity meets or exceeds projections. The project should achieve | Leasing activity meets or exceeds projections. The | Most leasing activity is within projections; however, stabilisation | Market rents do not meet expectations. Despite achieving target occupancy rate, cash flow coverage is |

| | Strong | Good | Satisfactory | Weak |
|---|---|---|---|---|
| | stabilisation in the near future | project should achieve stabilisation in the near future | will not occur for some time | tight due to disappointing revenue |
| (c) For construction phase | The property is entirely pre-leased through the tenor of the loan or pre-sold to an investment grade tenant or buyer, or the bank has a binding commitment for take-out financing from an investment grade lender | The property is entirely pre-leased or pre-sold to a creditworthy tenant or buyer, or the bank has a binding commitment for permanent financing from a creditworthy lender | Leasing activity is within projections but the building may not be pre-leased and there may not exist a takeout financing. The bank may be the permanent lender | The property is deteriorating due to cost overruns, market deterioration, tenant cancellations or other factors. There may be a dispute with the party providing the permanent financing |
| **Asset characteristics** | | | | |
| Location | Property is located in highly desirable location that is convenient to services that tenants desire | Property is located in desirable location that is convenient to services that tenants desire | The property location lacks a competitive advantage | The property's location, configuration, design and maintenance have contributed to the property's difficulties |
| Design and condition | Property is favoured due to its design, configuration, and maintenance, and is highly competitive with new properties | Property is appropriate in terms of its design, configuration and maintenance. The property's design and capabilities are competitive with new properties | Property is adequate in terms of its configuration, design and maintenance | Weaknesses exist in the property's configuration, design or maintenance |

| | Strong | Good | Satisfactory | Weak |
|---|---|---|---|---|
| Property is under construction | Construction budget is conservative and technical hazards are limited. Contractors are highly qualified | Construction budget is conservative and technical hazards are limited. Contractors are highly qualified | Construction budget is adequate and contractors are ordinarily qualified | Project is over budget or unrealistic given its technical hazards. Contractors may be under qualified |
| **Strength of Sponsor/Developer** | | | | |
| Financial capacity and willingness to support the property. | The sponsor or developer made a substantial cash contribution to the construction or purchase of the property. The sponsor or developer has substantial resources and limited direct and contingent liabilities. The sponsor or developer's properties are diversified geographically and by property type | The sponsor or developer made a material cash contribution to the construction or purchase of the property. The sponsor or developer's financial condition allows it to support the property in the event of a cash flow shortfall. The sponsor or developer's properties are located in several geographic regions | The sponsor or developer's contribution may be immaterial or non-cash. The sponsor or developer is average to below average in financial resources | The sponsor or developer lacks capacity or willingness to support the property |
| Reputation and track record with similar properties. | Experienced management and high sponsors' quality. Strong reputation and lengthy and successful record with similar properties | Appropriate management and sponsors' quality. The sponsor or management has a successful record with similar properties | Moderate management and sponsors' quality. Management or sponsor track record does not raise serious concerns | Ineffective management and substandard sponsors' quality. Management and sponsor difficulties have contributed to difficulties in managing properties in the past |

| | Strong | Good | Satisfactory | Weak |
|---|---|---|---|---|
| Relationships with relevant real estate actors | Strong relationships with leading actors such as leasing agents | Proven relationships with leading actors such as leasing agents | Adequate relationships with leasing agents and other parties providing important real estate services | Poor relationships with leasing agents and/or other parties providing important real estate services |
| **Security Package** | | | | |
| Nature of charge | Perfected first charge[312] | Perfected first charge[312] | Perfected first charge[312] | Ability of lender to foreclose is constrained |
| Assignment of rents (for projects leased to long-term tenants) | The lender has obtained an assignment. They maintain current tenant information that would facilitate providing notice to remit rents directly to the lender, such as a current rent roll and copies of the project's leases | The lender has obtained an assignment. They maintain current tenant information that would facilitate providing notice to the tenants to remit rents directly to the lender, such as current rent roll and copies of the project's leases | The lender has obtained an assignment. They maintain current tenant information that would facilitate providing notice to the tenants to remit rents directly to the lender, such as current rent roll and copies of the project's leases | The lender has not obtained an assignment of the leases or has not maintained the information necessary to readily provide notice to the building's tenants |
| Quality of the insurance coverage | Appropriate | Appropriate | Appropriate | Substandard |

[MAS Notice 637 (Amendment) 2013]

[312] Lenders in some markets extensively use loan structures that include junior charges. Junior charges may be indicative of this level of risk if the total LTV inclusive of all senior positions does not exceed a typical first loan LTV.

[MAS Notice 637 (Amendment) 2013]

**Annex 7W**

**USE OF TOP-DOWN APPROACH FOR QUALIFYING PURCHASED CORPORATE RECEIVABLES**

**Section 1: Overview**

1.1 The requirements in this Annex apply to a Reporting Bank which intends to use the top-down approach to calculate any of the following:

(a) $K_{df,cp}$ and $K_{df,sp}$ for purchased corporate receivables and purchased corporate small business receivables respectively; and

(b) $K_{dil,cp}$ ,$K_{dil,sp}$ and $K_{dil,rp,}$ for purchased corporate receivables, purchased corporate small business receivables and purchased retail receivables respectively.

1.2 A Reporting Bank shall assign the qualifying purchased receivables into sufficiently homogeneous pools so that accurate and consistent estimates of PD and LGD (or EL) for default losses and estimates of EL for dilution losses can be determined.

1.3 For purposes of paragraph 1.2 above, the assignment shall reflect the seller's underwriting practices and the heterogeneity of the customers of the seller.

1.4 Notwithstanding paragraph 2.13(a) and footnote 313A, a Reporting Bank shall ensure that the method used to derive estimates of IRBA parameters under the top-down approach complies with the requirements and should meet the guidelines in Section 5 of Annex 7AB of Part VII. The Reporting Bank shall ensure that the methods and data for estimating PD, LGD and EL complies with the requirements and should meet the guidelines for retail exposures in Annex 7AB of Part VII. In particular, the Reporting Bank shall ensure that the parameterisation process incorporates all relevant information available to the Reporting Bank regarding the quality of the underlying purchased receivables and data for similar pools provided by the seller, the Reporting Bank or by external sources. A Reporting Bank shall determine if the data provided by the seller is consistent with expectations agreed upon by both the Reporting Bank and the seller concerning, for example, the type, volume and on-going quality of receivables purchased. If this is not the case, the Reporting Bank should obtain and rely upon more relevant data.

[MAS Notice 637 (Amendment No. 2) 2014]

**Section 2: Operational Requirements and Guidelines**

2.1 A Reporting Bank which has purchased receivables shall demonstrate that current and future advances can be repaid from the liquidation of or collections against the receivables pool. A Reporting Bank shall not qualify for the top-down approach unless it monitors closely and controls the receivable pool and the overall lending relationship. The Reporting Bank shall demonstrate to the satisfaction of the Authority its compliance with the requirements stated in paragraphs 2.2 to 2.9 of this Section.

[MAS Notice 637 (Amendment) 2012]

Legal Certainty

2.2 The Reporting Bank shall satisfy itself that the structure of the facility is such that it has effective ownership and control of all cash remittances from the receivables under all foreseeable circumstances, including incidences of seller or servicer distress and bankruptcy.

2.3 In instances where the obligor makes payments directly to a seller or a servicer, a Reporting Bank shall verify regularly that payments are forwarded completely and in accordance to the contractually agreed terms.

2.4 A Reporting Bank shall have procedures in place to ensure that ownership over the purchased receivables and cash receipts are protected against bankruptcy stays or legal challenges that could materially delay the ability of the seller to liquidate or assign the receivables or retain control over cash receipts.

Monitoring Systems

2.5 A Reporting Bank shall monitor both the quality of the purchased receivables and the financial condition of the seller and servicer. In particular, a Reporting Bank shall –

(a) assess the correlation among the quality of the purchased receivables and the financial condition of both the seller and servicer;

(b) put in place policies and procedures that provide adequate safeguards to protect against such contingencies, including the assignment of an internal risk rating for each seller and servicer;

(c) have clear and effective policies and procedures for determining seller and servicer eligibility;

  (i) periodic reviews of sellers and servicers shall be conducted in order to verify the accuracy of reports from the seller or servicer, to detect fraud or any operational weaknesses and to verify the quality of the credit policies of the seller and the collection policies and procedures of the servicer; and

  (ii) the findings of such reviews shall be well-documented;

(d) assess the characteristics of the receivables pool including –

  (i) over-advances;

  (ii) history of the seller's arrears, bad debts and bad debt allowances;

  (iii) payment terms; and

  (iv) potential contra accounts;

(e) have effective policies and procedures for monitoring on an aggregate basis single obligor concentrations both within and across receivable pools; and

(f) receive timely and sufficiently detailed reports of receivables ageings and dilutions to –

(i) ensure compliance with the Reporting Bank's eligibility criteria and advancing policies governing purchased receivables; and

(ii) provide an effective means with which to monitor and confirm the seller's terms of sale (e.g. invoice date ageing) and dilution.

Work-Out Systems

2.6 A Reporting Bank shall have systems and procedures for detecting deterioration in the financial condition of the seller and deterioration in the quality of the receivables at an early stage, and for addressing emerging problems proactively.

2.7 In addition, a Reporting Bank shall have clear and effective policies, procedures and where applicable, information systems to –

(a) monitor compliance with –

(i) all contractual terms of the facility (including covenants, advancing formulas, concentration limits, early amortization triggers etc.); and

(ii) internal policies governing advance rates and receivables eligibility;

in order to track covenant violations and waivers and exceptions to established policies and procedures;

(b) detect, approve, monitor and correct over-advances so as to limit inappropriate draws; and

(c) address situations regarding financially weakened sellers or servicers and deterioration in the quality of receivable pools, which could include –

(i) early termination triggers in revolving facilities and other covenant protections;

(ii) a structured and disciplined approach to dealing with covenant violations; and

(iii) clear and effective policies and procedures for initiating legal actions and dealing with problem purchased receivables.

Systems for Controlling Collateral, Credit Availability and Cash

2.8 A Reporting Bank shall have clear and effective policies and procedures governing the control of purchased receivables, credit availability and cash. In particular, a Reporting Bank shall have –

(a) written internal policies that specify all material elements of the receivables purchase programme, (including advancing rates, eligible collateral, necessary documentation, concentration limits, and how cash receipts are to be handled), where these elements should take into account all relevant and material factors, (including the financial condition of the seller and servicer, risk concentrations, and trends in the quality of the purchased receivables and the customer base of the seller); and

(c) internal systems to ensure that funds are advanced only against specified supporting collateral and documentation (such as servicer attestations, invoices and shipping documents).

[MAS Notice 637 (Amendment No. 2) 2018]

Compliance with Internal Policies and Procedures

2.9 A Reporting Bank shall have an internal process for assessing compliance with all internal policies and procedures, which shall include –

(a) regular internal and external audits of all critical phases of the receivables purchase programme of the Reporting Bank;

(b) verification of the separation of duties between –

(i) the assessment of the seller and servicer and the assessment of the obligor;

(ii) the assessment of the seller and servicer and the field audit of the seller and servicer; and

(c) evaluations of back office operations, with particular focus on qualifications, experience, staffing levels and supporting systems.

Calculation of Capital Requirements for Default Risk, $K_{df,cp}$ and $K_{df,sp}$ using the top-down approach

2.10 For each pool of qualifying corporate purchased receivables and corporate small business purchased receivables, the Reporting Bank shall estimate the one-year EL arising from default risk expressed as a percentage of the amount of receivables in the relevant pool. This estimate shall be calculated without regard to any assumption of recourse or other support (e.g. guarantees) from the seller or other parties.

2.11 With the estimated EL for each pool, a Reporting Bank shall calculate $K_{df,cp}$ using the formula in paragraph 7.4.21 or 7.4.21A as appropriate, and $K_{df,sp}$ using the formula in

paragraph 7.4.22 or 7.4.22A as appropriate.[313] Where a Reporting Bank does not have the information to calculate the average size of the pool, $K_{df,sp}$ shall be calculated using the formula in paragraph 7.4.21.

2.12 For the purposes of paragraph 2.11 of this Annex, a Reporting Bank adopting the F-IRBA for its corporate asset sub-class or corporate small business asset sub-class shall calculate $K_{df,cp}$ and $K_{df,sp}$, respectively, with the following as inputs into the formulae –

(a) if the Reporting Bank is unable to decompose its EL estimate into its PD and LGD components in a reliable manner, but it is able to demonstrate that the exposures are exclusively senior claims to corporate borrowers, it shall determine PD, LGD and EAD as follows:

(i) LGD = 0.45;

(ii) PD = EL/LGD; and

(iii) EAD = EAD calculated in accordance with Division 2 of Part VII – $K_{dil}$;

(b) if the Reporting Bank is unable to decompose its EL estimate into its PD and LGD components in a reliable manner, and it is unable to demonstrate that the exposures are exclusively senior claims to corporate borrowers, it shall determine PD, LGD and EAD as follows:

(i) LGD = 1.00;

(ii) PD = EL; and

(iii) EAD = EAD calculated in accordance with Division 2 of Part VII – $K_{dil}$; or

(c) if the Reporting Bank is able to estimate PD in a reliable manner, it shall calculate $K_{df}$ pursuant to paragraphs 7.4.21 to 7.4.34, where applicable.

2.13 For the purposes of paragraph 2.1, a Reporting Bank adopting the A-IRBA for its corporate asset sub-class or corporate small business asset sub-class shall calculate $K_{df,cp}$ and $K_{df,sp}$, respectively, with the following as inputs into the formulae[313A]:

(a) if the Reporting Bank is able to estimate PD, it shall determine PD, LGD and EAD as follows:

(i) PD = PD estimated in accordance with Annex 7AB of Part VII;

(ii) LGD = EL/PD; and

(iii) EAD = EAD calculated in accordance with Division 2 of Part VII – $K_{dil}$; and

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[313] Where the Reporting Bank uses the formula in paragraph 7.4.22, S is computed as the weighted average by individual exposures of the pool of purchased receivables.

[313A] The LGD shall not be less than the long-run default-weighted average loss rate given default.

(b) if the Reporting Bank is able to estimate LGD, it shall determine PD, LGD and EAD as follows:

(i) LGD = LGD estimated in accordance with Annex 7AB of Part VII;

(ii) PD = EL/LGD; and

(iii) EAD = EAD calculated in accordance with Division 2 of Part VII – $K_{dil}$.

2.14 For purposes of paragraphs 2.12 and 2.13, the EAD for a revolving purchase facility shall be calculated as follows:

EAD = current amount of receivables purchased + (0.75 x undrawn purchase commitment) – $K_{dil}$

2.15 For the purposes of paragraph 2.13, M shall be calculated as follows:

(a) for drawn amounts, M = the pool's exposure-weighted average effective M as determined in Annex 7Z of Part VII;

(b) for undrawn amounts where the facility contains covenants, early amortisation triggers, or other features that protect the Reporting Bank against a significant deterioration in the quality of the future receivables it is required to purchase over the facility's term , M = the pool's exposure-weighted average effective M as determined in Annex 7Z of Part VII;

(c) for undrawn amounts where the facility does not contact such effective protections, M = longest-dated potential receivable under the purchase agreement + remaining maturity of the purchase facility.

**Annex 7X**

## DEFINITION OF DEFAULT UNDER THE IRBA

### Section 1: Application of Definition of Default under IRBA

1.1 Subject to paragraph 1.2 below, a Reporting Bank shall use the definition of default under Section 2 below for deriving estimates of PD, and where relevant LGD and EAD.

1.2 In deriving estimates of PD, and where relevant LGD and EAD, a Reporting Bank may use external data available to it that is not itself consistent with the definition of default in this Annex.[314] In such cases, the Reporting Bank shall demonstrate to the satisfaction of the Authority that appropriate adjustments to the data are made to achieve broad equivalence with the definition of default in this Annex. This also applies to any internal data used by the Reporting Bank up to 1 January 2008. Beyond 1 January 2008, internal data and any pooled data used by the Reporting Bank to derive estimates of IRBA parameters shall be consistent with the definition of default in this Annex.

### Section 2: Definition of Default

2.1 A Reporting Bank shall record a default on any IRBA exposure to a particular obligor if -

(a) it considers that the obligor is unlikely to pay its credit obligations to the banking group in full, without recourse by the Reporting Bank or any of its banking group entities to actions such as realising collateral; or

(b) the obligor is past due more than 90 days on any credit obligation to the banking group.[315]

[MAS Notice 637 (Amendment No. 3) 2017]

2.2 If the Reporting Bank considers that paragraph 2.1 above no longer applies to a previously defaulted exposure, the Reporting Bank shall assign a new obligor and facility grade to the exposure using the applicable borrower and facility rating system, and where relevant estimate LGD and EAD as it would for a non-defaulted exposure. Should the definition of default in this Annex subsequently be triggered, a second default shall be deemed to have occurred.

Indications of Unlikeliness to Pay in Full

2.3 A Reporting Bank shall consider a default to have occurred with regard to a particular obligor if any of the following indicators of default is present:

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[314] A Reporting Bank which uses external data shall meet the requirements in paragraph 5.2(d) of Annex 7AB of Part VII.

[315] The Authority may permit an extension of days past due beyond 90 days for a foreign PSE obligor, of up to 180 days, if a Reporting Bank requests such permission and provides strong justification for the extension.

(a) the Reporting Bank puts any credit obligation of the obligor on non-accrued status;

(b) the Reporting Bank makes a charge-off or account-specific allowance resulting from a significant perceived decline in credit quality of the obligor subsequent to the Reporting Bank taking on the exposure[316];

(c) the Reporting Bank sells the credit obligation at a material credit-related economic loss. For the purposes of this sub-paragraph, the Reporting Bank shall implement internal policies to determine when a material credit-related economic loss has been incurred and track the performance of such policies over time[317];

(d) the Reporting Bank consents to a distressed restructuring[317A] of the credit obligation where this is likely to result in a diminished financial obligation of the obligation due to the material forgiveness or postponement of principal, interest or where relevant fees[318]. A Reporting Bank shall implement internal policies on the above criteria (and any other factors it considers appropriate) and internal procedures to ensure that restructured exposures are classified appropriately;

(e) the Reporting Bank or any banking group entity has filed for the bankruptcy of the obligor or a similar order in respect of the credit obligation of the obligor to the banking group;

(f) the obligor has sought or has been placed in bankruptcy or similar protection which would enable the obligor to avoid or delay repayment of the credit obligation to the banking group;

(g) any facility to that particular obligor has been accelerated;

(h) where the obligor is a bank, the bank's authorisation to operate has been revoked[319];

(i) where the obligor is a central government, there has been an announcement of a downgrade to a default rating by a recognised ECAI;

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316 Specific allowances on equity exposures may be set aside for price risk and do not signal default.
[MAS Notice 637 (Amendment No. 3) 2017]

317 These internal policies are examined by the Authority in connection with a Reporting Bank's application to adopt the IRBA.

317A This includes situations where the intention of the restructuring is to accommodate a deterioration in the obligor's financial position or the obligor's inability to meet the original repayment schedule or where the revised repayment terms of the credit obligation are of "non-commercial" nature, i.e. where the interest rate, fees or repayment period are not what would normally be granted by the Reporting Bank to a new obligor of similar creditworthiness.

318 This includes distressed restructuring of any equity exposure using the PD/LGD method.

319 This indication of default does not include the voluntary surrender of licenses, for example, in the course of a business combination.

(j) a default by the obligor on credit obligations to other financial creditors, for example, financial institutions or bondholders, has occurred based on publicly available information; or

(k) the Reporting Bank, in its judgement, deems that the default of a related obligor is an indication of default of that particular obligor (as described in paragraphs 2.6 and 2.7 below).

2.4 For cases where a Reporting Bank liquidates collateral to satisfy any of the credit obligation and does not consider a default to have occurred with regard to the obligor, the Reporting Bank shall put in place internal processes, independent of the credit risk control and origination functions, to review and validate, on a regular basis, that the classification of the exposure as a non-default exposure is in accordance with paragraphs 2.1 to 2.3 above. Such internal processes shall include validating that the liquidation of the collateral is not due to a deterioration of the creditworthiness of the obligor. [319A]

[MAS Notice 637 (Amendment No. 3) 2017]

2.5 [Deleted by MAS Notice 637 (Amendment No. 3) 2017]

Related Obligor Default

2.6 When a default is recorded for any obligor for IRBA purposes, a Reporting Bank shall review all ratings of obligors related to that particular obligor[320] to determine if that default is an indication that any other related obligor is unlikely to fulfill its obligations.

2.7 The Reporting Bank should ensure that such determination be based on the judgement of the Reporting Bank of the degree of economic interdependence and integration between the obligors concerned. There is no presumption that related entities would necessarily default together. This would depend on the credit judgement of the Reporting Bank expressed in its internal ratings systems, in particular –

(a) where a Reporting Bank rates a group of obligors together as a single economic unit, a default by any obligor in the group shall be considered a default by all the obligors in the group; and

(b) where the ratings of individual obligors in a group are stand-alone ratings or "notched" ratings, a default by any obligor in the group need not be considered a default by all the obligors in the group. However, it should be noted that this principle should not override the result of any ratings review.

[319A] For example, for certain types of facilities such as securities financing, collateral is liquidated not due to a deterioration of the creditworthiness of an obligor but due to a fall in the value of the collateral. For such facilities, the collateral may be liquidated to restore an agreed collateral coverage ratio after a fall in the value of the collateral, in accordance with the standard practice for facilities of the same type and where such practice has been disclosed to the customer in writing at the inception of the facility.

[MAS Notice 637 (Amendment No. 3) 2017]

[320] For example, any obligor that is treated as a related group entity under section 29(1)(a) of the Banking Act, or any obligor that is linked to the particular obligor in the rating process of the Reporting Bank.

Calculation of Days Past Due for Any Facility

2.8 For the purposes of determining whether an obligor is past due more than 90 days on any credit obligation to the banking group, a Reporting Bank shall include all components of amounts due, including principal, accrued interest and fees related to the credit obligation, in making that determination (e.g. in the case of corporate exposures, annual facility fees, or in the case of retail exposures, annual card fees[321]) inasmuch as they form part of the return that the Reporting Bank receives on the credit risk it underwrites.

2.9 A Reporting Bank shall record a default when –

[MAS Notice 637 (Amendment No. 2) 2018]

(a) for an overdraft, the approved limit (i.e. advised limit) remains breached for more than 90 days[322];

(b) for a revolving corporate exposure, an amount is overdue for more than 90 days;

(c) for a revolving retail exposure (e.g. credit card), the minimum monthly payment is not paid in full by the due date nor within the 90 days thereafter, and subsequent minimum monthly payments billed are also not paid in full; and

(d) for a loan with periodic principal instalments, interest payments, or both, an amount due and payable is not paid in full within 90 days of the instalment or payment due date.

Re-ageing

2.10 For the purposes of paragraph 2.9 above, a Reporting Bank shall have clearly articulated and documented policies in respect of the counting of days past due, in particular in respect of the re-ageing of the facilities and the granting of extensions, deferrals, renewals and rewrites to existing accounts.

2.11 A Reporting Bank shall ensure that the re-ageing policy includes clear prescriptions on –

[MAS Notice 637 (Amendment No. 2) 2018]

(a) the approval authorities and reporting requirements on re-aging;

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[321] For avoidance of doubt, an obligor is not normally considered by the Authority to be in default only by virtue of annual fees payable to the Reporting Bank where the Reporting Bank has already commenced steps to reverse or waive such fees.

[322] This includes where the obligor has been advised of a limit smaller than current outstandings and the lower limit remains breached for more than 90 days. A Reporting Bank shall also have adequate internal policies for assessing the creditworthiness of obligors who are offered overdraft accounts.

(b) the minimum age of a facility before it is eligible for re-ageing;

(c) the delinquency levels of facilities that are eligible for re-ageing;

(d) the maximum number of re-ageings per facility; and

(e) the associated reassessments of the capacity of the obligor to repay should re-aging take place.

2.12 A Reporting Bank shall apply its internal policies on re-aging consistently over time, and such policies shall support the 'use requirements' under paragraph 2.7 of Annex 7AB of Part VII.[323]

2.13 Subject to paragraphs 2.11 and 2.12 above, a Reporting Bank may only re-age when –

(a) in the case of an overdraft, the outstanding amount is reduced to or below the approved limit;

(b) in the case of a revolving corporate exposure, the amount overdue is repaid in full;

(c) in the case of a revolving retail exposure where an unpaid minimum monthly payment is rolled into the following month's minimum payment, the latest minimum monthly payment is paid in full; and

(d) in the case of a loan with periodic instalments, interest payments, or both, the longest overdue amount is repaid in full, inclusive of accrued interest and penalties, in which case the start date of the days past due count is then reset to the due date of the remaining instalment or payment that is longest overdue.

2.14 When granting extensions, deferrals, renewals and rewrites, a Reporting Bank shall consider if these are in fact distressed restructurings under paragraph 2.3(d) above. If so, the Reporting Bank shall record a default in respect of the exposure.

Treatment of overdrafts

2.15 Authorised overdrafts shall be subject to a credit limit set by the Reporting Bank and brought to the knowledge of the obligor. The Reporting Bank shall monitor any break of the credit limit. The Reporting Bank shall record a default on such overdrafts if the account is not brought under the credit limit for more than 90 days. Non-authorised overdrafts shall be associated with a zero limit for IRB purposes by the Reporting Bank. The days past due commence once any credit is granted to an unauthorised customer. The Reporting Bank shall record a default on such overdrafts if such credit is not repaid for more than 90 days. The Reporting Bank shall have in place rigorous internal policies for assessing the creditworthiness of obligors who are offered overdraft accounts.

[323] If a Reporting Bank treats a re-aged exposure in a similar fashion to exposures which are in default, this exposure shall be recorded as in default for IRBA purposes.

**Section 3: Exclusion from Obligor-level Application of Definition of Default**

3.1 Notwithstanding paragraph 2.1 above, a Reporting Bank may, for exposures categorised under the IRBA retail asset class, apply the definition of default in this Annex at the level of a particular facility, rather than at the level of the obligor. Therefore, a default by an obligor on one credit obligation does not require a Reporting Bank to treat all other credit obligations of the same obligor to the banking group as defaulted.

**Annex 7Y**

**DEFINITION OF IRBA PARAMETERS**

**Section 1: Introduction**

1.1 Subject to paragraph 1.2 below, a Reporting Bank shall derive estimates of PD, and where relevant LGD and EAD, that are consistent with the definitions under Sections 2, 3 and 4 below as inputs to the IRBA risk weight functions in Division 4 of Part VII.

1.2 In deriving these estimates, a Reporting Bank may use external data available to it that is not itself consistent with the definition of PD, and where relevant LGD and EAD, in this Annex.[324] In such cases, the Reporting Bank shall make appropriate adjustments to the data to achieve broad equivalence with the definition of PD, and where relevant LGD and EAD, in this Annex. This also applies to any internal data used by the Reporting Bank up to 1 January 2008. Beyond 1 January 2008, internal data and any pooled data used by the Reporting Bank to derive estimates of IRBA parameters shall be consistent with the definition of PD, and where relevant LGD and EAD, in this Annex.

1.3 A Reporting Bank shall calculate M in accordance with Annex 7Z of Part VII as an input to the IRBA risk weight function for the IRBA wholesale asset class under Division 4 of Part VII.

**Section 2: Definition of PD**

2.1 The PD attached to any particular obligor grade is a statistic that measures the long-run average of one-year default rates for obligors in that grade. Subject to paragraph 2.2 below, a Reporting Bank shall calculate PD in accordance with the following formula:

$$PD_t = D_t/N_t$$

where –

(a) "$PD_t$" refers to the probability of default over one year for a particular obligor grade;

(b) "$N_t$" refers to the total number of obligors assigned to that obligor grade at the beginning of year t, i.e. the obligor grade cohort; and

(c) "$D_t$" is the number of defaults observed for the obligor grade cohort over year t.

2.2 A Reporting Bank should assess the effects of the following events when calculating historical outcomes and deriving forward-looking estimates of $PD_t$ for any obligor grade:

[324] In using external data, the Reporting Bank shall meet the requirements in paragraph 5.2(d) of Annex 7AB of Part VII.

(a) withdrawals of obligors from the obligor grade cohort over a one-year horizon; and

(b) addition of obligors to that particular obligor grade cohort during the one-year horizon and defaults of such obligors within the same one-year horizon.

If the effects are material, the Reporting Bank should take them into account when estimating $PD_t$. This may entail modifying the formula for calculating $PD_t$ under paragraph 2.1 above, or using other methods to account for the bias in the Reporting Bank's PD estimate arising from an unequal distribution of such events.

**Section 3: Definition of LGD**

3.1 The LGD attached to any particular facility grade or retail pool of exposures is a statistic that measures the long-run rate of economic loss[325] associated with any facility grade or retail pool of exposures should a default occur.

3.2 A Reporting Bank shall comply with the following requirements and should meet the following guidelines when calculating historical LGDs and deriving forward-looking estimates of LGD:

(a) all relevant factors which could affect the costs of holding or collecting on a defaulted facility should be taken into account when calculating LGD. This shall include material discount effects and material direct and indirect costs associated with collecting on the exposure. For avoidance of doubt, the Reporting Bank shall not simply measure the loss recorded in accounting records, although it shall be able to compare accounting and economic losses;

(b) subject to (a) above, economic loss may be calculated using EAD, loss of principal, interest, and fees, and the present value of subsequent recoveries and related expenses discounted at a suitable rate. The Reporting Bank should discount the streams of recoveries received after a facility goes into default in order to compare the net present value of recovery streams as of a default date with a measure of EAD;

(c) the discount rate used to calculate economic loss should reflect the costs of holding defaulted assets over a workout period, including an appropriate risk premium. In establishing an appropriate discount rate, the Reporting Bank should take into account the following:

(i) when recovery streams are uncertain and involve risks which cannot be diversified away, net present value calculations should reflect the time value of money and risk premiums appropriate to such risks. In establishing appropriate risk premiums for the estimation of LGDs consistent with economic downturn conditions, the Reporting Bank should focus on the uncertainties in recovery cash flows associated with defaults which arise during economic downturn conditions; and

[325] As specified in paragraph 5.6 of Annex 7AB of Part VII.

(ii) when there is no uncertainty in recovery streams (e.g. recoveries derived from cash collateral), net present value calculations need only reflect the time value of money, and a risk-free discount rate may be appropriate;

(d) the Reporting Bank may estimate the present values of recovery rates by –

(i) discounting the stream of recoveries and the stream of workout costs by a risk-adjusted discount rate which is the sum of the risk-free rate and a spread appropriate for the risk of the recovery and cost cash flows;

(ii) converting the stream of recoveries and the stream of workout costs to certainty-equivalent cash flows[326] and discounting these by the risk-free rate; or

(iii) using a combination of adjustments to the discount rate and the stream of recoveries and the stream of workout costs which are consistent with sub-paragraphs (i) and (ii) above[327];

(e) workout costs which can be clearly attributed to certain facilities or types of facilities should be reflected in the LGD assignments of the Reporting Bank for those exposures. When such allocation is not practical, the Reporting Bank may assign those costs using factors based on broad averages. The allocation of recovery costs may require judgement, but the process should be carefully designed to ensure that all true recovery costs are reasonably allocated;

(f) if a Reporting Bank chooses to close the period of observation before final resolution of the facility, for example, at a point in time when most costs have been incurred and when recoveries are substantially complete, it should have a well-founded process for estimating the additional costs and recoveries which would likely occur beyond that point in time and include them in its LGD estimates; and

(g) the Reporting Bank should not adjust its LGD estimates to take into account its own workout and collection expertise unless it has sufficient internal empirical evidence of the impact of its expertise on recovery rates and any adjustment is made in consultation with the Authority.

[326] A certainty-equivalent cash flow is defined as the cash payment required for a risk averse investor to be indifferent between receiving the cash payment with certainty at the payment date and holding an asset which would yield an uncertain payout at the payment date.

[327] A Reporting Bank may use an "effective interest rate" in accordance with FRS 109 as the discount rate, but in that case should adjust the stream of net recoveries in a way which is consistent with sub-paragraphs (i) and (ii).

**Section 4: Definition of EAD**

4.1 The EAD for an on-balance sheet asset or off-balance sheet item is defined as the expected gross exposure of the facility upon default of the obligor. A Reporting Bank shall estimate EAD in accordance with the requirements under Division 2 of Part VII.

[328] *[This footnote has been intentionally left blank.]*

**Annex 7Z**

## CALCULATION OF M

### Section 1: Calculation of M for IRBA Wholesale Asset Class

1.1 Subject to Sections 2 to 5 below, a Reporting Bank adopting the F-IRBA or A-IRBA for an exposure that falls within the IRBA wholesale asset class, shall calculate the M in years for that exposure based on the contractual cash flow schedule for that exposure in accordance with the following formula:

$$M = \sum_t t \times CF_t \Big/ \sum_t CF_t$$

where "$CF_t$" denotes the cash flows (including principal, interest payments and fees) contractually payable by the obligor in period t, subject to the following:

(a) M shall be no greater than five years; and

(b) M shall be no lower than one year.

### Section 2: Calculation of M for OTC Derivative Transactions, Long Settlement Transactions and SFTs Covered by Qualifying Bilateral Netting Agreements

2.1 Subject to Sections 3 to 5 below, a Reporting Bank adopting the F-IRBA or A-IRBA for any OTC derivative transaction, long settlement transaction or SFT that fall within the IRBA wholesale asset class and that are subject to a qualifying bilateral netting agreement, shall calculate the M in years for all the transactions to a single counterparty as follows:

(a) calculate the M in years for each transaction with the counterparty in accordance with paragraph 1.1 above; and

(b) calculate M in accordance with the following formula:

$$M = \sum_i M_i \times \frac{N_i}{N}$$

where "$N_i$" denotes the notional amount of each transaction and N denotes the notional amount of all the transactions covered by the qualifying bilateral netting agreement

**Section 3: Calculation of M for CCR Internal Models Method where the Original Maturity of the Longest-Dated Contract Exceeds One Year**

3.1 Subject to Sections 4 and 5 below, a Reporting Bank using the CCR internal models method shall calculate the M for netting sets in which the original maturity of the longest-dated contract within the set is greater than one year as follows:

$$M^{329} = \frac{\sum_{k=1}^{t_k \le 1year} \text{Effective } EE_k \times \Delta t_k \times df_k + \sum_{t_k > 1year}^{maturity} EE_k \times \Delta t_k \times df_k}{\sum_{k=1}^{t_k \le 1year} \text{Effective } EE_k \times \Delta t_k \times df_k}$$

where "$df_k$" is the risk-free discount factor for future time period $t_k$.

3.2 M calculated in accordance with paragraph 3.1 shall be no greater than five years and shall be no lower than one year.

**Section 4: Calculation of M for Short-term Exposures**

4.1 Notwithstanding paragraphs 1.1 and 2.1 above and subject to paragraphs 4.4 and 5.1 below, a Reporting Bank adopting the CCR internal models method, or the F-IRBA or A-IRBA for a short-term exposure that falls within the IRBA wholesale asset class, may calculate M in years for that exposure in accordance with the following formula:

$$M = \sum_t t \times CF_t \Big/ \sum_t CF_t$$

where "$CF_t$" denotes the cash flows (including principal, interest payments and fees) contractually payable by the obligor in period t, subject to the following:

(a) M shall be no greater than five years; and

(b) M shall be at least one day.

4.2 For the purposes of paragraph 4.1 above, a short-term exposure means any self-liquidating issued and confirmed letter of credit that has an original maturity of less than one year, or any one of the following exposures that is transaction-oriented, has an original maturity of less than one year and does not form part of the ongoing financing of an obligor by a Reporting Bank –

(a) any OTC derivative transaction and margin lending transaction;

[329] M shall be adjusted to reflect rollover risk by replacing EE with effective EE for forecasting horizons under one year. Rollover risk is the amount by which EPE is understated when future transactions with a counterparty are expected to be conducted on an ongoing basis, but the additional exposure generated by the future transactions is not included in calculation of EPE.

(b) any repo-style transaction (i.e. repo, reverse repo, securities lending or securities borrowing transaction);

[MAS Notice 637 (Amendment) 2012]

(c) any short-term loan and deposit, including any negotiable certificates of deposit;

(d) any short-term self-liquidating trade transaction other than issued and confirmed letters of credit. These transactions could be accounted for at their actual remaining maturity;

(e) any exposure arising from settling the purchase and sale of securities. This could also include any overdraft arising from failed securities settlements provided that such an overdraft does not continue for more than a short, fixed number of business days;

(f) any exposure arising from cash settlements by wire transfer, including any overdraft arising from failed transfers provided that such an overdraft does not continue for more than a short, fixed number of business days;

(g) any exposure to banking institutions arising from foreign exchange or money market transactions; and

(h) any exposure to central governments and central banks that are denominated and funded in the local currency of that jurisdiction.

4.3 For transactions referred to in paragraph 4.2(a) and (b), the documentation applicable to the exposure shall require daily remargining and daily revaluation and provide for the prompt liquidation or setoff of collateral in the event of default or failure to remargin.

4.4 Notwithstanding paragraphs 2.1, 3.1 and 4.1 above and subject to Section 5 below, a Reporting Bank adopting the F-IRBA or A-IRBA for an OTC derivative transaction, long settlement transaction or SFT that qualifies as a short-term exposure as defined in paragraph 4.2 above, fall within the IRBA wholesale asset class and is subject to a qualifying bilateral netting agreement or a qualifying cross-product netting agreement shall calculate the M in years for all the transactions to a single counterparty as follows:

(a) calculate the M in years for each transaction with the counterparty in accordance with paragraph 4.1 above; and

(b) calculate M in accordance with the following formula:

$$M = \sum_{i} M_i \times \frac{N_i}{N}$$

where –

(i) "$N_i$" refers to the notional amount of each transaction;

(ii) "N" refers to the notional amount of all the transactions covered by the qualifying bilateral netting agreement or qualifying cross-product netting agreement; and

(iii) "M" is subject to a floor equal to the minimum holding period for the transaction type set out in Table 7J-2 of Annex 7J of Part VII, or where there is more than one transaction type, a floor equal to the highest holding period.

**Section 5: Calculation of M using Residual Contractual Maturity**

5.1 A Reporting Bank which is not able to calculate M in accordance with Sections 1 to 4 above shall use a more conservative measure of M such as the maximum remaining time (in years) that the obligor is permitted to take to fully discharge its contractual obligation (including principal, interest, and fees) under the terms of the agreement giving rise to the obligation[330], subject to a minimum M of one year and a cap on M of five years.[331]

**Section 6: Calculation of M for Securitisation Exposures**

[MAS Notice 637 (Amendment No. 2) 2017 (Insertion of this Section)]

6.1 Subject to paragraphs 6.2 and 6.3, a Reporting Bank shall calculate the tranche maturity $M_T$ of a securitisation exposure –

(a) as the weighted-average maturity of the contractual cash flows of the tranche, in accordance with the following formula –

$$M_T = \sum_t t \cdot CF_t \Big/ \sum_t CF_t$$

where "$CF_t$" denotes the cash flows (including principal, interest payments and fees) contractually payable by the obligor in period t. The contractual cash flows shall be unconditional and shall not be dependent on the actual performance of the underlying exposures; or

(b) on the basis of the final legal maturity of the tranche, in accordance with the following formula –

$$M_T = 1 + (M_L - 1) \cdot 80\%$$

where "$M_L$" is the final legal maturity of the tranche.

6.2 The Reporting Bank shall calculate tranche maturity on the basis of the final legal maturity in accordance with paragraph 6.1(b), if unconditional contractual payment dates are not available.

6.3 The Reporting Bank shall subject the tranche maturity calculated in accordance with paragraph 6.1 to a cap of five years and a floor of one year.

[330] In some instances, this will correspond to the notional maturity of the instrument.

[331] The one-year maturity floor shall not apply to short-term exposures as defined in paragraph 4.2 of this Annex.

6.4 In calculating $M_T$, a Reporting Bank shall take into account the maximum period of time it is exposed to potential losses from the underlying exposures –

(a) where the Reporting Bank provides a commitment to a securitisation transaction, the Reporting Bank shall calculate $M_T$ of the securitisation exposure resulting from this commitment as the sum of the contractual maturity of the commitment and the longest maturity of the underlying exposures to which the Reporting Bank would be exposed after a draw on the commitment has occurred. If the underlying exposures are revolving, the Reporting Bank shall apply the longest contractually possible remaining maturity of the asset that might be added to the underlying pool during the revolving period, rather than the longest maturity of the assets currently in the underlying pool;

(b) where the Reporting Bank provides any other instrument to a securitisation transaction resulting in a securitisation exposure to the Reporting Bank that is not limited to losses realised until the maturity of that instrument (e.g. total return swaps), the Reporting Bank shall calculate $M_T$ of the securitisation exposure resulting from this instrument in accordance with sub-paragraph (a); and

(c) where the Reporting Bank provides a credit protection instrument to a securitisation transaction resulting in a securitisation exposure to the Reporting Bank that is limited to losses that occur up to the maturity of the instrument provided, the Reporting Bank shall calculate $M_T$ of the securitisation exposure resulting from this instrument as the contractual maturity of the instrument. The Reporting Bank shall not look through to the protected position in the calculation of $M_T$.

**Annex 7AA**

## MINIMUM REQUIREMENTS ON INFORMATION AND DATA USED FOR DERIVING ESTIMATES OF IRBA PARAMETERS

### Section 1: Minimum Requirements

1.1 The appropriate length of the information and data series for each IRBA asset sub-class would depend on, inter-alia, the information and data sources, the IRBA asset sub-class in question, the risk characteristics of the exposures, the type of rating system in use by the Reporting Bank, and the representativeness of the information and data series to the exposures of the Reporting Bank at the relevant time. A Reporting Bank may be expected to apply additional margins of conservatism if the Authority deems that the information and data series used by the Reporting Bank is inadequate or not sufficiently representative.

1.2 A Reporting Bank shall ensure that the historical observations of IRBA parameters, henceforth referred to as data series in this Annex, are not shorter than as set out in paragraphs 1.4 to 1.6 below.

1.3 For avoidance of doubt, a Reporting Bank should not expect that merely meeting the minimum expectations on the length of the data series as set out in paragraphs 1.4 to 1.6 below will automatically qualify the Reporting Bank for IRBA adoption. The Reporting Bank shall also consider if its data series is of sufficient breadth to cover a wide range of possible economic events and is representative of the Reporting Bank's exposures at the relevant time.

<u>Minimum Requirements for IRBA Wholesale Asset Class</u>

1.4 Without prejudice to paragraph 1.1 above and subject to paragraph 2.1 below, a Reporting Bank shall ensure that the data series used in the process for deriving estimates of IRBA parameters for any exposure that falls within the IRBA wholesale asset class –

(a) for deriving any PD estimate, covers at least five years for at least one data source. This is irrespective of whether the Reporting Bank is using external, internal, or pooled data sources, or a combination of the above. If the available observation period spans a longer period for any source and the data is relevant and material, the Reporting Bank shall use the longer period;

(b) for deriving any LGD estimate, ideally covers a complete economic cycle but is no shorter than a period of seven years for at least one data source. If the available observation period spans a longer period for any source and the data is relevant and material, the Reporting Bank shall use the longer period; and

(c) for deriving any EAD estimate, ideally covers a complete economic cycle but is no shorter than a period of seven years for at least one data source. If the available observation period spans a longer period for any source and

the data is relevant and material, the Reporting Bank shall use the longer period.

Minimum Requirements for IRBA Retail Asset Class

1.5 Without prejudice to paragraph 1.1 above and subject to paragraph 2.1 below, a Reporting Bank shall ensure that the data series used in the process for deriving estimates of IRBA parameters for any exposure that falls within the IRBA retail asset class –

[MAS Notice 637 (Amendment No. 2) 2018]

(a) for deriving any PD estimate, covers at least five years for at least one data source. If the available observation period spans a longer period for any source and the data is relevant and material, the Reporting Bank shall use the longer period. A Reporting Bank need not give equal importance to historic data if it can demonstrate that more recent data is a better predictor of default rates;

(b) for deriving any LGD estimate, ideally covers a complete economic cycle but is no shorter than a period of five years for at least one data source. A Reporting Bank need not give equal importance to historic data if it is able to demonstrate that more recent data is a better predictor of loss rates; and

(c) for deriving any EAD estimate, ideally covers a complete economic cycle but is no shorter than a period of five years for at least one data source. A Reporting Bank need not give equal importance to historic data if it is able to demonstrate that more recent data is a better predictor of drawdowns.

Minimum Requirements for IRBA Purchased Receivables Asset Class

1.6 Without prejudice to paragraph 1.1 above and subject to paragraph 2.1 below, a Reporting Bank shall ensure that the data series used in the process for deriving estimates of IRBA parameters for any exposure that falls within the IRBA purchased receivables asset class shall follow the treatment for the IRBA asset class to which the underlying purchased asset is categorised.

[MAS Notice 637 (Amendment No. 2) 2018]

**IRBA VALIDATION STANDARDS**

## Section 1: Overview

### 1.1 Introduction

(a) A Reporting Bank that adopts IRBA shall observe the standards set out in this Annex.

(b) A Reporting Bank shall comply with the requirements and should meet the guidelines set out in this Annex at the outset and on an ongoing basis. It should also note that meeting these standards does not automatically qualify the Reporting Bank for IRBA adoption. The Authority will want to be assured that the intention of the Reporting Bank in adopting IRBA is to seek continual improvements in its risk management practices. A Reporting Bank should not regard these standards as an exhaustive checklist to be satisfied in order to adopt IRBA. The Authority will consider the willingness and ability of a Reporting Bank to maintain and improve its rating systems to ensure the continuing appropriateness of the capital requirements calculated using estimates of IRBA parameters derived from the rating systems. The Authority will consider a Reporting Bank's abilities to rank order and quantify risk in a consistent, reliable and valid manner. The Reporting Bank shall ensure that its overall credit risk management practices are consistent with the evolving sound practice guidelines issued by the BCBS and the Authority, where applicable.

(c) The overarching principles behind these standards are as follows:

(i) A Reporting Bank shall ensure that the internal ratings of a Reporting Bank (including segmentations of exposures to pools of homogenous exposures) and process for deriving estimates of IRBA parameters ("parameterisation process") provide for a meaningful assessment of borrower and facility characteristics of the credit exposures of the Reporting Bank and a meaningful differentiation of risk, as well as generate consistent and predictive estimates of IRBA parameters suitable for use under IRBA to calculate minimum capital requirements;

(ii) A Reporting Bank shall ensure that the internal ratings and estimates of IRBA parameters is used pervasively in internal credit risk management and other significant business decisions relating to credit risk of the Reporting Bank. The Reporting Bank shall ensure that the rating and risk estimation systems and parameterisation processes are consistent with internal use of the estimates of IRBA parameters; and

(iii) A Reporting Bank has set up and is able to maintain a governance framework, including the appropriate organisational structures and control mechanisms, to ensure that it is able to continue to derive consistent and predictive estimates of IRBA parameters.

(d) The standards in this Annex apply to all asset classes and to both the F-IRBA and A-IRBA unless noted otherwise. The standards related to the process of assigning exposures to borrower or facility grades (and the related standards on oversight, validation, etc.) apply equally to the process of assigning retail exposures to pools of homogenous exposures, unless noted otherwise.

## Section 2: Oversight and Control

### 2.1 Board Oversight

(a) A Reporting Bank shall ensure that the Board has ultimate responsibility for the continuing appropriateness of the rating systems, the parameterisation process, the use of the rating systems and estimates of IRBA parameters, and stress tests[332]. This includes responsibility for the adequacy of control processes in respect of these areas. Accordingly, a Reporting Bank should undertake efforts to equip the Board with a general understanding of the objectives and basis of the rating systems and parameterisation process of the Reporting Bank. The Reporting Bank shall ensure that the information provided to the Board is adequate for the Board to be able to perform its roles effectively.

(b) A Reporting Bank shall ensure that the Board reviews and approves all important aspects of the rating systems, parameterisation process, use of rating systems and estimates of IRBA parameters, and stress tests of the Reporting Bank.

(c) A Reporting Bank shall inform the Board of material changes to the rating systems, the parameterisation process, and the controls in respect of the rating systems and parameterisation process. The Reporting Bank shall inform the Board of any significant exceptions from established policies and procedures, or weaknesses in respect of the design and operation of rating systems, parameterisation process, the use of rating systems and estimates of IRBA parameters, or stress tests of the Reporting Bank. By way of example, persistent concentrations of borrowers in particular borrower grades (for wholesale exposures), and persistent occurrences of significant differences between realised and predicted outcomes of estimates of IRBA parameters for any IRBA asset sub-class should be reported to the Board.

(d) A Reporting Bank shall ensure that the Board establishes comprehensive and adequate written policies and procedures relating to the oversight and control of the design and operation of its rating systems, the parameterisation process, the use of rating systems and estimates of IRBA parameters, and stress tests of the Reporting Bank. At a minimum, these policies shall include –

    (i) the roles and responsibilities of the Board, senior management and other personnel involved in the design and approval of the rating systems and parameterisation process of the Reporting Bank;

    (ii) the internal control processes and independent oversight of the design and operation of its rating systems, the parameterisation process of the

[332] The roles of the Board should include, but not be confined to, the areas under paragraphs 2.1(b) to (e).

Reporting Bank, the use of rating systems and estimates of IRBA parameters, and stress tests;

(iii) the matters which the Reporting Bank considers material and the authority and approval levels for these matters;

(iv) the frequency and level of detail of reporting to the Board and senior management on the rating systems of the Reporting Bank; and

(v) the frequency and level of detail of reporting to the Board and senior management on the estimates of IRBA parameters used by the Reporting Bank to calculate minimum capital requirements under IRBA.

(e) A Reporting Bank should ensure that the Board integrates the IRBA systems and practices of the Reporting Bank into its risk management processes and operations.

### 2.2 Senior Management Oversight

(a) A Reporting Bank shall ensure that senior management exercises active oversight[333] to ensure the continuing appropriateness of the rating systems, the parameterisation process, the use of rating systems and estimates of IRBA parameters, and stress tests.[334] The Reporting Bank should ensure that senior management articulates its expectations and provides guidance for the technical and operational aspects in respect of these areas.

(b) A Reporting Bank shall ensure that senior management has a good understanding of the design and operation of the rating systems, parameterisation process, the use of rating systems and estimates of IRBA parameters, and stress tests of the Reporting Bank. The Reporting Bank shall also ensure that senior management has a good understanding of its credit policies, underwriting standards, lending practices, as well as collection and recovery practices. The Reporting Bank shall ensure that senior management approves material aspects of these areas and material differences between established procedure and actual practice and reports significant issues to the Board on a regular and timely basis.

(c) A Reporting Bank shall also ensure that senior management ensures, on an ongoing basis, that the rating systems and the parameterisation process –

(i) provide for a meaningful assessment of borrower and facility characteristics of the credit exposures of the Reporting Bank, a meaningful differentiation of risk, and generate consistent and predictive estimates of IRBA parameters suitable for use under IRBA to calculate minimum capital requirements; and

(ii) are consistent with all applicable rules and regulations as well as established internal policies.

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[333] The Reporting Bank shall ensure that the involvement of senior management in respect of these areas to exceed the level of involvement by the Board.

[334] The roles of senior management should include, but not be confined to the areas under paragraphs 2.2 (b) to (f).

(d) A Reporting Bank shall ensure that senior management and staff in the credit control functions meet regularly to discuss the consistency of ratings assignments, the parameterisation process, areas needing improvement, and the status of efforts to improve previously identified deficiencies.

(e) A Reporting Bank should ensure that senior management ensures that the staff responsible for any aspect of its rating systems, including ratings assignments, credit risk control and internal validation, are adequately qualified and trained to undertake their respective roles.

(f) A Reporting Bank should ensure that senior management exercises active oversight to ensure steps are taken by staff at all levels to integrate the IRBA systems and practices of the Reporting Bank into its day-to-day risk management processes and operations.

### 2.3 Regular Reporting to the Board and Senior Management

(a) A Reporting Bank shall integrate internal ratings, estimates of IRBA parameters and results of stress tests into regular reports to the Board and senior management on the changes in the risk profile of the Reporting Bank, trends in risk-adjusted profitability, and the material risks which the Reporting Bank is exposed to. The depth and frequency of information provided to these parties should be commensurate with the operations, size, and risk profile of the Reporting Bank.

(b) At a minimum, a Reporting Bank shall ensure that the Board and senior management get regular reports on the following for material credit portfolios –

(i) risk profile by internal grade (or in the case of retail exposures, risk profile by exposure pool);

(ii) risk rating migration across grades with emphasis on unexpected results;

(iii) changes in estimates of IRBA parameters by borrower and facility grade (and in the case of retail exposures, changes in estimates of IRBA parameters of exposure pools);

(iv) comparison of realised PD, LGD, and EAD against the estimates of IRBA parameters of the Reporting Bank;

(v) changes in regulatory capital requirements under IRBA and economic capital over time;

(vi) results of credit stress testing;

(vii) results of internal validation, including results of replication tests performed to check for systematic biases in rating assignments; and

(viii) reports from internal audit and credit risk control units on material issues in respect of the Reporting Bank's IRBA systems.

## 2.4 Credit Risk Control Function

(a) A Reporting Bank shall have a credit risk control unit that is responsible for the design or selection, implementation and performance of the rating systems of the Reporting Bank, and for putting in place an appropriate parameterisation process. The Reporting Bank shall ensure that the unit is structurally and functionally independent from the personnel and management functions responsible for originating exposures.

(b) A Reporting Bank should ensure that the evaluation of the performance and remuneration of the credit risk control unit takes into consideration how well credit risks are managed (e.g. the reliability and consistency of rating assignments and predictiveness of estimates of IRBA parameters and other risk estimates).

(c) A Reporting Bank shall ensure that the areas of responsibility of the credit risk control unit(s) include at least the following:

(i) testing and monitoring internal grades;

(ii) conducting comprehensive stress tests in accordance with Section 6 below;

(iii) producing and analysing summary reports from the rating systems of the Reporting Bank, including historical default data sorted by rating at the time of default and one year prior to default, grade migration analyses, as well as monitoring trends in key rating criteria;

(iv) ensuring the reliability and consistency of the estimates of IRBA parameters, including implementing procedures to verify that rating definitions are consistently applied across departments and geographic areas. In this regard, the Reporting Bank shall implement internal standards for the estimate of IRBA parameters and associated remedial actions to be taken when such standards are not met;

(v) reviewing and documenting any changes to the rating process, including the reasons for the changes;

(vi) reviewing the rating criteria to evaluate if they remain predictive of risk. The Reporting Bank shall document and retain changes to the rating process, criteria or individual rating parameters;

(vii) participating actively in the design or selection, implementation and validation of rating systems;

(viii) oversight and supervision responsibilities for any systems used in the rating process, and ultimate responsibility for the ongoing assessments of the performance of and alterations to the rating systems. In this regard, the Reporting Bank shall use one or more of the appropriate methodologies or techniques in assessing the discriminatory power of the rating systems and the stability of such power. The Reporting Bank shall also implement internal standards for assessing the discriminatory power of its rating

systems and associated remedial actions to be taken when such standards are not met; and

(ix) establishing and documenting the accountability and reporting structure of the credit risk control unit.

### 2.5 Internal Validation

(a) Internal validation encompasses a range of processes and activities that contribute to the internal assessment of a Reporting Bank of whether it is capable of deriving consistent and predictive estimates of IRBA parameters. A Reporting Bank has primary responsibility for internal validation. A Reporting Bank shall have a robust system in place to validate the accuracy and consistency of its rating systems, processes, and the estimation of all relevant risk components. A Reporting Bank shall demonstrate to the satisfaction of the Authority that its internal validation process enables it to assess the performance of its internal rating and risk estimation systems consistently and meaningfully, and its internal validation is robust and likely to remain so.

(b) Internal validation is an iterative process and encompasses both quantitative and qualitative elements. A Reporting Bank shall perform regular internal validation of its rating systems (at least annually). The Reporting Bank shall ensure that such internal validation comprises at least the following:

(i) assessment of whether the standards in this Annex relating to the design of rating systems, rating systems operations, deriving estimates of IRBA parameters (PD only in the case of a Reporting Bank adopting F-IRBA and PD, LGD and EAD in the case of a Reporting Bank adopting A-IRBA,) oversight and control and stress tests are met;

[MAS Notice 637 (Amendment No. 2) 2014]

(ii) assessment of whether in totality, the systems and processes of the Reporting Bank in respect of the areas outlined in paragraph 2.5(b)(i) above have adhered to the overarching principles under paragraph 1.1(c) above;

[MAS Notice 637 (Amendment No. 2) 2014]

(iii) regular comparison of realised outcomes with estimates of IRBA parameters, using historical data over as long a period as possible, covering a range of economic conditions, and ideally one or more complete business cycles. A Reporting Bank shall regularly compare realised default rates with estimated PDs for each rating grade and demonstrate to the satisfaction of the Authority that the realised default rates are within the expected range for that grade. A Reporting Bank which is using the A-IRBA shall complete such analysis for its estimates of LGDs and EADs. A Reporting Bank shall clearly

document the methods and data used in such comparisons, and update this analysis and documentation at least annually;[335]

[MAS Notice 637 (Amendment) 2012]

(iv) use of appropriate validation methodology and quantitative tools, and comparison with relevant (i.e., in terms of appropriateness, timeliness and time period) external data sources where applicable. A Reporting Bank shall ensure that the analysis must be based on data that is appropriate to the portfolio, are updated regularly and cover a relevant observation period. A Reporting Bank shall ensure that internal assessments of the performance of its rating systems is based on long data histories, covering a range of economic conditions, and ideally one or more business cycles. A Reporting Bank shall demonstrate that the validation methodologies and tools do not vary systematically with the economic cycle;

(v) well-articulated internal validation standards, taking into account business cycles and similar systematic variability in default experiences, for distinguishing situations where deviations in realised outcomes of IRBA parameters from expectations (i.e. estimates of IRBA parameters) become significant enough to call into question the validity and predictive power of the estimates of IRBA parameters. Where such deviations continue to be significant, a Reporting Bank shall revise relevant estimates of IRBA parameters upwards to reflect its default and loss experience; and

(vi) in the case where a Reporting Bank uses a statistical rating model, it shall also monitor the performance and stability of the statistical rating model and review the inherent statistical relationships and assumptions of the model.

(c) A Reporting Bank shall ensure that no person responsible for the design or implementation of the rating system for a class of exposures or the parameterisation process for that class of exposures participates in the validation work relating to that rating system. Where any person or group of persons is involved in the validation work relating to a rating system designed or implemented by another person or group of persons of the same unit, the Reporting Bank shall ensure that senior management ensures that there is no conflict of interest, and that the person or group of persons involved in the validation work relating to that rating system can provide objective and effective challenge to the person or group of persons responsible for the design or implementation of that rating system and the parameterisation process.

### 2.6 Independent Review of Internal Validation

(a) A Reporting Bank shall ensure that the IA reporting to the Audit Committee reviews the internal validation processes of the rating systems and ensure that validation

[335] The Authority encourages a Reporting Bank adopting F-IRBA to compare realised (i.e. historical) LGDs and EADs to those that the Authority has set and to take such comparisons into account in its ICAAP. Where the realised outcomes are materially higher than what the Authority has set, the ICAAP should consider if additional capital buffers would be appropriate.

processes are implemented as designed and are effective. In performing this role, the IA may seek the assistance of other internal or third party specialists, so long as overall responsibility remains with the IA.

(b) In the event where the IA has sought assistance from internal or external specialists in the review process for any class of exposures, a Reporting Bank shall ensure that such specialists are not involved in or responsible for –

(i) the design, selection or implementation of rating systems used for that class of exposures;

(ii) the parameterisation process for that class of exposures; and

(iii) the origination of exposures for that class of exposures.

(c) A Reporting Bank shall ensure that the IA conducts regular reviews (at least annually) of the ongoing validation of the IRBA systems of the Reporting Bank. The Reporting Bank shall ensure that the review at least covers aspects of the internal validation related to the operations and processes of the credit risk control function. The Reporting Bank shall ensure that the IA conducts checks to attest to the depth, scope, and quality of the internal validation to ensure that its findings are well founded. In particular, the Reporting Bank shall ensure that the checks cover the process of the Reporting Bank for estimating, documenting and justifying the estimates of IRBA parameters used to calculate minimum capital requirements under IRBA, given that it is an important area which affects regulatory capital requirements.[337] The Reporting Bank shall also ensure that the IA ensures that the person or group of persons involved in the internal validation of a rating system is independent from those involved in designing or implementing that rating system or in the related parameterisation process and is able to provide objective and effective challenge, as specified in paragraph 2.5(c) above.

(d) A Reporting Bank shall ensure that the IA –

(i) documents the scope of its review and the findings and recommendations in respect of its independent review of the internal validation;

(ii) proactively discusses its findings and recommendations in respect of its independent review of the internal validation with senior management of the Reporting Bank;

(iii) reports important findings to the Audit Committee on a timely basis; and

(iv) monitors the implementation of the recommendations accepted by the Audit Committee and report incidences of non-implementation to the Audit Committee.

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336 *[This footnote has been intentionally left blank.]*

337 The Authority may also require an external audit of the Reporting Bank's rating assignment process and its estimates of IRBA parameters.

(e) A Reporting Bank shall ensure that the Audit Committee ensures that IA is adequately qualified and trained to assume its responsibilities of independent review of the internal validation of the Reporting Bank.

## 2.7 Use of Internal Ratings and Estimates of IRBA Parameters

(a) A Reporting Bank shall not design its rating systems and parameterisation process exclusively for the purpose of qualifying for IRBA. The Reporting Bank shall ensure that the internal ratings and estimates of IRBA parameters are used pervasively by the Reporting Bank and play an essential role[338] in –

(i) credit approval;

(ii) risk management and setting of risks tolerances for credit portfolios;

(iii) internal capital allocations and pricing;

(iv) provisioning; and

(v) corporate governance functions, including reporting to the Board and senior management on credit risk profile and trends.

(b) In addition, a Reporting Bank should also consider the internal ratings and estimates of IRBA parameters in other significant decisions relating to credit risk, such as –

(i) business strategies, and potential mergers and acquisitions;

(ii) performance measurement and performance-related remuneration; and

(iii) credit targeting or credit portfolio rebalancing.

(c) While a Reporting Bank may not necessarily be using the same estimates of IRBA parameters for all internal purposes specified in paragraphs 2.7 (a) and (b)[339], it shall nevertheless document the differences and the justifications for such differences. The Reporting Bank shall ensure that the justifications provide the reasonableness of use of certain estimates in each particular instance, and a demonstration of consistency in the use of the different set of the estimates or in the risk factors or criteria driving these estimates. The Reporting Bank shall ensure that senior management approves the use of different estimates of IRBA parameters for different purposes.

(d) A Reporting Bank shall have a credible track record in the use of internal ratings and estimates of IRBA parameters. A Reporting Bank adopting IRBA before 1 January 2012 shall demonstrate that it has been using a rating system for all IRBA exposures as at its IRBA adoption date, broadly in line with the minimum standards

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[338] While internal ratings and estimates of IRBA parameters shall play an essential role in these areas, this does not mean that internal ratings and estimates of IRBA parameters must play an exclusive or primary role.

[339] For example, pricing models are likely to use PDs and LGDs relevant to the life of the asset.

for use, for at least the two years prior to its IRBA adoption date. A Reporting Bank adopting IRBA on or after 1 January 2012 shall demonstrate that it has been using a rating system for all IRBA exposures as at its IRBA adoption date, broadly in line with the minimum standards for use, for at least the three years prior to its IRBA adoption date.

(e) A Reporting Bank using A-IRBA for the wholesale asset class shall demonstrate that it has been estimating and employing LGDs and EADs in a manner that is broadly consistent with the applicable standards for use of own estimates of LGDs and EADs in this Annex for at least the three years prior to its A-IRBA adoption date.

(f) For the purpose of meeting the standards on duration of use under paragraph 2.7 (d) and (e) above, improvements to a Reporting Bank's rating systems will not render a Reporting Bank non-compliant provided that the changes do not render prior use experience irrelevant in assessing the reliability of the rating systems.

### 2.8 Documentation

(a) A Reporting Bank shall ensure that the internal validation of a Reporting Bank is comprehensively documented. A Reporting Bank shall ensure that the internal validation itself is based on comprehensively documented processes and systems. A Reporting Bank shall document clearly changes in validation methodology and tools, and data used, including data sources and periods covered. The objective of these requirements is to promote the stability of the IRBA systems and to enable independent verification.

(b) A Reporting Bank shall document in writing the design and operational details of its rating systems. The Reporting Bank shall ensure that the documentation evidences the observance of the standards in this Annex by the Reporting Bank, and addresses topics such as portfolio differentiation, rating criteria, rating process, overrides and management oversight of the rating systems. In addition, the Reporting Bank shall also articulate its rating philosophy[340], including implications for capital adequacy as economic conditions change.

(c) A Reporting Bank shall ensure that the documentation of the rating criteria by a Reporting Bank includes at least the following:

(i) the rationale for the choice of rating criteria, including analyses demonstrating that the rating criteria and procedures are likely to result in ratings that meaningfully differentiate risk, and that the rating criteria have taken all relevant and material borrower and transaction characteristics into account;

(ii) the rationale for assigning a borrower or a group of borrowers to a particular rating system if the Reporting Bank uses multiple rating systems within each asset class;

[340] A rating philosophy is a broad term referring to the approach of the Reporting Bank in assigning obligors to groups that are expected to share common default frequencies, including whether the Reporting Bank groups obligors by expected common default frequency over the next year or over a wider range of possible economic and stress outcomes.

(iii) the relationship between borrower grades in terms of the level of risk each grade implies, and the risk of each grade in terms of both a description of the probability of default typical for borrowers assigned to that grade and the criteria used to distinguish that level of credit risk;

(iv) the relationship between facility grades in terms of the level of risk each grade implies, and the risk of each grade in terms of both a description of the expected severity of loss upon default and the criteria used to distinguish that level of credit risk;[341] and

(v) the periodic review of rating criteria and procedures to determine whether the rating criteria remain fully applicable to the current portfolio taking into account external conditions.

(d) A Reporting Bank shall ensure that the documentation of the rating process by a Reporting Bank includes at least the following:

(i) the responsibilities of the parties that rate and approve rating grades for borrowers and facilities;

(ii) the definition of what constitutes a rating exception and override, and the situations where exceptions and overrides can be used and the approval authorities for such exceptions and overrides;

(iii) the frequency of rating reviews, including the policy on refreshing relevant and material borrower and facility characteristics;

(iv) the history of significant changes in the rating process to enable easy identification of any changes made to the rating process subsequent to the last supervisory review by the Authority[342]; and

(v) the organisation of rating assignment, including the internal control structure.

(e) A Reporting Bank shall document the specific definitions of default and loss used and demonstrate consistency with the definitions set out in Annexes 7X and 7Y of Part VII.

(f) If a Reporting Bank employs statistical models in the rating process, the Reporting Bank shall document the methodologies. The Reporting Bank shall ensure that the documentation includes at least the following[343]:

(i) a detailed outline of the theory, assumptions and mathematical and empirical basis for deriving estimates of IRBA parameters for grades,

[341] A Reporting Bank adopting F-IRBA may fulfill this requirement by describing the risk of each facility grade in terms of both borrower and transaction-specific factors if the facility dimension reflects both these factors.

[342] The supervisory review would include a review by the home supervisor of a foreign bank subsidiary.

[343] Use of a model obtained from a third-party vendor that claims proprietary technology is not a justification for exemption from documentation or any other of the standards applicable to rating systems in this Annex. The burden is on the Reporting Bank to demonstrate that the standards are met.

individual borrowers, exposures or pools of exposures, and the data sources used to estimate the model;

(ii) a rigorous statistical process (including out-of-time and out-of-sample performance tests) for validating the model; and

(iii) any circumstances under which the model does not work effectively.

## Section 3: Design of Rating Systems

### 3.1 Multiple Rating Systems: Standards for Wholesale and Retail Exposures

(a) Within each IRBA asset class, a Reporting Bank may use multiple rating systems (including the case of multiple rating methodologies under a common rating system framework). For example, a Reporting Bank may have customised rating systems for specific industries or market segments (e.g. middle market, and large corporate) within an IRBA asset class.

(b) If a Reporting Bank uses multiple rating systems, the rationale for applying any rating system shall be documented. A Reporting Bank shall apply the rating system that is most appropriate to measure the risk of the borrower or the credit facility. A Reporting Bank shall not allocate borrowers or credit facilities across rating systems inappropriately to minimise regulatory capital requirements (i.e. cherry-picking by choice of rating system). A Reporting Bank shall demonstrate that each rating system used for IRBA purposes meets the minimum standards as set out in this Annex.

### 3.2 Rating Dimensions: Standards for Wholesale Exposures

(a) A Reporting Bank shall ensure that the rating systems for its wholesale exposures have two separate and distinct dimensions: (i) one that is oriented to the risk of borrower default ("borrower dimension"), and (ii) one that takes into account transaction-specific factors ("facility dimension").

(b) For the borrower dimension, separate credit exposures to the same borrower are assigned to the same borrower grade, irrespective of any differences in the nature of each specific transaction, except under the following circumstances where separate credit exposures may result in multiple borrower grades for the same borrower:

(ii) the rating systems are also used to measure country transfer risks. Under such a circumstance, the Reporting Bank may assign a different borrower grade to a credit exposure denominated in foreign currency from a credit exposure denominated in local currency if the Reporting Bank has a documented framework for taking into account country transfer risks. The

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[344] *[This footnote has been intentionally left blank.]*

framework shall at least cover the methodology for assigning different borrower grades to foreign currency and local currency exposures; and

(iii) a Reporting Bank adjusts the borrower grade of a credit exposure on account of associated guarantees in respect of that credit exposure.

(c) A Reporting Bank shall articulate in its credit policy the relationship between borrower grades in terms of the level of risk each grade implies. The Reporting Bank shall ensure that perceived and measured risk increases as credit quality declines from one borrower grade to the next. The policy shall articulate the risk of each borrower grade in terms of both a description of the probability of default typical for borrowers assigned to that grade and the criteria used to distinguish that level of credit risk.

(d) A Reporting Bank shall ensure that the facility dimension reflects transaction-specific factors, such as collateral, seniority, product type, industry and purpose in respect of any credit facility. For a Reporting Bank adopting -

(iv) F-IRBA, this standard can be fulfilled even if the facility dimension reflects both borrower and transaction-specific factors. For example, the standard can be fulfilled where a rating dimension reflects EL by incorporating both borrower strength (PD) and loss severity (LGD) considerations, and a rating system that exclusively reflects LGD. Where a rating dimension reflects EL and does not separately quantify LGD, the Reporting Bank shall use the supervisory estimates of LGD.

(v) A-IRBA, a Reporting Bank shall ensure that facility ratings reflect only factors that can influence LGD. Borrower characteristics may be included as rating criteria only to the extent they are predictive of LGD. A Reporting Bank may alter the factors that influence facility grades across segments of the portfolio as long as it can demonstrate that the alteration improves the relevance and reliability of its LGD estimates.

(e) Notwithstanding paragraphs 3.2 (a) to (d) above, a Reporting Bank using the supervisory slotting criteria for the SL asset sub-class and the HVCRE asset sub-class may use rating systems with a single rating dimension that reflects EL by incorporating both the risk of borrower default and transaction-specific factors, given the interdependence of borrower and transaction-specific factors for exposures categorised under the SL asset sub-class and HVCRE asset sub-class.

### 3.3 Rating Dimensions: Standards for Retail Exposures

(a) A Reporting Bank shall ensure that rating systems for credit exposures categorised under the IRBA retail asset class are oriented to both borrower and transaction risk, and capture all relevant borrower and transaction characteristics.

(b) A Reporting Bank shall have a process of assigning exposures categorised under the IRBA retail asset class into pools of homogenous exposures, with corresponding quantitative measures of default and loss characteristics (i.e. PD, LGD and EAD

estimates) for each pool.[345] The Reporting Bank shall demonstrate that the process of assigning exposures to pools provides for a meaningful differentiation of risk and for a grouping of sufficiently homogenous exposures, and allows for consistent and predictive estimation of default and loss characteristics for each pool of exposures. The Reporting Bank shall consider at least the following risk drivers when assigning any exposure to a pool of exposures:

(i) borrower characteristics such as borrower type and demographics (e.g. age, occupation);

(ii) facility characteristics, including product, collateral types, loan to collateral value measures in the case of secured facilities, seasoning, guarantees, seniority of the facility, and cross-collateral provisions[346]; and

(iii) delinquency of exposure. A Reporting Bank shall identify exposures that are delinquent from those that are not.

### 3.4 Rating Structure: Standards for Wholesale Exposures

(a) A Reporting Bank shall have a meaningful distribution of exposures across grades with no excessive concentrations, on both its borrower-rating and its facility-rating scales.

(b) A Reporting Bank shall ensure that its rating systems for the borrower dimension have at least seven borrower grades for non-defaulted borrowers and one grade for defaulted borrowers. Where a Reporting Bank lends to borrowers of diverse credit quality, its rating systems for the borrower dimension should have a greater number of borrower grades. In this regard, -

(i) a Reporting Bank shall have a grade definition for each borrower grade. The Reporting Bank shall ensure that the grade definition includes both a description of the degree of default risk typical for borrowers assigned to that grade and the criteria used to distinguish that level of credit risk. "+" or "-" modifiers to alpha or numeric grades may qualify as distinct grades if the Reporting Bank has developed complete rating descriptions and criteria for their assignment, and separately derives PD estimates for alpha or numeric grades with "+" or "-" modifiers; and

(ii) a Reporting Bank with a loan portfolio concentrated in a particular market segment and range of default risk shall have enough grades within that range to avoid undue concentrations of borrowers in particular grades. The Reporting Bank shall ensure that significant concentrations within a single grade or grades are supported by convincing empirical evidence that the grade or grades cover reasonably narrow PD bands and that the default risk posed by all borrowers in a grade fall within that band.

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[345] Different pools of exposures may share identical estimates of some but not all IRBA parameters.

[346] A Reporting Bank shall, consider cross-collateral provisions in the process of assigning exposures to pools.

[347] *[This footnote has been intentionally left blank.]*

(c) For the facility dimension, a Reporting Bank adopting A-IRBA shall have a sufficient number of facility grades to avoid grouping facilities with widely varying LGDs into a single grade. The Reporting Bank shall ensure that the criteria used to define facility grades is grounded in empirical evidence.

(d) A Reporting Bank using the supervisory slotting criteria for the SL asset sub-class and HVCRE asset sub-class shall have at least four grades for non-defaulted borrowers and one grade for defaulted borrowers.

### 3.5 Rating Structure: Standards for Retail Exposures

(a) A Reporting Bank shall ensure that the number of exposures in a given pool is sufficiently large to allow for meaningful quantification and validation of the default and loss characteristics at the pool level. However, the Reporting Bank shall ensure that there is also a meaningful distribution of borrowers and exposures across pools within any IRBA retail sub-class, i.e. a single pool does not include an undue concentration of the exposures of the Reporting Bank in any IRBA retail sub-class.

### 3.6 Rating Definitions and Criteria: Standards for Wholesale Exposures

(a) A Reporting Bank shall have specific rating definitions, processes and criteria for assigning exposures to grades within a rating system. The Reporting Bank shall ensure that the rating definitions and criteria are both plausible and intuitive and should result in a meaningful differentiation of risk. In this regard, the Reporting Bank shall ensure that -

(i) the rating definitions and criteria are sufficiently detailed to allow those responsible for assigning ratings to consistently assign the same grade to borrowers or facilities posing similar risk. This consistency should exist across lines of business, departments and geographic locations using the same rating system. If rating criteria and procedures differ for different types of borrowers or facilities that are rated using the same rating system, a Reporting Bank shall monitor for possible inconsistency with the prescribed rating criteria and procedures, and continually seek to improve the degree of consistency;

(ii) written rating definitions, processes and criteria are clear and detailed enough to allow third parties, such as internal audit or the Authority, to understand the assignment of borrower and facility ratings, replicate the assignments, and evaluate the appropriateness of the assignments; and

(iii) the rating criteria is also consistent with the internal lending standards of a Reporting Bank and its policies for handling borrowers and facilities.

(b) A Reporting Bank shall use all relevant, reliable and material information in assigning ratings to borrowers and facilities. The less information a Reporting Bank has, the more conservative it shall be in its assignment of borrowers and facilities

[348] *[This footnote has been intentionally left blank.]*

to grades or pools. While an external rating can be an important factor determining an internal rating assignment, the Reporting Bank shall ensure that it considers other relevant information. A Reporting Bank shall –

(i) endeavour to use current information;

(ii) specify the frequency of updating the information; and

(iii) apply greater conservatism in its assignments of exposures to borrower or facility grades if the Reporting Bank is not able to take into account all the information it would normally consider.

**3.7 Segmentation Criteria: Standards for Retail Exposures**

(a) A Reporting Bank shall have specific segmentation processes and criteria for assigning exposures to pools. The Reporting Bank shall ensure that the segmentation criteria is both plausible and intuitive and should result in a meaningful differentiation of risk. The Reporting Bank shall ensure that:

(i) the segmentation criteria is sufficiently detailed to allow those responsible for assigning exposures into pools to consistently assign retail exposures posing similar risk into the same pool;

(ii) written segmentation processes and criteria are clear and detailed enough to allow third parties, such as internal audit or the Authority, to understand the assignment of exposures into pools, replicate the assignments, and evaluate the appropriateness of the assignments; and

(iii) the segmentation criteria is also consistent with the Reporting Bank's internal lending standards and its policies for handling exposures.

(b) A Reporting Bank shall use all relevant, reliable and material information in assigning exposures to pools. The Reporting Bank shall –

(vi) endeavour to use current information;

(vii) specify the frequency of updating the information; and

(viii) apply greater conservatism in its assignments of exposures to pools of exposures if the Reporting Bank is not able to take into account all the information it would normally consider.

**3.8 Rating Definitions and Criteria: Standards Specific to the Use of the Supervisory Slotting Criteria for Exposures in the SL Asset Sub-class and HVCRE Asset Sub-class**

(a) A Reporting Bank using the supervisory slotting criteria for exposures in the SL asset sub-class and HVCRE asset sub-class shall assign such exposures to internal rating grades based on its own criteria, systems and processes. The Reporting Bank shall then map these internal rating grades into the five supervisory rating

categories in Annex 7V of Part VII according to the general assessment factors and characteristics exhibited by the exposures which fall under each of the four categories of SL asset sub-class as defined in Annex 7U of Part VII and the HVCRE asset sub-class.

(b) For purposes of paragraph 3.8 (a) above –

(i) a Reporting Bank shall demonstrate that the characteristics associated with its internal rating grades are consistent with a preponderance of the characteristics of the respective supervisory rating categories to which they are mapped; and

(ii) where a Reporting Bank allows overrides of its internal rating grades based on its internal criteria, it shall also demonstrate that the overrides do not render the mapping process ineffective.

**3.9 Rating Assignment Horizon: Standards for Wholesale and Retail Exposures**

(a) The time horizon used in PD estimation is one year. However, a Reporting Bank shall use a time horizon of longer than one year in assigning ratings.

[MAS Notice 637 (Amendment) 2012]

(b) For purposes of paragraph 3.9(a) above, a Reporting Bank should clearly articulate its rating philosophy and the intended time horizon underlying the assignment of ratings. In particular, for borrower rating systems –

(i) a Reporting Bank should state whether borrowers are grouped by expected common default frequency over the next year or over a wider range of possible economic and stress outcomes; and

(ii) a Reporting Bank should articulate how its ratings are expected to migrate in response to economic cycles for all borrower grades. [349]

(c) A Reporting Bank shall ensure that a borrower rating represents the conservative assessment of the borrower's ability and willingness to contractually perform despite adverse economic conditions or the occurrence of unexpected events. The Reporting Bank shall ensure that PD estimates for borrowers that are highly leveraged financial institutions or for borrowers whose assets are predominantly traded assets reflects the performance of the underlying assets based on periods of stressed volatilities. By way of example, the following types of assessments would be acceptable to the Authority:

(i) the Reporting Bank may base rating assignments on specific, appropriate stress scenarios; and

[349] Borrowers grouped by an expected common default frequency over the next year should experience cyclical variations in the grades to which individual borrowers are assigned while borrowers grouped by an expected common default frequency over a wider range of possible stress outcomes should experience relative stability in their borrower grades.

(ii) the Reporting Bank may take into account borrower characteristics that are reflective of the borrower's vulnerability to adverse economic conditions or unexpected events, without explicitly specifying a stress scenario if the range of economic conditions that are considered when making assessments are consistent with current conditions and those that are likely to occur over a business cycle within the respective industry or geographic region. In the case of borrowers that are highly leveraged financial institutions where there is likely a significant vulnerability to market risk, the Reporting Bank shall assess the potential impact on the borrower's ability to perform in periods of stressed volatilities when assigning a rating and corresponding PD to that borrower under the IRBA.

(d) For purposes of paragraph 3.9(c) above, a Reporting Bank shall –

(ix) take a conservative view of projected information, given the difficulties in forecasting future events and the influence they will have on the financial condition of a particular borrower; and

(x) adopt a conservative bias to its analysis, particularly if limited data is available.

**3.10 Additional Expectations Specific to the Application of Statistical Models to Assign Borrower or Facility Ratings**

(a) Statistical models (including credit scoring models or other mechanical methods) may be the primary or partial basis of rating assignments provided there is sufficient human judgement and oversight to ensure that all relevant, reliable and material information that has not been fully taken into account in the statistical model is considered[350, 351] and that the statistical model is used appropriately, and the following standards are met:

(i) a Reporting Bank shall demonstrate that a statistical model has good predictive power and that minimum capital requirements will not be distorted as a result of its use. In particular, the Reporting Bank shall ensure that the variables that are inputs to the model form a set of reasonable and plausible predictors, the model is accurate on average across the range of borrowers or facilities to which the Reporting Bank is exposed and there is no known material biases;

(ii) the Reporting Bank shall have in place a process for vetting data inputs into a statistical model which includes an assessment of the accuracy, completeness and appropriateness of the data specific to the assignment of an approved rating;

[350] While statistical models may sometimes avoid some of the idiosyncratic errors made by rating systems in which human judgement plays a large role, there could potentially be rating errors introduced by the use of limited information.

[351] In the case where statistical models are employed for retail and other portfolios where the size of any individual exposure is not significant, the use of all relevant and material information is necessary only if their omission results in systematic biases in rating assignments.

(iii) the Reporting Bank shall have procedures in place to continually assess whether the data used to build the model are representative of the population of the Reporting Bank's borrowers or facilities;

(iv) the Reporting Bank shall, when combining model results with human judgement, take into account all relevant and material information not considered by the model in the judgement used, and have written procedures describing how human judgement and model results are to be combined;

(v) the Reporting Bank shall have procedures for human review of statistical model-based rating assignments. Such procedures should focus on finding and limiting errors associated with known model weaknesses and shall also include ongoing efforts to improve the model's performance; and

(vi) the Reporting Bank shall have a regular cycle of model validation that includes monitoring the performance and stability of the statistical model, reviewing the inherent statistical relationships, and testing the predictiveness of the model. The Reporting Bank shall ensure that subsequent changes made to the statistical model meet the standards set out in this Annex. The Reporting Bank should ensure that the details and rationale for changes made to the statistical model are documented before the changes take effect.

## Section 4: Rating Systems Operations

### 4.1 Coverage for Wholesale Exposures

(a) A Reporting Bank shall ensure that every new and existing borrower of an exposure categorised under the IRBA wholesale asset class, and every eligible protection provider recognised for purposes of calculating credit RWA for the wholesale component is assigned a rating as part of the credit approval process.

(b) A Reporting Bank shall ensure that every exposure categorised under the IRBA wholesale asset class is associated with a facility rating as part of the credit approval process.

(c) A Reporting Bank shall ensure that each separate legal entity to which it has a credit exposure is assigned a separate borrower grade. The Reporting Bank shall have clear and appropriate policies regarding the assignment of ratings to separate legal entities in a connected group, including –

(i) the circumstances under which the Reporting Bank may or may not assign the same rating to separate legal entities within a connected group; and

352 *[This footnote has been intentionally left blank.]*
353 *[This footnote has been intentionally left blank.]*

(ii) the definition of a connected group of legal entities for purposes of rating assignment.

(d) A Reporting Bank shall ensure that the policies regarding the assignment of ratings include a process for the identification of specific wrong-way risk for each legal entity to which the bank is exposed.

## 4.2 Coverage for Retail Exposures

(a) A Reporting Bank shall ensure that every new and existing exposure categorised under the IRBA Retail asset class is assigned to a pool consisting of exposures with similar default and loss characteristics as part, or immediately upon completion, of the credit approval process.

## 4.3 Integrity of Rating Process: Standards Applicable to Wholesale Exposures

(a) A Reporting Bank shall ensure that the rating assignments and periodic rating reviews are approved by an independent person or unit. Such rating approvals and reviews should be independently checked by internal audit or an equally independent function at least annually.

(b) For purposes of 4.3 (a) above, an independent person or unit is one that does not directly stand to benefit from the extension of credit.

(c) A Reporting Bank shall have in place rigorous internal policies for assessing the creditworthiness of every borrower and eligible protection provider, and the riskiness of each facility. The credit policies and underwriting procedures of the Reporting Bank shall foster and reinforce the consistency and independence of the rating process. Operational processes shall be documented in the policies and procedures of the Reporting Bank.

(d) A Reporting Bank shall ensure that every borrower, eligible protection provider and facility has its ratings refreshed at least on an annual basis.

(e) A Reporting Bank shall define clearly in its policies and procedures the required review frequency for each type of borrower, eligible protection provider and facility. The policies and procedures should clearly articulate the types of borrowers, eligible protection providers and facilities that require more frequent reviews than on an annual basis. In particular, the Reporting Bank shall subject higher risk borrowers and problem exposures to more frequent reviews.

(f) A Reporting Bank shall initiate a rating review in a timely fashion if relevant and material information on any borrower, eligible protection provider or facility emerges.

[354] *[This footnote has been intentionally left blank.]*

### 4.4 Integrity of Process for Assigning Retail Exposures to Pools

(a) A Reporting Bank shall assign a retail exposure to a pool of exposures based on available information on that exposure at the time of assignment.

(b) A Reporting Bank shall review the loss characteristics and delinquency status of each risk pool at least on an annual basis. In order to ensure that retail exposures continue to be assigned to homogenous pools and generate consistent and predictive estimates of IRBA parameters, a Reporting Bank shall review the status of individual borrowers within each pool and continually monitor the risk characteristics of exposures of every pool and migrate exposures from one pool to another, based on updated information on risk drivers gathered by the Reporting Bank as part of its monitoring process.

(c) For purposes of paragraph 4.4 (a) and (b) above, a Reporting Bank shall –

  (i) in the process of segmenting exposures, use risk drivers that best reflect the risk of an exposure and are consistent with risk measures used for credit risk management; and

  (ii) ensure that risk driver information[355] is sufficiently accurate and timely to track changes in underlying credit quality and to migrate exposures between risk pools. It is expected that the Reporting Bank should –

    (A) clearly articulate its operational processes for monitoring and updating of information on risk drivers and for migrating exposures between risk pools; and

    (B) clearly articulate the risk drivers to be updated, as well as the frequency of such updates, for each product type or asset sub-class.

(d) To ensure that the segmentation system continues to maintain meaningful differentiation of risk, a Reporting Bank should –

  (i) institute clear policies to define the criteria for reviewing and modifying its process of segmenting exposures;

  (ii) review its criteria and process of segmenting exposures at least on an annual basis;

  (iii) document changes, as well as justifications for the changes, to its criteria and process for segmenting exposures to ensure consistency in the Reporting Bank's criteria and process over time and obtain historically comparable measurements of estimates of IRBA parameters; and

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[355] The Authority recognises that the benefit of more frequent information updates needs to be balanced against the incremental costs of such updates. However, updating of relevant information cannot be sacrificed if more frequent updates of risk drivers enable a Reporting Bank to derive more predictive estimates of IRBA parameters, especially if the potential impact on the calculation of minimum capital adequacy requirements arising from low frequency of information updates is large.

(iv) assess its approach to updating information on risk drivers and migrating exposures as part of the validation of the segmentation process.

### 4.5 Overrides for all Exposure Types

(a) For rating assignments based exclusively or partly on expert judgement, a Reporting Bank shall clearly articulate in its credit policies whether it allows for the outputs of the rating process to be overridden. Its credit policies shall at least articulate –

(i) the circumstances under which such overrides may be used and the implications such overrides would have on the mapping process of the Reporting Bank should the Reporting Bank use any of the technique under paragraph 5.4(e)(iii) to derive estimates of PD;

(ii) the extent of overrides allowed;

(iii) the persons which are responsible for approving these overrides and the documentation that is required for supporting the overrides;

(iv) the process for identifying overrides and separately tracking their performance[356]; and

(v) the procedures to ensure that the credit approver(s) of the Reporting Bank is informed of any overrides made and the reasons for the overrides, at the point of credit approval and periodic rating reviews.

(b) For rating assignments where statistical models play a role (or in combination with expert judgement), a Reporting Bank shall, in addition to meeting the standards in paragraphs 4.5(a)(i) to (v) above, also have a process to monitor instances where certain variables used in the statistical models were excluded or altered.

### 4.6 Maintenance of Key Borrower and Facility Characteristics for Wholesale Exposures[357]

(a) A Reporting Bank shall collect and retain reliable information on key borrower and facility characteristics at the individual exposure level. A Reporting Bank shall also collect and retain data on aspects of their internal ratings as required under Part XI of this Notice. A Reporting Bank shall have an effective process to obtain and update relevant and material information on –

(i) the financial condition of all borrowers and all eligible protection providers; and

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356 This should include, but is not limited to, validation of the performance of both the overridden ratings and the ratings after overrides.

357 A Reporting Bank may be required to submit the key borrower and facility characteristics, rating histories and estimates of IRBA parameters to the Authority.

358 *[This footnote has been intentionally left blank.]*

(ii) facility characteristics (such as the condition of collateral secured against a facility) that affect LGD and EAD estimates.

(b) A Reporting Bank shall ensure that key borrower and facility characteristics collected and retained for the purposes of paragraph 4.6 (a) include those that support assignment of borrower and facility grades or could significantly affect underwriting decisions. Examples of key borrower and facility characteristics that should be retained include –

(i) credit scores from statistical rating models;

(ii) qualitative factors that affect rating assignment.

(iii) type of collateral secured against an exposure;

(iv) facility amount;

(v) key financial ratios; and

(vi) ongoing characteristics that could significantly affect account management decisions, for example, refreshed credit scores, payment history, prepayment, and past instances of default.

(c) For purposes of paragraph 4.6 (b) above, data collected should be sufficiently detailed and retained for an adequate period of time to allow reallocation of borrowers and facilities to grades, including refinements of rating systems to achieve finer segregations of borrowers and facilities.

**4.7 Maintenance of Key Borrower and Facility Characteristics for Retail Exposures**

(a) A Reporting Bank shall collect and maintain information on key borrower and facility characteristics at the individual exposure level.

(b) A Reporting Bank shall ensure that key borrower and facility characteristics collected and maintained pursuant to paragraph 4.7(a) above include all risk drivers that are used, either directly or through the use of a statistical model, to support the segmentation process of a Reporting Bank.

**4.8 Maintenance of Rating Histories and Estimates of IRBA Parameters for Wholesale Exposures**

(a) A Reporting Bank shall maintain borrower and facility rating histories on every borrower and eligible protection provider, including –

[359] *[This footnote has been intentionally left blank.]*

(i) the ratings that have been assigned since the borrower or eligible protection provider was first assigned to an internal grade (history of rating migrations), and person or model responsible;

(ii) the dates that such ratings were assigned;

(iii) the methodology used to assign the ratings, including information on whether a statistical model has played a role in the rating assignment;

(iv) key characteristics used to assign the ratings; and

(v) in the case where an expert judgement rating system was used or when an override was approved, the persons responsible for applying the judgement or approving the override.

(b) A Reporting Bank shall maintain information on the borrowers and facilities that have defaulted, such as the timing and circumstances of default.

(c) A Reporting Bank shall maintain PD estimates and realised default rates associated with each rating grade and ratings migration in order to track the predictive power of the borrower rating system.

(d) A Reporting Bank adopting A-IRBA shall maintain –

(i) a complete history of LGD and EAD estimates associated with each facility), and person or model responsible;

(ii) key data used to derive the LGD and EAD estimates;

(iii) the methodologies used to derive the LGD and EAD estimates;

(iv) in the case where expert judgement was applied or when an override was approved in estimates of IRBA parameters, the person responsible for applying the judgement or approving the override;

(v) the components of economic losses for each defaulted exposure, such as –

(A) the amounts recovered;

(B) the source of recovery, for example, collateral, liquidation proceeds or enforcement of guarantees;

(C) the time period required for recovery;

(D) the opportunity costs; and

(E) the administrative costs associated with recovery; and

(vi) the LGD and EAD estimates, and the realised LGD and EAD, associated with each defaulted exposure.

(e) A Reporting Bank adopting A-IRBA and that reflects the credit risk mitigating effects of credit protection by adjusting LGD pursuant to Division 4 of Part VII shall maintain data on the LGD of the facility before and after evaluation of the effects of the credit protection.

(f) A Reporting Bank adopting F-IRBA or the supervisory slotting criteria for the SL and HVCRE asset sub-classes shall retain data on loss and recovery experience for the exposures.

### 4.9 Maintenance of Rating Histories and Estimates of IRBA Parameters for Retail Exposures

(a) A Reporting Bank shall maintain –

  (i) information on risk drivers;

  (ii) the methodology and data (including data on borrower and transaction risk characteristics used either directly or through use of a model, and data on delinquency) used in the process of allocating exposures to pools; and

  (iii) a complete history of the PD, LGD and EAD estimates associated with each pool of exposures.

(b) For every defaulted exposure, a Reporting Bank shall maintain –

  (i) the history of assignments of that exposure to pools over the one-year period prior to the point of default;

  (ii) the PD, LGD and EAD estimates for the pools to which the exposure was assigned over the one-year period prior to the point of default; and

  (iii) the realised LGD and EAD for that exposure.

## Section 5: Deriving Estimates of IRBA Parameters ("Parameterisation Process")

### 5.1 Definitions of IRBA Parameters

(a) A Reporting Bank adopting IRBA shall adopt the definitions of default, PD, LGD and EAD in Annexes 7X and 7Y of Part VII.

(b) A Reporting Bank which fails to adopt the definitions of LGD or EAD specified in Annex 7Y of Part VII, fails to meet the requirements specified in Annex 7AA of Part VII, or paragraphs 5.6 to 5.7 below, for wholesale exposures shall use the supervisory estimates of these parameters in accordance with Divisions 2 and 4 of Part VII.

### 5.2 Reference Data Used in Parameterisation Process

(a) Whether a Reporting Bank uses internal data or data from external sources (including pooled data) for the parameterisation process, it shall ensure that the historical default and loss experiences embodied in the reference data set is of sufficient breadth, i.e. the reference data set shall include relevant default and loss experiences derived from periods of economic downturns. The Reporting Bank shall demonstrate that its internal estimates of PD, LGD and EAD are representative of long run experience.

(b) For purposes of meeting paragraph 5.2(a), the reference data set should cover at least one complete economic cycle with a reasonable mix of high-default and low-default years. A Reporting Bank shall not omit data from any periods with relatively higher rates of default and loss rates from the reference data set. A Reporting Bank which does not utilise a reference data set that covers a complete economic cycle shall apply a greater degree of conservatism in its parameterisation process. In this respect, the Reporting Bank shall also take into consideration the need for an additional degree of conservatism in view of the standards on deriving estimates of PD, LGD and EAD in paragraphs 5.3 to 5.7.

<u>Data Representativeness and Relevance</u>

(c) A Reporting Bank shall ensure the ongoing applicability of the statistical inferences which are grounded on the reference data set. To this end, a Reporting Bank shall continually ensure the representativeness of the reference data set by ensuring broad comparability between –

(i) the population of exposures represented in the reference data set with the Reporting Bank's current credit exposures;

(ii) the definitions of default and IRBA parameters in use when the reference data set was generated with the definitions of the Reporting Bank;

(iii) lending standards in use when the reference data set was generated with the Reporting Bank's lending standards; and

(iv) other applicable characteristics that could affect estimates of IRBA parameters when the reference data set was generated with the characteristics that are in occurrence. The Reporting Bank shall demonstrate that economic or market conditions that underlie the reference data set are relevant to current and foreseeable economic or market conditions.

(d) Where the reference data set includes external data (including legacy data from different institutions after a business combination), the Reporting Bank shall exercise greater care in ensuring the representativeness of the reference data set. In particular, the Reporting Bank shall demonstrate that –

(i) the external data is representative of the portfolio for which the external data is used;

(ii) it has sufficient understanding of the data collection process;

(iii) the external data includes periods of economic downturns; and

(iv) the external data broadly adheres to the definitions of default and IRBA parameters for the portfolio.

Size of Reference Data Set

(e) A Reporting Bank shall ensure that the number of exposures and default observations, and the data period in the reference data set is sufficient to provide the Reporting Bank with confidence in the accuracy and robustness of its estimates of IRBA parameters.

**5.3 Standards on Parameterisation Process**

(a) The parameterisation process of a Reporting Bank should be oriented to the derivation of forward-looking, consistent and predictive estimates of IRBA parameters.

(b) A Reporting Bank should demonstrate an intention to characterise the future risk of losses arising from its portfolios.

(c) A Reporting Bank shall ensure that the estimates of IRBA parameters are grounded in historical and empirical evidence, and not based purely on subjective or judgemental considerations. A Reporting Bank shall promptly take into account the changes in lending practice or the process for pursuing recoveries over the observation period in its parameterisation process.

(d) A Reporting Bank shall not mechanically calculate its estimates of IRBA parameters from historical losses. The Reporting Bank should assess the relevance of the historical loss experiences for purposes of deriving estimates of IRBA parameters, and be cognisant that historical losses are the outcome of a combination of contextual circumstances which may not be repeated in the future. The Reporting Bank shall take into account the implications of technical advances deployed in banking, new data and other information, as such information becomes available.

(e) A Reporting Bank shall ensure that the parameterisation process of a Reporting Bank incorporates all relevant, material and available data, information and methods which could influence its view and outlook on credit risks.

(f) A Reporting Bank should take into account external data on defaults and losses, to the extent that they are reliable and relevant, in deriving forward-looking estimates of IRBA parameters, particularly if internal default or loss experience is limited. In such cases, a Reporting Bank shall consider judiciously the relevance of representative external data and other information sources for enhancing the breadth of experience of its reference data set.

(g) Judgemental inputs may form part of the parameterisation process of a Reporting Bank. Judgemental input includes any adjustment of the results derived from the parameterisation process or observed from the reference data set. For example, a

Reporting Bank would be considered to have used judgemental inputs if it has "smoothed" its observed PDs, by judgementally raising the PD of a rating grade to ensure that there is a monotonic relationship between rating grades and PDs.

(h) A Reporting Bank shall not use judgmental input to reduce its estimates of IRBA parameters, unless the judgemental input has been subjected to a high degree of scrutiny within the Reporting Bank. The Reporting Bank should conduct ex-post evaluations of the contribution of such judgemental input to the derivation of consistent and predictive estimates of IRBA parameters. The causes of persistent failures of judgemental input should be investigated to improve the consistency and predictiveness of estimates of IRBA parameters.

(i) A Reporting Bank shall review its estimates of IRBA parameters when new information that may affect the IRBA parameters comes to light but in any case at least annually. Particular attention should be given to new business lines or portfolios in which the mix of borrowers is believed to have changed substantially. Upon completion of the review of the estimates of IRBA parameters, a Reporting Bank should document –

    (i) the data, information and considerations which were taken into account in deriving the PD, LGD and EAD estimates. If a Reporting Bank has used multiple parameterisation processes to derive estimates of IRBA parameters for any borrower or facility (or pool of exposures), it should document the data, information and considerations which were taken into account in deriving each set of estimates;

    (ii) its justification for its estimates of PD, LGD and EAD used for calculating minimum capital requirements under IRBA; and

    (iii) a description of the statistical precision of the PD, LGD and EAD estimates used for calculating minimum capital requirements under IRBA. This standard could be fulfilled by a description of the potential errors associated with the estimates of IRBA parameters by the unit responsible for deriving the estimates.

(j) A Reporting Bank should, at a regular interval, examine the justifications of its estimates of IRBA parameters, particularly the "judgemental input" used, with the view to improving its parameterisation processes.

(k) A Reporting Bank shall add to its estimates of IRBA parameters a margin of conservatism that is related to the likely range of errors. This is to account for potential uncertainties and weaknesses in the parameterisation process, as such potential uncertainties and weaknesses could lead to unpredictable errors in its estimates of IRBA parameters. A Reporting Bank shall apply a greater margin of conservatism if the data, information and methods used in the parameterisation process do not fully take into account all relevant considerations and may potentially result in a larger range of unpredictable errors.

(l) A Reporting Bank shall continually review its parameterisation process to incorporate new data, analytical techniques, and evolving industry practice.

(m) A Reporting Bank shall ensure that the estimation technique used by it to derive estimates of IRBA parameters for any borrower and facility (or pool of exposures) performs well in out-of-sample tests.

### 5.4 Standards on Estimation of PD for Wholesale Exposures

(a) A Reporting Bank shall estimate a PD[360] for each internal borrower grade for each rating system used for wholesale exposures.

(b) A Reporting Bank shall ensure that the PD estimate for any borrower grade reflects the expectation of the Reporting Bank of the "long-run average" of one-year default rates for borrowers categorised in that grade. The "long-run average" should reflect the expected average default experience for that grade (combining a mix of high default and low default years that are expected to occur over a full economic cycle).

(c) For purposes of meeting paragraph 5.4 (b), a Reporting Bank which has not fully incorporated an assessment of the vulnerability of the borrower to adverse economic conditions or unexpected events in its rating assignments should incorporate such an assessment in its process of deriving PD estimates.

(d) A Reporting Bank shall not estimate its long-run average PD purely by a mechanical calculation of its historical default rates without supporting analysis, even if the Reporting Bank has representative and consistent historical default experience covering one or more economic cycles. A Reporting Bank shall recognise the importance of judgemental considerations in combining results of techniques and in making adjustments for limitations of techniques and information.

(e) A Reporting Bank shall use information and techniques that allow it to most appropriately take account of the long-run experience of the Reporting Bank to derive a long-run average estimate of PD for each rating grade. By way of example, the following are four specific techniques that a Reporting Bank may use and some of the attendant issues arising from their use:

  (i) A Reporting Bank uses data based on internal default experiences for deriving PD estimates. When using this technique, the Reporting Bank shall demonstrate that the PD estimates have taken into account underwriting standards and potential differences due to changes in the definition of default, calculation of PD, underwriting standards, rating systems, and the profile of the population of exposures of the Reporting Bank over time. Where only limited internal default data are available, or if changes have rendered historical internal default rates less representative, a Reporting Bank shall add a greater margin of conservatism in its estimate of PD.

  (ii) A Reporting Bank uses data based on internal default experiences and data pooled across banking institutions for deriving PD estimates. When using this technique, the Reporting Bank shall demonstrate to the satisfaction of

[360] A Reporting Bank is not required to produce its own estimates of PD for certain equity exposures and certain exposures that fall within the SL asset sub-class and the HVCRE asset sub-class.

the Authority that the internal rating systems and criteria of other banking institutions contributing to the pool are comparable with that of the Reporting Bank. The Reporting Bank shall, in addition to observing paragraph 5.4(e)(i) above, properly account for differences in definition of default, calculation of PD, underwriting standards, rating systems, and the profile of the population of exposures across the institutions contributing to the data pool. Where differences across institutions contributing to the data pool are significant, a Reporting Bank shall add a greater margin of conservatism in its estimate of PD.

(iii) A Reporting Bank associates or maps its internal grades to the rating scale used by an external credit assessment institution or similar institution and then attributes the default rates observed for the external credit assessment institution's grades to the grades of the Reporting Bank. A Reporting Bank shall ensure that, where such a technique is used, the mappings of the Reporting Bank are based on a comparison of internal rating criteria with the criteria used by the external credit assessment institution and on a comparison of the internal and external ratings of any common borrowers. The external credit assessment institution's criteria shall be oriented to the risk of the borrower and not reflect transaction characteristics. The Reporting Bank shall properly account for differences in definition of default, calculation of PD, underwriting standards (where applicable), rating systems, and the profile of the population of exposures between itself and the external credit assessment institution to prevent biases or inconsistencies in the mapping process and underlying data. The Reporting Bank shall document the basis for the mapping.

(iv) A Reporting Bank uses a simple average of default-probability estimates for individual borrowers in a given grade where such estimates are drawn from statistical default prediction models. When using this technique, the Reporting Bank shall meet the standards specified in paragraph 3.10, and ensure that the definitions and exposures used to construct such models are representative of the credit exposures of a Reporting Bank and that the data covers at least one economic cycle.

(f) For the purposes of meeting the standard in paragraph 5.4(e) above, a Reporting Bank may have a primary technique and may use other techniques as a point of comparison and potential adjustment.

(g) A Reporting Bank should consider alternative techniques for deriving a PD estimate for portfolios where there are insignificant incidences of past representative defaults to make meaningful statistical inferences. For example, a Reporting Bank may use one or more of the following:

(i) use pooled data, external data or market measures of risk to complement internal loss data;

(ii) combine internal portfolio segments with similar characteristics, subject to the fulfillment of other standards in this Annex;

(iii) combine different rating categories and analyse PDs for the combined category. For example, a Reporting Bank using a rating system that maps

to the rating categories of an external credit assessment institution might find it useful to combine AAA, AA and A-rated credits;

(iv) use the upper bound of the PD estimate as an input to the formula for risk-weighted assets for those portfolios where the PD estimate itself is deemed to be too unreliable to warrant direct inclusion in capital adequacy calculations; and

(v) derive PD estimates from data with a horizon that is different from one year. Where defaults are spread out over several years, a Reporting Bank may calculate a multi-year cumulative PD and then annualise the resulting figure.[361] Where intra-year rating migrations contain additional information, these migrations could be analysed as separate rating movements in order to infer PDs, which may be especially useful for the higher-quality rating grades.

### 5.5 Standards on Estimation of PD for Retail Exposures

(a) A Reporting Bank shall estimate a PD for each pool of retail exposures.[362]

(b) A Reporting Bank shall rely on internal default data as the primary source of information for estimating PD given that the Reporting Bank is unlikely to find representative external default data for all of its pools of exposures.[363] A Reporting Bank need not give equal importance to historical data if it can demonstrate that more relevant estimates of IRBA parameters can be derived from recent data.

(c) Notwithstanding paragraph 5.5(b) above, a Reporting Bank may use external data or statistical models provided –

(i) it does not omit any available and relevant internal data source selectively;

(ii) it has verified that there is a strong link between its process of assigning exposures to a pool and the process used by the external data source; and

(iii) it has verified that the exposures composing the external data are representative of the internal risk profile of its exposures.

(d) A Reporting Bank should have an ongoing process to anticipate the implications of seasoning effects for long-term retail exposures which could peak several years after origination of such exposures, particularly if the Reporting Bank is experiencing rapid exposure growth. A Reporting Bank should take steps to ensure that its estimation techniques are accurate, and that its current capital level and earnings and funding prospects are adequate to cover its future capital needs. A Reporting Bank should adjust PD estimates upward for anticipated seasoning effects in a consistent manner over time, given that PD estimates for retail exposures may not be fully reflective of possible changes to the risk profile of long-

361 This cumulative PD should be calculated by taking into account rating migrations over the horizon.

362 A Reporting Bank should not derive PD and LGD estimates for any retail pool based on an estimate of the expected long-run loss rate for that retail pool.

363 This standard applies equally to the estimation of LGD and EAD for retail exposures by a Reporting Bank.

term retail exposures over the horizon to which the exposures remain with the Reporting Bank.

### 5.6 Standards on Estimation of LGD

(a) A Reporting Bank adopting the IRBA for the retail asset sub-class or the A-IRBA shall estimate an LGD for each facility or retail pool that aims to reflect economic downturn conditions. Appropriate downturn conditions for any IRBA asset sub-class are those in which the relevant drivers of default rates are consistent with conditions where credit losses for that IRBA asset sub-class are expected to be substantially higher than average. At a minimum, separate downturn conditions should be identified for each IRBA asset sub-class. The following examples are considered by the Authority as acceptable methods of identifying appropriate economic downturn conditions:

   (i) periods of negative GDP growth and high unemployment rates (for a well-diversified wholesale portfolio);

   (ii) periods in which observed historical default rates have been high for a portfolio of exposures that is representative of the Reporting Bank's current portfolio; and

   (iii) periods where common risk drivers (e.g. collateral values) that influence default and recovery rates are expected to be distressed.

   In addition, a Reporting Bank shall take into account the potential for the LGD estimate of a facility to be higher than the long-run default-weighted average loss rate given default, during a period when credit losses are substantially higher than average.[363A]

(b) The Reporting Bank should have a rigorous and well documented process for assessing the effects, if any, of economic downturn conditions on recovery rates and for producing LGD estimates consistent with downturn conditions.

(c) A Reporting Bank should identify downturn conditions at a granular level. Where recovery rates of exposures are sensitive to local economic conditions, a Reporting Bank should identify separate downturn conditions for each jurisdiction at the IRBA asset sub-class level.[364] Where recovery rates of exposures are not sensitive to local economic conditions (e.g. exposures to internationally diversified borrowers), a Reporting Bank may identify downturn conditions appropriate to the exposures, which may span national boundaries.

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[363A] For certain facilities, the cyclical variability in loss severities may be important and will need to be incorporated by a Reporting Bank in the LGD estimates. For this purpose, a Reporting Bank may use averages of loss severities observed during periods of high credit losses or forecasts based on appropriately conservative assumptions, or other similar methods. Appropriate estimates of LGD during periods of high credit losses may be formed using either internal or external data.

[364] In those cases where a Reporting Bank can demonstrate that exposures in the same asset sub-class in different jurisdictions exhibit strong co-movement in recovery rates, the Reporting Bank can group those jurisdictions together for the purpose of defining downturn conditions.

(d) The Reporting Bank should identify adverse dependencies between default and recovery rates. For example, the Reporting Bank may use some or all of the following techniques:

(i) a comparison of average recovery rates with recovery rates observed during appropriate downturn periods;

(ii) a statistical analysis of the relationship between observed default and recovery rates over a complete economic cycle;

(iii) for secured exposures where default is shown to be highly (negatively) correlated with collateral values, the Reporting Bank may compare –

(A) the recovery rate forecasts derived from robust statistical models that use "typical" assumptions about collateral value changes with those under conditions identified according to paragraph 5.6(a); or

(B) observed recovery rates for defaulted exposures given typical collateral values with those under conditions identified according to paragraph 5.6(a) where collateral values are depressed; and

(iv) an identification of the underlying factors (risk drivers) that determine recovery rates and analysis of the relationship between those factors and default rates, combined with an assessment of the net impact of those factors on recovery rates under downturn conditions.

(e) A Reporting Bank should incorporate adverse dependencies, if any, between default and recovery rates so as to produce LGD estimates for its exposures which are consistent with identified downturn conditions.

(f) For those exposures for which adverse dependencies between default and recovery rates have been identified through analysis consistent with paragraph 5.6(d), a Reporting Bank may derive LGD estimates by –

(i) basing them on averages of observed loss rates during downturn periods identified according to paragraph 5.6(a); or

(ii) deriving them from forecasts based on stressing appropriate risk drivers in a manner consistent with downturn conditions identified according to paragraph 5.6(a).

(g) If there are no material adverse dependencies between default and recovery rates, a Reporting Bank may derive its LGD estimates by –

(i) basing them on long-run default-weighted averages of observed loss rates; or

(ii) deriving them from forecasts that do not involve stressing appropriate risk drivers.

(h) A Reporting Bank shall establish internal policies on the determinants of high dependency between the risk of the borrower and the collateral or collateral

provider, such as the existence of a legal connection or economic considerations. These policies shall also determine the actions to take when there is a significant dependency, with respect to terms of business, exposure and limit measurement, capital requirements and other forms of risk mitigation (e.g. through the use of guarantees or credit derivatives). In such cases, the dependence shall be addressed in a conservative manner. A Reporting Bank shall consider any currency mismatch between the underlying obligation and the collateral and ensure that they are treated conservatively in the Reporting Bank's assessment and process of deriving LGD estimates.

(i) A Reporting Bank shall derive LGD estimates on the basis of historical recovery rates and not solely based on the collateral's estimated market value in order to account for the potential inability of the Reporting Bank to gain control of collateral and liquidate it expeditiously. If internal historical recovery rates are insufficient for a Reporting Bank to make meaningful statistical inferences, the Reporting Bank may consider whether external data would be appropriate. To the extent that LGD estimates take into account the existence of collateral, a Reporting Bank shall establish internal requirements for collateral management, operational procedures, legal certainty and risk management processes that are at least consistent with the requirements set out in Annex 7F of Part VII.

(j) A Reporting Bank should not adjust its LGD estimates to take into account its own workout and collection expertise unless it has sufficient internal empirical evidence of the impact of its expertise on recovery rates, and a Reporting Bank shall ensure that such an adjustment to its LGD estimates is made in consultation with the Authority.

(k) The estimate of the LGD associated with any facility grade or retail pool of a Reporting Bank shall not be less than the long-run default weighted average loss rate given default calculated based on the average economic loss of all observed defaults within the data source for that type of facility or retail pool.

(l) The LGD assigned by a Reporting Bank to a defaulted exposure should reflect the possibility of recognising additional, unexpected losses during the recovery period as realised losses can at times systematically exceed expected levels. A Reporting Bank shall construct its best estimates of the expected loss for each defaulted exposure based on current economic circumstances and facility status. The amount, if any, by which the LGD on a defaulted exposure is greater than the best estimate of expected loss on that exposure represents the capital requirement for that exposure as set out in paragraph 7.4.63 of Sub-division 11 of Division 4 of this Part. If the sum of specific allowances and partial charge-offs on a defaulted exposure is greater than the best estimate of expected loss on that exposure, the Reporting Bank has to provide to the Authority the justification for such difference.

[MAS Notice 637 (Amendment No. 3) 2017]

[365] *[This footnote has been intentionally left blank.]*

## 5.7 Standards on Estimation of EAD

(a) A Reporting Bank adopting the IRBA for the retail asset class or the A-IRBA shall estimate EAD at no less than the current drawn amount and have procedures in place for the estimation of EAD for off-balance sheet items (excluding derivatives). The Reporting Bank shall ensure that such procedures specify the estimates of EAD to be used for each facility type.

(b) A Reporting Bank shall ensure that the estimates of EAD of a Reporting Bank reflect the possibility of additional drawings by the borrower up to and after the time a default event is triggered. Where estimates of EAD differ by facility type, a Reporting Bank shall ensure that the delineation of these facilities is clear and unambiguous. For exposures in the IRBA retail asset class with uncertain future drawdown such as credit cards, a Reporting Bank shall take into account its history and expectation of additional drawings prior to default in its overall calibration of loss estimates.

(c) A Reporting Bank adopting the IRBA for the retail asset class or the A-IRBA shall estimate an EAD for each facility or pool of exposures. The EAD estimate for each facility or pool of exposures shall be an estimate of the long-run default-weighted average EAD (and not a time-weighted average) for similar facilities or pool of exposures over a sufficiently long period of time (including periods of stress), but with a margin of conservatism appropriate to the likely range of errors in the estimate. If a positive correlation can reasonably be expected between the default frequency and the magnitude of EAD, the EAD estimate shall incorporate a larger margin of conservatism.

(d) For purposes of meeting the standards in paragraph 5.7(c) above, a Reporting Bank shall use EAD estimates that are appropriate for an economic downturn for exposures for which EAD estimates are volatile over the economic cycle, if EAD estimates appropriate in an economic downturn are more conservative than the long-run average EAD estimates. By way of example, this may be achieved by –

   (i) considering the cyclical nature, if any, of the drivers of EAD models for a Reporting Bank which is using such models to estimate EAD;

   (ii) examining the impact of previous recession(s) on EAD estimates based on historical internal data;

   (iii) applying conservatism in EAD estimates if historical internal data does not cover recessionary period(s); or

   (iv) making conservative use of external data if historical internal data is insufficient.

(e) A Reporting Bank shall ensure that the process for deriving EAD estimates –

   (i) is plausible and intuitive;

   (ii) takes into account the effects of material drivers of EAD;

   (iii) takes into account all relevant and material information; and

(iv) is supported by credible internal analysis by the Reporting Bank.

(f) A Reporting Bank shall be able to provide a breakdown of its EAD experience by the factors which the internal analysis in paragraph 5.7(e) has uncovered as drivers of EAD.

(g) A Reporting Bank shall review its estimates of EAD for each facility type or pool of exposures when material new information comes to light and at least on an annual basis.

(h) For purposes of meeting the standard in paragraph 5.7(e)(ii), a Reporting Bank shall consider its specific policies and strategies adopted in respect of account monitoring and payment processing. The Reporting Bank shall also consider its ability and willingness to prevent further drawings in circumstances short of payment default, such as covenant violations or other technical default events.

(i) A Reporting Bank shall –

(i) have adequate systems and procedures in place to monitor facility amounts, current outstanding balances against committed lines and changes in outstanding balances per borrower and per grade; and

(ii) be able to monitor outstanding balances on a daily basis.

## 5.8 Standards on Reporting Banks Adopting IRBA for the Retail Asset Class or A-IRBA for Assessing Effect of Credit Protection

Eligible Protection Providers

(a) There are no restrictions on the types of eligible protection providers for purposes of recognising the effect of credit protection for a Reporting Bank adopting the IRBA for the retail asset class or the A-IRBA, subject to the following if the credit protection is through a guarantee:

(i) the guarantee is in writing;

(ii) the guarantee is non-cancellable on the part of the guarantor;

(iii) the guarantee will be in force until the obligation is satisfied in full (to the extent of the amount and tenor of the guarantee); and

(iv) the guarantee is legally enforceable against the guarantor in a jurisdiction where the guarantor has assets to attach and enforce a judgement.

(b) A Reporting Bank shall have clearly specified criteria for the types of protection providers it will recognise for regulatory capital purposes.

Recognition of Guarantees through an Adjustment to Borrower or Facility Grade

(c) A Reporting Bank using its own estimates of LGD may reflect the risk-mitigating effect of guarantees through an adjustment to PD or LGD estimates. For retail exposures, where guarantees exist, either in support of an individual exposure or a pool of exposures, a Reporting Bank may reflect the risk-reducing effect either through its estimates of PD or LGD, provided this is done consistently both across types of guarantees and over time.

(d) A Reporting Bank shall assign a borrower rating to both the borrower and all recognised guarantors at the outset and on an ongoing basis, and abide by all standards for assigning borrower ratings set out in this Annex, including the standards on the regular monitoring of the financial condition of the guarantor as well as its ability and willingness to honour its obligations. A Reporting Bank shall retain all relevant information on the borrower absent of the guarantee and the guarantor. In the case of retail guarantees, these requirements also apply to the assignment of an exposure to a pool, and the estimation of PD.

(e) A Reporting Bank shall not derive an adjusted PD or LGD estimate for a guaranteed exposure such that the adjusted risk weight would be lower than that of a comparable, direct exposure to the guarantor. The Reporting Bank shall not consider possible favourable effects of imperfect expected correlation between default events for the borrower and guarantor for purposes of calculating regulatory capital requirements in the rating criteria and rating processes. As such, a Reporting Bank shall ensure that the adjusted risk weight does not reflect the risk mitigation of "double default".

(f) A Reporting Bank shall have clearly specified internal criteria for adjusting borrower grades or LGD estimates (or in the case of retail and eligible purchased receivables, the process of assigning exposures to pools) to reflect the impact of guarantees for regulatory capital purposes. Such criteria shall be as detailed as the criteria for assigning borrower or facility ratings and be consistent with the standards in Section 4 above.

(g) The internal criteria at paragraph 5.8(f) shall be plausible and intuitive, and shall address the guarantor's ability and willingness to perform under the guarantee. The criteria shall also address the likely timing of any payments and the degree to which the guarantor's ability to perform under the guarantee is correlated with the borrower's ability to repay. The Reporting Bank's criteria shall also consider the extent to which residual risk to the borrower remains, for example, a currency mismatch between the guarantee and the underlying exposure.

(h) In adjusting borrower grades or LGD estimates (or in the case of exposures under the IRBA retail asset class, the process of assigning exposures to pools), a Reporting Bank shall take all relevant available information into account.

Recognition of Single-Name Credit Derivatives through an Adjustment to Borrower or Facility Grade

(i) A Reporting Bank using its own estimates of LGD may reflect the risk-mitigating effect of single-name credit derivatives through an adjustment to PD or LGD estimates, subject to the following:

(i) the standards for recognition under paragraphs 5.8(c) to (h) are met;

(ii) a Reporting Bank shall ensure that the internal criteria used for assigning adjusted borrower grades or deriving LGD estimates for exposures hedged with credit derivatives –

(A) requires that the asset on which the protection is based (the reference asset) is not different from the underlying asset, unless the requirements outlined in the Division 4 of Part VII are complied with; and

(B) addresses the payout structure of the credit derivative and conservatively assesses the impact this has on the level and timing of recoveries. The Reporting Bank's internal criteria shall also consider the extent to which other forms of residual risk remain for an exposure hedged with a single-name credit derivative.

**5.9 Standards on Reporting Banks Adopting F-IRBA for the IRBA Wholesale Asset Class for Assessing Effect of Credit Protection**

(a) For the purposes of recognising the effect of credit protection for a Reporting Bank adopting the F-IRBA for the wholesale asset class shall comply with the requirements in paragraph 5.8 of this Annex, with the following exceptions:

(i) a Reporting Bank shall calculate the credit risk-weighted exposure amount in accordance with paragraph 7.4.52 under Sub-division 10 of Division 4 of this Part; and

(ii) a Reporting Bank shall limit the range of eligible credit protection providers and eligible credit protections in accordance with Annex 7F of this Part.

**Section 6: Stress Tests**

**6.1 General Stress Tests**

(a) A Reporting Bank adopting the IRBA shall have in place sound and comprehensive stress testing processes for use in the assessment of its capital adequacy. Stress testing shall involve identifying possible events or future changes in economic conditions that could have unfavourable effects on the Reporting Bank's credit exposures and assessment of the Reporting Bank's ability to withstand such changes. Examples of scenarios that could be used are –

(i) economic or industry downturns;

(ii) market-risk events; and

(iii) liquidity conditions.

The 1998 Asian crisis and 2001 slowdown in the U.S. economy, in particular the electronics sector, are examples of historical events that may be used in developing stress scenarios.

(b) A Reporting Bank recognising the effects of CRM of eligible credit protection for its IRBA exposures under the double default framework shall include as part of its stress testing processes the impact of a deterioration in the credit quality of eligible protection providers, in particular the impact of eligible protection providers falling outside the eligibility criteria set out in Section 3 of Annex 7G of Part VII due to rating changes. A Reporting Bank should also include the impact of the default of either the obligor or the eligible protection provider but not both, and the consequent increase in risk and capital requirements at the time of the default.

### 6.2 Credit Stress Test

(a) In addition to the general stress tests described above, a Reporting Bank shall specifically conduct regular (at least semi-annually[365A], or more frequently if so directed by the Authority) credit risk stress tests to assess the effect of certain specific conditions on its IRBA minimum capital requirements. Notwithstanding the foregoing, the Authority may, from time to time, direct a Reporting Bank to conduct additional credit risk stress tests as the Authority considers necessary. The stress tests to be employed would be chosen by the Reporting Bank, subject to review by the Authority.[366] The stress tests to be conducted shall be meaningful and reasonably conservative. The stress tests should be consistent with the historical economic downturns experienced in Singapore and in regions or countries in which the Reporting Bank has material exposures.

(b) A Reporting Bank may develop different approaches to undertaking stress tests depending on its circumstances. A Reporting Bank should use a range of stress scenarios, which may include historical and hypothetical scenarios. The techniques, scenarios and risk factors used by a Reporting Bank in its stress tests should commensurate with the nature, size and complexity of its business.

(c) The objective of the credit stress tests is not to require a Reporting Bank to consider worst-case scenarios but a Reporting Bank should consider at least the effect of mild recession scenarios. At a minimum, the Reporting Bank should assess the impact of two consecutive quarters of zero growth on its PDs, LGDs and EADs. It is up to the Reporting Bank to determine how this mild recession scenario translates into movements in specific risk factors and how these risk factors affect its minimum regulatory capital requirement[366A]. In addition, the time horizon of the stress test should be consistent with the specifics of the scenario and should take into account the lag effect of an economic downturn on the Reporting Bank's credit

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[365A] The Reporting Bank shall perform additional stress tests where it determines that the prevailing economic circumstances are such that the results of the last semi-annual stress test have become irrelevant.

[366] The Authority may prescribe specific scenarios for stress testing, on top of the Reporting Bank's own scenarios.

[366A] Any consideration by a Reporting Bank of its international diversification should be on a conservative basis.

exposures. A Reporting Bank should also stress all material portfolios, including portfolios that contain the vast majority of its total exposures, under the IRBA.

(d) Regardless of the approach used for stress testing, the Reporting Bank shall also incorporate the following sources of information:

(i) the data of the Reporting Bank which should allow for the estimation of the ratings migration of at least some of its exposures;

(ii) the impact of smaller deteriorations in the credit environment on the Reporting Bank's ratings which may give some information on the likely effect of bigger, stress circumstances; and

(iii) the evidence of ratings migration in external ratings. This would include the Reporting Bank broadly matching its internal grades to rating categories of external credit assessment institutions.

**6.3 Oversight of Stress Tests**

(a) A Reporting Bank shall ensure that the Board and senior management approve and exercise effective oversight over its stress test process. The Reporting Bank shall ensure that the Board or senior management, or both, regularly review the techniques, assumptions, results and effectiveness of the stress tests, as well as approve material changes to the stress test techniques and assumptions.

(b) A Reporting Bank shall ensure that senior management is actively involved in the process of designing stress tests, monitoring of results and drawing up plans for remedial actions.

(c) A Reporting Bank shall ensure that senior management also establishes comprehensive and adequate written policies and procedures, to be approved by the Board, on its stress test processes. The Reporting Bank shall ensure that the documentation includes the objectives, techniques, assumptions, reporting requirements, remedial actions, responsibilities and lines of authority for the stress tests of the Reporting Bank. In addition, the Reporting Bank shall ensure that senior management regularly updates the Board on the stress test results as well as the remedial actions taken, in accordance with the stress test policy.

(d) A Reporting Bank shall ensure that senior management includes the following key elements when implementing stress testing processes:

(i) stress tests shall include both quantitative and qualitative criteria. Quantitative criteria shall identify plausible stress scenarios, preferably with different levels of severity, to which the Reporting Bank could be exposed. Qualitative criteria shall emphasise that the two major goals of stress testing are to evaluate the capacity of the capital and earnings of the Reporting Bank to absorb potentially significant losses and to identify the steps that the Reporting Bank can take to manage its risk (including hedging and asset sales) and conserve capital;

(ii) stress scenarios shall reflect specific risk characteristics of the portfolios of the Reporting Bank and take into consideration prevailing market conditions. All related risk factors shall be identified and stressed;

(iii) stress tests shall be integrated into the Reporting Bank's risk management system;

(iv) the Reporting Bank shall put in place adequate information systems to support the stress test process; and

(v) the review of the stress tests shall take into account changes in portfolio characteristics and external conditions. The validity of the underlying assumptions shall also be reviewed. Such reviews shall be done at least once a year or more frequently if the portfolio or the environment changes significantly.

**Annex 7AC**

## IRBA ROLLOUT PARAMETERS

### Section 1: IRBA Coverage

1.1 A Reporting Bank should observe the parameters set out in this Annex in its IRBA rollout.

[MAS Notice 637 (Amendment No. 2) 2018]

1.2 A Reporting Bank should adopt the IRBA across the entire banking group, except for business units, asset classes or asset sub-classes excluded under permitted exclusions in paragraphs 4.1 to 4.8 below, and exposures to CCPs for which CCP RWA is calculated in accordance with paragraph 7.1.1(d) of Sub-division 1 of Division 1 of this Part. The credit RWA for exposures to CCPs arising from any OTC derivative transaction, exchange-traded transaction or SFT shall be calculated in accordance with paragraph 7.1.1(d) of Division 1 of this Part, regardless of materiality.

[MAS Notice 637 (Amendment) 2012]

1.3 The Authority recognises that a simultaneous rollout across all material asset classes may not be practicable in all circumstances. As such, the Authority may permit phased rollouts in certain cases. Notwithstanding this, the Authority will generally not permit a Reporting Bank to adopt the IRBA unless it is able to do so meaningfully from its IRBA adoption date. In a case where a phased rollout is permitted by the Authority, the initial rollout should account for the banking group's most significant portfolios in terms of size and risk profile. At minimum, the Authority expects a Reporting Bank to transition exposures that attract at least 60% to 70% of its capital requirements for credit risk at the Group level to the IRBA from the IRBA adoption date. This percentage is to be computed based on the exposures and the approaches of the Reporting Bank that are in use as at the start of the recognised parallel run[367].

1.4 To minimise the risk of capital arbitrage, the Reporting Bank should ensure that –

(a) all corporate exposures (including exposures in the corporate small business asset sub-class and SL asset sub-class, but not necessarily exposures in the

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[367] By way of example, a Reporting Bank adopting IRBA on 1 Jan 2018 shall compute this threshold by dividing the sum of the RWA calculated in paragraph 7.1.1(b) and the SEC-IRBA RWA calculated in accordance with Sub-division 6 of this Division for exposures transitioning to the IRBA on 1 Jan 2018 by the sum of (a) the RWA calculated in paragraph 7.1.1(b) and the SEC-IRBA calculated in accordance with Sub-division 6 of this Division for exposures transitioning to the IRBA on 1 Jan 2018; (b) the RWA calculated in paragraph 7.1.1(a) for exposures that are permitted to be excluded from the IRBA; and (c) its SEC-ERBA RWA, SEC-SA RWA, and RWA from securitisation exposures to which the SEC-IRBA, SEC-ERBA, and SEC-SA cannot be applied, calculated in accordance with Sub-division 6 of this Division. Equity exposures excluded from IRBA(EQ) as set out in paragraph 4.8 of this Annex and exposures to CCPs for which CCP RWA is calculated in accordance with paragraph 7.1.1(d) of Sub-division 1 of Division 1 of this Part are to be excluded from the computation of this threshold.

[MAS Notice 637 (Amendment) 2012]
[MAS Notice 637 (Amendment No. 2) 2018]

sovereign asset sub-class and bank asset sub-class ) within a given jurisdiction transition to the IRBA simultaneously[367A];

(b) all retail exposures within a given jurisdiction transition to the IRBA simultaneously; and

(c) asset classes across jurisdictions in which the Reporting Bank operates, where arbitrage opportunities may be created by a phased IRBA rollout (e.g. large corporates), transition to the IRBA simultaneously.

1.5 During the rollout period, capital relief shall not be granted for intra-group transactions which are designed to reduce a banking group's aggregate capital charge by transferring credit risk among entities on the standardised approach, foundation and advanced IRB approaches. Such transactions include, but are not limited to, asset sales or cross guarantees.

**Section 2: IRBA Rollout Plan**

[MAS Notice 637 (Amendment No. 2) 2014]

2.1 A Reporting Bank shall, in its application to the Authority to adopt the IRBA pursuant to paragraph 7.4.1 of Part VII, submit an IRBA rollout plan, specifying to what extent and when it intends to rollout the IRBA across business units, asset classes or asset sub-classes of the banking group. A Reporting Bank which has been permitted to rollout the IRBA in a phased manner should –

(a) provide reasonable assurances to the Authority that all remaining exposures, except those that are permitted to be excluded from the IRBA, will be brought onto the IRBA steadily;

(b) complete its IRBA rollout across the entire banking group within two years of the IRBA adoption date, save in exceptional circumstances such as a significant merger or acquisition;

(c) be able to demonstrate that its IRBA rollout plan is driven by the practicality and feasibility of moving to the IRBA, and not minimisation of its capital requirements.

[MAS Notice 637 (Amendment No. 2) 2014]

**Section 3: IRBA Rollout Relative to Advanced Approaches for Other Risks**

3.1 A Reporting Bank should not apply for approval to adopt the A-IRBA unless –

(a) where market risk is significant for the banking group, it has adopted or applied for approval to adopt the IMA for market risk; and

[367A] A Reporting Bank shall adopt the IRBA for the HVCRE asset class only if it has adopted the IRBA for the IPRE lending exposures under the SL asset sub-class, where its IPRE lending exposures are material.

(b) it is able to demonstrate progress towards the eventual adoption of the AMA for operational risk.

**Section 4: Permitted Exclusions**

4.1 A Reporting Bank adopting the IRBA may, with the approval of the Authority, exclude certain exposures from the IRBA, IRBA(EQ) or SEC-IRBA as described in this Section. The Reporting Bank shall use the SA(CR), SA(EQ), SEC-ERBA or SEC-SA to calculate the credit risk-weighted exposure amounts for such exposures from its IRBA adoption date.[368] In such cases, the Authority may require the Reporting Bank to maintain additional capital under Part X.

[MAS Notice 637 (Amendment No. 2) 2017]

4.2 Unless they have been classified as an immaterial asset class, exposures in the sovereign asset sub-class and bank asset sub-class may not be excluded from the IRBA.

Exclusions for Non-equity Exposures

4.3 Beyond the end of the rollout period, a Reporting Bank may exclude from the IRBA only business units, asset classes or asset sub-classes that are immaterial in size and risk profile. These have to be specifically approved for exclusion by the Authority and approval may be revoked if the excluded portfolios become significant. For the avoidance of doubt, the assessment of materiality for the purposes of paragraphs 4.3 to 4.7 does not take into account exposures to CCPs for which CCP RWA is calculated in accordance with paragraph 7.1.1(d) of Sub-division 1 of Division 1 of this Part.

[MAS Notice 637 (Amendment) 2012]

4.4 A Reporting Bank shall show why the business unit, asset class or asset sub-class it proposes to exclude from the IRBA is considered to be immaterial both in terms of size and risk profile. As business unit boundaries are not specified in this Notice, the Reporting Bank shall also show how it defines the boundaries of a putative immaterial business unit and how it allocate exposures to that business unit on an on-going basis.

4.5 When approving exclusions, the Authority will consider not only compliance with the overall limit as specified in paragraph 4.7 below but also risk concentrations that may be present in excluded portfolios.

4.6 Where the Authority grants approval for a Reporting Bank to exclude a business unit, asset class or asset sub-class from the IRBA, the exclusion applies to the entire business unit, asset class or asset sub-class within a given jurisdiction. The Reporting Bank shall not be permitted to classify only some exposures within a business unit, asset class or asset sub-class as immaterial.

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[368] A Reporting Bank may use the SA(CR), SA(EQ), SEC-ERBA or SEC-SA to calculate the credit risk-weighted exposure amounts for long settlement transactions on a permanent basis.

[MAS Notice 637 (Amendment No. 2) 2017]

4.7 On a continuing basis, the Reporting Bank should ensure that the aggregate credit risk capital requirements of the business units, asset classes, and asset sub-classes excluded from the IRBA do not exceed 15% of the capital requirements for credit risk of the Reporting Bank at the Group level. In determining compliance with this threshold, the approaches then in use for calculating the CET1 CAR, Tier 1 CAR and Total CAR of the Reporting Bank shall be used. Equity exposures excluded from the IRBA(EQ), as set out in paragraph 4.8 below, and exposures to CCPs for which CCP RWA is calculated in accordance with paragraph 7.1.1(d) of Sub-division 1 of Division 1 of this Part, are to be excluded from both the numerator and the denominator in the computation of this threshold.

[MAS Notice 637 (Amendment) 2012]
[MAS Notice 637 (Amendment No. 2) 2014]

Exclusions for Equity Exposures

4.8 A Reporting Bank may exclude its equity exposures from the IRBA(EQ) if they are immaterial. Equity exposures shall be considered as material if their aggregate value exceeds, on average over the prior year, 10% of the Eligible Total Capital of the Reporting Bank. This materiality threshold shall be lowered to 5% of the Eligible Total Capital of the Reporting Bank if the equity portfolio consists of less than 10 individual holdings.

**Section 5: Treatment of Pre-Transition Exposures**

5.1 A Reporting Bank shall use the SA(CR), SA(EQ), SEC-ERBA or SEC-SA to calculate the credit risk-weighted exposure amounts for exposures that have yet to transition to the IRBA, IRBA(EQ) or SEC-IRBA from 1 Jan 2008.

[MAS Notice 637 (Amendment No. 2) 2017]

**Annex 7AD**

## REQUIREMENTS FOR EXCLUSION OF SECURITISED EXPOSURES FROM THE CALCULATION OF CREDIT RWA

### Section 1: Traditional Securitisation

1.1 In the case of a traditional securitisation, a Reporting Bank may exclude securitised exposures from its calculation of credit RWA only if all of the following requirements have been complied with:

(a) except as provided for in sub-paragraph (h)(i) below, significant credit risk associated with the underlying exposures has been transferred to third parties[368A];

(b) the Reporting Bank does not have any effective control[369] over the underlying exposures;

(c) the Reporting Bank obtains a written legal opinion from its legal advisors confirming that the underlying exposures are beyond the reach of the Reporting Bank and its creditors, even in an insolvency situation or receivership;

(d) the securities issued pursuant to the securitisation are not obligations of the Reporting Bank and any investor who purchases the securities shall only have a claim to the underlying exposures;

(e) the securities are issued pursuant to the securitisation by an SPE and the holders of the securities have the right to pledge, transfer or sell their interests without restriction;

(f) where a securitisation includes a clean up call, the call complies with the requirements set out in Section 3 of this Annex;

(g) where a securitisation includes early amortisation provisions, the provisions do not result in the securitisation transaction contravening the requirements set out in Section 4 of this Annex;

[MAS Notice 637 (Amendment No. 2) 2017]

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[368A] The Reporting Bank shall consider material costs of credit protection purchased that have not yet been recognised in earnings as a retained position of the Reporting Bank. These costs could be quantified through an appropriately conservative present value calculation.

[369] A Reporting Bank is deemed to have effective control over the transferred exposures if -
(a) it is able to repurchase from the transferee the previously transferred exposures in order to realise their benefits; or
(b) it is obligated to retain the risk of the transferred exposures.
In this regard, a Reporting Bank acting as a servicer in respect of the transferred exposures will not necessarily constitute effective control of the exposures.

(h) the documentation of the securitisation does not contain any clauses that –

(i) other than clean-up calls, obliges the Reporting Bank to repurchase any of the underlying exposures, at any time, except where that obligation arises from the exercise of a representation or warranty given by the Reporting Bank. The Reporting Bank may give a representation or warranty solely in respect of the nature or existing state of facts of any underlying exposure, that is capable of being verified, at the time of its transfer[370];

(ii) requires the Reporting Bank to alter the underlying exposures such that the credit quality of the pool is improved unless this is achieved by selling exposures to independent third parties which are not related corporations or affiliates of the Reporting Bank, at market prices[371];

[MAS Notice 637 (Amendment No. 2) 2014]

(iii) allows for increases in a retained first loss position or credit enhancement provided by the Reporting Bank after the inception of the securitisation;

(iv) increases the yield payable to parties other than the Reporting Bank, such as investors and third-party providers of credit enhancements, in response to a deterioration in the credit quality of the underlying exposures; or

(v) allow for termination options or triggers for termination, except for eligible clean-up calls or termination triggered by specific changes in tax or regulations;

[MAS Notice 637 (Amendment No. 2) 2017]

(i) the transfer of the underlying exposures or the transfer of risk through sub-participation does not contravene the terms and conditions of any underlying agreement in respect of the underlying exposures and where applicable, all the necessary consents for the transfer or sub-participation have been obtained;

[MAS Notice 637 (Amendment No. 2) 2017]

(j) the documentation of the securitisation specifies that, if cash flows relating to the underlying exposures are rescheduled or renegotiated, the SPE and not the Reporting Bank, would be subject to the rescheduled or renegotiated terms;

[MAS Notice 637 (Amendment No. 2) 2017]

[370] In addition, the Reporting Bank shall undertake appropriate due diligence prior to giving any such representation or warranty.

[371] For avoidance of doubt, this requirement does not preclude the substitution of non-defaulted assets which have been fully amortised.

(k) the Reporting Bank receives a fixed amount of consideration[372] for the underlying exposures;

[MAS Notice 637 (Amendment No. 2) 2017]

(l) all transactions with the SPE are conducted at arm's length and on market terms and conditions[373]; and

[MAS Notice 637 (Amendment No. 2) 2017]

(m) the RWA of the Reporting Bank's exposures to the securitisation is at all times not more than 20% of the sum of the RWA of all the securitisation exposures of the securitisation.

[MAS Notice 637 (Amendment No. 2) 2017]

1.2 Notwithstanding paragraph 1.1(m), a Reporting Bank shall consult the Authority if it intends to hold more than 20% of the sum of the RWA of all securitisation exposures of the securitisation. The Authority may allow the Reporting Bank to exclude securitised exposures from its calculation of credit RWA if the Reporting Bank can demonstrate to the Authority's satisfaction that a significant portion of the credit risk associated with the underlying exposures has been transferred to third parties, and the requirements in paragraph 1.1(a) to (l) have been complied with.

[MAS Notice 637 (Amendment No. 2) 2017]

**Section 2: Synthetic Securitisation**

2.1 In the case of a synthetic securitisation, a Reporting Bank may recognise the credit protection obtained through the synthetic securitisation in its calculation of credit RWA only if all of the following requirements have been complied with:

(a) the Reporting Bank transfers significant credit risk associated with the underlying exposures to third parties[373A];

(b) the instrument used to transfer credit risk does not contain terms or conditions that limit the amount of credit risk transferred, such as clauses that –

[372] For avoidance of doubt, the amount of consideration received in the form of a fixed amount of securities in the SPE would generally be regarded as meeting this requirement if the transaction is conducted at arm's length and on market terms and conditions. Also, this requirement does not preclude excess cash from being channeled to the Reporting Bank after all claims connected with the securities issued by the SPE have been paid out.

[372A] [Deleted by MAS Notice 637 (Amendment No. 2) 2017]

[373] This requirement does not apply where a Reporting Bank acquires securities in the SPE pursuant to an underwriting arrangement, provided that the Reporting Bank complies with the 20% limit no later than 8 weeks after the date on which the securities were acquired. The Reporting Bank shall calculate its credit RWA or market RWA for the securities acquired pursuant to the underwriting arrangement in accordance with Sub-division 6 of Division 1 of this Part or Sub-division 2 of Division 1 of Part VIII respectively.

[373A] A Reporting Bank shall consider material costs of credit protection purchased that have not yet been recognised in earnings as a retained position of the Reporting Bank. These costs could be quantified through an appropriately conservative present value calculation.

(i) materially limit the credit protection or credit risk transference[373B];

(ii) require the Reporting Bank to alter the underlying exposures to improve the average credit quality of the pool[374];

(iii) increase the cost of credit protection to the Reporting Bank in response to deterioration in the credit quality of the underlying exposures;

(iv) increase the yield payable to parties other than the Reporting Bank, such as investors and third-party providers of credit enhancements, in response to a deterioration in the credit quality of the underlying exposures; or

(v) allow for increases in a retained first loss position or credit enhancement provided by the Reporting Bank after the inception of the securitisation;

(c) the Reporting Bank obtains a written legal opinion from its legal advisors that confirms the enforceability of the contracts in all relevant jurisdictions;

(d) where a securitisation includes a clean up call, the call complies with the requirements set out in Section 3 of this Annex;

(e) when a securitisation includes early amortisation provisions, the provisions do not result in the securitisation transaction contravening the requirements set out in Section 4 of this Annex; and

[MAS Notice 637 (Amendment No. 2) 2017]

(f) in the case where the risks associated with the underlying exposures are transferred to an SPE -

(i) the securities issued by the SPE are not obligations of the Reporting Bank;

(ii) the holders of the beneficial interests in that SPE have the right to pledge or exchange their interests without restriction; and

(iii) all transactions with the SPE are conducted at arm's length and on market terms and conditions[375] ; and

[MAS Notice 637 (Amendment No. 2) 2017]

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[373B] For instance, by way of an early amortisation provision in a securitisation of revolving credit facilities that effectively subordinates the Reporting Bank's interest, significant materiality thresholds below which credit protection is deemed not to be triggered even if a credit event occurs, or clauses that allow for the termination of the credit protection due to deterioration in the credit quality of the underlying exposures.

[MAS Notice 637 (Amendment No. 2) 2017]

[374] For avoidance of doubt, this requirement does not preclude the substitution of non-defaulted assets which have been fully amortised.

[375] This requirement does not apply where a Reporting Bank acquires securities in the SPE pursuant to an underwriting arrangement, provided that the Reporting Bank complies with the 20% limit no later than 8 weeks after the date on which the securities were acquired. The Reporting Bank shall calculate its credit RWA or market RWA for the securities acquired pursuant to the underwriting arrangement in accordance with Sub-division 6 of Division 1 of Part VII or Sub-division 2 of Division 1 of Part VIII respectively.

(g) the RWA of the Reporting Bank's exposures to the securitisation is at all times not more than 20% of the sum of the RWA of all the securitisation exposures of the securitisation.

[MAS Notice 637 (Amendment No. 2) 2017]

2.2 Notwithstanding paragraph 2.1(g), a Reporting Bank shall consult the Authority if it intends to hold more than 20% of the sum of the RWA of all the securitisation exposures of the securitisation. The Authority may allow the Reporting Bank to exclude securitised exposures from its calculation of credit RWA if the Reporting Bank can demonstrate to the Authority's satisfaction that a significant portion of the credit risk associated with the underlying exposures has been transferred to third parties, and the requirements in paragraph 2.1(a) to (f) have been complied with.

[MAS Notice 637 (Amendment No. 2) 2017]

**Section 3: Securitisation Containing Clean-Up Calls**

3.1 If a securitisation includes a clean-up call, the Reporting Bank which has the ability to exercise the clean-up call shall ensure that –

(a) the exercise of the clean-up call is at its discretion and is not mandatory, in form or in substance;

(b) the clean-up call is not structured to avoid allocating losses to credit enhancements or positions held by investors or in any way structured to provide credit enhancement; and

(c) the clean-up call is exercisable by the Reporting Bank only when 10% or less of the original underlying exposures or securities issued remain or, for synthetic securitisation, when 10% or less of the original reference portfolio value remains.

[MAS Notice 637 (Amendment No. 2) 2017]

3.2 Where a clean-up call, when exercised, is found to serve as a credit enhancement, the Reporting Bank shall consider the exercise of the clean-up call as a form of implicit support and treat it in accordance with paragraph 7.6.85.

[MAS Notice 637 (Amendment No. 2) 2017]

3.3 Where a securitisation includes a clean-up call which does not meet the all of the criteria in paragraph 3.1, a Reporting Bank which is an originator of the securitisation shall –

(a) in the case of a traditional securitisation, treat the underlying exposures as if they were not securitised. Additionally, the Reporting Bank shall deduct from Common Equity Tier 1 capital any increase in equity capital due to a gain-on-sale in accordance with paragraph 6.1.3(f); and

[MAS Notice 637 (Amendment No. 2) 2014]
[MAS Notice 637 (Amendment No. 2) 2017]

(b) in the case of a synthetic securitisation, hold capital against the entire amount of the securitised exposure as if the Reporting Bank did not benefit from any credit protection.

3.4 Where a synthetic securitisation incorporates a call (other than a clean-up call) that effectively terminates the transaction and the purchased credit protection on a specific date, the Reporting Bank which is an originator of the synthetic securitisation shall treat the transaction in accordance with paragraphs 7.6.87 and 7.6.88.

[MAS Notice 637 (Amendment No. 2) 2017]

**Section 4: Securitisation Containing Early Amortisation Provisions**

[MAS Notice 637 (Amendment No. 2) 2017 (Insertion of this Section)]

4.1 A Reporting Bank shall be deemed not to have met the requirements for exclusion of securitised exposures set out in Section 1 and Section 2 of this Annex, and shall not exclude securitised exposures from the calculation of credit RWA if –

(a) the securitisation originated by the Reporting Bank is a securitisation of one or more revolving credit facilities in the underlying pool; and

(b) the securitisation transaction incorporates an early amortisation provision or similar provision that, if triggered, would –

(i) subordinate the Reporting Bank's senior or pari passu interest in the underlying revolving credit facilities to the interest of other investors;

(ii) subordinate the Reporting Bank's subordinated interest to an even greater degree relative to the interests of other parties; or

(iii) in other ways increase the Reporting Bank's exposure to losses associated with the underlying revolving credit facilities.

4.2 Notwithstanding paragraph 4.1 of this Annex, a Reporting Bank may exclude securitised exposures from the calculation of credit RWA if the securitisation transaction meets the operational requirements in Section 1 (for a traditional securitisation) and Section 2 (for a synthetic securitisation) of this Annex, and contains one of the following early amortisation provisions -

(a) replenishment structures where the underlying exposures do not revolve and the early amortisation terminates the ability of the Reporting Bank to add new exposures;

(b) transactions of revolving credit facilities containing early amortisation features that mimic term structures (i.e. where the risk on the underlying facilities does not return to the Reporting Bank) and where the early amortisation provisions do not effectively result in subordination of the Reporting Bank's interest;

(c) structures where the Reporting Bank securitises one or more revolving credit facilities and where investors remain fully exposed to future draws by borrowers even after an early amortisation event has occurred; or

(d) the early amortisation clause is triggered solely by events not related to the performance of the securitised assets or the Reporting Bank, such as material changes in tax laws or regulations.

**Annex 7AE**

## OPERATIONAL REQUIREMENTS FOR USE OF SEC-ERBA

[MAS Notice 637 (Amendment No. 2) 2017 (Replacement of this Annex in its entirety)]

### Section 1: Operational Requirements for Use of External Credit Assessments

1.1 A Reporting Bank shall ensure that the following operational criteria are satisfied before it can use external credit assessments to determine risk weights for securitisation exposures –

(a) the external credit assessments must take into account and reflect the entire amount of credit risk exposure a Reporting Bank has with regard to all payments owed to it[375A];

(b) the external credit assessment must be from a recognised ECAI listed in Annex 7RA;

(c) the external credit assessment, procedures, methodologies, assumptions and the key elements underlying the assessments must be publicly available in an accessible form on a non-selective basis and free of charge[376]. The external credit assessment shall be included in the ECAI's transition matrix. The ECAI's loss and cash flow analysis of the securitisation transaction and the sensitivity of ratings to changes in the underlying rating assumptions should be publicly available. A Reporting Bank shall not use an external credit assessment that is made available only to the parties to a transaction;

(d) recognised ECAIs must have a demonstrated expertise in assessing securitisations, which may be evidenced by common and widespread reliance by independent investors on the ECAI's external credit assessments;

(e) where two or more recognised ECAIs assess the credit risk of the same securitisation exposure differently, paragraph 7.3.4 shall apply;

(f) where CRM is provided to specific underlying exposures or the entire pool by an eligible protection provider, and is reflected in the external credit assessment assigned to a securitisation exposure, the Reporting Bank shall apply the risk weight associated with that external credit assessment. In order to avoid any double-counting, the Reporting Bank shall not recognise additional CRM in this case;

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[375A] For example, if the Reporting Bank is owed both principal and interest, the assessment must fully take into account and reflect the credit risk associated with timely repayment of both principal and interest.

[376] Where the eligible credit assessment is not publicly available free of charge, the ECAI should provide an adequate justification within its own publicly available code of conduct, in accordance with the "comply or explain" nature of the IOSCO's Code of Conduct Fundamentals for Credit Rating Agencies.

(g) where CRM is provided to specific underlying exposures or the entire pool by a protection provider which is not an eligible protection provider, and the effect of the CRM is reflected in the external credit assessment assigned to a securitisation exposure, the Reporting Bank shall treat the securitisation exposure as unrated;

(h) where a CRM solely protects a specific securitisation exposure within a given structure and this protection is reflected in the external credit assessment of that securitisation exposure, the Reporting Bank shall treat the exposure as if it is unrated and then recognise the effect of the CRM based on the CRM treatment for SA(CR) or F-IRBA exposures to recognise the hedge; and

(i) where the external credit assessment of a securitisation exposure is at least partly based on unfunded support provided by the Reporting Bank, the Reporting Bank shall treat the securitisation exposure as unrated[377].

**Section 2: Operational Requirements for Use of Inferred Ratings**

2.1 A Reporting Bank shall ensure that the following operational requirements are satisfied before the Reporting Bank can recognise inferred ratings for unrated securitisation exposures in the SEC-ERBA –

(a) the reference securitisation exposure from which the inferred rating is derived must rank pari passu or be subordinate in all respects to the unrated securitisation exposure. Credit enhancements, if any, must be taken into account when assessing the relative subordination of the unrated securitisation exposure and the reference securitisation exposure[378];

(b) the maturity of the reference securitisation exposure must be equal to or longer than that of the unrated securitisation exposure;

(c) the Reporting Bank shall update any inferred rating on an ongoing basis to reflect any subordination of the unrated securitisation exposure or changes in the external rating of the reference securitisation exposure; and

(d) the external rating of the reference securitisation exposure must satisfy the operational requirements for use of external credit assessments in Section 1 of this Annex.

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377 For example, if a Reporting Bank buys ABCP where it provides an unfunded securitisation exposure extended to the ABCP programme (e.g. liquidity facility or credit enhancement), and that exposure plays a role in determining the external credit assessment of the ABCP, the Reporting Bank shall treat the ABCP as if it were not rated.

378 For example, if the reference securitisation exposure benefits from any third-party guarantees or other credit enhancements that are not available to the unrated securitisation exposure, the Reporting Bank may not assign an inferred rating to the unrated securitisation exposure based on the reference securitisation exposure.

**Annex 7AF**

## INTERNAL ASSESSMENT APPROACH (IAA) FOR SECURITISATION EXPOSURES IN THE BANKING BOOK

[MAS Notice 637 (Amendment No. 2) 2017]

### Section 1: Eligibility Requirements

1.1 Subject to the approval of the Authority, a Reporting Bank may use its internal assessments of the credit quality of the unrated securitisation exposures (such as liquidity facilities and credit enhancements) that the Reporting Bank extends to ABCP programmes to determine its capital requirement for those securitisation exposures, provided that –

(a) the Reporting Bank has obtained the Authority's approval to adopt the IRBA for at least one asset class; and

(b) the internal assessment process of the Reporting Bank meets the operational requirements set out in paragraph 1.2 of this Annex.

[MAS Notice 637 (Amendment No. 2) 2017]

1.1A The Authority may subsequently withdraw its approval of the Reporting Bank's use of the IAA in relation to its ABCP programme exposures, both existing and newly originated, for the purposes of calculating regulatory capital requirements, if the Authority is satisfied that the Reporting Bank no longer meets the requirements in paragraph 1.2 of this Annex, until the Reporting Bank has remedied the deficiencies. If a Reporting Bank does not have the Authority's approval to apply the IAA, it shall use the SEC-SA for calculating its capital requirements for the unrated securitisation exposures it extends to ABCP programmes.

[MAS Notice 637 (Amendment No. 2) 2017]

1.2 A Reporting Bank shall ensure that its internal assessment process meets the following requirements:

(a) the commercial paper issued by the ABCP programme shall be rated by a recognised ECAI, and the Reporting Bank shall use the SEC-ERBA to risk-weight any exposures it has to the commercial paper;

(b) the Reporting Bank shall consider all publicly available rating methodologies of recognised ECAIs for the type of asset purchased by the programme in developing its internal assessments[379]. The Reporting Bank shall not use the rating methodology of the ECAI to derive an internal assessment if the process or rating criteria of the ECAI is not publicly available. The Reporting Bank should also consider non-publicly available rating methodologies of recognised ECAIs, to the extent that it has access to such information, in

[379] In general, if the rating methodologies of an ECAI for an asset are not publicly available, then the IAA may not be used. However, in certain instances, for example, new or uniquely structured transactions which are not currently addressed by the rating criteria of an ECAI rating the ABCP, a Reporting Bank may discuss the specific transaction with the Authority to determine whether the IAA may be applied.

developing its internal assessments, particularly if it leads to more conservative ratings than the publicly available methodologies;

(c) the internal assessment of the credit quality of a securitisation exposure to the ABCP programme shall be based on the rating criteria of recognised ECAIs for the type of asset purchased by the programme and shall be the equivalent of a credit quality grade of "10" or better when initially assigned to the securitisation exposure. The Reporting Bank shall demonstrate to the satisfaction of the Authority that its internal assessments correspond with the relevant standard of the recognised ECAI[380];

(d) the internal assessment of the credit quality of a securitisation exposure to the ABCP programme shall be used in the internal risk management processes of the Reporting Bank, including its management information and economic capital systems, and generally shall meet all the relevant requirements of the IRBA framework. The Reporting Bank shall inform the Authority if its internal assessments are unable to meet any of the use test requirements set out in paragraphs 2.7(a) and (b) of Annex 7AB, with the following modifications:

(i) "IRBA" is read as referring to IAA; and

(ii) "internal ratings and estimates of IRBA parameters" is read as referring to IAA internal ratings;

(e) the internal assessment process shall identify gradations of risk. The ratings based on internal assessments shall correspond to the external ratings of recognised ECAIs;

(f) the internal assessment process, particularly the stress factors for determining credit enhancement requirements, shall be at least as conservative as the publicly available rating criteria for the asset type being purchased by the ABCP programme, of recognised ECAIs that have rated the commercial paper issued by the ABCP programme, and -

(i) in the case where the commercial paper issued by an ABCP programme is externally rated by two or more recognised ECAIs and the benchmark stress factors of the different ECAIs require different levels of credit enhancement to achieve the same external rating equivalent, the Reporting Bank shall apply the ECAI stress factor that requires the most conservative or highest level of credit protection[382];

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380 For example, in the case of the Reporting Bank's calculation of the credit enhancement level using the IAA, the Authority may disallow, on a full or partial basis, any seller- provided recourse guarantees or excess spread, or any other first loss credit enhancements that provide limited protection to the Reporting Bank.

[MAS Notice 637 (Amendment No. 2) 2017]

381 [Deleted by MAS Notice 637 Amendment (No. 2) 2017]

382 For example, if one ECAI required enhancement of 2.5 to 3.5 times historical losses for a type of asset to obtain a single "A" rating equivalent and another required 2 to 3 times historical losses, the Reporting Bank shall use the higher range of stress factors in determining the appropriate level of seller-provided credit enhancement.

(ii) when selecting recognised ECAIs to externally rate the commercial paper issued by an ABCP programme, the Reporting Bank shall not choose only those ECAIs that generally have relatively less restrictive rating methodologies. In addition, if there are changes in the methodology of a selected ECAI, including the stress factors, that adversely affect the external rating of the commercial paper issued by the ABCP programme, then the revised rating methodology shall be considered in evaluating whether the internal assessments assigned to the Reporting Bank's securitisation exposures to the ABCP programme are in need of revision;

(g) internal or external auditors, a recognised ECAI, or the internal credit review or risk management function of the Reporting Bank shall perform reviews of the internal assessment process at least annually and assess the validity of the internal assessments of the Reporting Bank. If the internal audit, credit review, or risk management functions of the Reporting Bank perform the reviews of the internal assessment process, these functions shall be independent of the ABCP programme business line and the underlying customer relationships;

(h) the Reporting Bank shall track the performance of its internal assessments over time to evaluate the performance of the assigned internal assessments and make adjustments, as necessary, to its assessment process when the performance of its securitisation exposures to the ABCP programme routinely diverges from the assigned internal assessments on those exposures;

(i) the ABCP programme shall have credit and investment guidelines[382A]. ;

(j) the Reporting Bank shall perform a credit analysis of the risk profile of the asset seller. The credit analysis should consider, for example, past and expected future financial performance, current market position, expected future competitiveness, leverage, cash flow and interest coverage and debt rating. The Reporting Bank shall perform a review of the seller's underwriting standards, servicing capabilities, and collection processes;

(k) the underwriting policy of the ABCP programme shall establish minimum asset eligibility criteria that, among others, excludes the purchase of assets that are significantly past due or defaulted, limits excess concentration to an individual obligor or a geographic area and limits the tenor of the assets to be purchased;

(l) the ABCP programme shall have collections processes established that consider the operational capability and credit quality of the servicer. The ABCP programme shall mitigate to the extent possible seller or servicer risk

[382A] For instance, in the consideration of an asset purchase, the ABCP programme administrator should develop an outline of the structure of the purchase transaction and consider the type of asset being purchased, the type and monetary value of the exposures arising from the provision of liquidity facilities and credit enhancements, the loss waterfall, and the legal and economic isolation of the transferred assets from the entity selling the assets.

[MAS Notice 637 (Amendment No. 2) 2017]

through various methods, such as triggers based on current credit quality that would preclude commingling of funds and impose lockbox arrangements that would help ensure the continuity of payments to the ABCP programme;

(m) the aggregate estimate of loss on an asset pool that the ABCP programme is considering purchasing shall take into account all sources of potential risk, such as credit and dilution risk. If the seller-provided credit enhancement is sized based on only credit-related losses and dilution risk is material for the particular exposure pool, then a separate reserve should be established for dilution risk. In addition, in sizing the required enhancement level, the Reporting Bank should review several years of historical information, including losses, delinquencies, dilutions, and the turnover rate of the receivables. Furthermore, the Reporting Bank should evaluate the characteristics of the underlying asset pool, for example, weighted average credit score, any concentrations to an individual obligor or geographic region, and the granularity of the asset pool; and

(n) the ABCP programme shall incorporate structural features into the purchase of assets in order to mitigate potential credit deterioration of the underlying portfolio, for example, wind-down triggers specific to a pool of exposures.

[MAS Notice 637 (Amendment No. 2) 2017]

**Section 2: Calculation of Credit Risk-Weighted Exposure Amount**

2.1 A Reporting Bank using the IAA shall calculate the credit-risk weighted exposure amount for an unrated securitisation exposure to an ABCP programme by -

(a) assigning an internal rating, mapped to a credit rating equivalent, to the unrated securitisation exposure;

(b) allocating the risk weight appropriate to the credit rating equivalent assigned to that exposure in accordance with Tables 7-21 and 7-22, except where the credit rating equivalent is less than investment grade, in which case the Reporting Bank shall apply a 1250% risk weight to the unrated securitisation exposure; and

(c) applying the formula in paragraph 7.1.8.

[MAS Notice 637 (Amendment No. 2) 2017]

[Section 3 Deleted by Notice 637 (Amendment No. 2) 2017]

## CRITERIA FOR SIMPLE, TRANSPARENT AND COMPARABLE (STC) SECURITISATIONS

[MAS Notice 637 (Amendment No. 2) 2017 (Replacement of this Annex in its entirety)]

### Section 1: Asset Risk

Nature of Assets

1.1 The Reporting Bank shall ensure that the assets underlying the securitisation are credit claims or receivables that are homogeneous. In assessing homogeneity, the Reporting Bank shall give consideration to asset type, jurisdiction, legal system and currency, in accordance with paragraph 1.3.

1.2 The Reporting Bank shall ensure that credit claims or receivables for the more exotic asset classes have contractually identified periodic payment streams relating to rental[383], principal, interest, or principal and interest payments as such asset classes require deeper and more complex analysis. The Reporting Bank shall ensure that any referenced interest payments or discount rates are based on commonly encountered market interest rates[384], but do not reference complex or complicated formulae or exotic derivatives[385].

1.3 A Reporting Bank should assess homogeneity by giving consideration to the following –

(a) The nature of assets should be such that investors would not need to analyse and assess materially different legal or credit risk factors, or both, and risk profiles when carrying out risk analysis and due diligence checks;

(b) The assets underlying the securitisation should have common risk drivers, including similar risk factors and risk profiles;

(c) Credit claims or receivables included in the securitisation should have standard obligations, in terms of rights to payments or income, or both, from assets and that result in a periodic and well-defined stream of payments to investors. Credit card facilities should be deemed to result in

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[383] Payments on operating and financing leases are typically considered to be rental payments rather than payments of principal and interest.

[384] Commonly encountered market interest rates may include rates reflective of a lender's cost of funds, to the extent that sufficient data are provided to investors to allow them to assess their relation to other market rates. Examples of these include –

(a) interbank rates and rates set by monetary policy authorities, such as Libor, Euribor and the fed funds rate; and

(b) sectoral rates reflective of a lender's cost of funds, such as internal interest rates that directly reflect the market costs of a bank's funding or that of a subset of institutions.

[385] The Global Association of Risk Professionals (GARP) defines an exotic instrument as a financial asset or instrument with features making it more complex than simpler, plain vanilla, products. Interest rate caps and/or floors would not be automatically considered exotic derivatives.

a periodic and well-defined stream of payments to investors for the purposes of this criterion;

(d) Repayment of noteholders should mainly rely on the principal and interest proceeds from the securitised assets. Partial reliance on refinancing or re-sale of the asset securing the exposure may occur provided that re-financing is sufficiently distributed within the pool, the residual values on which the transaction relies are sufficiently low and the reliance on refinancing is thus not substantial.

Asset Performance History

1.4 In order to provide investors with sufficient information on an asset class to conduct appropriate due diligence and access to a sufficiently rich data set to enable a more accurate calculation of expected loss in different stress scenarios, the Reporting Bank shall ensure that verifiable loss performance data, such as delinquency and default data,is available for credit claims and receivables with substantially similar risk characteristics to those being securitised, for a time period long enough to permit meaningful evaluation by investors, ideally covering a complete economic cycle. The Reporting Bank shall ensure that sources of and access to data and the basis for claiming similarity to credit claims or receivables being securitised are clearly disclosed to all market participants.

1.5 A Reporting Bank shall satisfy itself that originator of the securitisation, as well as the original lender who underwrites the assets, has sufficient experience in originating exposures similar to those securitised.

1.6 A Reporting Bank that is an investor in a securitisation shall satisfy itself that the performance history of the originator and the original lender for substantially similar claims or receivables to those being securitised has been established for an "appropriately long period of time[386B]". This performance history must be no shorter than a period of seven years for non-retail exposures. For retail exposures, the minimum performance history is five years.

1.7 As an additional consideration[386], a Reporting Bank that is an investor in a securitisation should consider whether the servicer and other parties with a fiduciary responsibility to the securitisation have an established performance history[386A] for substantially similar credit claims or receivables to those being securitised and for an appropriately long period of time[386B].

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[386] This "additional consideration" may form part of investors' due diligence process, but does not form part of the criteria when determining whether a securitisation can be considered "simple, transparent and comparable".

[386A] It is not the intention of the criteria to form an impediment to the entry of new participants to the market, but rather that investors should take into account the performance history of the asset class and the transaction parties when deciding whether to invest in a securitisation.

[386B] A Reporting Bank may take reference from the IRB data requirements contained in paragraphs 1.4B and 1.5B of Annex 7AA to better define the term "appropriately long period of time". These data requirements would apply irrespective of the credit risk approach used to determine capital requirements on the underlying pool.

Payment Status

1.8 Non-performing credit claims and receivables are likely to require more complex and heightened analysis. In order to ensure that only performing credit claims and receivables are assigned to a securitisation, the Reporting Bank shall satisfy itself that credit claims or receivables being transferred to a securitisation do not include, at the time of inclusion in the pool, obligations that are in default or delinquent, or obligations for which the transferor[386C] or parties to the securitisation[386D] are aware of evidence indicating a material increase in expected losses or enforcement actions.

1.9 The Reporting Bank shall satisfy itself that the originator does not transfer any credit claims or receivables to the securitisation unless the credit claims or receivables meet the following conditions –

(a) the obligor has not been the subject of an insolvency or debt restructuring proceedings due to financial difficulties within three years prior to the date of origination, unless the obligor's credit incidents have been removed from credit registries and the obligor belongs to a jurisdiction in which borrowers have the "right to be forgotten[386E];

(b) the obligor is not recorded on a public credit registry of persons with an adverse credit history;

(c) the obligor does not have a credit assessment by an ECAI or a credit score indicating a significant risk of default; and

(d) the credit claim or receivable is not subject to a dispute between the obligor and the original lender.

1.10 The Reporting Bank shall satisfy itself that the originator assesses the credit claims or receivables in accordance with paragraph 1.9 above no earlier than 45 days prior to the closing date. In addition, at the time of this assessment, the Reporting Bank shall satisfy itself that the originator has assessed that there is no evidence indicating likely deterioration in the performance status of the credit claim or receivable.

1.11 The Reporting Bank shall satisfy itself that, at the time of the inclusion of the credit claims or receivables in the pool, at least one payment must have been made on the underlying exposures, except in the case of revolving asset trust structures such as those for credit card receivables, trade receivables, and other exposures payable in a single instalment, at maturity.

Consistency of Underwriting

1.12 To ensure that the quality of the securitised credit claims and receivables is not affected by changes in underwriting standards, the Reporting Bank shall satisfy itself that

[386C] Such as the originator.

[386D] Such as the servicer or a party with a fiduciary responsibility.

[386E] Such jurisdictions provide legal rights to allow borrowers to remove negative credit records after the passage of a period of time or after certain conditions have been met.

the originator demonstrates to investors that any credit claims or receivables being transferred to the securitisation have been originated in the ordinary course of the originator's business to materially non-deteriorating underwriting standards.[386F] Where underwriting standards change, the Reporting Bank shall satisfy itself that the originator will disclose the timing and purpose of such changes before the change. The Reporting Bank shall satisfy itself that the originator does not impose less stringent standards than those applied to credit claims and receivables retained on the originator's balance sheet.

1.13 The Reporting Bank shall satisfy itself that the credit claims or receivables transferred to the securitisation are credit claims or receivables which have satisfied materially non-deteriorating underwriting criteria and are credit claims or receivables:

(a) for which the obligors have been assessed by the originator as having the ability and volition to make timely payments on obligations; or

(b) on granular pools of obligors originated in the ordinary course of the originator's business where expected cash flows have been modelled to meet stated obligations of the securitisation under prudently stressed loan loss scenarios.

1.14 In all circumstances, the Reporting Bank shall satisfy itself that all credit claims or receivables are originated in accordance with sound and prudent underwriting criteria based on an assessment that the obligor has the "ability and volition to make timely payments" on its obligations.

1.15 The Reporting Bank shall satisfy itself that where underlying credit claims or receivables have been acquired from third parties, the originator reviews the underwriting standards (i.e. to check their existence and assess their quality) of these third parties and ascertains that these third parties have assessed the obligors' "ability and volition to make timely payments on obligations".

Asset Selection and Transfer

1.16 Whilst recognising that credit claims or receivables transferred to a securitisation will be subject to defined criteria set out in the securitisation documentation[386G], the Reporting Bank shall satisfy itself that the performance of the securitisation does not rely upon the ongoing selection of assets through active management[386H] on a discretionary basis of the securitisation's underlying portfolio. The Reporting Bank shall ensure that credit claims or receivables transferred to a securitisation satisfy clearly defined eligibility criteria set out in the securitisation documentation. The Reporting Bank shall satisfy itself that credit claims or receivables transferred to a securitisation after the closing date are not be actively selected, actively managed or otherwise cherry-picked on a discretionary basis. The Reporting Bank shall ensure that sufficient information on the securitisation is made available to allow investors to assess the credit risk of the asset pool prior to their investment decisions.

[386F] Investor analysis should be simpler and more straightforward where the securitisation is of credit claims or receivables that satisfy materially non-deteriorating origination standards.

[386G] Such as the size of the obligation, the age of the borrower or the LTV (loan-to-value) of the property, DTI (debt-to-income) and/or DSC (debt service coverage) ratios.

[386H] Provided they are not actively selected or otherwise cherry-picked on a discretionary basis, the addition of credit claims or receivables during the revolving periods or their substitution or repurchasing due to the breach of representations and warranties do not represent active portfolio management.

1.17 In order to meet the principle of true sale, the Reporting Bank shall satisfy itself that the securitisation effects true sale such that the underlying credit claims or receivables –

(a) are enforceable against the obligor and their enforceability is included in the representations and warranties of the securitisation;

(b) are beyond the reach of the seller, its creditors or liquidators and are not subject to material re-characterisation or clawback risks;

(c) are not effected through credit default swaps, derivatives or guarantees, but by a transfer[386I] of the credit claims or the receivables to the securitisation; and

(d) demonstrate effective recourse to the ultimate obligation for the underlying credit claims or receivables and are not a securitisation of other securitisations.

1.18 In applicable jurisdictions, the Reporting Bank shall ensure that securitisations employing transfers of credit claims or receivables by other means must demonstrate the existence of material obstacles preventing true sale at issuance[386J] and clearly demonstrate the method of recourse to ultimate obligors[386K]. In such jurisdictions, the Reporting Bank shall ensure that any conditions where the transfer of the credit claims or receivables is delayed or contingent upon specific events and any factors affecting timely perfection of claims by the securitisation are clearly disclosed.

1.19 The Reporting Bank shall ensure that the originator has provided representations and warranties that the credit claims or receivables being transferred to the securitisation are not subject to any condition or encumbrance that can be foreseen to adversely affect enforceability in respect of collections due.

1.20 The Reporting Bank shall ensure that the claim that the true sale and the transfer of assets under the applicable laws comply with sub-paragraphs (a) through (d) of paragraph 1.17 of this Annex is supported by an independent third party legal opinion.

Initial and Ongoing Data

1.21 To assist investors in conducting appropriate due diligence prior to investing in a new offering, the Reporting Bank shall ensure that sufficient loan-level data in accordance with applicable laws or, in the case of granular pools, summary stratification data on the relevant risk characteristics of the underlying pool is available to potential investors before pricing of a securitisation.

1.22 The Reporting Bank shall satisfy itself that timely loan-level data in accordance with applicable laws or granular pool stratification data on the risk characteristics of the underlying pool and standardised investor reports is and will be made readily available to

[386I] The requirement should not affect jurisdictions whose legal frameworks provide for a true sale with the same effects as described above, but by means other than a transfer of the credit claims or receivables.
[386J] Such as the immediate realisation of transfer tax or the requirement to notify all obligors of the transfer.
[386K] Such as equitable assignment, or perfected contingent transfer.

current and potential investors at least on a quarterly basis throughout the life of the securitisation to assist investors in conducting appropriate and ongoing monitoring of their investments' performance and to ensure that investors that wish to purchase a securitisation in the secondary market have sufficient information to conduct appropriate due diligence. The Reporting Bank must ensure that cut-off dates of the loan-level or granular pool stratification data are aligned with those used for investor reporting.

1.23 To provide a level of assurance that the reporting of the underlying credit claims or receivables is accurate and that the underlying credit claims or receivables meet the eligibility requirements, the Reporting Bank shall ensure that the initial portfolio is reviewed[386L] for conformity with the eligibility requirements by an appropriate legally accountable and independent third party, such as an independent accounting practice or the calculation agent or management company for the securitisation.

## Section 2: Structural Risk

### Redemption Cash Flows

2.1 Liabilities subject to the refinancing risk of the underlying credit claims or receivables are likely to require more complex and heightened analysis. To ensure that the underlying credit claims or receivables do not need to be refinanced over a short period of time, the Reporting Bank shall satisfy itself that the securitisation does not rely on the sale or refinancing of the underlying credit claims or receivables in order to repay the liabilities, unless the underlying pool of credit claims or receivables is sufficiently granular and has sufficiently distributed repayment profiles. The Reporting Bank shall consider rights to receive income from the assets specified to support redemption payments as eligible credit claims or receivables in this regard[386M].

### Currency and Interest Rate Asset and Liability Mismatches

2.2 To reduce the payment risk arising from the different interest rate and currency profiles of assets and liabilities and to improve investors' ability to model cash flows, the Reporting Bank shall satisfy itself that the interest rate and foreign currency risks of the securitisation are appropriately mitigated[386N] at all times, and if any hedging transaction is executed, the Reporting Bank shall ensure that the transaction is documented according to industry-standard master agreements. Subject to paragraph 2.4, the Reporting Bank shall ensure that the securitisation only conduct these hedging transactions with derivatives used for genuine hedging of asset and liability mismatches of interest rate, currency, or both.

2.3 The Reporting Bank shall satisfy itself that the originator will demonstrate the appropriateness of the mitigation of interest rate and foreign currency through the life of

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[386L] For instance, the review should confirm that the credit claims or receivables transferred to the securitisation meet the portfolio eligibility requirements. The review could, for example, be undertaken on a representative sample of the initial portfolio, with the application of a minimum confidence level. The verification report need not be provided but its results, including any material exceptions, should be disclosed in the initial offering documentation.

[386M] For example, associated savings plans designed to repay principal at maturity.

[386N] The term "appropriately mitigated" should be understood as not necessarily requiring a completely perfect hedge.

the transaction by making available to potential investors, in a timely and regular manner, quantitative information including the fraction of notional amounts that are hedged, as well as sensitivity analysis that illustrates the effectiveness of the hedge under extreme but plausible scenarios.

2.4 The Reporting Bank shall satisfy itself that if the securitisation does not perform hedges through derivatives, then the securitisation shall only use risk-mitigating measures that are specifically created and used for the purpose of hedging an individual and specific risk, and not multiple risks at the same time (such as credit and interest rate risks). The Reporting Bank shall satisfy itself that non-derivative risk mitigation measures used by the securitisation are fully funded and available at all times.

Payment Priorities and Observability

2.5 To prevent investors being subjected to unexpected repayment profiles during the life of a securitisation, the Reporting Bank shall ensure that the priorities of payments for all liabilities in all circumstances at the time of securitisation are clearly defined, and that a legal opinion on the enforceability of the payment priorities is provided.

2.6 To ensure that junior noteholders do not have inappropriate payment preference over senior noteholders that are due and payable, throughout the life of a securitisation, or, where there are multiple securitisations backed by the same pool of credit claims or receivables, throughout the life of the securitisation programme, the Reporting Bank shall ensure that junior liabilities do not have payment preference over senior liabilities which are due and payable. The Reporting Banks shall ensure that the securitisation is not structured as a "reverse" cash flow waterfall such that junior liabilities are paid where due and payable senior liabilities have not been paid.

2.7 To help provide investors with full transparency over any changes to the cash flow waterfall, payment profile or priority of payments that might affect a securitisation, the Reporting Bank shall ensure that all triggers affecting the cash flow waterfall, payment profile or priority of payments of the securitisation are clearly and fully disclosed in both the offering documents and investor reports, with information in the investor report that clearly identifies the breach status, the ability for the breach to be reversed and the consequences of the breach. The Reporting Bank shall ensure that investor reports contain information that allows investors to monitor the evolution over time of the indicators that are subject to triggers. The Reporting Bank shall also satisfy itself that any triggers breached between payment dates are disclosed to investors on a timely basis in accordance with the terms and conditions of all underlying transaction documents.

2.8 The Reporting Bank shall ensure that securitisations featuring a revolving period include provisions for appropriate early amortisation events and/or triggers of termination of the revolving period, including, notably –

(a) deterioration in the credit quality of the underlying exposures;

(b) a failure to acquire sufficient new underlying exposures of similar credit quality; and

(c) the occurrence of an insolvency-related event with regard to the originator or the servicer.

2.9 Following the occurrence of a performance-related trigger, an event of default or an acceleration event, the Reporting Bank shall ensure that the securitisation positions are repaid in accordance with a sequential amortisation priority of payments, in order of tranche seniority, and that there are no provisions requiring immediate liquidation of the underlying assets at market value.

2.10 To assist investors in their ability to appropriately model the cash flow waterfall of the securitisation, the Reporting Bank shall satisfy itself that the originator makes available to investors, both before pricing of the securitisation and on an ongoing basis, a liability cash flow model or information on the cash flow provisions allowing appropriate modelling of the securitisation cash flow waterfall.

2.11 To ensure that debt forgiveness, forbearance, payment holidays and other asset performance remedies can be clearly identified, the Reporting Bank shall ensure that policies and procedures, definitions, remedies and actions relating to delinquency, default or restructuring of underlying debtors are provided in clear and consistent terms, such that investors can clearly identify debt forgiveness, forbearance, payment holidays, restructuring and other asset performance remedies on an ongoing basis.

Voting and Enforcement Rights

2.12 To ensure clarity for securitisation note holders of their rights and ability to control and enforce on the underlying credit claims or receivables upon the insolvency of the originator, the Reporting Bank shall ensure that the originator transfers all voting and enforcement rights related to the credit claims or receivables to the securitisation. The Reporting Bank shall ensure that investors' rights in the securitisation are clearly defined in all circumstances, including the rights of senior versus junior note holders.

Documentation Disclosure and Legal Review

2.13 To help investors to fully understand the terms, conditions, legal and commercial information prior to investing in a new offering[386O] and to ensure that this information is set out in a clear and effective manner for all programmes and offerings, the Reporting Bank shall ensure that sufficient initial offering[386P] and draft underlying[386Q] documentation are made available to investors (and readily available to potential investors on a continuous basis) within a reasonably sufficient period of time prior to pricing, or when legally permissible, such that the investor is provided with full disclosure of the legal and commercial information and comprehensive risk factors needed to make informed investment decisions. The Reporting Bank shall also ensure that final offering documents are made available from the closing date and all final underlying transaction documents

[386O] For the avoidance of doubt, any type of securitisation should be allowed to fulfil the requirements of paragraphs 2.13 and 2.14 of this Annex once it meets its prescribed standards of disclosure and legal review.

[386P] Such as a draft offering circular, draft offering memorandum, draft offering document or draft prospectus.

[386Q] Such as a/an asset sale agreement, assignment, novation or transfer agreement; servicing, backup servicing, administration and cash management agreements; trust/management deed, security deed, agency agreement, account bank agreement, guaranteed investment contract, incorporated terms or master trust framework or master definitions agreement as applicable; any relevant inter-creditor agreements, swap or derivative documentation, subordinated loan agreements, start-up loan agreements and liquidity facility agreements; and any other relevant underlying documentation, including legal opinions.

shortly thereafter. These should be composed such that readers can readily find, understand and use relevant information.

2.14 To ensure that all the securitisation's underlying documentation has been subject to appropriate review prior to publication, the Reporting Bank shall ensure that the terms and documentation of the securitisation are reviewed by an appropriately experienced third party legal practice, such as a legal counsel already instructed by one of the transaction parties, e.g. by the arranger or the trustee. The Reporting Bank shall satisfy itself that investors are notified in a timely fashion of any changes in such documents that have an impact on the structural risks in the securitisation.

Alignment of Interest

2.15 In order to align the interests of those responsible for the underwriting of the credit claims or receivables with those of investors, the Reporting Bank shall ensure that the originator of the credit claims or receivables retains a material net economic exposure and demonstrates a financial incentive in the performance of these assets following their securitisation.

**Section 3: Fiduciary and Servicer Risk**

Fiduciary and Contractual Responsibilities

3.1 The Reporting Bank shall satisfy itself that servicers in a securitisation have extensive workout expertise, thorough legal and collateral knowledge and a proven track record in loss mitigation. The Reporting Bank shall satisfy itself that –

(a) the servicer is able to demonstrate expertise in the servicing of the underlying credit claims or receivables, supported by a management team with extensive industry experience;

(b) the servicer at all times acts in accordance with reasonable and prudent standards;

(c) the servicer's policies, procedures and risk management controls are well documented and adhere to good market practices and relevant regulatory regimes; and

(d) the servicer has in place strong systems and reporting capabilities, in accordance with paragraph 3.5 of this Annex.

3.2 The Reporting Bank shall ensure that both the initial offering and all underlying documentation contain provisions facilitating the timely resolution of conflicts between different classes of note holders by the trustees, to the extent permitted by applicable law.

3.3 The Reporting Bank shall satisfy itself that the party or parties with fiduciary responsibility to the securitisation and to investors demonstrate sufficient skills and

resources to comply with their duties of care in the administration of the securitisation vehicle, and to act on a timely basis in the best interests of securitisation note holders.

3.4 The Reporting Bank should satisfy itself that remuneration to parties with fiduciary responsibility towards investors and to servicers is such that these parties are incentivised and able to meet their responsibilities in full and on a timely basis.

3.5 In assessing whether "strong systems and reporting capabilities are in place", well documented policies, procedures and risk management controls, as well as strong systems and reporting capabilities, may be substantiated by a third-party review for non-banking entities.

Transparency to Investors

3.6 To help provide full transparency to investors, assist investors in the conduct of their due diligence and to prevent investors being subject to unexpected disruptions in cash flow collections and servicing, the Reporting Bank shall ensure that the contractual obligations, duties and responsibilities of all key parties to the securitisation, both those with a fiduciary responsibility and of the ancillary service providers, are defined clearly both in the initial offering and all underlying documentation. The Reporting Bank shall ensure that provisions are documented for the replacement of servicers, bank account providers, derivatives counterparties and liquidity providers in the event of failure or non-performance or insolvency or other deterioration of creditworthiness of any such counterparty to the securitisation.

3.7 To enhance transparency and visibility over all receipts, payments and ledger entries at all times, the Reporting Bank shall satisfy itself that the performance reports to investors distinguish and report the securitisation's income and disbursements, such as scheduled principal, redemption principal, scheduled interest, prepaid principal, past due interest and fees and charges, delinquent, defaulted and restructured amounts under debt forgiveness and payment holidays, including accurate accounting for amounts attributable to principal and interest deficiency ledgers.

3.8 The terms "initial offering" and "underlying transaction documentation" should be understood in the context defined in paragraph 2.13 of this Annex. The term "income and disbursements" should also be understood as including deferment, forbearance, and repurchases among the items described.

## Section 4: Additional Criteria

Credit Risk of Underlying Exposures

4.1 At the portfolio cut-off date, the Reporting Bank shall ensure that the underlying exposures meet the conditions under the Standardised Approach for credit risk, after taking into account any eligible credit risk mitigation, for being assigned a risk weight equal to or smaller than –

(a) 40% on a value-weighted average exposure basis for the portfolio where the exposures are loans secured by residential mortgages or fully guaranteed residential loans;

(b) 50% on an individual exposure basis where the exposure is a loan secured by a commercial mortgage;

(c) 75% on an individual exposure basis where the exposure is a retail exposure; or

(d) 100% on an individual exposure basis for any other exposure.

Granularity of the Underlying Pool

4.2 At the portfolio cut-off date, the Reporting Bank shall ensure that the aggregated value of all exposures to a single obligor shall not exceed 1%[387] of the aggregated outstanding exposure value of all exposures in the portfolio.

[387] In jurisdictions with structurally concentrated corporate loan markets available for securitisation subject to ex-ante supervisory approval and only for corporate exposures, the applicable maximum concentration threshold could be increased to 2% if the originator retains subordinated tranche(s) that form loss absorbing credit enhancement, as defined in paragraph 7.6.33(a), and which cover at least the first 10% of losses. These tranche(s) retained by the originator shall not be eligible for the STC capital treatment.

**Annex 7AH**

[Deleted by MAS Notice 637 (Amendment No. 2) 2017]

**Annex 7AI**

## CREDIT VALUATION ADJUSTMENT

### Section 1: Overview of Calculation of CVA RWA

1.1 A Reporting Bank shall calculate its CVA risk capital requirements arising from its OTC derivative transactions[387A] using one of the following methods:

(a) if it has approval to use the CCR internal models method and to use the IMA for the specific interest rate risk of bonds[388], the CVA advanced method set out in Section 3 of this Annex; or

(b) in all other cases, the CVA standardised method set out in Section 2 of this Annex.

[MAS Notice 637 (Amendment No. 2) 2014]

1.2 A Reporting Bank is not required to calculate CVA risk capital requirements for SFTs and transactions with a central counterparty. The Authority may however require CVA risk capital requirements to be calculated for SFT if the Reporting Bank's CVA loss exposures arising from SFT are deemed to be material.

1.3 A Reporting Bank is not required to calculate CVA risk capital requirements for a credit derivative bought to hedge a banking book exposure where –

(a) the Reporting Bank recognises the effects of CRM of the credit derivative on the banking book exposure; and

(b) the banking book exposure itself is not subject to CVA risk capital requirements.

The Reporting Bank shall not recognise the effects of CRM of this credit derivative for any other exposure.

1.4 A Reporting Bank shall calculate the CVA RWA as the CVA risk capital requirement calculated using the CVA standardised method in accordance with Section 2 of this Annex

[387A] A Reporting Bank shall not be required to calculate CVA risk capital requirements for defaulted counterparties where the loss due to default has been recognised for accounting purposes and provided that, as a result of the default, the OTC derivative transactions have been transformed into a simple claim and no longer have the characteristics of an OTC derivative.

[MAS Notice 637 (Amendment No. 2) 2014]

[388] For exposures to certain counterparties, the Reporting Bank's approved market risk VaR model may not reflect the risk of credit spread changes appropriately, because the Reporting Bank's market risk VaR model does not appropriately reflect the specific risk of debt instruments issued by the counterparty. For such exposures, the Reporting Bank shall not be allowed to use the CVA advanced method, and shall calculate its CVA risk capital requirements arising from its OTC derivative transactions using the CVA standardised method set out in Section 2 of this Annex. The Reporting Bank shall only use the CVA advanced method to calculate its CVA risk capital requirements for exposures to counterparties for which the Reporting Bank has approval for modeling the specific risk of debt instruments.

or the CVA advanced method in accordance with Section 3 of this Annex, multiplied by 12.5.

1.5 A Reporting Bank shall only include hedges used for the purpose of mitigating CVA risk, and managed as such[389], in the calculation of the CVA risk capital requirement using the CVA standardised method in accordance with Section 2 of this Annex or the CVA advanced method in accordance with Section 3 of this Annex.[390]

1.6 Subject to paragraph 1.6A of this Annex, a Reporting Bank shall only include the following as eligible hedges[391] in the calculation of the CVA risk capital requirement using the CVA standardised method in accordance with Section 2 of this Annex or the CVA advanced method in accordance with Section 3 of this Annex[391A]:

[MAS Notice 637 (Amendment No. 2) 2014]

(a) single-name credit default swap;

(b) single-name contingent credit default swap;

(c) other equivalent hedging instruments referencing the counterparty directly; and

(d) index credit default swap, only if the basis between any individual counterparty spread and the spreads of index credit default swap hedges are taken into account in the calculation of VaR under the IMA[392].

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[389] For avoidance of doubt, a Reporting Bank shall only recognise hedges with external counterparties as CVA risk mitigants in the calculation of the CVA risk capital requirement. The Reporting Bank shall not recognize hedges with an internal desk within the Reporting Bank as CVA risk mitigants in the calculation of the CVA risk capital requirement.

[390] For example, if a credit default swap referencing an issuer is in the Reporting Bank's inventory and that the issuer also happens to be an OTC derivative counterparty but the credit default swap is not managed as a hedge of CVA, then such a credit default swap is not eligible to offset the CVA risk capital requirement.

[391] For avoidance of doubt, a Reporting Bank shall not include all tranched or nth-to-default credit default swaps, including credit linked notes and first loss credit default swaps on a single entity or basket of entities, as eligible hedges in the calculation of the CVA risk capital requirement. The Reporting Bank shall consider whether in economic substance, the credit default swap protection is effectively tranched, taking into account all forms of arrangements between the Reporting Bank and the protection provider. If the Reporting Bank remains effectively exposed to a tranche of the underlying default risk by providing a liquidity facility or any form of credit enhancement to the protection provider, then the credit default swap is not an eligible hedge. The Reporting Bank shall include a single name short bond position as an eligible hedge only if the basis risk is taken into account in the calculation of VaR under the IMA. The Reporting Bank shall not include any instrument of which the associated payment depends on cross default as an eligible hedge. When restructuring is not included as a credit event in the credit default swap -
(a) for the purposes of calculating the CVA risk capital requirement under the CVA advanced method, the credit default swap shall be recognised as in the Reporting Bank's approved VaR model under the IMA; and
(b) for the purposes of calculating the CVA risk capital requirement under the CVA standardised method, the credit default swap will be recognised according to the SA(MR).

[MAS Notice 637 (Amendment No. 2) 2014]

[391A] The Reporting Bank shall ensure that it derecognises overhedging on a single name level.

[MAS Notice 637 (Amendment No. 2) 2014]

[392] This applies regardless of whether available spreads or proxy spreads are used. In the case of proxy spreads, the Reporting Bank shall use reasonable basis time series out of a representative bucket of similar names for which a spread is available. If the basis is not reflected to the satisfaction of the Authority, the Reporting Bank shall only reflect 50% of the notional amount of the index credit default swap hedges in the VaR.

1.6A A Reporting Bank may consider a single-name credit default swaption or an index credit default swaption as an equivalent hedging instrument, and therefore an eligible hedge, if the option contract does not contain a knock-out clause (i.e. the option contract is not terminated following a credit event).

[MAS Notice 637 (Amendment No. 2) 2014]

1.7 A Reporting Bank shall treat other types of counterparty risk hedges, that are not eligible hedges in the calculation of the CVA risk capital requirement, as any other instrument in its inventory for regulatory capital purposes. A Reporting Bank shall only remove eligible hedges that are included in the CVA risk capital requirement from its market risk capital requirement.

1.8 A Reporting Bank shall not offset the CVA risk capital requirement against other instruments on its balance sheet.

**Section 2: CVA standardised method**

2.1 A Reporting Bank shall calculate the CVA risk capital requirement, $K_{CVA}$, using the following formula:

$$K_{CVA} = 2.33 \times \sqrt{h} \times \sqrt{\left\{\sum_i 0.5 \times w_i \times \left(M_i \times EAD_i^{total} - M_i^{hedge} \times B_i\right) - \sum_{ind} w_{ind} \times M_{ind} \times B_{ind}\right\}^2 + \sum_i 0.75 \times w_i^2 \times \left(M_i \times EAD_i^{total} - M_i^{hedge} \times B_i\right)^2}$$

where -

(a) $h$ is the one-year risk horizon (in units of a year), $h$ = 1;

(b) $w_i$ is the weight applicable to counterparty 'i'. Counterparty 'i' shall be mapped to one of the six weights set out in Table 7AI-1 based on its credit quality grade[393]. For a counterparty which does not have an external credit assessment by a recognised ECAI, if a Reporting Bank has received approval from the Authority to adopt the IRBA pursuant to Division 4 of this Part, it shall map the internal rating of the counterparty to the appropriate credit quality grade, and in all other cases, it shall apply a weight of 2% to the counterparty;

[MAS Notice 637 (Amendment) 2013]
[MAS Notice 637 (Amendment No. 2) 2014]

(c) $EAD_i^{total}$ is the E or EAD, whichever is applicable, of counterparty 'i' (summed across its netting sets), including the effect of collateral and netting, as per the applicable rules set out in Annex 7O or Annex 7Q, with the following adjustments –

(iv) the effect of any credit protection that the Reporting Bank intends to include as an eligible hedge shall be excluded; and

393 A Reporting Bank shall assign the counterparty to the credit quality grade based on the external credit assessment that is applicable to the counterparty in accordance with Table 7R-1 of Annex 7R of this Part.

(ii) the reduction of E or EAD, whichever is applicable, by incurred CVA losses, as set out in paragraphs 7.2.20A and 7.2.32A of Part VII, shall not apply.

For a Reporting Bank using the SA-CCR, the exposure shall be discounted by applying the factor (1-exp(-0.05*$M_i$))/(0.05*$M_i$). For a Reporting Bank using the CCR internal models method, no such discount shall be applied as the discount factor is already included in $M_i$;

[MAS Notice 637 (Amendment) 2016]

(d) $B_i$ is the notional of purchased single name credit default swap hedges (summed if more than one position) referencing counterparty 'i', and used to hedge CVA risk[393A]. This notional amount shall be discounted by applying the factor (1-exp(-0.05*$M_i^{hedge}$))/(0.05* $M_i^{hedge}$);

[MAS Notice 637 (Amendment No. 2) 2014]

(e) $B_{ind}$ is the full notional of one or more index credit default swap of purchased protection, used to hedge CVA risk[393B]. This notional amount shall be discounted by applying the factor (1-exp(-0.05*$M_{ind}$))/(0.05* $M_{ind}$);

[MAS Notice 637 (Amendment No. 2) 2014]

(f) $w_{ind}$ is the weight applicable to index hedges. A Reporting Bank shall map indices to one of the six weights set out in Table 7AI-1 based on the average spread of index 'ind'[393C];

[MAS Notice 637 (Amendment No. 2) 2014]

(g) $M_i$ is the effective maturity of the transactions with counterparty 'i'. For a Reporting Bank using the CCR internal models method, $M_i$ shall be calculated as per paragraph 3.1 of Annex 7Z. For a Reporting Bank using the SA-CCR, $M_i$ shall be calculated as per paragraph 2.1 of Annex 7Z[394], except that the five year limit on M set out in paragraph 1.1(a) of Annex 7Z shall not apply;

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[393A] In the case where the eligible hedge is a single-name credit default swaption, a Reporting Bank shall reflect the moneyness of the credit default swaption in the formula set out in paragraph 2.1 of this Annex. For this purpose, $B_i$ shall be the delta-weighted notional of the single-name credit default swaption.

[MAS Notice 637 (Amendment No. 2) 2014]

[393B] In the case where the eligible hedge is an index credit default swaption, a Reporting Bank shall reflect the moneyness of the credit default swaption in the formula set out in paragraph 2.1 of this Annex. For this purpose, $B_{ind}$ shall be the delta-weighted notional of the index credit default swaption.

[MAS Notice 637 (Amendment No. 2) 2014]

[393C] The Reporting Bank shall first determine the weight applicable to each constituent of the index in accordance with paragraph 2.1(b) of this Annex, and then compute the weighted average of the weights applicable to the constituents, where the weighting used for the weighted average is the proportion of the index that each constituent represents.

[MAS Notice 637 (Amendment No. 2) 2014]

[394] The Reporting Bank shall determine the effective maturity $M_i$ separately for each netting set, if there is more than one netting set to the same counterparty. Where $M_i$ of a netting set is less than one year, $M_i$ shall be set at one year. The Reporting Bank shall discount E or EAD, whichever is applicable, of each netting set according to its individual maturity and sum the product of $M_i$ and $EAD_i$ for each counterparty.

[MAS Notice 637 (Amendment No. 2) 2014]

(h) $M_i^{hedge}$ is the maturity of the hedge instrument with notional $B_i$ (the quantities $M_i^{hedge} \times B_i$ shall be summed if these are several positions); and

(i) $M_{ind}$ is the maturity of the index hedge 'ind' with notional $B_{ind}$ (the quantities $M_{ind} \times B_{ind}$ shall be summed if these are several positions).

For any counterparty that is also a constituent of an index on which a credit default swap is used for hedging counterparty credit risk, the notional amount attributable to that single name (as per its reference entity weight) may, with supervisory approval, be subtracted from the index credit default swap notional amount and treated as a single name hedge ($B_i$) of the individual counterparty with maturity based on the maturity of the index.

For an eligible hedge of a Reporting Bank recognised in the CVA risk capital requirement calculated pursuant to paragraph 2.1, the Reporting Bank shall include the CVA risk to the protection provider for the eligible hedge.

**Table 7AI-1 – Counterparty Credit Rating and Weight $w_i / w_{ind}$**

| Credit Quality Grade | Weight $w_i / w_{ind}$ |
|---|---|
| 1 | 0.7% |
| 2 | 0.8% |
| 3 | 1.0% |
| 4 | 2.0% |
| 5 | 3.0% |
| 6 | 10.0% |

2.2 For the purpose of paragraph 2.1, in the case where a Reporting Bank bought credit protection to hedge a counterparty credit risk exposure that is subject to the CVA risk capital requirement and recognises the effects of CRM of the credit protection on the exposure, the Reporting Bank shall –

(a) deduct the protected amount of the credit protection multiplied by the residual maturity of the credit protection, from the $M_i * EAD_i$ of the counterparty whose counterparty credit risk is being hedged; and

(b) add the protected amount of the credit protection multiplied by the residual maturity of the credit protection, to the $M_i * EAD_i$ of the protection provider.

**Section 3: CVA advanced method**

3.1 A Reporting Bank, regardless of the accounting valuation method used for determining CVA, shall calculate the CVA risk capital requirement for each OTC derivative counterparty based on the following formula:

$$CVA = (LGD_{MKT}) \sum_{i=1}^{T} Max\left(0; e^{-\frac{s_{i-1}t_{i-1}}{LGD_{MKT}}} - e^{-\frac{s_i t_i}{LGD_{MKT}}}\right)\left(\frac{EE_{i-1}D_{i-1} + EE_i D_i}{2}\right)$$

[MAS Notice 637 (Amendment) 2013]

where –

(a) $t_i$ is the time of the i-th revaluation time bucket, starting from $t_0 = 0$;

(b) $t_T$ is the longest contractual maturity across the netting sets with the counterparty;

(c) $s_i$ is the credit spread of the counterparty at tenor $t_i$, using the credit default swap spread of the counterparty, or where such a credit default swap spread is unavailable, a proxy spread that is appropriate based on the rating, industry and region of the counterparty[395];

[MAS Notice 637 (Amendment No. 2) 2014]

(d) $LGD_{MKT}$ is the loss given default of the counterparty, based on the spread of a market instrument of the counterparty, or where such a market instrument is unavailable, a proxy spread that is appropriate based on the rating, industry and region of the counterparty[396];

(e) $EE_i$ is the expected exposure to the counterparty at revaluation time $t_i$, as per the applicable rules set out in Annex 7Q, including the effect of collateral and netting but excluding the effect of any credit protection that the Reporting Bank intends to include as an eligible hedge, where exposures of different netting sets for such counterparty are added, and where the longest maturity of each netting set is given by the longest contractual maturity inside the netting set[397]: and

(f) $D_i$ is the default risk-free discount factor at time $t_i$, where $D_0 = 1$.

3.2 [Deleted by MAS Notice 637 (Amendment) 2016]

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[395] The Reporting Bank shall employ a methodology for determining the proxy that is consistent with the methodology applied under the IMA for specific interest rate risk.

[396] $LGD_{MKT}$ is a market assessment and is different from the LGD used under the IRBA, which are internal estimates. In cases where netting set of OTC derivatives has a different seniority than those OTC derivative instruments that trade in the market from which $LGD_{MKT}$ is inferred, the Reporting Bank may adjust $LGD_{MKT}$ to reflect this difference in seniority. Risk mitigants or experience specific to the firm shall not be considered in the calculation of this adjustment. A Reporting Bank may also use market information on fixed recovery rate for credit default swap pricing purposes for the purposes of $LGD_{MKT}$ in the absence of other information.

[MAS Notice 637 (Amendment No. 2) 2014]

[397] A Reporting Bank with approval to use the CCR internal models method for the majority of their businesses, but which uses the SA-CCR for certain smaller portfolios, and which has the approval to use the IMA for the specific interest rate risk of bonds, shall calculate the CVA risk capital requirement for such netting sets in accordance with this Section, unless the Authority decides that the CVA standardised method set out in Section 2 of this Annex should apply for these portfolios. The Reporting Bank shall calculate the CVA risk capital requirement for such netting sets under the CVA advanced method by assuming a constant EE profile, where EE is set equal to the E or EAD, whichever is applicable, as computed under the SA-CCR for a maturity equal to the maximum of (i) half of the longest maturity occurring in the netting set; and (ii) the notional weighted average maturity of all transactions inside the netting set. The same approach applies where the CCR internal models method does not produce an EE profile.

[MAS Notice 637 (Amendment) 2016]

3.3 For the purpose of paragraph 3.1, in the case where a Reporting Bank bought credit protection to hedge a counterparty credit risk exposure that is subject to the CVA risk capital requirement and recognises the effects of CRM of the credit protection on the exposure[398], the Reporting Bank shall –

(a) reduce EEi to the counterparty on which the protection was bought, by the protected amount; and

(b) increase EEi to the protection provider, by the amount of protection sold.

3.4 A Reporting Bank shall use the formula set out in paragraph 3.1 as the basis for inputs into the Reporting Bank's approved VaR model for bonds under the IMA to calculate its CVA risk capital requirement for a counterparty. The approved VAR model shall model the impact of changes in the counterparties' credit spreads on the CVAs of all OTC derivative counterparties, together with eligible hedges according to paragraphs 1.5 and 1.6[398A]. The approved VAR model shall be restricted to changes in the counterparties' credit spreads and shall not model the sensitivity of CVA to changes in other market factors, such as changes in the value of the reference asset, commodity, currency or interest rate of a derivative. The CVA risk capital requirement shall consist of both general and specific credit spread risks, including stressed VaR but excluding the IRC. Examples of the application of the CVA formula are set out in Table 7AI-2 below.

[MAS Notice 637 (Amendment No. 2) 2014]

3.5 A Reporting Bank shall calculate VaR, in accordance with the quantitative standards set out in Sub-division 9 of Division 3 of Part VIII as the sum of –

(a) non-stressed VaR, using current parameter calibrations for EE; and

(b) stressed VaR, using future counterparty EE profiles (according to the stressed exposure parameter calibration as set out in paragraph 8.18A of Annex 7Q of this Part), and the most severe one-year stress period contained within the three-year stress period used for the exposure parameters as the period of stress for credit spread parameters[399].

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[398] A Reporting Bank shall recognise the effect of CRM of the credit protection only where $t_i$ is smaller than the maturity of the credit protection.

[398A] Where a Reporting Bank includes a single-name credit default swaption or an index credit default swaption as an eligible hedge under paragraph 1.6A of this Annex, the Reporting Bank shall properly capture the non-linear risk of credit default swaptions in the Reporting Bank's approved VaR model for the purposes of calculating the CVA risk capital requirement.

[MAS Notice 637 (Amendment No. 2) 2014]

[399] The three-times multiplier inherent in the calculation of a bond VaR and a stressed VaR will apply to these calculations.

**Table 7AI-2: Examples of application of the CVA formula**

| Basis of approved VaR Model under the IMA | Application of CVA formula[400] |
|---|---|
| Full repricing | Direct use of formula as in Paragraph 3.1 of this Annex |
| Credit spread sensitivities for specific tenors | Each credit spread sensitivity shall be based on the following formulas: <br><br> For $i < T$: <br><br> $$CS01_i = 0.0001 t_i e^{\left(-\frac{s_i t_i}{LGD_{MKT}}\right)} \left(\frac{EE_{i-1}D_{i-1} - EE_{i+1}D_{i+1}}{2}\right)$$ <br><br> For $i = T$: <br><br> $$CS01_T = 0.0001 t_T e^{\left(-\frac{s_T t_T}{LGD_{MKT}}\right)} \left(\frac{EE_{T-1}D_{T-1} + EE_T D_T}{2}\right)$$ |
| Credit spread sensitivities to parallel shifts in credit spreads | $$CS01 = 0.0001 \sum_{i=1}^{T} \left(t_i e^{-\frac{s_i t_i}{LGD_{MKT}}} - t_{i-1} e^{-\frac{s_{i-1} t_{i-1}}{LGD_{MKT}}}\right) \left(\frac{EE_{i-1}D_{i-1} + EE_i D_i}{2}\right)$$ |
| Second-order sensitivities to shifts in credit spreads | Spread gamma shall be calculated based on the formula as in Paragraph 3.1 of this Annex |

[400] For a Reporting Bank using full repricing-based models, the Reporting Bank shall use credit spreads that are based on the relevant stress scenarios in the CVA formula. For a Reporting Bank using sensitivities-based models, the Reporting Bank shall use credit spreads that are as at valuation date in the CVA formula.

**ANNEX 7AJ**

## EXPOSURES TO CENTRAL COUNTERPARTIES

### Section 1: Overview

1.1 A Reporting Bank shall include exposures to CCPs arising from the following transactions[401] in the calculation of its CCP RWA -

(a) OTC derivative transactions;

(b) exchange-traded derivative transactions;

(c) SFTs; and

(d) Long settlement transactions.

[MAS Notice 637 (Amendment No. 2) 2014]

Where the clearing member-to-client leg of an exchange-traded derivative transaction is conducted under a bilateral agreement, a Reporting Bank shall, whether it is a clearing member or a client in the transaction, or a lower level client or higher level client in the case of a multi-level client structure, capitalise that transaction as an OTC derivative transaction in accordance with Subdivision 3 or Subdivision 4 of Division 1 of this Part VII and calculate CVA RWA for such exposures in accordance with Annex 7AI.

[MAS Notice 637 (Amendment) 2016]

1.2 Where a Reporting Bank applies paragraph 1.3 of this Annex for calculating CCP RWA for exposures to a qualifying CCP, the Reporting Bank shall ensure that the CCP meets the following requirements in order to be treated as a qualifying CCP:

[MAS Notice 637 (Amendment No. 2) 2014]

(a) the CCP holds a licence to operate as a CCP (including a licence granted by way of confirming an exemption), and is permitted by a financial services regulatory authority to operate as a CCP with respect to the products it offers;

(b) the CCP is based and subject to prudential standards and supervision in a jurisdiction where the financial services regulatory authority has established, and publicly indicated that the financial services regulatory authority applies to the CCP on an ongoing basis, domestic rules and regulations that are consistent with the CPSS-IOSCO Principles for Financial Market Infrastructures; and

[MAS Notice 637 (Amendment No. 2) 2014]

[401] For the avoidance of doubt, exposures arising from the settlement of cash transactions, such as equity, fixed income, spot foreign exchange or spot commodity transactions shall not be included in the calculation of the CCP RWA.

[401A] [Deleted by MAS Notice 637 (Amendment) 2016]

[401B] [Deleted by MAS Notice 637 (Amendment) 2016]

(c) the terms defined in paragraphs 3.6 to 3.9 of this Annex relating to the calculation of the capital requirement for default fund exposures are made available or calculated in accordance with the requirements in paragraph 3.2 of this Annex.

[MAS Notice 637 (Amendment) 2016]

1.3 Subject to paragraph 1.3A, for exposures to a qualifying CCP, a Reporting Bank shall calculate the CCP RWA for exposures to the CCP as the sum of –

(a) RWA for CCP trade exposures calculated in accordance with Section 2 of this Annex; and

(b) RWA for default fund exposures, calculated as the capital requirement calculated in accordance with paragraph 3.5 to 3.9 of this Annex, multiplied by 12.5. For avoidance of doubt, the Reporting Bank shall apply a 0% risk weight to its contributions to pre-funded default funds covering settlement-risk-only products.

[MAS Notice 637 (Amendment) 2016]

1.3A Where a Reporting Bank's CCP RWA (calculated in accordance with paragraph 1.3 of this Annex) for trade exposures and default fund contribution to a qualifying CCP is higher than the CCP RWA (calculated in accordance with paragraph 1.5 of this Annex) that would apply if the CCP is a non-qualifying CCP, the Reporting Bank shall calculate its CCP RWA for trade exposures and default fund contribution to the qualifying CCP in accordance with paragraph 1.5 of this Annex.

[MAS Notice 637 (Amendment) 2016]

1.4 The Authority shall have the discretion to determine if a Reporting Bank shall be required to hold more than the CCP RWA calculated in accordance with paragraph 1.3 of this Annex, under Part X[402].

[MAS Notice 637 (Amendment) 2016]

1.5 For exposures to a CCP which is not a qualifying CCP, a Reporting Bank shall calculate the CCP RWA for exposures to the CCP as the sum of –

(a) RWA for CCP trade exposures calculated by applying the steps set out in Subdivision 3 of Division 1 of Part VII[403]; and

(b) 1250% of default fund exposures, including all pre-funded contributions and unfunded[404] contributions which are liable to be paid by the Reporting

402 This might be appropriate where, for example, an external assessment such as a Financial Sector Assessment Program by the International Monetary Fund and World Bank has found material shortcomings in the CCP or the regulation of CCPs, and the CCP or the financial services regulatory authority supervising the CCP has not since publicly addressed the issues identified.

403 For avoidance of doubt, the RWA for such CCP trade exposures shall not be included within the SA(CR) RWA of the Reporting Bank.

404 Where there is unlimited liability for unfunded contributions (i.e. unlimited binding commitments) of the Reporting Bank to the default fund of any CCP, the amount of unfunded commitments to which the 1250% risk weight should apply shall be determined by the Authority under Part X.

Bank should the CCP so require. For avoidance of doubt, the Reporting Bank shall apply a 0% risk weight to its contributions to pre-funded default funds covering settlement-risk-only products.

[MAS Notice 637 (Amendment) 2016]

1.6 For exposures to a CCP which operates in a jurisdiction that does not have a financial services regulatory authority applying the CPSS-IOSCO Principles for Financial Market Infrastructures, a Reporting Bank shall calculate the CCP RWA for exposures to the CCP in accordance with paragraph 1.5 of this Annex, unless the Authority determines otherwise.

[MAS Notice 637 (Amendment) 2016]

1.7 Where a CCP (for which CCP RWA had been calculated in accordance with paragraph 1.3 of this Annex) ceases to meet the requirements to be treated as a qualifying CCP set out in paragraph 1.2 of this Annex, a Reporting Bank shall, within three months of the CCP ceasing to meet the requirements to be treated as a qualifying CCP set out in paragraph 1.2 of this Annex, calculate the CCP RWA for exposures to the CCP in accordance with paragraph 1.3 of this Annex, unless the Authority requires otherwise. After the three months, the Reporting Bank shall calculate the CCP RWA for exposures to the CCP in accordance with paragraph 1.5 of this Annex.

[MAS Notice 637 (Amendment) 2016]

1.8 Notwithstanding paragraphs 1.2, 1.3 and 1.5 of this Annex and regardless of whether a CCP is treated as a qualifying CCP, a Reporting Bank shall ensure that it maintains adequate capital for its exposures to a CCP and shall consider as part of its ICAAP under Part X if it should hold capital in excess of the requirements set out in paragraphs 1.3 and 1.5 of this Annex if, for example, its transactions with the CCP give rise to exposures that pose higher risks or where, given the context of that Reporting Bank's dealings with the CCP, it is unclear that the CCP meets the requirements specified in paragraph 1.2 of this Annex.

[MAS Notice 637 (Amendment) 2016]

1.9 Where a Reporting Bank acts as a clearing member of a CCP, it shall assess through appropriate scenario analysis and stress testing whether the level of capital held against exposures to a CCP adequately addresses the inherent risks of those transactions. The Reporting Bank shall include, in the assessment, potential future or contingent exposures resulting from future drawings on default fund commitments, and from secondary commitments to take over or replace offsetting transactions from clients of another clearing member in case of that clearing member defaulting or becoming insolvent.

1.10 A Reporting Bank shall monitor and report to senior management and the appropriate committee of the Board of the Reporting Bank on a regular basis all its exposures to CCPs, including exposures arising from trading through a CCP and exposures arising from CCP membership obligations, such as default fund contributions.

**Section 2: CCP Trade Exposures**

Exposures to a CCP where a Reporting Bank is a Clearing Member

2.1 Where a Reporting Bank acts as a clearing member of a CCP for its own purposes, the Reporting Bank shall calculate its RWA for CCP trade exposures as 2% of E or EAD, whichever is applicable, of the Reporting Bank's CCP trade exposures to the CCP. Where a Reporting Bank which acts as a clearing member of a CCP offers clearing services to clients, the Reporting Bank shall calculate its RWA for CCP trade exposures as 2% of E or EAD, whichever is applicable, of the Reporting Bank's CCP trade exposures to the CCP, that arises when the Reporting Bank is obligated to reimburse the client for any losses due to changes in the value of its transactions in the event that the CCP defaults. The Reporting Bank shall calculate its RWA for collateral posted to the CCP in accordance with paragraphs 2.8 to 2.13 of this Annex.

[MAS Notice 637 (Amendment) 2016]

2.2 A Reporting Bank shall calculate E or EAD, whichever is applicable, of the CCP trade exposures in accordance with Subdivision 6, 7 or 8, whichever is applicable, of Division 2 of Part VII, including the provisions for calculating the effects of CRM for collateralised transactions. A Reporting Bank shall apply the method for calculating E or EAD, whichever is applicable, of CCP trade exposures consistently as that applied for the Reporting Bank's measurement of its other pre-settlement counterparty exposures[404A].

[MAS Notice 637 (Amendment No. 2) 2014]
[MAS Notice 637 (Amendment) 2016]

2.3 Notwithstanding paragraph 2.2 of this Annex, for a Reporting Bank calculating E or EAD, whichever is applicable, using the CCR internal models method or SA-CCR, the 20-day floor for the margin period of risk and the minimum holding period for a netting set where the number of trades exceeds 5,000 at any point during a quarter, as set out in paragraph 6.5 of Annex 7Q and Table 7J-2 of Annex 7J, shall not apply if there are no disputed trades within the netting set and the netting set does not contain any illiquid collateral or exotic trades, subject to the following –

(a) in all cases, a minimum margin period of risk of 10 business days shall apply to the calculation of RWA for trade exposures to CCPs for OTC derivative transactions; and

(b) where CCPs retain variation margin against certain trades and collateral posted by a clearing member is not protected against the insolvency of the CCP, the minimum time risk horizon applied to banks' trade exposures on

[404A] Where a Reporting Bank provides clearing services to clients and passes collateral collected from a client to the CCP for trades cleared through a CCP, the Reporting Bank may recognise the effects of CRM for such collateral in both capitalisation of exposures to the client and the capitalisation of exposures to the CCP. Where the Reporting Bank is part of a multi-level client structure, the same treatment for such collateral may apply to transactions between both lower level clients and higher level clients. For the avoidance of doubt, a Reporting Bank may, in calculating E or EAD of the collateralised transactions with their clients, recognise the effects of CRM of the initial margin posted by their clients.

[MAS Notice 637 (Amendment No. 2) 2014]
[MAS Notice 637 (Amendment) 2016]

such trades shall be the lesser of one year and the remaining maturity of the transaction, subject to a floor of 10 business days.

[MAS Notice 637 (Amendment) 2016]

2.4 Where the settlement of transactions is legally enforceable on a net basis in an event of default, regardless of whether the counterparty is insolvent or bankrupt, a Reporting Bank may calculate the total replacement cost of all contracts relevant to the calculation of E or EAD, whichever is applicable, of CCP trade exposures as a net replacement cost if the applicable close-out netting sets meet the requirements set out in Annex 7N[406]. If the Reporting Bank is not able to ensure that the netting agreements meet these requirements, the Reporting Bank shall regard each single transaction as a netting set of its own for the calculation of CCP trade exposures.

[MAS Notice 637 (Amendment) 2016]

Exposures to a CCP where a Reporting Bank is a Client of a Clearing Member

2.5 Where a Reporting Bank is a client of a clearing member or a lower level client in a multi-level client structure, and enters into a transaction with the clearing member or a higher level client acting as a financial intermediary (i.e. the clearing member or higher level client completes an offsetting transaction with a CCP or clearing member), or enters into a transaction with a CCP with a clearing member or higher level client guaranteeing the performance of the Reporting Bank, the Reporting Bank shall treat the exposure arising from the transaction as a CCP trade exposure and calculate the RWA for such CCP trade exposures in accordance with paragraphs 2.1 to 2.4 of this Annex if the following conditions are met:

(a) The Reporting Bank shall confirm that the offsetting transactions are identified by the CCP as client transactions and shall obtain a legal opinion which concludes[407] that the collateral to support such transactions is held by the CCP or the clearing member or both, as applicable, under arrangements that prevent any losses to the Reporting Bank due to –

(i) the default or insolvency of the clearing member;

(ii) the default or insolvency of the clearing member's other clients; and

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[405] [Deleted by MAS Notice 637 (Amendment) 2016]

[406] For the purposes of this Annex, the treatment of netting shall include any netting agreement that provides legally enforceable rights of set-off. This takes into account that for netting agreements employed by CCPs, no standardisation has currently emerged that would be comparable to level of standardisation with respect to netting agreements for bilateral trading of OTC derivative transactions.

[407] That is, in the event of legal challenge, the relevant courts and administrative authorities would find that the arrangements set out in paragraph 2.5(a) of this Annex would be legal, valid, binding and enforceable under the relevant laws of the relevant jurisdictions.

[MAS Notice 637 (Amendment) 2016]

(iii) the joint default or insolvency of the clearing member and any of its other clients[408]; and

(b) relevant laws, regulation, rules, contractual, or administrative arrangements –

(i) provide that the offsetting transactions with the defaulted or insolvent clearing member are highly likely[408A] to continue to be indirectly transacted through the CCP, or by the CCP, should the clearing member default or become insolvent; and

(ii) allow for the Reporting Bank's positions and collateral placed with the CCP to be transferred at market value unless the Reporting Bank requests to close out at market value.

[MAS Notice 637 (Amendment No. 2) 2014]
[MAS Notice 637 (Amendment) 2016]

2.5A Where a Reporting Bank is a lower level client in a multi-level client structure, the Reporting Bank shall apply the capital treatment specified in paragraph 2.5 of this Annex to exposures arising from transactions with the higher level client acting as a financial intermediary or exposures arising from transactions with a CCP with a higher level client guaranteeing the performance of the Reporting Bank, if the conditions set out in paragraphs 2.5(a) and 2.5(b) of this Annex are met by all the client levels in-between the Reporting Bank and the clearing member.

[MAS Notice 637 (Amendment) 2016]

2.6 Notwithstanding paragraph 2.5 of this Annex , where a Reporting Bank is a client of a clearing member or lower level client in a multi-level client structure, the Reporting Bank shall calculate the RWA for CCP trade exposures to the clearing member or to the higher level client as 4% of E or EAD, whichever is applicable, of the CCP trade exposures calculated in accordance with paragraphs 2.2 to 2.4 of this Annex if all conditions set out in paragraph 2.5 of this Annex, other than paragraph 2.5(a)(iii) of this Annex, are met.

[MAS Notice 637 (Amendment) 2016]

2.7 Where a Reporting Bank is a client of a clearing member or lower level client in a multi-level client structure and the conditions set out in paragraphs 2.5 or 2.6 of this

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[408] That is, upon the insolvency of the clearing member, there is no legal impediment (other than the need to obtain a court order to which the Reporting Bank, as a client of the clearing member, is entitled) to the transfer of the collateral belonging to clients of a defaulting clearing member to the CCP, to one or more other surviving clearing members or to the Reporting Bank or the Reporting Bank's nominee. The Reporting Bank should consult the Authority to determine if this is achieved based on particular facts. The Authority intends to consult and communicate with other financial services regulatory authorities via the "frequently asked questions" process of the Basel Committee on Banking Supervision to ensure consistency.

[408A] Where there is a clear precedent for transactions being ported to another clearing member at a CCP and industry intent for this practice to continue, the Reporting Bank may consider these factors when assessing if trades are highly likely to be ported. The Reporting Bank shall not base a determination that the criteria in paragraph 2.5(b) of this Annex is met solely on the absence of any prohibition of the porting of client trades in documentation provided by the CCP.

[MAS Notice 637 (Amendment No. 2) 2014]

Annex are not met, the Reporting Bank shall capitalise its exposure to the clearing member or to the higher level client as a bilateral trade and shall calculate the RWA for such exposures in accordance with Subdivision 3 or Subdivision 4 of Division 1 of Part VII and calculate CVA RWA for such exposures in accordance with Annex 7AI.

[MAS Notice 637 (Amendment) 2016]

Treatment of Collateral Posted

2.8 Where a Reporting Bank acts as a clearing member of a CCP, the Reporting Bank shall not be subject to a capital requirement for counterparty credit risk to a custodian for collateral[409] posted by the Reporting Bank that is held by a custodian[410] and is bankruptcy remote from the CCP.

2.9 Where a Reporting Bank acts as a clearing member of a CCP, and posts collateral with the CCP that meets the definition of CCP trade exposure[411], is held at the CCP and is not held in a bankruptcy remote manner, the Reporting Bank shall calculate the CCP RWA for such CCP trade exposures as 2% of E or EAD, whichever is applicable, of the collateral posted.

2.10 Where a Reporting Bank posts collateral as a client of a clearing member of a CCP and the collateral is held by a custodian and is bankruptcy remote from the CCP, the clearing member and other clients, the Reporting Bank shall not be subject to a capital requirement for counterparty credit risk for the collateral posted.

2.11 Where a Reporting Bank posts collateral as a client of a clearing member of the CCP and the collateral is held at the CCP on the Reporting Bank's behalf and is not held on a bankruptcy remote basis, the Reporting Bank shall calculate the RWA for such CCP trade exposures as –

(a) 2% of E or EAD, whichever is applicable, of the collateral posted if the conditions set out in paragraph 2.5 of this Annex are met; or

(b) 4% of E or EAD, whichever is applicable, of the collateral posted if all conditions set out in paragraph 2.5 of this Annex, other than paragraph 2.5(a)(iii) of this Annex, are met.

2.12 Where a Reporting Bank posts collateral as a client of a clearing member of the CCP and the collateral is held at the clearing member and is not held on a bankruptcy

[409] Collateral may include cash, securities, other pledged assets, and excess initial or variation margin (or overcollateralisation).

[MAS Notice 637 (Amendment) 2016]

[410] Custodian may include a trustee, agent, pledgee, secured creditor or any other person that holds property in a way that does not give such person a beneficial interest in such property and will not result in such property being subject to legally-enforceable claims by the creditors of such persons, or to a court-ordered stay of the return of such property, should such person become insolvent or bankrupt.

[411] Where a Reporting Bank posts collateral with a CCP that does not meet the definition of CCP trade exposure or the definition of default fund, the Reporting Bank shall include such exposure to the CCP in the calculation of SA(CR) RWA or IRBA RWA, whichever is applicable, and shall calculate the RWA for such exposures to the CCP in accordance with Subdivision 3 or Subdivision 4 of Division 1 of Part VII based on the creditworthiness of the CCP.

[MAS Notice 637 (Amendment) 2016]

remote basis, a Reporting Bank shall calculate the CCP RWA for such exposures to the clearing member by applying the steps set out in Subdivision 3 or Subdivision 4 of Division 1 of Part VII[412] based on the creditworthiness of the clearing member, to recognise credit risk based upon the collateral being exposed to risk of loss.

[MAS Notice 637 (Amendment) 2016]

2.12A For the purposes of paragraphs 2.8 to 2.12 of this Annex, where a Reporting Bank uses the SA-CCR to calculate E or EAD, whichever is applicable, for pre-settlement counterparty exposures, the Reporting Bank shall include collateral that is posted and not held on a bankruptcy remote basis in the NICA term in accordance with Annex 7O. Where a Reporting Bank uses the CCR Internal Models Method to calculate E or EAD, whichever is applicable, for pre-settlement counterparty exposures, the Reporting Bank shall apply $\alpha$ to the E or EAD measurement of collateral that is posted and not held on a bankruptcy remote basis.

[MAS Notice 637 (Amendment) 2016]

2.13 Notwithstanding paragraphs 2.8 to 2.12 of this Annex, for any asset posted as collateral by a Reporting Bank under paragraphs 2.8 to 2.12 of this Annex, the Reporting Bank shall apply the appropriate capital treatment that applies to such asset under this Notice[412A].

[MAS Notice 637 (Amendment No. 2) 2014]
[MAS Notice 637 (Amendment) 2016]

Clearing Member Exposures to Clients

2.14 For the avoidance of doubt, a Reporting Bank that is a clearing member of a CCP shall capitalise its exposures to clients in accordance with Subdivision 3 or Subdivision 4 of Division 1 of Part VII and calculate CVA RWA for such exposures in accordance with Annex 7AI, regardless of whether the Reporting Bank guarantees the trade or acts as a financial intermediary between its client and a CCP. To recognise the shorter close-out period for cleared transactions, a Reporting Bank that is a clearing member of a CCP may capitalise its exposure to its clients applying a margin period of risk of at least 5 business days in the CCR Internal Models Method or SA-CCR. A Reporting Bank that is a clearing member of a CCP shall use the reduced E or EAD, whichever is applicable, for its pre-settlement counterparty exposures to clients in the calculation of the CVA risk capital requirement under both the CVA standardised method and CVA advanced method.

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[412] For the avoidance of doubt, the RWA for such CCP trade exposures shall not be included within the SA(CR) RWA or IRBA RWA of the Reporting Bank.

[412A] For the avoidance of doubt, a Reporting Bank shall treat the collateral as if it had not been posted to the CCP under Part VII or Part VIII. In addition, posted collateral shall be subject to paragraphs 2.8 to 2.12 of this Annex, regardless of whether it is a banking or trading book exposure. The Reporting Bank shall apply the haircut denoted by $H_E$ or $H_s$ set out in paragraphs 1.1 to 1.3 in Annex 7J based on the standardised supervisory haircuts or own estimates haircuts set out in Annex 7J to the measurement of E or EAD for such posted collateral, for the purpose of paragraphs 2.8 to 2.12 of this Annex. For the avoidance of doubt, the Reporting Bank shall not apply the haircuts denoted by $H_C$ and $H_{FX}$ in Annex 7J to reduce the measurement of E or EAD for such posted collateral for the purpose of paragraphs 2.8 to 2.12 of this Annex.

[MAS Notice 637 (Amendment No. 2) 2014]

[413] [Deleted by MAS Notice 637 (Amendment) 2016]

[MAS Notice 637 (Amendment) 2016]

**Section 3: Default Fund Exposures**

3.1 A Reporting Bank shall calculate its capital requirement for default fund exposures to a qualifying CCP in accordance with paragraphs 3.5 to 3.9 of this Annex.

[MAS Notice 637 (Amendment No. 2) 2014]

3.2 A Reporting Bank shall ensure that the following requirements are met in relation to the calculation of the hypothetical capital requirement of a CCP ("$K_{CCP}$"), the total prefunded default fund contributions from all clearing members ("$DF_{CM}^{pref}$"), the CCP's prefunded own resources[413B] which are contributed to the default waterfall, where these are junior or *pari passu* to prefunded default fund contributions of the CCP's clearing members ("$DF_{CCP}$") and the Reporting Bank's capital requirement for default fund exposures to the CCP ("$K_{CM(Bank)}$") –

(a) The CCP, the financial services regulatory authority supervising the CCP or any other entity with access to the required data calculates $K_{CCP}$, $DF_{CM}^{pref}$ and $DF_{CCP}$, and where the calculation is performed by the CCP or any other entity, the CCP or any other entity confirms to the Reporting Bank that the calculation is performed in a manner to permit the financial services regulatory authority supervising the CCP to oversee the calculation;

(b) The CCP, the financial services regulatory authority supervising the CCP or any other entity performing the calculations makes available sufficient information of the calculation results to the Reporting Bank to permit the Reporting Bank to calculate its capital requirement for default fund exposures to a CCP ($K_{CM(Bank)}$) and to permit the Authority to review and confirm such calculations;

(c) The CCP, the financial services regulatory authority supervising the CCP or any other entity performing the calculations, calculates $K_{CCP}$, $DF_{CM}^{pref}$ and $DF_{CCP}$ quarterly at a minimum, or more frequently if so required by the Authority in case of material changes (such as the clearing of a new product by the CCP);

(d) The CCP, the financial services regulatory authority supervising the CCP or any other entity performing the calculations, makes available to the Authority sufficient aggregate information about the composition of the CCP's exposures to its clearing members and the information provided to the clearing member for the purposes of the calculation of $K_{CCP}$, $DF_{CM}^{pref}$ and $DF_{CCP}$, at least quarterly or more frequently if the Authority so requires;

(e) Where the Reporting Bank is a subsidiary of a banking institution incorporated outside Singapore, the CCP, the financial services regulatory authority supervising the CCP or any other entity performing the calculations, makes available to the Authority and to the home bank regulatory agency of the Reporting Bank, sufficient aggregate information

[413A] [Deleted by MAS Notice 637 (Amendment) 2016]

[413B] Contributed capital, retained earnings, and other resources as may be approved by the financial services regulatory authority supervising the CCP.

[MAS Notice 637 (Amendment) 2016]

about the composition of the CCP's exposures to its clearing members and the information provided to the clearing member for the purposes of the calculation of $K_{CCP}$, $DF_{CM}^{pref}$ and $DF_{CCP}$, at least quarterly or more frequently if the Authority or the home bank regulatory agency of the Reporting Bank so requires; and

(f) The CCP, the financial services regulatory authority supervising the CCP or any other entity performing the calculations shall calculate $K_{CCP}$, $DF_{CM}^{pref}$, $DF_{CCP}$ and $K_{CM(Bank)}$ at least quarterly, and whenever there are material changes to the number or exposures of transactions cleared by the CCP or material changes to the financial resources of the CCP.

[MAS Notice 637 (Amendment) 2016]

3.3 Where a default fund of a CCP is shared between products or types of business with settlement risk only (for example, equities and bonds) and products or types of business which give rise to CCR (i.e. OTC derivatives, exchange traded derivatives, SFTs or long settlement transactions), a Reporting Bank shall calculate the capital requirement for all default fund exposures of the Reporting Bank to the CCP in accordance with paragraphs 3.5 to 3.9 of this Annex, without apportioning to the different classes or types of business or products.

[MAS Notice 637 (Amendment) 2016]

3.4 Where the contributions from clearing members to a default fund of a CCP are segregated by product types and only accessible for specific product types, a Reporting Bank shall calculate the capital requirement for the default fund exposures of the Reporting Bank to the CCP in accordance with paragraphs 3.5 to 3.9 of this Annex for each specific product giving rise to CCR. A Reporting Bank shall obtain a confirmation from the CCP, the financial services regulatory authority supervising the CCP or any other entity performing the calculations of $K_{CCP}$, $DF_{CM}^{pref}$ and $DF_{CCP}$ that in the case where the CCP's prefunded own resources are shared among the specific product types, the CCP has allocated those funds to each of the calculations of $K_{CCP}$, $DF_{CM}^{pref}$ and $DF_{CCP}$, in proportion to the respective product-specific EAD.

[MAS Notice 637 (Amendment) 2016]

3.5 The calculation of a Reporting Bank's capital requirement for default fund exposures to a CCP, $K_{CM(Bank)}$, using the formulae[414] in paragraphs 3.6 to 3.9 of this Annex may be performed by the Reporting Bank, the CCP, the financial services regulatory authority supervising the CCP or any other entity with access to the required data, where the requirements in paragraph 3.2 of this Annex are met.

[MAS Notice 637 (Amendment) 2016]

Calculation of the CCP's Hypothetical Capital Requirement

[414] The formulae considers the size and quality of a qualifying CCP's financial resources, the counterparty credit risk exposures of such CCP, and the application of such resources via the CCP's loss bearing waterfall, in the case of one or more clearing member defaults.

3.6 $K_{CCP}$ shall be calculated in accordance with the following formula:

$$K_{CCP} = \sum_i EAD_i \times 20\%^{415} \times 8\%$$

where –

(a) $K_{CCP}$ is the hypothetical capital requirement of the CCP due to its counterparty credit risk exposures to all its clearing members and their clients[416]; and

(b) $EAD_i$ is the exposure value of the CCP to clearing member 'i', including both the clearing member's own transactions and client transactions guaranteed by the clearing member, and all values of collateral held by the CCP (including the clearing member's prefunded default fund contribution) against these transactions, relating to the valuation at the end of the reporting date set out in Part XII before the margin called on the final margin call of that day is exchanged. The exposure value of the CCP shall be calculated by aggregating all clearing member accounts.

[MAS Notice 637 (Amendment) 2016]

3.7 For the purpose of paragraph 3.6 of this Annex –

(a) Where a clearing member provides client clearing services, and client transactions and collateral are held in separate (individual or omnibus) sub-accounts to the clearing member's proprietary business, the transactions and collateral in each such client sub-account shall be included in the sum of $EAD_i$ separately.[417] If any of these sub-accounts contains both derivative transactions and SFTs, the exposure value of that sub-account is the sum of the exposure values of the derivative transactions and SFTs;

(b) Where collateral is held by the CCP against a clearing member account or client sub-account containing both derivative transactions and SFTs, the prefunded initial margin provided by the clearing member or client of a clearing member shall be allocated to the exposure values of the SFTs and derivative transactions in proportion to the respective product specific exposure values, calculated in accordance with –

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[415] The Authority may from time to time, specify a risk weight higher than 20% taking into account, among other things, the creditworthiness of the clearing members of the CCP. An increase in such risk weight may be considered if, for example, the clearing members in a CCP are not highly rated. A Reporting Bank shall communicate any such increase in risk weight to the CCP, the financial services regulatory authority supervising the CCP or any other entity performing the calculation of $K_{CCP}$.

[416] $K_{CCP}$ is calculated on a consistent basis for the sole purpose of determining the capitalisation of clearing member default fund contributions; it does not represent the actual capital requirements for a CCP which may be determined by a CCP and its supervisor.

[417] The exposure value of the CCP to a clearing member "i" is the sum of the exposure values of the client sub-accounts and the exposure value of any house sub-account. The Reporting Bank shall ensure that collateral posted by the client and held at the CCP cannot be used to offset the CCP's exposures to clearing members' proprietary activity in the calculation of $K_{CCP}$.

[MAS Notice 637 (Amendment) 2016]

(i) paragraphs 1.2 and 1.3, and applying the standard supervisory haircuts in paragraphs 2.1 and 2.4, in Annex 7J for SFTs; and

(ii) Annex 7O without including the recognition of the effect of collateral, for derivative transactions;

(c) Where the default fund contributions of a clearing member are not split with regards to client sub-accounts and house sub-accounts, such default fund contributions are to be allocated per sub-account according to the respective fraction the initial margin of the sub-account has in relation to the total initial margin posted by or for the account of the clearing member;

(d) The holding periods for SFTs, as set out in paragraphs 2.4 and paragraphs 4.1 to 4.3 of Annex 7J, and for derivative transactions, as set out in paragraph 6.5 of Annex 7Q, shall apply, with the exception that in the case of netting sets where the number of trades exceeds 5000 at any point in a quarter, the minimum holding period set at the margin period of risk floored at 20 business days set out in paragraph 6.5 of Annex 7Q shall not apply; and

(e) The netting sets that are applicable to regulated clearing members are the same as those referred to in paragraph 2.4 of this Annex. For unregulated clearing members, the netting rules of the CCP notified to its clearing members shall apply.[418]

[MAS Notice 637 (Amendment) 2016]

3.8 For the purpose of paragraph 3.6(b) of this Annex –

(a) $EAD_i$ for derivative transactions is calculated in accordance with Annex 7O as the bilateral trade exposure the CCP has against the clearing member 'i'[419]. All collateral held by the CCP to which the CCP has a legal claim in the event of the default of clearing member 'i' or its client, including default fund contributions of clearing member 'i', may be used to offset the CCP's exposure to clearing member 'i' or its client through inclusion in the multiplier set out in paragraph 3.1 of Annex 7O; and

(b) $EAD_i$ for SFTs is equal to $\max(EBRM_i - IM_i - DF_i; 0)$,

where –

(i) $EBRM_i$ is the exposure value to clearing member 'i' before credit risk mitigation in accordance with paragraphs 1.2 and 1.3, and applying the standard supervisory haircuts in paragraphs 2.1 and 2.4, in Annex 7J of Part VII for SFTs. For the purposes of this calculation, variation margin that has been exchanged (before the

[418] The Authority may from time to time, by notice in writing, specify more granular netting sets than laid out by the CCP.

[MAS Notice 637 (Amendment) 2016]

[419] A margin period of risk of 10 business days shall be used to calculate the CCP's potential future exposure to its clearing members on derivative transactions.

[MAS Notice 637 (Amendment) 2016]

margin called on the final margin call of that day) enters into the mark-to-market value of the transactions;

(ii) $IM_i$ is the initial margin collateral posted by the clearing member 'i' with the CCP; and

(iii) $DF_i$ is the prefunded default fund contribution by the clearing member 'i' that will be applied upon the default of the clearing member, either along with or immediately following the initial margin posted by the clearing member, to reduce the CCP's loss.

[MAS Notice 637 (Amendment) 2016]

Calculation of the Capital Requirement for each of the CCP's Clearing Members

3.9 The Reporting Bank's capital requirement for default fund exposures to a CCP shall be calculated in accordance with the following formula[420]:

$$K_{CM(Bank)} = \max\left(K_{CCP} \times \frac{DF^{pref}_{CM\ (Bank)}}{DF_{CCP} + DF^{pref}_{CM}}; 8\% \times 2\% \times DF^{pref}_{CM\ (Bank)}\right)$$

where –

(a) $K_{CM(Bank)}$ is the Reporting Bank's capital requirement for default fund exposures to the CCP;

(b) $DF^{pref}_{CM}$ is the total prefunded default fund contributions from all clearing members;

(c) $DF_{CCP}$ is the CCP's prefunded own resources, including contributed capital and retained earnings, which are contributed to the default waterfall, where these are junior or pari passu to prefunded default fund contributions of the CCP's clearing members ; and

(d) $DF^{pref}_{CM(Bank)}$ is the prefunded default fund contribution of the Reporting Bank.

[MAS Notice 637 (Amendment) 2016]

3.10 [Deleted by MAS Notice 637 (Amendment) 2016]

3.11 [Deleted by MAS Notice 637 (Amendment) 2016]

3.12 [Deleted by MAS Notice 637 (Amendment) 2016]

[420] Under this approach, a 2% risk weight floor is applied to the default fund exposure.
[MAS Notice 637 (Amendment) 2016]

**Section 4: Transitional Arrangements**

4.1 This Annex shall not apply to a Reporting Bank for the period from 1 January 2017 to –

(a) the day set out in a notice in writing issued by the Authority informing all Reporting Banks to comply with this Annex; or

(b) the day where the Reporting Bank has pursuant to paragraph 4.3 elected to comply with this Annex,

whichever occurs first.

[MAS Notice 637 (Amendment) 2016]

4.2 A Reporting Bank referred to in paragraph 4.1 of this Annex shall continue to comply with Annex 7AJ of MAS 637, including all definitions used in Annex 7AJ which are set out in Part II of this Notice, in force immediately before 1 January 2017 during the period referred to in paragraph 4.1 of this Annex.

[MAS Notice 637 (Amendment) 2016]

4.3 Notwithstanding paragraphs 4.1 and 4.2 of this Annex, a Reporting Bank may elect to comply with this Annex at any time before the expiry of the period referred to in paragraph 4.1 of this Annex. When a Reporting Bank elects to comply with this Annex, the Reporting Bank shall give the Authority notice in writing of the date from which the Reporting Bank elects to comply with this Annex (the "election date"), no less than 30 days before the election date and in that event, paragraph 4.1 shall not apply to the Reporting Bank from the election date.

[MAS Notice 637 (Amendment) 2016]

4.4 For the avoidance of doubt, these transitional arrangements are intended to apply wherever Annex 7AJ is referenced in this Notice.

[MAS Notice 637 (Amendment) 2016]

[421] [Deleted by MAS Notice 637 (Amendment) 2016]
[421A] [Deleted by MAS Notice 637 (Amendment) 2016]
[422] [Deleted by MAS Notice 637 (Amendment) 2016]

## ILLUSTRATION ON THE CALCULATION OF CREDIT RISK-WEIGHTED EXPOSURE AMOUNTS FOR EQUITY INVESTMENTS IN FUNDS

### Section 1: Illustrative Example – Calculation using the LTA

1.1 Assume a Reporting Bank, which is using the SA(CR) to calculate the credit risk-weighted exposure amount for the underlying exposures of funds if the exposures were held directly by the Reporting Bank, owns 20% of the shares of an individual fund that replicates an equity index. Further assume that the fund holds short term (less than one year) forward contracts that are cleared through a qualifying CCP of notional amount of $100, and presents the following balance sheet:

[MAS Notice 637 (Amendment No. 2) 2018]

**Assets**
Cash $20
Government bonds (AAA rated) $30
Variation margin receivable – forward contracts $50

**Liabilities**
Notes payable $5

**Equity**
Shares $95

1.2 Assume that the balance sheet exposures will be risk-weighted according to the following risk weights: cash (RW=0%), government bonds (RW=0%), centrally-cleared equity forward positions (RW=2%), underlying of forward contract (i.e. equity exposures) (RW=100%, to be applied to the notional amount of the forward contract), counterparty credit risk charge associated with the forward contract, and no CVA charge, since forward contracts are cleared through a qualifying CCP.

1.3 The Reporting Bank shall calculate the credit risk-weighted exposure amount for its equity investment in the fund as follows:

Credit $RWE_{investment}$ = Avg $RW_{fund}$ * Lvg * Equity Investment

= $RWE_{fund}$ / Total $Assets_{fund}$ * Lvg * Equity Investment

Where –

(a) Credit $RWE_{fund}$ = ($RWE_{cash}$ + $RWE_{bonds}$ + $RWE_{underlying}$ + $RWE_{forward}$ + $RWE_{CCR}$)
= ($20*0% + $30*0% + $100*100% + $50*2% + $100*6%*2%)
= $101

(b) Lvg = (Total Assets) / (Total Equity)
= $100 / $95
= 1.05

(c) Equity Investment $=$ Proportion of shares in fund * Total Equity
$=$ 20% * $95
$=$ $19

Therefore, Credit $RWE_{investment}$ = $101/$100 * 1.05 * $19 = $20.15

**Section 2: Illustrative Example – Calculation using the MBA**

2.1 Assume a Reporting Bank, which is using the SA(CR) for calculating capital requirements, owns 20% (i.e. representing an investment of $18.18) of the shares of an individual fund that replicates an equity index. Further assume that the fund has assets of $100, and a mandate that permits investments in cash, equities, and long positions in equity index futures up to a maximum nominal amount equivalent to the size of the fund's balance sheet, and a maximum financial leverage of 1.1.

2.2 The Reporting Bank shall calculate the credit risk-weighted exposure amount of its equity investment in the fund as follows:

Credit $RWE_{investment}$ = Avg $RW_{fund}$ * Lvg * Equity Investment

= $RWE_{fund}$ / Total $Assets_{fund}$ * Lvg * Equity Investment

Where –

(a) $RWE_{fund}$ is calculated as the sum of: -

(v) the credit risk-weighted exposure amount for on-balance sheet exposures of the fund (i.e. $100), which will be risk-weighted according to the risk weights applied for equity exposures (RW=100%), i.e. $RWE_{on\text{-}balance}$ = $100*100% = $100

(vi) the credit risk-weighted exposure amount for derivative exposures of the fund based on the maximum notional amount of the derivative exposures (i.e. $100) and risk weight associated with the underlying of the derivative exposures, which in this case is publicly-traded equity holdings (RW=100%), i.e. $RWE_{underlying}$ = $100*100% = $100

(vii) the counterparty credit risk associated with the pre-settlement counterparty exposures of the fund's derivative transactions. Assuming that the Reporting Bank does not know the replacement cost related to the futures contract and the supervisory factor, the Reporting Bank shall calculate the exposure measure for the counterparty credit risk by using the maximum notional amount (i.e. $100) as a proxy for the replacement cost, and apply the maximum supervisory factor of 40%. Assuming that the futures contract is cleared through a qualifying CCP, such that a risk-weight of 2% will apply, and there is no CVA charge assessed, since the futures contract is cleared through a CCP, the Reporting Bank shall calculate the counterparty credit risk charge as $RWE_{CCR}$ = $100*140%*2%=$2.80.

(b) Lvg (as given) = 1.1

(c) Equity Investment (as given) = $18.18

Therefore, Credit $RWE_{investment}$ = $202.80/$100 * 1.1 * $18.18 = $40.56

**Section 3: Illustrative Example – Calculation of the leverage adjustment**

3.1 Assume a Reporting Bank, which is using the SA(CR) for calculating capital requirement, has an equity investment in a fund with assets of $100 that invests in corporate debt. Further assume that the fund is highly levered with equity of $5 and debt of $95 (i.e. the leverage of the fund = 100/5 = 20). Consider the following two cases:

<u>Case 1</u>

| **Assets** | |
|---|---|
| Cash | $10 |
| A+ to A- bonds | $20 |
| BBB+ to BB- bonds | $30 |
| Below BB- bonds | $40 |

The average risk weight of the fund is 100% (i.e. ($10*0% + $20*50% + $30*100% + $40*150%)/$100). The financial leverage of 20 would result in a risk weight of 2000%. The Reporting Bank shall apply the conservative risk weight of 1250% for its equity investment in the fund, in accordance with paragraph 7.5.73.

<u>Case 2</u>

| **Assets** | |
|---|---|
| Cash | $5 |
| AAA to AA- bonds | $75 |
| A+ to A- bonds | $20 |

The average risk weight of the fund is 25% (i.e. ($5*0% + $75*20% + $20*50%) / $100). The financial leverage of 20 would result in a risk weight of 500%.

3.2 The above example illustrates that the rate at which the 1250% cap is reached is dependent on the underlying riskiness of the portfolio, which is determined by the average risk weight of the fund.

[MAS Notice 637 (Amendment) 2016]

# PART VIII: MARKET RISK

## Division 1: Overview of Market RWA Calculation

### Sub-division 1: Introduction

8.1.1 Market risk is the risk of losses in on and off-balance sheet positions arising from movements in market prices. When calculating market RWA[501], a Reporting Bank shall include –

(a) any risk pertaining to any interest rate-related instrument in the trading book;

(b) any risk pertaining to any equity position in the trading book;

(c) any foreign exchange risk, whether arising from positions in the trading book or otherwise[501A]; and

(d) any commodity risk, whether arising from positions in the trading book or otherwise.

8.1.2 A Reporting Bank shall include every transaction which falls within paragraph 8.1.1 above, including any forward sale and purchase transaction, in its calculation of market RWA from the date on which the transaction is entered into. A Reporting Bank shall ensure that it maintains an adequate level of capital to cover its market risk at the close of each business day and shall take immediate measures to rectify the situation if it fails to meet the capital requirements.[502]

8.1.3 A Reporting Bank with a global consolidated trading book may report short and long positions in exactly the same instrument on a net basis regardless of where they are booked, and apply the offsetting rules in this Part on a consolidated basis, except in cases where there are legal or operational impediments to the quick repatriation of profits from a foreign subsidiary or timely management of risks on a consolidated basis. In such a case, the individual positions arising from the affected entities shall be taken into the measurement system without any offsetting or netting against positions arising from other banking group entities. The Authority shall retain the right to impose market risk capital requirements on a non-consolidated basis to ensure that significant imbalances within a banking group are addressed. A Reporting Bank shall not engage in transactions in such a way as to avoid measurement on reporting dates.

[MAS Notice 637 (Amendment) 2016]

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[501] For the avoidance of doubt, all pre-settlement counterparty exposures arising from OTC derivative transactions, long settlement transactions, repo-style transactions (i.e. repo, reverse repo, securities lending or securities borrowing transactions) and other transactions booked in the trading book shall be included in credit RWA under Part VII.

[MAS Notice 637 (Amendment) 2012]

[501A] Certain structural foreign exchange positions may be excluded. Please refer to Sub-division 5 of this Part.

[502] In addition, a Reporting Bank shall maintain appropriate risk management systems to ensure that intra-day exposures are not excessive.

**Sub-division 2: Methods of Measuring Market Risks**

8.1.4 A Reporting Bank shall use the SA(MR) or, subject to the approval of the Authority, the IMA or a combination of both the SA(MR) and the IMA to calculate its market RWA.

8.1.5 The SA(MR) is described in Division 2 of this Part. Sub-divisions 1 to 4 of that Division set out the capital treatment for the following risk categories - interest rate risk, equity position risk, foreign exchange risk and commodity risk. Sub-division 5 of that Division sets out the possible methods for measuring the market risk in options. The market risk capital requirement calculated using the SA(MR) shall be the sum of the capital requirements calculated based on Sub-divisions 1 to 5 of that Division.

8.1.6 The IMA, which allows a Reporting Bank to use the risk measures derived from its own internal risk management models to calculate its market risk capital requirement, is described in Division 3 of this Part. A Reporting Bank which adopts the IMA is subject to the requirements set out in that Division.

8.1.7 The market RWA of a Reporting Bank shall be the sum of the market risk capital requirement calculated using the SA(MR) in accordance with Division 2 of this Part and the market risk capital requirement calculated using the IMA in accordance with Division 3 of this Part, multiplied by 12.5.

**Sub-division 3: Determination of the Trading Book**

8.1.8 A Reporting Bank shall allocate all its positions to either its trading book or its banking book. For the avoidance of doubt, all positions excluded from the trading book shall be deemed to be part of the banking book.

8.1.9 A Reporting Bank shall allocate to the trading book any position in a financial instrument[502A] or commodity which is held with trading intent or to hedge other positions held in the trading book[503]. The Reporting Bank shall frequently and accurately value every trading book position and manage the portfolio actively.

8.1.10 A position shall be considered to be held with trading intent if –

(a) it is held for short-term resale;

(b) it is taken on by a Reporting Bank with the intention of benefiting in the short term from actual or expected differences between its buying and selling price, or from other price or interest rate variations; or

(c) it is taken on by a Reporting Bank to lock in arbitrage profits.

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[502A] A financial instrument is any contract that gives rise to both a financial asset of one entity and a financial liability or equity instrument of another entity, and includes both cash and derivative instruments. A financial asset is any asset that is cash, the right to receive cash or another financial asset, or the contractual right to exchange financial assets on potentially favourable terms, or an equity instrument. A financial liability is the contractual obligation to deliver cash or another financial asset or to exchange financial liabilities under conditions that are potentially unfavourable.

[503] A financial instrument or commodity in the trading book shall be free of any restrictive covenants on its tradability or be able to be hedged completely.

8.1.11 A Reporting Bank shall determine which positions are to be included in, or excluded from, its trading book in accordance with the policies and procedures in its trading book policy statement.

8.1.12 A Reporting Bank should include the following in its trading book[503A] –

(a) a proprietary position in a financial instrument or commodity satisfying any of the criteria specified in paragraph 8.1.10;

(b) any position arising from client servicing (e.g. matched principal broking) and market making*;* and

(c) any position that satisfies the criteria which the Reporting Bank applies in its determination of the composition of its trading book on a consistent basis.

[MAS Notice 637 (Amendment) 2012]

8.1.13 For the avoidance of doubt, the following positions shall be excluded from the trading book[504]:

(a) an equity position in a hedge fund;

(b) an exposure relating to direct holdings of immovable property;

(c) a position in a securitisation warehouse; and

(d) a private equity investment,

owing to significant constraints on the ability of Reporting Banks to liquidate these positions and value them reliably on a daily basis.

8.1.14 A position which materially or completely offsets the component risks of a position in the banking book (i.e. an internal hedge) may be eligible for trading book capital treatment if it satisfies the criteria specified in paragraph 8.1.10 and the following criteria on prudent valuation:

(a) the internal hedge is not intended to avoid or reduce regulatory capital which the Reporting Bank would otherwise be required to maintain;

(b) the internal hedge is properly documented and subject to internal approval and audit procedures;

(c) the internal hedge is dealt with at market conditions;

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[503A] Term trading-related repo-style transactions (i.e. repo, reverse repo, securities lending or securities borrowing transaction) that a Reporting Bank accounts for in its banking book may be included in the Reporting Bank's trading book for regulatory capital purposes, as long as all such repo-style transactions are included. For this purpose, trading-related repo-style transactions are those that meet the requirements set out in paragraph 8.1.10 and where both legs are in the form of cash and securities that can be included in the trading book.

[MAS Notice 637 (Amendment) 2012]

[504] A Reporting Bank may exclude an equity or debt position that arises from an underwriting mandate and include such positions in the banking book.

(d) the bulk of the market risk which is generated by the internal hedge is dynamically managed in the trading book within agreed limits set by management; and

(e) the internal hedge is carefully monitored.

8.1.15 Notwithstanding paragraph 8.1.14, where a Reporting Bank hedges a banking book exposure using a credit derivative booked in the trading book, the banking book exposure is not deemed to be hedged for the purpose of calculating its regulatory capital requirement, unless the Reporting Bank purchases from an eligible protection provider a credit derivative which complies with the requirements and meets the guidelines set out in Annex 7F of Part VII. Where eligible credit protection is purchased and is recognised as a hedge of the banking book exposure for the purpose of calculating its regulatory capital requirement, the Reporting Bank shall exclude both the internal and external credit derivative hedge from the trading book for the purpose of calculating its regulatory capital requirement for the period of the hedge.

**Sub-division 4: Trading Book Policy Statement**

8.1.16 A Reporting Bank shall have a trading book policy statement which covers, at a minimum, the policies and procedures, including the methodologies, by which the Reporting Bank –

(a) defines its trading book and identifies positions to be included in its trading book;

(b) allocates positions between the banking book and the trading book;

(c) actively manages and values its positions in the trading book;

(d) measures its trading book risks; and

(e) controls the transfer of positions between the banking book and the trading book.

8.1.17 A Reporting Bank shall obtain the approval of its Board on its trading book policy statement. The Reporting Bank shall review and where necessary update the policy statement, at least annually. The Reporting Bank shall obtain the approval of the Board for all significant changes.

8.1.18 The Reporting Bank shall, at a minimum, address the following in its trading book policy statement:

(a) the definition of trading book and trading strategy, including –

(i) the activities that the Reporting Bank considers to be trading and the types of positions that are to be allocated to the trading book for the purposes of calculating its regulatory capital requirements;

(ii) the types of positions that are excluded from the trading book; and

(iii) the procedures to ensure that the criteria by which positions are allocated to the trading book are adhered to on a consistent basis, including details on –

(A) the unit or department within the Reporting Bank responsible for monitoring adherence to the trading book policy statement;

(B) how often this monitoring is conducted;

(C) how this monitoring is done; and

(D) how the continuing appropriateness of allocations is confirmed;

(b) the extent of active management and valuation[505], including –

(i) the extent to which a position can be marked-to-market daily by reference to an active and liquid two-way market;

(ii) for positions which are marked-to-model, the extent to which the Reporting Bank can –

(A) identify the material risks of the position;

(B) hedge the material risks of the position and, where the material risks of the position are hedged, the extent to which hedging instruments would have an active and liquid two-way market; and

(C) derive reliable external estimates for the key assumptions and parameters used in the model;

(iii) the extent to which the Reporting Bank can, and is required to, generate valuations for the positions which can be validated externally by its auditors or the Authority in a consistent manner;

(iv) the extent to which the Reporting Bank can, and is required to, maintain documents to support valuations of its trading book positions;

(v) the basis for determining and maintaining valuation adjustments for the purposes of calculating regulatory capital requirements;

(vi) the extent to which legal restrictions or other operational requirements would impede the ability of the Reporting Bank to effect an immediate liquidation of the position; and

(vii) the extent to which the Reporting Bank can, and is required to, actively risk manage a position within its trading operations;

[505] A Reporting Bank shall meet the standards for prudent valuation set out in Annex 8N of this Part.

(c) transfers between banking and trading books, including –

(i) the extent to which a Reporting Bank may transfer positions between the banking book and the trading book and the criteria for such transfers;

(ii) the procedures to effect such transfers; and

(iii) the controls in place to prevent inappropriate transfers of positions between the banking book and the trading book; and

(d) the following additional considerations:

(i) whether there are any subsidiaries or offshore branches of the Reporting Bank undertaking transactions to be included in the trading book. If so, a list of such subsidiaries or offshore branches shall be included, along with a description of the trading activities carried out by such entities;

(ii) the treatment of inter-desk deals; and

(iii) the identification and management of structural foreign exchange positions.

8.1.19 A Reporting Bank shall meet the following basic requirements for each position to be included in the trading book:

(a) a clearly documented trading strategy[506] for the position or portfolio which is approved by senior management;

(b) clearly defined policies and procedures for the active management of the position, covering the following:

(i) the position is managed on a trading desk;

(ii) position limits are set and monitored for appropriateness;

(iii) every dealer has the autonomy to enter into or manage the position within agreed limits and according to the agreed strategy;

(iv) the position is marked-to-market at least daily or, where the position is marked-to-model, the parameters are assessed on a daily basis;

(v) positions and exceptions are reported to senior management as an integral part of the risk management process of the Reporting Bank; and

(vi) the position is actively monitored with reference to market information sources[507]. This would include assessing the quality and

[506] This would include the expected holding horizon for the underlying position or portfolio.
[507] An assessment of market liquidity, ability to hedge the positions or the portfolio risk profiles should be made.

availability of market inputs to the valuation process, level of market turnover and sizes of positions traded in the market; and

(c) clearly defined policies and procedures to monitor the position against the trading strategy of the Reporting Bank, including the monitoring of turnover and stale positions in its trading book.

8.1.20 A Reporting Bank shall prepare its trading book policy statement on a consolidated basis where the banking group either manages its trading risk centrally or employs the same risk management techniques across all the entities in the banking group. Where a trading book policy statement is prepared on a consolidated basis, a Reporting Bank shall ensure that its application to the Reporting Bank and each of the other entities in the banking group is made clear and approved by the Board of the Reporting Bank and the Board of each of those entities.

**Sub-division 5: Treatment of Structural Foreign Exchange Positions**

8.1.21 A Reporting Bank which has deliberately taken a position in order to partially or totally hedge against the adverse effect of the exchange rate on its capital adequacy ratios, in respect of an asset or any other item, may exclude such a position from the calculation of its net open foreign exchange positions if -

(a) the position is of a non-dealing nature;

(b) the position does no more than protect the capital adequacy ratios of the Reporting Bank; and

(c) any exclusion of the position is applied consistently, with the treatment of the hedge remaining the same for the life of the asset or other item.

The exclusion of such a position from the calculation of the Reporting Bank's net open foreign exchange positions is subject to such further directions as the Authority may issue.

[MAS Notice 637 (Amendment No. 2) 2017]

8.1.22 A Reporting Bank, in calculating its net open foreign exchange positions, may also exclude any foreign exchange position related to –

(a) items which are deducted in the calculation of CET1 Capital, AT1 Capital or Tier 2 Capital; and

[MAS Notice 637 (Amendment) 2016]

(b) unconsolidated subsidiaries, associated companies and joint ventures denominated in foreign currencies which are reported in the published accounts of the Reporting Bank at historic cost.

[MAS Notice 637 (Amendment) 2012]

**Sub-division 6: Risk Management Standards**

8.1.23 A Reporting Bank shall have systems in place to –

(a) assign positions correctly between its banking book and its trading book, at both the Solo and Group levels; and

[MAS Notice 637 (Amendment) 2012]

(b) control the transfer of positions from one book to the other, both at the inception of a deal and, if the intent changes, during the life of the deal or position.

8.1.24 A unit independent of the market risk-taking units of the Reporting Bank shall do a periodic review of its compliance with the policies and procedures set out in the trading book policy statement. A Reporting Bank shall maintain relevant documents and proper audit trails to facilitate such reviews.

**Division 2: SA(MR)**

8.2.1 A Reporting Bank using the SA(MR) shall calculate its market risk capital requirement in accordance with the requirements set out in this Division.

**Sub-division 1: Interest Rate Risk**

8.2.2 A Reporting Bank shall calculate its market risk capital requirement for interest rate risk by –

(a) identifying the positions in its trading book which have interest rate risk;

(b) allocating the positions into individual currency portfolios;

(c) for each currency portfolio –

(i) calculating the net positions in accordance with paragraphs 8.2.8 to 8.2.10;

(ii) including these net positions in the calculation of its specific risk capital requirement after applying any offsets allowed pursuant to paragraph 8.2.11;

(iii) including these net positions in the calculation of its general market risk capital requirement; and

(d) summing all specific risk and general market risk capital requirements for each currency portfolio.

<u>Scope</u>

8.2.3 In calculating its market risk capital requirement for interest rate risk, a Reporting Bank shall include all its trading book positions[508], whether long or short, in instruments[509] whose market values are affected by changes in interest rates, unless –

(a) the position is a convertible bond[510] which has been included in the equity position risk calculation of the Reporting Bank;

(b) the position is an investment that is deducted in the calculation of CET1 Capital, AT1 Capital or Tier 2 Capital; or

[MAS Notice 637 (Amendment) 2016]

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[508] This includes positions in any interest rate-related instrument that is sold or lent under an SFT, but excludes any interest rate-related instrument that is bought or borrowed under an SFT.

[509] This includes derivatives and off-balance sheet instruments.

[510] A debt issue or preference shares which are convertible at a stated price into ordinary shares of the issuer, shall be treated as a debt instrument if it is traded like debt and as an equity instrument if it is traded like equity.

(c) the position is an option or is hedging an option which is caught under Sub-division 5 of this Division, except where the Reporting Bank is required under that Sub-division to include the delta-weighted position in this Sub-division.

Measurement of Positions with Interest Rate Risk

8.2.4 Except for any interest rate-related derivative referred to in paragraph 8.2.5 and any credit derivative referred to in paragraph 8.2.6, a Reporting Bank shall use the current market value of the principal amount of its positions in interest rate-related instruments to calculate its market risk capital requirement for interest rate risk.

8.2.5 A Reporting Bank shall convert its interest rate-related derivatives into notional positions in the relevant underlying instruments and use the current market value of the principal amount of the underlying instruments to calculate its market risk capital requirement for interest rate risk. Annex 8A of this Part illustrates how a Reporting Bank should convert certain interest rate-related derivatives into notional positions in the relevant underlying instruments.

8.2.6 A Reporting Bank shall convert its credit derivatives into notional positions in the relevant reference obligations and use the current market value of the principal amount of the reference obligations to calculate its market risk capital requirement for interest rate risk, except in the case of credit linked notes, where the current market value of the notes shall be used. Annex 8B of this Part illustrates how a Reporting Bank should treat credit derivatives in the trading book.

8.2.7 In determining the value of the positions or notional positions, a Reporting Bank should use the valuation of the relevant position with reference to prices quoted by exchanges or dealers or, for OTC contracts for which there are no ready market prices, the valuation should be based on appropriate valuation models or discounted cash flows using market quoted rates. For leveraged instruments where the apparent notional amount differs from the effective notional amount, a Reporting Bank shall use the effective notional amount in determining the market value.

Allowable Netting of Matched Positions

8.2.8 For the purpose of calculating the specific risk and general market risk capital requirements for its positions in interest rate-related instruments, or notional positions in interest rate-related derivatives, a Reporting Bank may net[511] -

(a) a long and a short position (including any notional position) in an identical issue[512]; or

(b) a matched position in a futures contract or forward and its corresponding underlying exposures or financial instruments[513].

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[511] The net position is the difference between the value of the long positions of the Reporting Bank (including notional positions) and the value of its short positions (including notional positions) in the same debt security.

[512] Even though the issuer is the same, no netting will be permitted between different issues since differences in coupon rates, liquidity, call features, etc. mean that prices may diverge in the short run.

[513] The position representing the time to expiry of a futures contract should nevertheless be included in the calculation of the market risk capital requirement of a Reporting Bank.

8.2.9 Where a futures contract or forward comprises a range of deliverable debt securities, a Reporting Bank may net a short position in the futures contract or forward and a long position in the corresponding "cheapest-to-deliver" underlying security[514]. This netting is permitted only where the Reporting Bank has sold the futures contract or forward.

8.2.10 A Reporting Bank may net opposite positions in the same category of interest rate-related instruments if –

(a) the positions relate to the same underlying instruments;

(b) the positions are of the same notional value; and

(c) the positions are denominated in the same currency;

and –

(i) in the case of futures contracts, the offsetting positions in the notional or underlying instrument to which the futures contract relates are for identical products and mature within seven days of each other;

(ii) in the case of swaps and FRAs, the reference rates (for floating rate positions) are identical and the coupons are closely matched (i.e. within 15 basis points); and

(iii) in the case of swaps, FRAs and forwards, the next interest fixing date or, for fixed coupon positions or forwards, the residual maturity correspond as follows:

(A) on the same day, if the next interest fixing date or residual maturity is less than one month;

(B) within seven days, if the next interest fixing date or residual maturity is between one month and a year; or

(C) within 30 days, if the next interest fixing date or residual maturity is more than a year.

Allowable Offsets for Positions Hedged by Credit Derivatives

8.2.11 For the purpose of calculating the specific risk capital requirement for a credit derivative and its hedged position, a Reporting Bank may –

(a) apply a full offset when the values of the two legs always move in opposite directions and broadly to the same extent. This would be the case when –

(i) the two legs consist of completely identical instruments; or

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[514] The "cheapest-to-deliver" security shall be readily identifiable and most profitable for the Reporting Bank to deliver.

(ii) a long cash position is hedged by a total rate of return swap (or vice versa) and there is an exact match between the reference obligation and the underlying instrument (i.e. the cash position)[515];

(b) apply an 80% offset to the side of the transaction with the higher specific risk capital requirement and a zero specific risk capital requirement on the other side when the values of the two legs (i.e. long and short) always move in opposite directions but not broadly to the same extent. This would be the case when –

(i) a long cash position is hedged by a credit default swap or a credit linked note (or vice versa);

(ii) there is an exact match in terms of –

(A) the reference obligation;

(B) the maturity of both the reference obligation and the credit derivative; and

(C) the currency of the underlying instrument; and

(iii) the key features of the credit derivative contract (e.g. credit event definitions, settlement mechanisms) do not cause the price movement of the credit derivative to materially deviate from the price movement of the cash position; and

(c) apply the higher of the two specific risk capital requirements when the values of the two legs (i.e. long and short) usually move in opposite directions. This would be the case when –

(i) the position would be captured in sub-paragraph (a)(ii) but for an asset mismatch between the reference obligation and the underlying instrument where –

(A) the reference obligation ranks *pari passu* with or is junior to the underlying instrument; and

(B) the underlying instrument and reference obligation share the same obligor and legally enforceable cross-default or cross acceleration clauses are in place;

(ii) the position would be captured in sub-paragraph (a)(i) or (b) but for a currency or maturity mismatch between the credit derivative and the underlying instrument; or

(iii) the position would be captured in sub-paragraph (b) but for an asset mismatch between the cash position and the reference obligation, and the underlying instrument is included in the deliverable obligations in the credit derivative documentation.

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515 The maturity of the swap itself may be different from that of the underlying instrument.

8.2.12 A Reporting Bank shall calculate a specific risk capital requirement for both the credit derivative and the hedged position if none of the sub-paragraphs of paragraph 8.2.11 apply to them.

Specific Risk Capital Requirement

8.2.13 The specific risk capital requirement is intended to protect against an adverse movement in the price of an individual instrument owing to factors related to the individual issuer. A Reporting Bank shall calculate the specific risk capital requirement for each net position in an interest rate-related instrument[516] or a credit derivative (including the net delta-weighted position of options on that interest rate-related instrument or credit derivative where the Reporting Bank is using the delta-plus method or the scenario approach to calculate its market risk capital requirement for options) by[516A] –

(a) in the case of a securitisation exposure, multiplying the market value of each net position (ignoring the sign) by the relevant specific risk charge. The specific risk charge is computed as the risk weight that would apply to the securitisation exposure if the Reporting Bank were to hold it in the banking book, applying the approach as determined by paragraph 7.1.8(b)(iii), calculated in accordance with paragraphs 7.6.12 to 7.6.17, divided by 12.5, and converting the resultant amount into the base currency of the Reporting Bank at prevailing foreign exchange spot rates[516B,516C].

[MAS Notice 637 (Amendment No. 2) 2014]
[MAS Notice 637 (Amendment No. 2) 2017]

(b) in the case of a credit derivative and its hedged position for which the Reporting Bank has applied an offset pursuant to paragraph 8.2.11, multiplying the market value of the resulting net position (ignoring the sign) by the relevant specific risk charge in Table 8C-1 of Annex 8C of this Part, and converting this amount into the base currency of the Reporting Bank at prevailing foreign exchange spot rates;

(c) in the case of a CTP, using the larger of:

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516 This includes both actual and notional positions (e.g. futures contracts where the underlying is a debt security or an index representing a basket of debt securities). However, notional positions in zero-specific-risk securities do not attract specific risk (e.g. interest rate and currency swaps, FRAs, forward foreign exchange contracts, interest rate futures and futures on an interest rate index).

516A A Reporting Bank may limit the capital charge for an individual position in a credit derivative or securitisation instrument to the maximum possible loss. For a short risk position, this limit could be calculated as a change in value due to the underlying names immediately becoming default risk-free. For a long risk position, the maximum possible loss could be calculated as the change in value in the event that all the underlying names were to default with zero recoveries. The maximum possible loss shall be calculated for each individual position.

516B In general, the specific risk capital requirement for securitisation exposures which are held in the trading book is to be calculated according to the method used for such positions in the banking book, unless specified otherwise in this Part.

[MAS Notice 637 (Amendment No. 2) 2017]

516C A securitisation exposure that is subject to a 100% specific risk charge may be excluded for the purpose of calculating the general market risk capital requirement whether the Reporting Bank applies SA(MR) or IMA for the calculation of the general market risk capital requirement.

(i) the aggregate of each of the net long positions from the net long correlation trading exposures multiplied by the relevant specific risk charge in the relevant table of Annex 8C of this Part, and converting this amount into the base currency of the Reporting Bank at prevailing foreign exchange spot rates; and

(ii) the aggregate of each of the net short positions from the net short correlation trading exposures multiplied by the relevant specific risk charge in the relevant table of Annex 8C of this Part, and converting this amount into the base currency of the Reporting Bank at prevailing foreign exchange spot rates;

and

(d) in all other cases, multiplying the market value of each net position (ignoring the sign) by the relevant specific risk charge in Table 8C-1 of Annex 8C of this Part, and converting this amount into the base currency of the Reporting Bank at prevailing foreign exchange spot rates.

8.2.14 *[This paragraph has been intentionally left blank.]*

8.2.15 *[This paragraph has been intentionally left blank.]*

General Market Risk Capital Requirement

8.2.16 The general market risk capital requirement is intended to capture the risk of loss arising from changes in market interest rates. A Reporting Bank shall calculate the general market risk capital requirement for each currency portfolio by[517A] –

(a) applying either the maturity method or the duration method to calculate the general market risk capital requirement in the foreign currency; and

(b) converting the resultant amount into the base currency of the Reporting Bank at prevailing foreign exchange spot rates.

Such market risk capital requirements shall be summed up with no offsetting between positions of opposite sign.

Maturity Method[518]

8.2.17 A Reporting Bank applying the maturity method shall –

(a) slot each net position (including the net delta-weighted position of options on interest rate-related instruments where the Reporting Bank is using the delta-plus method to calculate its market risk capital requirement for options) into the appropriate maturity band according to the maturity and

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[517] *[This footnote has been intentionally left blank.]*

[517A] A securitisation exposure that is subject to a 100% specific risk charge may be excluded for the purpose of calculating the general market risk capital requirement whether the Reporting Bank applies SA(MR) or IMA for the calculation of the general market risk capital requirement.

[518] An illustration on the calculation of the general market risk capital requirement for interest rate risk under the maturity method is set out in Annex 8D of this Part.

coupon of the instrument in accordance with Table 8C-2 of Annex 8C of this Part. Fixed rate instruments should be allocated according to the residual term to maturity and floating rate instruments according to the residual term to the next repricing date;

(b) calculate the weighted long and short positions for each maturity band by multiplying the net positions by the corresponding general risk charge in Table 8C-2 of Annex 8C of this Part;

(c) match the weighted long and short positions within –

(i) the same maturity band;

(ii) the same zone (using unmatched positions from sub-paragraph (i)); and

(iii) different zones (using unmatched positions from sub-paragraph (ii));

(d) calculate the maturity band requirement, by multiplying the total amount matched within each maturity band by the maturity band matching factor in Table 8C-4 of Annex 8C of this Part;

(e) calculate the zone requirement, by multiplying the total amount matched within each zone by the corresponding zone matching factor in Table 8C-4 of Annex 8C of this Part;

(f) calculate the adjacent zone requirement, by multiplying the total amount matched between adjacent zones by the adjacent zone matching factor in Table 8C-4 of Annex 8C of this Part;

(g) calculate the non-adjacent zone requirement, by multiplying the total amount matched between Zones 1 and 3 and the non-adjacent zone matching factor in Table 8C-4 of Annex 8C of this Part;

(h) calculate the net position requirement as the sum of all unmatched positions after sub-paragraphs (c) to (g) above; and

(i) calculate the general market risk capital requirement as the sum of the maturity band requirement, the zone requirement, the adjacent zone requirement, the non-adjacent zone requirement and net position requirement determined in sub-paragraphs (d) to (h) above.

8.2.18 A Reporting Bank shall use separate slotting tables for positions in each currency, except in respect of those currencies in which the business of the Reporting Bank is insignificant. In such a case, the Reporting Bank may construct a single maturity ladder and slot, within each appropriate maturity band, the net long or short position for each currency. The Reporting Bank shall calculate the individual weighted net long and short positions for each maturity band by multiplying the net positions by the corresponding risk charges in Table 8C-2 of Annex 8C of this Part. The weighted net positions are to be summed within each maturity band, irrespective of whether they are long or short positions, to produce a gross position figure. The Reporting Bank shall then apply the

treatment specified in paragraphs 8.2.17(d) to (i) to calculate the general market risk capital requirement for these currencies.

Duration Method

8.2.19 A Reporting Bank may, having put in place the necessary IT systems and with prior approval from the Authority, apply the duration method to measure general market risk by calculating the price sensitivity of each position separately. A Reporting Bank which elects to use this method shall do so consistently, unless a change in method is approved by the Authority.

8.2.20 A Reporting Bank applying the duration method shall –

(a) calculate the modified duration of each instrument using the following formulae:

$$\text{Modified duration} = \frac{\text{Duration (D)}}{(1+r)}$$

$$D = \frac{\sum_{t=1}^{m} \frac{t\ C_t}{(1+r)^t}}{\sum_{t=1}^{m} \frac{C_t}{(1+r)^t}}$$

where -
r = yield to maturity;
$C_t$ = cash payment in time t; and
m = total maturity.

(b) slot each net position (including the net delta-weighted position of options on interest rate-related instruments where the Reporting Bank is using the delta-plus method to calculate its market risk capital requirement for options) into the appropriate duration band according to the modified duration of the instrument in accordance with Table 8C-3 of Annex 8C of this Part;

(c) calculate the weighted long and short positions for each duration band by multiplying the net positions by the modified duration of the position derived in sub-paragraph (a) and the relevant assumed change in yield in Table 8C-3 of Annex 8C of this Part;

(d) match the weighted long and short positions within –

(i) the same duration band;

(ii) the same zone (using unmatched positions from sub-paragraph (i)); and

(iii) different zones (using unmatched positions from sub-paragraph (ii));

(e) calculate the duration band requirement, by multiplying the total amount matched within each duration band by the duration band matching factor in Table 8C-4 of Annex 8C of this Part;

(f) calculate the zone requirement, by multiplying the total amount matched within each zone by the respective zone matching factor in Table 8C-4 of Annex 8C of this Part;

(g) calculate the adjacent zone requirement, by multiplying the total amount matched between adjacent zones by the adjacent zone matching factor in Table 8C-4 of Annex 8C of this Part;

(h) calculate the non-adjacent zone requirement, by multiplying the total amount matched between Zones 1 and 3 and the non-adjacent zone matching factor in Table 8C-4 of Annex 8C of this Part;

(i) calculate the net position requirement as the sum of all unmatched positions after sub-paragraphs (d) to (h) above; and

(j) calculate the general market risk capital requirement as the sum of the duration band requirement, the zone requirement, the adjacent zone requirement, the non-adjacent zone requirement and the net position requirement determined in sub-paragraphs (e) to (i) above.

8.2.20A A Reporting Bank shall use separate slotting tables for positions in each currency, except in respect of those currencies in which the business of the Reporting Bank is insignificant. In such a case, the Reporting Bank may construct a single maturity ladder and slot, within each appropriate duration band, the net long or short position for each currency. The Reporting Bank shall calculate the individual weighted net long and short positions for each duration band by multiplying the net positions by the corresponding assumed change in yield in Table 8C-3 of Annex 8C of this Part. The weighted net positions are to be summed within each duration band, irrespective of whether they are long or short positions, to produce a gross position figure. The Reporting Bank shall then apply the treatment specified in paragraphs 8.2.20(e) to (j) to calculate the general market risk capital requirement for these currencies.

**Sub-division 2: Equity Position Risk**

8.2.21 A Reporting Bank shall calculate its market risk capital requirement for equity position risk by –

(a) identifying the positions in its trading book which have equity position risk;

(b) allocating the positions into country portfolios in accordance with paragraph 8.2.22;

(c) for each country portfolio –

(i) calculating the net position in each equity, equity basket or equity index in accordance with paragraph 8.2.26; and

(ii) including these net positions in the calculation of its specific risk and general market risk capital requirements; and

(d) summing all specific risk and general market risk capital requirements for each country portfolio.

8.2.22 A Reporting Bank shall group equity positions into country portfolios as follows:

(a) a position in an individual equity belongs to –

(i) the country of its primary listing; or

(ii) where it is unlisted, the country of issue; and

(b) a position in an equity basket or equity index is allocated to –

(i) one or more country portfolios based on the countries to which the underlying equities belong under sub-paragraph (a) above; or

(ii) a hypothetical country.

Scope

8.2.23 In calculating its market risk capital requirement for equity position risk, a Reporting Bank shall include all its trading book positions[519], whether long or short, in instruments[520] which result in the Reporting Bank assuming equity position risk, unless –

(a) the position is deducted in the calculation of CET1 Capital, AT1 Capital or Tier 2 Capital; or

(b) the position is an option or is hedging an option which is caught under Sub-division 5 of this Division, except where the Reporting Bank is required under that Sub-division to include the delta-weighted position in this Sub-division.

Measurement of Positions with Equity Position Risk

8.2.24 Except for equity derivative instruments referred to in paragraph 8.2.25 below, a Reporting Bank shall use the current market value of its positions in equity instruments to calculate its market risk capital requirement for equity position risk.

8.2.25 A Reporting Bank shall convert its equity derivative instruments into notional positions in the relevant underlying equity instruments and use the current market value of the underlying instruments to calculate its market risk capital requirement for equity position risk. Annex 8E of this Part illustrates how a Reporting Bank should convert certain

[519] This includes positions in any equity instrument that is sold or lent under an SFT, but excludes any equity that is bought or borrowed under an SFT.

[520] This includes ownership interests, whether voting or non-voting, convertible securities that trade like equity, commitments to buy or sell equities, and derivatives on both individual equities and on equity indices. For the avoidance of doubt, non-convertible preference shares shall be covered under Sub-division 1 of Division 2 of this Part.

equity derivative instruments into notional positions in individual equities, equity baskets or equity indices.

Allowable Netting of Matched Positions

8.2.26 For the purpose of calculating the specific risk and general market risk capital requirements for its equity positions, a Reporting Bank may net[521] -

(a) a long position and a short position (including notional positions) in an identical equity[522], equity basket or equity index in the same country portfolio; and

(b) a matched position in a depository receipt against the corresponding underlying equity or identical equities in different country portfolios provided that any costs of conversion are fully taken into account[523].

Specific Risk Capital Requirement

8.2.27 A Reporting Bank shall calculate the specific risk capital requirement for each net position in an equity instrument (including the net delta-weighted position of options on that equity instrument where the Reporting Bank is using the delta-plus method or the scenario approach to calculate its market risk capital requirement for options) by –

(a) converting the value of the net position into the base currency of the Reporting Bank at prevailing foreign exchange spot rates; and

(b) multiplying the resultant amount by the appropriate specific risk charge as follows:

(i) any qualifying equity index (as defined in Annex 8F of this Part) – 0%; or

(ii) any other equity, equity basket or equity index – 8%.

General Market Risk Capital Requirement

8.2.28 A Reporting Bank shall calculate the general market risk capital requirement for each country portfolio by –

(a) calculating the net position in each country portfolio by summing the net positions of equities, equity baskets and equity indices in the same country portfolio (including the net delta-weighted positions of options on equities and equity indices where the Reporting Bank is using the delta-plus method to calculate its market risk capital requirement for options);

(b) converting the net position in each country portfolio into the base currency of the Reporting Bank at prevailing foreign exchange spot rates; and

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521 The net position is the difference between the value of the long positions of the Reporting Bank (including notional positions) and the value of its short positions (including notional positions) in the same equity.

522 Two equities are the same if they enjoy the same rights in all respects and are fungible.

523 Any foreign exchange risk arising out of these positions shall be dealt with under Sub-division 3.

(c) multiplying the resultant amount (ignoring the sign) by a general risk charge of 8%.

Additional Market Risk Capital Requirement for Qualifying Equity Indices

8.2.29 In addition to the general market risk capital requirement, a Reporting Bank shall apply an additional risk charge of 2% to the net long or short position in a qualifying equity index (as defined in Annex 8F of this Part). This is intended to cover factors such as execution risk.

Treatment of Arbitrage Strategies

8.2.30 In the case of the futures-related arbitrage strategies described below, a Reporting Bank shall apply the additional 2% risk charge referred to in paragraph 8.2.29 to only one index with the opposite position exempt from the market risk capital requirement. Such futures-related arbitrage strategies are –

(a) when the Reporting Bank takes an opposite position in exactly the same index at different dates or in different market centres; or

(b) when the Reporting Bank takes an opposite position in contracts at the same date in a different but similar index, subject to approval by the Authority. The Authority will not normally grant approval for a Reporting Bank to use this treatment unless the Reporting Bank is able to demonstrate that the two indices contain sufficient common components to justify offsetting.

8.2.31 Where a Reporting Bank engages in a deliberate arbitrage strategy in which a futures contract on a broadly-based index matches a basket of stocks, the Reporting Bank may exclude both positions for the purpose of calculating its specific risk and general market risk capital requirements, on condition that –

(a) the trades have been deliberately entered into and are separately controlled; and

(b) the composition of the basket of stocks represents at least 90% of the index when broken down into its underlying components.

In such a case, the Reporting Bank shall apply a minimum risk charge of 4% (i.e. 2% on the gross value of the positions on each side) to reflect divergence and execution risks. This applies even if all of the stocks comprising the index are held in identical proportions. Any excess value of the stocks comprising the basket over the value of the futures contract or excess value of the futures contract over the value of the basket shall be treated as an open long or short position.

**Sub-division 3: Foreign Exchange Risk**

8.2.32 A Reporting Bank shall calculate its market risk capital requirement for foreign exchange risk by –

(a) identifying the positions which have foreign exchange risk;

(b) calculating the net open position in each currency in accordance with paragraphs 8.2.35 and 8.2.36 below, and the net gold position in accordance with paragraphs 8.2.38 and 8.2.41 below;

(c) converting the net open position in each currency and the net gold position into the base currency of the Reporting Bank at prevailing foreign exchange spot rates;

(d) computing the overall net open position by aggregating –

  (i) the absolute value of the sum of the net short currency positions or the sum of the net long currency positions, whichever is greater; and

  (ii) the absolute value of the net position (long or short) in gold; and

(e) multiplying the overall net open position by 8%.

8.2.33 Notwithstanding paragraph 8.2.32 above, a Reporting Bank doing negligible business in foreign currency and which does not take foreign exchange positions for its own account may, subject to the prior approval of the Authority, be exempted from market risk capital requirements on these positions provided that –

(a) its foreign currency business, defined as the greater of the sum of its gross long positions and the sum of its gross short positions in all foreign currencies, does not exceed 100% of its Eligible Total Capital; and

(b) its overall net open position as defined in paragraph 8.2.32 above does not exceed 2% of its Eligible Total Capital.

Scope

8.2.34 In calculating its market risk capital requirement for foreign exchange risk, a Reporting Bank shall include all positions in gold and foreign currency-denominated instruments, regardless of whether these are in the trading book or banking book, unless –

(a) the position is deducted in the calculation of CET1 Capital, AT1 Capital or Tier 2 Capital;

(b) the position is hedging a position which is caught under sub-paragraph (a);

(c) the position is hedging an instrument which qualifies as capital of the Reporting Bank for the purpose of calculating its capital requirements;

(d) the position is an option or is hedging an option[524] which is caught under Sub-division 5 of this Division, except where the Reporting Bank is

[524] A market risk capital requirement for foreign exchange risk shall nevertheless be calculated for option premiums that are denominated in foreign currency.

required under that Sub-division to include the delta-weighted position in this Sub-division; or

(e) the position is a structural foreign exchange position defined in Sub-division 5 of Division 1 of this Part.

Measurement of Positions with Foreign Exchange Risk

8.2.35 A Reporting Bank shall calculate its net open position in each currency[524A] by summing –

(a) the net spot position (i.e. all asset items less all liability items, including accrued interest and accrued expenses, denominated in the currency in question);

(b) the net forward position (i.e. all amounts to be received less all amounts to be paid under forward foreign exchange transactions, including currency futures and the principal on currency swaps not included in the spot position);

(c) guarantees and other similar instruments denominated in foreign currency which are certain to be called and are likely to be irrecoverable;

(d) net future income or expenses not yet accrued but already fully hedged, as may be determined by the Reporting Bank[525];

(e) depending on particular accounting conventions in different countries, any other item representing a profit or loss in foreign currencies; and

(f) the net delta-weighted position of foreign currency options where the Reporting Bank is using the delta-plus method to calculate its market risk capital requirement for options.

8.2.36 A Reporting Bank shall allocate its positions in composite currencies to –

(a) one or more currency portfolios based on their component parts; or

(b) a hypothetical currency.

8.2.37 A Reporting Bank shall convert its foreign currency derivative instruments and derivative positions on gold into notional positions in the relevant foreign currencies and in gold. Annex 8G of this Part illustrates how a Reporting Bank should convert certain foreign currency derivative instruments and derivative positions on gold into notional positions in the relevant foreign currencies and in gold.

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[524A] Where the Reporting Bank is assessing its foreign exchange risk on a consolidated basis, and where the inclusion of certain positions could be impractical (e.g. marginal operations of a foreign branch or subsidiary), the internal limit in each currency may be used as a proxy for the positions, provided there is adequate ex-post monitoring of actual positions against such limits. The limits should be added, without regard to sign, to the net open position in each currency.

[525] A Reporting Bank may exclude future income and expenses unless these are certain and have been hedged, but shall do so on a consistent basis (i.e. a Reporting Bank shall not be permitted to select only those expected future flows which would reduce its net position).

**Sub-division 4: Commodity Risk**

8.2.38 A Reporting Bank shall calculate its market risk capital requirement for commodity risk by –

(a) identifying the positions which have commodity risk;

(b) expressing each commodity position in terms of the standard unit of measurement for that position (e.g. barrels, kilos, grams);

(c) converting each position into the base currency of the Reporting Bank at the prevailing foreign exchange spot rates and the current spot price for the commodity;

(d) calculating the market risk capital requirement for each commodity position in accordance with the simplified approach in paragraph 8.2.44 or the maturity ladder approach in paragraph 8.2.45[526]; and

(e) summing the resulting individual market risk capital requirement for each commodity position.

8.2.39 A Reporting Bank shall convert its commodity derivative instruments into notional positions in the relevant commodities. Annex 8H of this Part illustrates how a Reporting Bank should convert certain commodity derivative instruments into notional positions in the relevant commodities.

526 A Reporting Bank should use the IMA to calculate its market risk capital requirement for commodity risk if it conducts a significant amount of commodities business.

Scope

8.2.40 In calculating its market risk capital requirement for commodity risk, a Reporting Bank shall include all positions[527], whether long or short, in instruments[528], regardless of whether these are in the trading book or banking book, which result in the Reporting Bank assuming commodity position risk, unless –

(a) it is a gold position, in which case it shall be included within the scope of its foreign exchange risk and treated under Sub-division 3 of this Division;

(b) the position is hedging an option which is caught under Sub-division 5 of this Division, except where the Reporting Bank is required under that Sub-division to include the delta-weighted position in this Sub-division; and

(c) the position arises purely from stock financing (i.e. a transaction where a physical commodity is sold forward and the cost of funding is locked in until the date of the forward sale)[529].

Allowable Netting of Matched Positions

8.2.41 For the purpose of calculating the market risk capital requirement for its commodity positions, a Reporting Bank may net the long and short positions in an identical commodity.

8.2.42 Positions in different sub-categories of the same commodity shall be treated as different commodities unless they –

(a) can be delivered against each other; or

(b) are close substitutes of each other and have price movements which have exhibited a stable correlation coefficient of at least 0.9 over the last 12 months. The Reporting Bank shall then monitor the correlation coefficient to ensure that it remains at 0.9 on a continuing basis.

8.2.43 A Reporting Bank which intends to rely on the approach in paragraph 8.2.42(b) shall obtain the prior approval of the Authority. The Authority will grant its approval if it is satisfied that the chosen method is accurate.

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[527] This includes positions in any commodity that is sold under a repo or lent under a commodities lending transaction, but excludes positions in any commodity that is bought under a reverse repo or borrowed under a commodities borrowing transaction.

[528] This includes physical products which are or can be traded on a secondary market (e.g. agricultural products, minerals (including oil) and precious metals) and all commodity derivatives and off-balance sheet positions which are affected by changes in commodity prices (e.g. commodity futures, commodity swaps).

[529] Notwithstanding this, any interest rate or foreign exchange risk in respect of stock financing should be treated under Sub-divisions 1 and 3 of this Division.

Simplified Approach

8.2.44 A Reporting Bank using the simplified approach shall calculate the market risk capital requirement for each commodity by summing –

(a) 15% of the net position in the commodity (including the net delta-weighted position of options on that commodity where the Reporting Bank is using the delta-plus method to calculate its market risk capital requirement for options); and

(b) 3% of the gross position (long plus short, ignoring the sign) in the commodity (including the gross delta-weighted position of options on that commodity where the Reporting Bank is using the delta-plus method to calculate its market risk capital requirement for options).

Maturity Ladder Approach[530]

8.2.45 A Reporting Bank using the maturity ladder approach shall calculate the market risk capital requirement for each commodity by –

(a) offsetting long and short positions (including the net delta-weighted position of options on that commodity where the Reporting Bank is using the delta-plus method to calculate its market risk capital requirement for options) maturing –

(i) on the same day; or

(ii) in the case of positions arising from contracts traded in markets with daily delivery dates, within ten business days of each other;

(b) allocating the remaining positions to the appropriate maturity time-bands as follows:

(i) up to 1 month[531];

(ii) more than 1 month but not more than 3 months;

(iii) more than 3 months but not more than 6 months;

(iv) more than 6 months but not more than 12 months;

(v) more than 1 year but not more than 2 years;

(vi) more than 2 years but not more than 3 years; and

(vii) more than 3 years;

530 An illustration on the calculation of the market risk capital requirement for commodity risk under the maturity ladder approach is set out in Annex 8I of this Part.

531 Physical commodity positions are allocated to this time-band.

(c) matching long and short positions within each time-band. In each instance, calculating a spread charge equal to the sum of long and short positions matched multiplied by the spread rate of 1.5%;

(d) carrying unmatched positions remaining to another time-band where they can be matched, then matching them until all matching possibilities are exhausted. In each instance, calculating –

(i) a carry charge equal to the carried position multiplied by the carry rate of 0.6% and the number of time-bands by which the position is carried; and

(ii) a spread charge equal to the sum of long and short positions matched multiplied by the spread rate of 1.5%;

(e) calculating the outright charge on the remaining positions (which will either be all long positions or all short positions) equal to the sum of the remaining positions (ignoring the sign) multiplied by the outright charge of 15%; and

(f) summing the spread rates, carry rates and outright charge determined in sub-paragraphs (c) to (e) above.

**Sub-division 5: Treatment of Options**

8.2.46 A Reporting Bank shall calculate its market risk capital requirement for options[532] using –

(a) the simplified approach in accordance with paragraphs 8.2.47 to 8.2.49;

(b) the delta-plus method in accordance with paragraphs 8.2.50 to 8.2.56; or

(c) the scenario approach in accordance with paragraphs 8.2.57 to 8.2.63.

Simplified Approach[533]

8.2.47 A Reporting Bank may use the simplified approach only if –

(a) it does not write options; or

(b) where it writes options, all its written options are hedged by perfectly matched long positions in exactly the same options.

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532 A Reporting Bank shall use the more sophisticated methods under the SA(MR) i.e. the delta-plus method or the scenario approach, or use the IMA, if it engages in significant options trading. Such a Reporting Bank shall also monitor closely other risks associated with options (e.g. rho (this measures the rate of change of the option value with respect to the interest rate) and theta (this measures the rate of change of the option value with respect to time)). A Reporting Bank may also incorporate rho within their market risk capital requirement for interest rate risk.

533 An illustration on the calculation of the market risk capital requirement under the simplified approach is set out in Annex 8J of this Part.

8.2.48 Under the simplified approach, a Reporting Bank shall exclude the positions in the options and the associated underlying financial instruments or commodities, cash or forward, from the requirements in Sub-divisions 1 to 4 of this Division, and shall separately calculate the market risk capital requirements for those positions in accordance with paragraph 8.2.49 below. The Reporting Bank shall add the market risk capital requirements for those positions to the market risk capital requirements for the relevant risk categories (i.e. interest rate, equity positions, foreign exchange and commodities) calculated in accordance with Sub-divisions 1 to 4 of this Division.

8.2.49 A Reporting Bank using the simplified approach shall calculate its market risk capital requirement for options by –

(a) identifying the options and the associated underlying financial instruments or commodities;

(b) calculating the market risk capital requirement for each combination of a long put and a long outright position in the associated underlying financial instrument or commodity, or of a long call and a short outright position in the associated underlying financial instrument or commodity, by –

(i) multiplying the market value of the outright position[534] by the sum of the applicable specific and general risk charges, or single applicable risk charge, as the case may be[535]; and

(ii) subtracting the amount the option is in the money (if any) bounded at zero[536];

(c) calculating the market risk capital requirement for each long call or long put as –

(i) the market value of the underlying financial instrument or commodity multiplied by the sum of the applicable specific and general risk charges, or single applicable risk charge, as the case may be[535]; or

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[534] The underlying financial instrument or commodity should be taken to be the asset which would be received if the option were exercised. In addition, the notional value should be used for items where the market value of the underlying financial instrument or commodity could be zero (e.g. caps and floors, swaptions).

[535] Certain notional positions in zero-specific-risk securities do not attract specific risk, e.g. interest rate and currency swaps, FRAs, forward foreign exchange contracts, interest rate futures and futures on an interest rate index. Similarly, options on such zero-specific-risk securities also bear no specific risk. For the purpose of this sub-paragraph –
(a) the specific and general risk charges in respect of options on interest rate-related instruments shall be determined in accordance with Sub-division 1 of this Division;
(b) the specific and general risk charges in respect of options on equities and equity indices shall be determined in accordance with Sub-division 2 of this Division;
(c) the risk charge in respect of foreign currency and gold options shall be 8%; and
(d) the risk charge in respect of options on commodities shall be 15%.
[MAS Notice 637 (Amendment No. 2) 2014]

[536] For options with a residual maturity of more than 6 months, the strike price should be compared with the forward, and not current, price. A Reporting Bank unable to do so shall take the in-the-money amount to be zero.

(ii) the market value of the option[536A],

whichever is lower; and

(d) summing the market risk capital requirements determined in sub-paragraphs (b) and (c) above.

Delta-plus method[537]

8.2.50 A Reporting Bank using the delta-plus method[538] shall calculate its market risk capital requirement for options by –

(a) calculating the delta-weighted position of each option in accordance with paragraph 8.2.51 and adding these delta-weighted positions to the net positions in the relevant risk category in Sub-divisions 1 to 4 of this Division for the purpose of calculating the specific risk and general market risk capital requirements[539];

(b) calculating the capital requirement for gamma[540] risk of its option positions (including hedge positions) based on the options pricing model of the Reporting Bank, in accordance with paragraphs 8.2.52 to 8.2.55 below;

(c) calculating the capital requirement for vega[541] risk of its option positions (including hedge positions) based on the options pricing model of the Reporting Bank, in accordance with paragraph 8.2.56 below; and

(d) summing the capital requirements determined in sub-paragraphs (b) and (c) above.

8.2.51 A Reporting Bank shall calculate its delta-weighted position for each option as follows:

| **Delta-weighted position** | = | Market value of the underlying financial instruments or commodities | X | delta |
|---|---|---|---|---|

[536A] Where the position does not fall within the trading book (i.e. options on certain foreign exchange or commodities positions that do not belong to the trading book), it would be acceptable to use the book value instead.

[537] An illustration on the calculation of the market risk capital requirement under the delta-plus method is set out in Annex 8K of this Part.

[538] A Reporting Bank which trades in exotic options (e.g. barriers, digitals) shall use either the scenario approach or the IMA to calculate its market risk capital requirement for such options, unless it is able to demonstrate to the Authority that the delta-plus method is appropriate.

[539] In the case of options on futures or forwards, the relevant underlying is that on which the future or forward is based (e.g. for a bought call option on a June 3-month bill future, the relevant underlying is the 3-month bill). Annex 8L of this Part illustrates how a Reporting Bank should determine delta-weighted positions for interest rate options for the purpose of calculating delta-weighted positions.

[540] This measures the rate of change of delta.

[541] This measures the sensitivity of the value of the option with respect to a change in volatility.

8.2.52 A Reporting Bank shall calculate the "gamma impact" for each individual option according to a Taylor series expansion as follows:

| **Gamma impact** = ½ x Gamma x $(VU)^2$ |
|---|

where VU = variation of the underlying financial instruments or commodities of the option

8.2.53 For the purposes of paragraph 8.2.52 above, a Reporting Bank shall calculate VU as follows:

(a) for any interest rate-related option, the market value of the underlying interest rate-related instruments multiplied by the relevant general risk charge in Table 8C-2 of Annex 8C of this Part;

(b) for any option on equities and equity indices, the market value of the underlying equities or equity indices multiplied by 8%;

(c) for any foreign currency or gold option, the market value of the underlying currency or gold instruments multiplied by 8%; and

(d) for any option on commodities, the market value of the underlying commodities multiplied by 15%.

8.2.54 A Reporting Bank shall treat the following positions as positions with the same underlying financial instruments or commodities for the purpose of calculating the gamma impact:

(a) for interest rate-related instruments, positions under each time-band as set out in Table 8C-2 or Table 8C-3 of Annex 8C of this Part, depending on whether the Reporting Bank is using the maturity method or the duration method;

(b) for equities and equity indices, positions in the same country portfolio;

(c) for foreign currencies and gold, positions in the same currency pair and in gold; and

(d) for commodities, positions in the same individual commodity as defined in paragraphs 8.2.41 and 8.2.42.

8.2.55 A Reporting Bank shall calculate its capital requirement for gamma risk by–

(a) calculating the net gamma impact in respect of each underlying financial instrument or commodity by aggregating the individual gamma impacts for each option position in respect of that underlying financial instrument or commodity (which may be either positive or negative); and

(b) aggregating the absolute value of the net gamma impacts that are negative.

8.2.56 A Reporting Banks shall calculate its capital requirement for vega risk by –

(a) multiplying the sum of the vegas for all option positions in respect of the same underlying financial instrument or commodity, as defined in paragraph 8.2.54 above, by a proportional shift in volatility of ±25%; and

(b) aggregating the absolute value of the individual capital requirements which have been calculated for vega risk.

Scenario Approach[542]

8.2.57 A Reporting Bank shall obtain the prior approval of the Authority before using the scenario approach to calculate its market risk capital requirement for options.[543]

8.2.58 Under the scenario approach, a Reporting Bank shall exclude the positions in the options and the associated underlying financial instruments or commodities, cash or forward, from the requirements in Sub-divisions 1 to 4 of this Division for the purpose of calculating its general market risk capital requirements, and shall calculate the market risk capital requirements for those positions in accordance with paragraph 8.2.60 below.

8.2.59 A Reporting Bank applying the scenario approach shall analyse its option portfolios[544] using a two-dimensional matrix[545]. The first dimension analyses the changes in the value of the option portfolio due to changes in the value of the underlying financial instruments or commodities within a specified range of the current value. The second dimension analyses the changes in value of the option portfolio due to changes in the volatility of the value of the underlying financial instruments or commodities within that range.

8.2.60 A Reporting Bank shall calculate its market risk capital requirement for options under the scenario approach by –

(a) calculating the delta-weighted position of each position in accordance with paragraph 8.2.51 and adding these delta-weighted positions to the relevant risk category in Sub-divisions 1 to 4 of this Division for the purpose of calculating the specific risk capital requirement;

(b) calculating the general market risk capital requirement by –

(i) specifying, for each option portfolio, a fixed range of changes in the rate or price of the underlying financial instrument or commodity in

542 The scenario approach uses simulation techniques to calculate changes in the value of an option portfolio for changes in the level and volatility of the prices of its associated underlying instruments.

543 The Reporting Bank should, among others, take into account standards listed in Division 3 on IMA, which are relevant given the nature of the business.

544 Option portfolios include options and any related hedging positions grouped together according to their underlying financial instruments or commodities as defined in paragraph 8.2.54.

545 A Reporting Bank shall set up a different matrix for each individual underlying financial instrument or commodity as defined in paragraph 8.2.54. An example is set out in Annex 8M of this Part.

accordance with paragraph 8.2.61. For all risk categories, at least seven observations (including the current observation) shall be used to divide the range into equally spaced intervals;

(ii) specifying, for each option portfolio, a shift in the volatility of the rate or price of ±25%;

(iii) revaluing each option portfolio for simultaneous changes in the rate or price of the underlying financial instrument or commodity and in the volatility of that rate or price; and

(iv) aggregating the absolute value of the largest loss computed in each option portfolio matrix; and

(c) summing the capital requirements determined in sub-paragraph (b)(iv) above.

8.2.61 A Reporting Bank shall use the following specified range of changes in the rate or price of the underlying financial instruments or commodities:

(a) for interest rates, the range shall be ± the relevant assumed change in yield in Table 8C-2 of Annex 8C of this Part;

(b) for equities, the range shall be ±8%;

(c) for foreign exchange and gold, the range shall be ±8%; and

(d) for commodities, the range shall be ±15%.

8.2.62 Subject to the approval of the Authority, a Reporting Bank which has significant positions in interest rate options may analyse the changes in its interest rate option portfolio using a minimum of six sets of time-bands. A Reporting Bank using this approach shall not combine more than three of the time-bands as defined in Table 8C-2 of Annex 8C of this Part into any one set. The applicable yield for each set of time-bands shall be the highest of the assumed changes in yield applicable to the group to which the time-bands belong.[546]

8.2.63 Notwithstanding the parameters prescribed in paragraphs 8.2.60(b)(i) and (ii), the Authority may require a Reporting Bank to use a different change in rate, price, or volatility, or to calculate intermediate points on the matrix.

[546] For example, if the time-bands of 3 to 4 years, 4 to 5 years and 5 to 7 years are combined, the highest assumed change in yield of these three time-bands would be 0.75.

## Division 3: IMA

### Sub-division 1: General Requirements

8.3.1 A Reporting Bank shall comply with the requirements, and should meet the guidelines, in this Division before applying for approval from the Authority to adopt the IMA.

8.3.2 A Reporting Bank shall perform an internal assessment against the requirements and guidelines in this Division to ascertain its readiness to adopt the IMA before applying for approval from the Authority.

8.3.3 A Reporting Bank which complies with the requirements in this Division does not automatically qualify for IMA adoption. The Authority has to be satisfied that the intention of the Reporting Bank in adopting the IMA is to seek continual improvements in its risk management practices. The Reporting Bank should not regard these standards as an exhaustive checklist to be satisfied in order to adopt the IMA. As part of its approval process, the Authority will consider the willingness and ability of the Reporting Bank to maintain and improve its systems to ensure the continuing appropriateness of the market risk capital requirements. The Authority may require a period of initial monitoring and live testing of the Reporting Bank's IMA framework (including its internal models) before approving the adoption of the IMA for regulatory capital purposes.

8.3.4 A Reporting Bank using the IMA to calculate its market risk capital requirement shall have an integrated and comprehensive market risk measurement approach which captures broad risk factor categories (e.g. interest rates, equities, foreign exchange and commodities, with related options volatilities being included in each risk factor category) and a sound and robust market risk management process and system in place to support its use of the IMA.

8.3.4A A Reporting Bank which starts to use models for one or more risk factor categories will, over time, be expected to extend the models to all its market risks such that, except for insignificant exposures, all its market risks across the entire banking group are captured and reliably measured by its internal models[546A]. The following conditions shall apply to a Reporting Bank using a combination of IMA and the SA(MR):

(a) each broad risk factor category shall be assessed using a single approach (either IMA or the SA(MR)), no combination of the two methods shall in principle be permitted within a risk category or across different entities of a Reporting Bank for the same type of risk. A Reporting Bank shall obtain prior approval from the Authority for any deviation from this principle;

[MAS Notice 637 (Amendment No. 2) 2018]

(b) any modification of the combination of the two approaches shall not be permitted unless the Authority is satisfied with the justification provided by the Reporting Bank; and

[546A] Market risks arising from insignificant exposures which are not included in its models shall be separately measured and the market risk capital requirement for such exposures shall be calculated using the SA(MR).

(c) no element of market risk shall escape measurement, i.e. the exposure for all the various risk factors, whether calculated according to the SA(MR) or IMA, shall be captured.

8.3.5 A Reporting Bank may apply to the Authority for approval to use multiple models if it is able to demonstrate that it is inappropriate to model its market risk using a single model.

8.3.6 *[This paragraph has been intentionally left blank.]*

8.3.7 A Reporting Bank using the IMA to model general market risk only shall calculate specific risk capital requirement using the SA(MR).

8.3.8 In respect of insignificant exposures which continue to be measured according to the SA(MR), the Reporting Bank should review those exposures at least annually and, to the extent practicable, move towards using the IMA to calculate the market risk capital requirement for those exposures.

8.3.9 A Reporting Bank shall comply with the requirements, and should meet the guidelines, in this Division on an ongoing basis.

**Sub-division 2: Application to Adopt the IMA**

8.3.10 A Reporting Bank which intends to adopt the IMA to calculate its market risk capital requirement shall apply in writing to the Authority for approval, specifying whether its application is in relation to general market risk, specific risk or both.

8.3.11 The application pursuant to paragraph 8.3.10 shall contain the following:

(a) a written confirmation from the executive officer responsible for risk management in the Reporting Bank that –

(i) the Reporting Bank has conducted an internal assessment and has ascertained that it fulfills the requirements set out in this Division;

(ii) the use of IMA forms an integral part of the process and system of the Reporting Bank for managing market risk;

(iii) the Reporting Bank has carefully considered the implications of the use of IMA on market risk assessment and capital management;

(iv) the Reporting Bank has a process for continually determining the suitability of its market risk management strategy and framework and its IMA process and system, taking into account such regulations, Notices and guidelines that the Authority may issue from time to time;

(v) the Reporting Bank has policies, procedures, systems and controls to calculate its market risk capital requirement under the IMA accurately and that those policies, procedures, systems and controls are subject to internal audit at least annually; and

(vi) the Reporting Bank has a process to calculate the market risk capital requirement for any IMA exposure using the SA(MR) within a reasonable time[547] if required by the Authority;

(b) a written confirmation from the executive officer responsible for internal audit of the Reporting Bank that –

(i) he agrees with the confirmation by the executive officer responsible for risk management pursuant to sub-paragraph (a) above; and

(ii) the Reporting Bank has conducted an internal audit to independently verify, and has ascertained that, it has the systems, processes and controls necessary for adopting the IMA; and

(c) a report on the latest internal assessment conducted by the Reporting Bank prior to the application, including the latest report to senior management on its backtesting using at least 250 business days of observed results, and any relevant supporting documentation relating to the adoption of the IMA.

**Sub-division 3: Approval to Adopt the IMA**

8.3.12 The Authority may grant approval for a Reporting Bank to adopt the IMA, subject to such conditions or restrictions as the Authority may impose. The extent to which the Reporting Bank complies with the requirements and meets the guidelines in this Division will influence the level at which the Authority sets the multiplication factor referred to in paragraph 8.3.71. The Authority shall, at the minimum, consider the following in approving the Reporting Bank's internal models:

(a) the Reporting Bank's risk management process and system is conceptually sound and is implemented with integrity;

(b) the Reporting Bank has in the Authority's view, sufficient numbers of staff skilled in the use of the internal models not only in the market risk-taking units but also in other units such as risk control, audit, and back office;

(c) the Reporting Bank's internal validation processes described in paragraph 8.3.112 are operating in a satisfactory manner;

(d) the formulae used in the calculation process by the Reporting Bank, which includes the pricing of options and other complex instruments, are validated by a qualified unit independent of the activities of the market risk-taking units;

[547] In general, the Authority would expect the Reporting Bank to be able to calculate the market risk capital requirement for any IMA exposure using the SA(MR) within a 1-month period.

(e) the structure of the internal models is adequate with respect to the Reporting Bank's activities and geographical coverage;

(f) the internal models consistently provide reliable measure of potential losses over time (i.e. backtesting results should show consistent track record of reasonable accuracy in measuring risk). The Reporting Bank shall make the backtesting results as well as the underlying inputs to their calculation available to the Authority upon request;

(g) the data flows and processes associated with the market risk measurement system are transparent and accessible. In particular, there shall be easy access to models' specifications and parameters when required; and

(h) the Reporting Bank regularly conducts stress tests in accordance with the requirements set out in paragraphs 8.3.124 to 8.3.136.

8.3.13 A Reporting Bank which has received approval to use the IMA to calculate its market risk capital requirement for certain exposures shall not revert to calculating the market risk capital requirement for those types of exposures using the SA(MR), unless directed by the Authority to do so.

8.3.14 If a Reporting Bank becomes aware after adopting the IMA that any of the confirmations made pursuant to paragraph 8.3.11(a) and (b) above are no longer valid or that it no longer complies with any of the conditions or restrictions imposed by the Authority pursuant to paragraph 8.3.12 above, it shall –

(a) inform the Authority as soon practicable;

(b) assess the effect of the situation in terms of the risk posed to the Reporting Bank;

(c) prepare a plan to rectify the situation and inform the Authority of its plan as soon as practicable; and

(d) undertake prompt corrective action within a reasonable time in accordance with the plan prepared pursuant to sub-paragraph (c) above.

8.3.15 The Authority may suspend or revoke its approval for a Reporting Bank to adopt the IMA, subject the Reporting Bank to higher bank-specific capital requirements pursuant to section 10(3) of the Banking Act, or take any other actions, if –

(a) the Reporting Bank has not fulfilled any of the conditions or restrictions imposed by the Authority pursuant to paragraph 8.3.12;

(b) the Reporting Bank fails to comply with paragraph 8.3.14;

(c) the Authority subsequently becomes aware that the Reporting Bank has furnished information that is false or misleading in a material manner to the Authority in connection with its application for approval to adopt the IMA;

(d) the backtesting results of the Reporting Bank fall within the Red Zone as defined in paragraph 8.3.118(c); or

(e) the Authority is not satisfied that the risk management process and system of the Reporting Bank are adequate to support the IMA.

8.3.16 A Reporting Bank shall seek the approval of the Authority before it makes any significant change to its IMA framework (including its internal models) for market risk. Prior to receiving approval for any significant change to its internal models, the Reporting Bank shall continue to use its existing internal models to calculate its market risk capital requirement for the affected exposures, unless required by the Authority to use the SA(MR).

**Sub-division 4: Role of Board and Senior Management**

8.3.17 The Board should understand the nature and level of market risks taken by the Reporting Bank and how the risks fit in with its business strategy. The Board should review the market risk-return strategy of the Reporting Bank at least annually or more frequently if market conditions warrant. Senior management should keep the Board apprised on a regular basis of the market risk exposures and transactions of the Reporting Bank which have a significant impact on market risk.

8.3.18 The Board should ensure the continuing effectiveness of the market risk management process and system and regard market risk control as an essential aspect of the business. The Board may delegate some of its market risk management responsibilities to senior management or staff, or committees comprising senior management or staff. However, accountability of the Board should not be delegated and the Board should continue to exercise oversight to ensure that its delegated responsibilities are effectively carried out.

8.3.19 Senior management of a Reporting Bank should exercise active oversight[548] to ensure the continuing effectiveness of the market risk management process and system and regard market risk control as an essential aspect of the business to which significant resources need to be devoted. Accordingly, senior management should have a good understanding of the market risk management process and system.

8.3.20 The Board should ensure that senior management has the requisite skills to manage the market risks arising from business activities of the Reporting Bank. Senior management should ensure that there is sufficient depth of market risk management knowledge and experience across different levels and functions within the Reporting Bank.

8.3.21 The Board should approve all fundamental aspects relating to the IMA framework of the Reporting Bank. Senior management should approve all significant aspects of the use of the IMA.

8.3.22 The Board should ensure that there is adequate representation from independent risk management units on committees responsible for decisions which may

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[548] The Authority expects that involvement of senior management in respect of these areas to exceed the level of involvement by the Board.

impact the market risk of the Reporting Bank. These committees should have written terms of reference with clearly defined objectives, roles and responsibilities.

8.3.23 The Board should ensure that clear and comprehensive written policies, procedures and controls relating to the use of the IMA by the Reporting Bank are established. At a minimum, these policies should reflect the risk tolerance of the Board and clearly delineate lines of authority and responsibility for managing market risk. The Board should also ensure that the actions of senior management are consistent with the policies, as part of the checks and balances embodied in sound corporate governance.

8.3.24 Senior management should articulate its expectations and provide guidance on technical and operational aspects of the market risk management process and system. This responsibility includes ensuring that there are clear delineations of lines of responsibility for managing market risk, adequate systems for measuring market risk, a comprehensive set of risk limits, effective internal controls and a comprehensive market risk reporting process. Senior management should ensure that a routine is established for ensuring compliance with the market risk management policies, procedures and controls.

8.3.25 Senior management should ensure that the various components of the market risk management process and system of the Reporting Bank are regularly reviewed and evaluated. This review should take into account changes in the activities of the Reporting Bank, market conditions and the market risk management process and system.

8.3.26 The Board and senior management should exercise oversight over the stress testing process of the Reporting Bank in relation to market risk. The Board and senior management should regularly review the techniques, assumptions, results and appropriateness of the stress tests, as well as approve significant changes to the stress test techniques and assumptions.

8.3.27 Senior management should also keep the Board informed of any weaknesses associated with the use of the IMA by the Reporting Bank on a regular and timely basis.

**Sub-division 5: Role of Independent Risk Management Unit**

8.3.28 A Reporting Bank shall have one or more risk management units which are independent from its market risk-taking units and which have a functional reporting line to the Board Risk Committee, the Chief Risk Officer or a person of an equivalent position in the Reporting Bank. The remuneration of such independent risk management unit or units shall not be directly linked to the performance of market risk-taking units. In addition, the Reporting Bank shall ensure that there is no conflict of interest and that the staff in the independent risk management unit or units is able to provide objective and effective challenge to the staff of the market risk-taking units.

8.3.29 A Reporting Bank shall ensure that the responsibilities of the independent risk management unit or units include –

(a) designing and implementing the market risk management system of the Reporting Bank;

(b) establishing a comprehensive set of risk limits to align the business goals of the Reporting Bank with the market risk threshold approved by the Board;

(c) approving limit excesses within the Board's limit framework;

(d) establishing procedures for market risk identification, measurement, monitoring and control;

(e) monitoring the compliance of the Reporting Bank with established policies, controls and procedures;

(f) conducting the initial and on-going validation of the internal models of the Reporting Bank for market risk;

(g) conducting regular backtesting of the internal models for market risk; and

(h) performing stress tests on the market risk exposures of the Reporting Bank.

8.3.30 A Reporting Bank shall ensure that its independent risk management unit or units produce and analyse daily reports based on the output of the market risk measurement system of the Reporting Bank, including the evaluation of the relationship between measures of market risk exposure and risk limits. The Reporting Bank shall ensure that these reports are disseminated to market risk-taking units on a timely basis so that action can be taken, where appropriate.

8.3.31 A Reporting Bank shall ensure that its independent risk management unit or units provide senior management with an analysis of the market risk exposure of the Reporting Bank on a regular basis. Reports prepared by the independent risk management unit or units shall be reviewed by a level of management that has the authority to enforce reductions in market risk taken.

**Sub-division 6: Risk Management Process and System**

Overview

8.3.32 A Reporting Bank shall ensure that its market risk management process and system are commensurate with the scope, size and complexity of its trading and other financial activities and the market risks that it assumes. This is to enable its market risk exposures to be identified, measured, monitored and controlled on a timely basis.

8.3.33 Where a Reporting Bank is part of a banking group, the Reporting Bank shall manage the market risk from all the entities within the banking group and, where practicable, integrate its market risk management process and system across the banking group.

Policies, Procedures and Controls

8.3.34 A Reporting Bank shall establish policies to reflect its trading strategy, including its approach to managing market risk. These policies shall address the identification, measurement, monitoring and control of market risk.

8.3.35 A Reporting Bank shall ensure that all the market risk policies, including changes and exceptions to the policies, are approved by the Board. The Reporting Bank shall ensure that the policies are reviewed on a regular basis and kept up-to-date.

8.3.36 A Reporting Bank shall establish appropriate procedures to implement the market risk policies. The Reporting Bank shall also have a process in place for ensuring compliance with the documented set of internal policies, controls and procedures concerning the operation of the risk management process and system.

8.3.37 A Reporting Bank shall ensure that its staff has ready access to the market risk management documentation and are able to perform their respective risk management functions satisfactorily according to the documented policies, procedures and controls.

8.3.38 Senior management should ensure that market risk management policies, procedures and controls are clearly and comprehensively documented and communicated to relevant staff of the Reporting Bank. Senior management should also regularly evaluate the policies, procedures and controls in place to manage market risk to ensure that those policies, procedures and controls are appropriate and sound.

Management Information System

8.3.39 A Reporting Bank shall ensure that its management information system is able to support its use of the IMA, in particular, for the identification, measurement, monitoring and control of market risks.

8.3.40 A Reporting Bank shall have a process to ensure the integrity, accuracy and timeliness of data in its management information system and the reports produced.

8.3.41 A Reporting Bank shall ensure that its management information system has the capability to support backtesting of its internal models for market risk.

New Product Approval Process

8.3.42 A Reporting Bank shall have a policy to ensure that every new product that it engages in is properly assessed. The policy shall clearly explain what is to be considered a new product for which a review before engaging in the product is necessary. The policy shall also identify a functional unit independent of the market risk-taking units to be accountable for the approval process for a new product.

8.3.43 Before a Reporting Bank engages in a new product, it shall ensure that its market risk management process and system can accommodate the product.

8.3.44 A Reporting Bank shall ensure that every proposal to engage in a new product shall comprise –

(a) a description of the proposed product, the targeted market and the underlying objectives of the transactions (e.g. customer service, risk management tool, trading);

(b) an analysis of the risks that may arise and details of the identification, measurement, monitoring and control of the associated risks, including the validation of pricing models and valuation techniques;

(c) the identification of resources required to establish sound and effective market risk management of the proposed product;

(d) an analysis of the appropriateness of the proposed product in relation to the overall financial condition and capital levels of the Reporting Bank;

(e) an analysis of whether the proposed product complies with the relevant legal and regulatory requirements;

(f) a description of the relevant accounting guidelines and tax treatment for the proposed product; and

(g) a record of the review and approvals from staff with the appropriate level of authority in the relevant areas such as risk management, operations, accounting, legal and compliance to proceed with the proposed product.

8.3.45 A Reporting Bank shall conduct a post-implementation review of a new product at an appropriate time after its introduction. The Reporting Bank shall also perform periodic reviews of approved product proposals to ensure their continued relevance. A Reporting Bank shall maintain proper documentation of these reviews and take appropriate steps to address any issues that arise from such reviews.

**Sub-division 7: Risk Identification**

8.3.46 A Reporting Bank shall have a policy in place to ensure that all market risks are identified and understood before they are undertaken. The Reporting Bank shall establish procedures to identify market risks arising from all its business activities.

8.3.47 A Reporting Bank shall take into consideration, among other things, the risk-return relationship of its business activities in deciding on its market risk threshold and the types of business activities to engage in.

8.3.48 Once a Reporting Bank has determined its market risk threshold, it shall develop a trading strategy to align its business goals with the market risks that it is prepared to undertake. The Reporting Bank shall review the risk-return relationship of its business activities on an ongoing basis and consider whether its strategy needs to be re-evaluated based on changes in its business goals and in market conditions. The Board and senior management should actively participate in such reviews.

**Sub-division 8: Risk Measurement**

Overview

8.3.49 A Reporting Bank shall ensure that its market risk measurement system is comprehensive and accurate, and closely integrated with the day-to-day risk management

process and system of the Reporting Bank. Its output shall accordingly be an integral part of the market risk management process and system of the Reporting Bank.

8.3.50 A Reporting Bank shall have a robust model validation and approval process for its market risk measurement system.

8.3.51 The VaR measure calculated by the market risk measurement system shall be denominated in Singapore dollars or the functional currency of the Reporting Bank in accordance with the Accounting Standards.

8.3.52 A Reporting Bank shall relate its market risk and exposure limits to its risk measurement model in a manner that is consistent over time and that is well understood by both traders and senior management.

8.3.53 A Reporting Bank shall ensure that the mathematical and statistical basis of the risk measurement model is disclosed by the vendor where the model is not developed in-house.

8.3.54 A Reporting Bank shall not rely on the use of a risk measurement model obtained from a third-party vendor ("vendor model") that claims proprietary technology as a justification for exemption from documentation or any other requirement relating to its use of the IMA. The Reporting Bank shall, where necessary, rely more heavily on alternative validation techniques or methods designed to compensate for the lack of access to full information. Where vendor models are used, the Reporting Bank shall –

(a) be able to document and explain the role of the vendor model and the extent to which it is used within the market risk measurement system of the Reporting Bank;

(b) be able to demonstrate a thorough understanding of the vendor model;

(c) ensure that the vendor model is appropriate for measuring the market risk of the Reporting Bank; and

(d) have clearly described strategies for regularly reviewing the performance of the vendor model.

8.3.55 In cases where market risks are not adequately captured in its market risk measurement system, a Reporting Bank shall make appropriate adjustments to its risk measurement or set aside reserves to incorporate those risks.

8.3.56 The Board and senior management should understand the basis of the internal models used by the Reporting Bank, including their major assumptions, strengths and limitations.

8.3.57 The market risk measurement system should be able to easily accommodate volume increases, new valuation methodologies and new products. In particular, the computer systems used should be capable of handling the volume of transactions and the complexity of market risks assumed. The Reporting Bank should also consider the ease with which processing and other software errors can be corrected.

8.3.58 As model development and implementation is a complex process, a Reporting Bank should ensure that its staff and, where applicable, its vendors and consultants have the requisite skills to manage the inherent complexity involved.

Specification of Market Risk Factors

8.3.59 A Reporting Bank shall specify an appropriate set of market risk factors (i.e. the market rates and prices which affect the value of the trading positions of the Reporting Bank) as part of its market risk measurement system. The Reporting Bank shall ensure that the risk factors contained in its market risk measurement system are sufficient to capture the risks inherent in its portfolio of on and off-balance sheet trading positions. The granularity and comprehensiveness of the risk factors shall be commensurate with the complexity of the risks assumed by the Reporting Bank.

8.3.60 A Reporting Bank shall include market risk factors that are deemed relevant for pricing as risk factors in its market risk measurement system. Where any market risk factor is not captured, the Reporting Bank shall justify this omission to the satisfaction of the Authority. In addition, the Reporting Bank shall document this, together with a risk estimate, in a "Risk-Not-Captured" report to the Board and senior management. The Reporting Bank shall capture such risk factors within a reasonable time.

8.3.61 A Reporting Bank shall ensure that its market risk measurement system for interest rates complies with the following requirements:

(a) there shall be risk factors corresponding to interest rates in each currency in which the Reporting Bank has interest rate-sensitive on or off-balance sheet positions;

(b) the market risk measurement system shall model the yield curve using one of the generally accepted approaches (e.g. by estimating forward rates of zero coupon yields);

(c) the yield curve shall be divided into various maturity segments in order to capture variation in the volatility of rates along the yield curve;

(d) for significant exposures to interest rate movements in major currencies and markets, the Reporting Bank shall model the yield curve to capture its shape and characteristics using a minimum of 6 maturity segments;

(e) the number of risk factors used shall be driven by the nature of the trading strategies of the Reporting Bank; and

(f) the market risk measurement system shall incorporate separate risk factors to capture correlation effects and any form of spread risk.

8.3.62 There should be at least one risk factor corresponding to each maturity segment of the yield curve. A Reporting Bank with a portfolio of various types of securities across many points of the yield curve and which engages in complex arbitrage strategies would require a greater number of risk factors to capture interest rate risk accurately.

8.3.63 Where market rates are not reliable for particular segments of the yield curve (e.g. due to market illiquidity), a Reporting Bank should work towards verifying the rates. For example, the Reporting Bank may obtain alternative quotes to verify the primary source of the data. The Reporting Bank may also verify the data using statistical models. The Reporting Bank may manually adjust the data if the primary source is found to be unreliable, provided that the adjustment leads to a more conservative result.

8.3.64 A Reporting Bank shall ensure that its market risk measurement system for equity prices complies with the following requirements:

(a) there shall be risk factors corresponding to each of the equity markets in which the Reporting Bank holds positions;

(b) the risk factors shall capture the volatility and correlation effects of individual equity issues. Where it is not possible to have risk factors corresponding to individual equity issues, the risk factors shall correspond to sector- or market-wide movements in equity prices (e.g. a sector or market index). Positions in individual securities may be expressed in "beta-equivalents" relative to the sector or market index; and

(c) the sophistication and nature of the modelling technique for a particular market shall be commensurate with the exposure of the Reporting Bank to the overall market as well as its concentration in individual equity issues in that market.

8.3.65 A Reporting Bank shall ensure that its market risk measurement system for foreign exchange (which includes gold) includes risk factors corresponding to the exchange rates between individual currencies in which the Reporting Bank has exposure. Since the VaR measure calculated by the market risk measurement system is to be expressed in Singapore dollars or the functional currency of the Reporting Bank in accordance with the Accounting Standards, any net position denominated in a currency other than Singapore dollars (or its functional currency, as the case may be) will introduce a foreign exchange risk. Thus, foreign exchange risk factors corresponding to the exchange rate between Singapore dollars (or its functional currency, as the case may be) and each of the other currency in which the Reporting Bank has exposure, shall be included in its market risk measurement system.

8.3.66 A Reporting Bank shall ensure that its market risk measurement system for commodity prices complies with the following requirements:

(a) the methodology used shall encompass –

(i) directional risk, to capture the exposure to changes in spot prices arising from net open positions;

(ii) forward gap and interest rate risk, to capture the exposure to changes in forward prices arising from maturity mismatches;

(iii) basis risk, to capture the exposure to changes in the price relationships between two similar but not identical commodities;

(iv) market characteristics, notably delivery dates and the scope provided to traders to close out positions; and

(v) variation in the "convenience yield" between derivatives positions, such as forwards and swaps, and cash positions in the commodity, if it is engaged in more active trading; and

(b) the risk factors used shall be commensurate with the commodity exposure of the Reporting Bank.

8.3.67 A Reporting Bank shall ensure that its market risk measurement system incorporates risk factors to capture non-linearities for options and other relevant products (e.g. mortgage-backed securities, tranched exposures or n-th-to-default credit derivatives[548A]), as well as correlation risk and basis risk (e.g. between credit default swaps and bonds).

8.3.68 *[This paragraph has been intentionally left blank.]*

8.3.69 A Reporting Bank shall, as far as possible, use actual risk factors for the calculation of risk. Proxies or assumed data may be used only where available data is insufficient or is not reflective of the true volatility of a position or portfolio. Proxies used have to show a good track record for the actual position held (e.g. an equity index for a position in an individual stock). Where proxies or assumed data are used, they shall produce conservative results and the Reporting Bank shall –

(a) provide the rationale for the choice of the proxy or assumed data;

(b) check the appropriateness of formulae, algorithms or any other analytical tools used to obtain assumed data on the prices, rates or behaviour of the instruments for which market quotations are not readily available; and

(c) independently review and test all proxies and assumed data periodically to ensure that they remain valid and do not underestimate risk. If the tests show that the proxies or assumed data are no longer relevant, the Reporting Bank shall cease using those proxies or assumed data immediately.

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[548A] For the avoidance of doubt, securitisation exposures which are not part of the correlation trading portfolio are subject to both general market risk and specific risk capital requirements. These positions must be included in the Reporting Bank's VaR model for general market risk or be subject to the SA(MR) for general market risk. While the positions may be included in the Reporting Bank's internal specific risk model, they shall nonetheless be subject to the SA(MR) for specific risk.

Minimum Quantitative Standards

8.3.70 A Reporting Bank shall meet the following requirements for the purpose of calculating its market risk capital requirement:

(a) the VaR measure shall be calculated on a daily basis, using a 99th percentile, one-tailed confidence interval and an instantaneous price shock equivalent to a 10-day movement in prices, i.e. the minimum "holding period" shall be ten trading days. A Reporting Bank may use a VaR measure calculated according to a holding period of less than ten trading days, scaled up to ten days by, for example, the square root of time, where appropriate. A Reporting Bank using this approach shall periodically justify the reasonableness of its approach to the Authority;

(b) the VaR measure shall be based on the position of a static portfolio to price shocks, i.e. a Reporting Bank shall determine a specific time in the day where a snapshot of the positions is taken each trading day consistently over time, for the purpose of calculating its market risk capital requirement[549];

(c) the historical observation period (sample period) for calculating the VaR measure shall be at least one year. For a Reporting Bank which uses a weighting scheme or other methods for the historical observation period, the "effective" observation period shall be at least one year (that is, the weighted average time lag of the individual observations cannot be less than six months).[549A] Depending on the VaR methodology[549AA] and the structure of the portfolio, the Authority may also require a Reporting Bank to calculate its VaR measure using, among other things, a shorter observation period when there is a recent significant upsurge in price volatility;

(d) the data sets of the Reporting Bank shall be updated at least once every month and reassessed whenever market prices are subject to significant changes. The updating process shall be flexible enough to allow for more frequent updates;

(e) when measuring options risk, the Reporting Bank shall comply with the following requirements:

(i) its internal models shall capture the non-linear price characteristics of option positions;

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549 This is usually taken to be the end-of-day trading positions.

549A A Reporting Bank may calculate its VaR estimate using a weighting scheme that is not fully consistent with paragraph 8.3.70(c) as long as that method results in a capital charge at least as conservative as that calculated according to paragraph 8.3.70(c). This includes various methods to render the VaR model more reactive to market changes like, for example, models with time-dependent volatilities, which use a period of less than a year to calibrate current volatility. The weighting scheme should, however, not be used for stressed VaR.

549AA As long as the methodology used captures all material risks of the Reporting Bank, the Reporting Bank will be free to use models based on e.g. variance-covariance matrices, historical simulations, or Monte Carlo simulations.

(ii) it shall apply a full 10-day price shock to option positions or positions which display non-linear price characteristics; and

(iii) its risk measurement system shall have a set of risk factors which captures the volatilities of the rates and prices of underlying option positions (i.e. vega risk). A Reporting Bank with large or complex option portfolios shall have detailed specifications of the relevant volatilities (i.e. the volatilities of options positions broken down by different maturities are to be measured);

(f) a stressed VaR measure shall be calculated. The stressed VaR applies to all risk factor categories for which the Reporting Bank has obtained approval from the Authority to use a VaR model. This measure is intended to replicate a VaR calculation that would be generated on the Reporting Bank's current portfolio if the relevant market factors were experiencing a period of stress. The stressed VaR measure shall be based on the 10-day, 99th percentile, one-tailed confidence interval VaR measure of the current portfolio, with model inputs calibrated to historical data from a continuous 12-month period of significant financial stress relevant to the Reporting Bank's portfolio[549AB]. For example, for many portfolios, a 12-month period relating to significant losses in 2007/2008 would reflect a period of such stress, although other periods relevant to the current portfolio must be considered by the Reporting Bank. The time-series data upon which the stressed VaR is calculated should be stable. However, the Reporting Bank shall regularly review the period of historical data used to ensure that it continues to represent a period of significant financial stress relevant to the Reporting Bank's portfolio. The Reporting Bank shall also obtain the Authority's approval for the period that it uses;

(g) as no particular model is prescribed under paragraph (c) above, different techniques may need to be used to translate the model used for VaR into one that delivers a stressed VaR. For example, the Reporting Bank should consider applying anti-thetic data[549B], or applying absolute rather than relative volatilities[549BA] to deliver an appropriate stressed VaR. The stressed VaR shall be calculated at least weekly;

[549AB] This includes a continuous 12-month period during which a significant financial stress event lasting less than 12 months occurred. The historical data upon which the stressed VaR is calculated should be stable. To the extent that such data is used in the assessment of risk factors, these will also be fixed as a result of fixing the data. However, where a Reporting Bank changes its VaR model or risk factor approach, these changes should be reflected in the model used to calculate the stressed VaR measure.

[549B] Reporting Banks should consider modelling valuation changes that are relevant based on the magnitude of historic price movements, applied in both directions – irrespective of the direction of the historic movement. For example, if a time series included a significant upward spike in equity prices, the model could apply significant movements in equity prices both upwards and downwards. This might be particularly relevant if a Reporting Bank's portfolio is the "right way" to a period of financial stress (i.e. long equities in a period of stock market surge); the model used should reflect that open risk positions (in either direction) are vulnerable to stressed variables.

[549BA] In stressed periods, there are some price factors (e.g. credit spreads) which tend to have higher absolute values. Therefore, an increase in absolute volatility in these factors (i.e. large movements) might not correspond to significant increases in relative volatility (i.e. because the absolute level of the parameter is also higher). If the Reporting Bank's current VaR model tracks relative shifts in these price factors, then the relevant period of stress applied in benign periods (i.e. when the absolute values of credit spreads are smaller) might not deliver a VaR measure which accurately reflects what the VaR would be in a period of stress. The Reporting Bank should therefore consider modifying its VaR model to account for large absolute factor moves that can occur in times of stress.

(h) the market risk capital requirement, which shall be met daily, shall be the sum of:

(i) the higher of (A) the VaR measure of the Reporting Bank for the previous day calculated according to the parameters specified in this paragraph ($VaR_{t-1}$); and (B) an average of the daily VaR measures calculated according to the parameters specified in this paragraph on each of the preceding 60 business days ($VaR_{avg}$), multiplied by a multiplication factor ($m_c$) referred to in paragraph 8.3.71 below;

and

(ii) the higher of (A) its latest available stressed VaR measure calculated according to the parameters specified in paragraph 8.3.70(f) ($sVaR_{t-1}$); and (B) an average of the stressed VaR measures calculated according to the parameters specified in paragraph 8.3.70(f) over the preceding 60 business days ($sVaR_{avg}$), multiplied by a multiplication factor ($m_s$) referred to in paragraph 8.3.71 below.

Therefore, the capital requirement (c) shall be calculated according to the following formula:

$$c = \max\{VaR_{t-1}, m_c \cdot VaR_{avg}\} + \max\{sVaR_{t-1}, m_s \cdot sVaR_{avg}\}$$

8.3.71 The multiplication factors $m_c$ and $m_s$ shall be set by the Authority based on its assessment of the quality of the risk management process and system of the Reporting Bank, subject to a minimum factor of 3. The Reporting Bank shall increase these factors by a "plus" amount determined in accordance with the table in Annex 8O of this Part based on its backtesting outcomes. The backtesting results applicable for calculating the "plus" are based on VaR only and not sVaR.

8.3.72 A Reporting Bank, for the purpose of calculating its market risk capital requirement, may recognise empirical correlations within risk factor categories (i.e. interest rate, equity prices, foreign exchange and commodity prices respectively). The Reporting Bank may also recognise empirical correlations across risk factor categories provided that it is able to satisfy the Authority that its system for measuring correlations is robust and implemented with integrity.

8.3.73 Where a Reporting Bank has trading operations across different time zones, it should define the basis for its end-of-day positions and ensure that these positions are captured consistently.

8.3.74 A Reporting Bank should, where possible, use a single market risk measurement methodology. Where multiple measurement methodologies are used, there should be consistency in assumptions among the multiple measurement methodologies and they should be fully reflective of the market risk characteristics of the exposures of the Reporting Bank.

8.3.75 Where the market risk measurement system comprises multiple measurement methodologies, the Reporting Bank should consider, among other factors, the application of reasonable correlation assumptions for the different models.

8.3.76 In periods of high volatility, a Reporting Bank should use a shorter historical observation period to calculate its VaR measure where this would increase the responsiveness of the model to changes in market conditions.

Treatment of Specific Risk

8.3.77 *[This paragraph has been intentionally left blank.]*

8.3.77A For equity risk positions, the Reporting Bank is not required to subject these positions to the capital charge according to the standardised approach as specified in paragraphs 8.2.21 to 8.2.31 if the Reporting Bank receives approval from the Authority, on the basis that the VaR measure of the Reporting Bank incorporates specific risk from equity risk positions and meets all the qualitative and quantitative requirements for general market risk models, as well as the additional requirements set out in paragraphs 8.3.78 to 8.3.81B below.

8.3.77B For interest rate risk positions other than securitisation exposures and n-th-to-default credit derivatives, the Reporting Bank is not required to subject these positions to the standardised capital charge for specific risk as specified in paragraphs 8.2.2 to 8.2.15 if the Reporting Bank receives approval from the Authority on the basis of the following:

(a) the Reporting Bank has a VaR measure that incorporates specific risk and meets all the qualitative and quantitative requirements for general market risk models, as well as the additional requirements set out in paragraphs 8.3.78 to 8.3.81B below; and

(b) the Reporting Bank's internally developed approach adequately captures incremental default and migration risks for positions subject to specific interest rate risk according to the standards laid out in paragraphs 8.3.82 and 8.3.82A below.

The Reporting Bank can include its securitisation exposure and n-th-to-default credit derivatives in its VaR measure. Notwithstanding, it shall hold additional capital for these products according to the standardised approach with the exceptions noted in paragraphs 8.3.82B to 8.3.82E below.

8.3.78 A Reporting Bank shall ensure that its modelling of specific risk captures all significant components of price risk[549C] and is responsive to changes in market conditions and compositions of portfolios. In particular, the specific risk model of the Reporting Bank shall –

(a) explain the historical price variation in each portfolio;

(b) capture concentration (magnitude and changes in composition);

(c) be robust in an adverse environment;

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[549C] The Reporting Bank need not capture in the VaR measure default and migration risks for positions subject to the incremental risk capital charge referred to in paragraphs 8.3.82 and 8.3.82A. This is also the case for stressed VaR, since VaR and stressed VaR methodologies should be aligned. At the same time, specific risk for credit spread models are meant to capture idiosyncratic risk in terms of credit spreads. Specific risk models can include spread jumps and may therefore include rating migrations. The same applies to VaR and stressed VaR though the impact on stressed VaR may be greater than in VaR.

(d) capture name-related basis risk;

(e) capture event risk; and

(f) be validated through backtesting.

8.3.78A With respect to paragraph 8.3.78(a), the key ex-ante measures of model quality are "goodness-of-fit" measures which address the question of how much of the historical variation in price value is explained by the model. One such measure is an R-squared measure from regression methodology. If this measure is used, the risk factors included in the model of the Reporting Bank should explain at least 90% of the historical price variation or the model should explicitly include estimates of the residual variability not captured in the factors included in this regression. For some types of models, it may not be feasible to calculate a goodness-of-fit measure. In such instance, the Reporting Bank should work with the Authority to define an acceptable alternative measure which would meet this regulatory objective.

8.3.78B With respect to paragraph 8.3.78(b), a Reporting Bank should be able to demonstrate that the model is sensitive to changes in portfolio construction and that higher market risk capital requirements are estimated for portfolios which have increasing concentrations in particular names or sectors.

8.3.78C With respect to paragraph 8.3.78(c), a Reporting Bank should be able to demonstrate that the model signals rising risk in an adverse environment. This could be achieved by incorporating in the historical estimation period of the model at least one full credit cycle and ensuring that the model is accurate throughout the cycle. Another approach for demonstrating this is through simulation of historical or plausible worst-case environments.

8.3.78D With respect to paragraph 8.3.78(d), a Reporting Bank should be able to demonstrate that the model is sensitive to significant idiosyncratic differences between similar but not identical positions, for example, debt positions with different levels of subordination, maturity mismatches or credit derivatives with different default events.

8.3.78E With respect to paragraph 8.3.78(e), for equity positions, a Reporting Bank should capture events which are reflected in large changes or jumps in prices, for example, mergers, break-ups and takeovers. In particular, the Reporting Bank should consider issues related to survivorship bias.

8.3.78F With respect to paragraph 8.3.78(f), a Reporting Bank shall conduct backtesting to assess whether specific risk, as well as general market risk, is adequately captured.

8.3.79 In assessing the robustness of the model, the Authority shall consider the testing of the model by the Reporting Bank, including regression analysis, stress testing, the scope of testing, the number of tests completed and the results of these tests. If the results are unclear, or the testing of the model by the Reporting Bank is deemed insufficient to conclude that the model is robust, the Reporting Bank shall address these concerns before approval of the model may be granted.

8.3.80 *[This paragraph has been intentionally left blank.]*

8.3.81 A Reporting Bank shall ensure that its model conservatively assesses the risk arising from less liquid positions or positions with limited price transparency under realistic market scenarios. The Reporting Bank shall use proxies only where available data is insufficient or is not reflective of the true volatility of a position or portfolio, and only where they are appropriately conservative. Where the Authority considers that limited liquidity or price transparency undermines the effectiveness of a Reporting Bank's model to capture specific risk, the Authority shall take appropriate action, including, among other things, requiring the exclusion of positions from the Reporting Bank's specific risk model.

8.3.81A A Reporting Bank which calculates its specific risk capital requirement using modelled estimates of specific risk shall conduct backtesting aimed at assessing whether its specific risk is being accurately captured. To validate its specific risk estimates, the Reporting Bank shall perform separate backtests using daily data on sub-portfolios subject to specific risk. The key sub-portfolios for this purpose are traded debt and equity positions. If a Reporting Bank decomposes its sub-portfolios into finer categories (e.g. emerging markets, traded corporate debt), it is appropriate to keep these distinctions for sub-portfolio backtesting purposes. The Reporting Bank shall not make changes to any sub-portfolio structure without the prior approval of the Authority.

8.3.81B A Reporting Bank shall have a process in place to analyse exceptions identified through the backtesting of specific risk. There will be a presumption that models that incorporate specific risk are "unacceptable" if the results at the sub-portfolio level produce a number of exceptions commensurate with the Red Zone as defined in Annex 8O. A Reporting Bank with an "unacceptable" specific risk model shall take immediate action to correct the problem in the model and to ensure that there is a sufficient capital buffer to absorb the risk that the backtest showed had not been adequately captured.

8.3.82 A Reporting Bank shall have an approach in place to capture incremental risks in its market risk capital requirement, according to Sub-division 12 of this Part. Incremental risks include default and migration risks in positions subject to a capital charge for specific interest rate risk, with the exception of securitisation exposures and n-th-to-default credit derivatives, that are incremental to the risks captured by the VaR-based calculation as specified in paragraph 8.3.78 above. No specific approach for capturing incremental risks is prescribed. Notwithstanding this, the Reporting Bank shall demonstrate in the validation of the model that the choice is prudent. The Reporting Bank shall also demonstrate to the Authority, the impact and appropriateness of its chosen approach. In addition, all model uncertainties (e.g. simulation and discretisation errors) shall be quantified, and the uncertainty arising from the outcomes of the IRC model shall be reviewed and documented (e.g. by identifying the most significant assumptions, evaluating the techniques employed, estimating uncertainty bounds and quantifying the resulting impact).

8.3.82A A Reporting Bank shall demonstrate that the approach used to capture incremental risks meets a soundness standard comparable to that of the IRBA for credit risk, under the assumption of a constant level of risk, and adjusted where appropriate to reflect the impact of liquidity, concentrations, hedging and optionality. A Reporting Bank which is unable to capture the incremental risks through an internally developed approach shall use the specific risk capital charges under the standardised approach as set out in Division 2 of this Part.

8.3.82B Subject to the Authority's approval, a Reporting Bank may incorporate its CTP in a comprehensive risk measure based on an internally developed approach that adequately captures not only incremental default and migration risks, but all price risks. The value of such products is subject in particular to the following risks which shall be adequately captured:

(a) the cumulative risk arising from multiple defaults, including the ordering of defaults where such ordering has a price impact, in tranched products;

(b) credit spread risk, including the gamma and cross-gamma effects;

(c) volatility of implied correlations, including the cross effect between spreads and correlations;

(d) basis risk, including both the basis between the spread of an index and those of its constituent single names; and the basis between the implied correlation of an index and that of bespoke portfolios;

(e) recovery rate volatility, as it relates to the propensity for recovery rates to affect tranche prices; and

(f) to the extent the comprehensive risk measure incorporates benefits from dynamic hedging, the risk of hedge slippage and the potential costs of rebalancing such hedges.

The Reporting Bank's approach shall meet all of the requirements specified in paragraphs 8.3.82A, 8.3.82C and 8.3.82D. [549CA, 549CB] In addition, the Reporting Bank's approach for the comprehensive risk measure shall also form part of its risk management framework. For the exposures that the Reporting Bank incorporates in this internally developed approach, the Reporting Bank will be required to subject them to a capital charge equal to the higher of the capital charge according to this internally developed approach and 8% of the capital charge for specific risk according to the standardised approach. It will not be required to subject these exposures to the treatment specified in paragraph 8.3.82A. It shall, however, incorporate them in both the VaR and stressed VaR measures.

8.3.82C A Reporting Bank can apply this exception if it meets the following conditions:

(a) it is active in buying and selling products held in such a portfolio;

(b) it has sufficient market data to ensure that it fully captures the salient risks of these exposures in its comprehensive risk measure in accordance with the standards set forth above;

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[549CA] The Reporting Bank may enhance its IRC model to comply with the requirements for the comprehensive risk measure. The Reporting Bank shall not, however, perform a single calculation to cover positions that are subject to both the IRC charge and the comprehensive risk measure, as this could allow diversification between the portfolios.

[549CB] The Authority may permit approaches that capitalise different risks differently (e.g. via an add-on approach), provided that this can be undertaken conservatively and it does not undermine the strength of risk management. The resulting capital charge shall be the sum of the charges calculated from the different models. Nevertheless, the Reporting Bank is strongly encouraged to develop an integrated approach over time.

(c) it demonstrates (for example, through backtesting) that its risk measures can appropriately explain the historical price variation of these products; and

(d) it ensures that it can separate the positions for which it received approval to incorporate them in its comprehensive risk measure from those positions for which it did not receive this approval.

8.3.82D In addition to the data and modelling criteria specified above, a Reporting Bank applying this exception shall regularly apply a set of specific, predetermined stress scenarios to the CTP to which it applies the comprehensive risk measure. The Reporting Bank shall ensure that these stress scenarios examine the implications of stresses to (a) default rates, (b) recovery rates, (c) credit spreads, and (d) correlations on the correlation trading desk's profit or loss (as per the Guidelines on Stress Testing for the Correlation Trading Portfolio in Annex 8P). The Reporting Bank shall apply these stress scenarios at least weekly and report the results, including comparisons with the capital charges implied by the Reporting Bank's internal model for estimating comprehensive risks, to the Authority at least every quarter. The Reporting Bank shall report any instances where the stress tests indicate a material shortfall of the comprehensive risk measure to the Authority in a timely manner. Based on these stress testing results, the Authority may impose a supplemental capital charge against the CTP, to be added to the Reporting Bank's internally modelled capital requirement.

8.3.82E A Reporting Bank shall calculate the incremental risk measure according to paragraph 8.3.82 and the comprehensive risk measure according to paragraph 8.3.82B at least weekly, or more frequently as directed by the Authority. The capital charge for incremental risk is given by a scaling factor of 1.0 times the maximum of (a) the average of the incremental risk measures over 12 weeks, and (b) the most recent incremental risk measure. Likewise, the capital charge for comprehensive risk is given by a scaling factor of 1.0 times the maximum of (i) the comprehensive risk measures over 12 weeks, and (ii) the most recent comprehensive risk measure. Both capital charges are added up. There will be no adjustment for double counting between the comprehensive risk measure and any other risk measures.

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**Sub-division 9: Model Validation**

Overview

8.3.94 A Reporting Bank shall have policies and processes in place to ensure that its internal models for market risk are adequately validated by suitably qualified parties independent of the development process to ensure that they are robust and adequately capture all market risks.

8.3.95 A Reporting Bank shall conduct a model validation when the model is initially developed and when any significant change is made to the model. The Reporting Bank shall validate all models at least annually, and where there are significant structural changes in the market or changes to the composition of portfolios which might lead to the model no longer being adequate. Where necessary, the models shall be recalibrated. A Reporting Bank shall take into account academic and market development as part of its regular model review process. A Reporting Bank shall ensure that significant issues are escalated to senior management and promptly addressed.

8.3.96 Where a Reporting Bank has outsourced its validation function to an external party, it shall have qualified staff independent of the development process to assess the quality of the work done by the external party in validating the model. The Reporting Bank is ultimately responsible for all model validation work and shall ensure that it is endorsed by the Board and senior management.

Model Validation Policies

8.3.97 A Reporting Bank shall have sound model validation policies which include the following elements:

(a) Model Approval Process;

(i) there shall be a centralised unit responsible for model validation. This unit shall comprise staff with the necessary experience and expertise;

(ii) responsibilities of this unit shall include ensuring that the current systems setup is capable of supporting the models;

(iii) all changes made to the models being used, or to the modelling process, shall be validated and approved;

(iv) the Reporting Bank shall maintain previous versions of the model being altered; and

(v) models shall be subject to change-control procedures, so that computer codes cannot be changed except by authorised staff;

(b) Defined Responsibilities;

(i) the responsibilities for model construction and model validation shall be clearly and formally defined;

(ii) the staff performing model validation shall be independent of the staff who construct the model (i.e. the Reporting Bank shall ensure that there is no conflict of interest and that the staff performing the validation work can provide objective and effective challenge to the staff who construct the model); and

(iii) the staff (whether in-house or external) responsible for model validation shall ascertain that the model is robust and suitable for its proposed usage, before a model can be used;

(c) Documentation;

(i) the unit responsible for model validation shall maintain a log of all models used and their specific application; and

(ii) all models used shall be clearly documented and such documentation shall include –

(A) a summary of the procedures used when applying each model;

(B) a description of the mathematical and statistical aspects of each model, model applications and limitations;

(C) an identification of key staff involved in model construction and in model validation;

(D) a log of all the activities related to the construction or alteration of the model, including the thought process and decisions taken; and

(E) a description of the validation procedures and results.

Model Validation Process

8.3.98 A Reporting Bank shall observe the following 3 procedures when validating a model:

(a) review the logical and conceptual soundness;

(b) compare the model against an identical model constructed by staff independent of those who constructed the first-mentioned model or another model chosen as a benchmark; and

(c) review the backtesting done on the model, where backtesting is an appropriate validation process.

8.3.99 A Reporting Bank shall have a model validation process which addresses 3 components of the model:

(a) a model inputs component, which delivers data and assumptions to the model;

(b) a model processing component, which encompasses the theoretical model and the computer codes which transform the model inputs into mathematical estimates; and

(c) a reporting component, which translates the mathematical estimates into useful business information.

8.3.100 In validating the model inputs component, a Reporting Bank shall –

(a) ensure that data from both internal and external sources is consistent, timely, reliable, independent and complete;

(b) have filter and inspection procedures to surface potential data errors, which shall be verified with an alternate data source;

(c) automate the extraction of data to the extent possible. As manual extraction of data is error-prone, the Reporting Bank shall pay more attention to validating such data;

(d) ensure that all data required for risk measurement is captured by the risk measurement model;

(e) ensure that assumptions required to model the risks involved are appropriately derived and justified, and do not underestimate risk. This may include the assumption of the normal distribution, volatility and correlation assumptions, the use of the square root of time scale from a one-day holding period to a 10-day holding period or where extrapolation or interpolation techniques are used, or the use of pricing models; and

(f) check its assumptions periodically, to ensure that they do not diverge from observed behaviour.

8.3.101 In addition to the backtesting required pursuant to paragraph 8.3.117, a model validation includes the following:

(a) testing carried out for longer periods than required for the regular backtesting required pursuant to paragraph 8.3.115 (e.g. 3 years). A longer time period generally improves the power of the backtesting, but may not be desirable if the VaR model or market conditions have changed to the extent that historical data is no longer relevant;

(b) testing carried out using confidence intervals other than the 99% interval required under the quantitative standards; and

(c) testing of sub-portfolios within its overall market risk portfolio.

8.3.102 In validating the model processing component, a Reporting Bank shall –

(a) validate all models, whether they are purchased from a vendor or developed in-house, to ensure the accuracy of valuation and risk factor calculations. The Reporting Bank shall not rely solely on a model validation done by the vendor;

(b) apply the same validation principles to all models;

(c) apply procedures to test the programmed model and the mathematics used against the functional specifications of the model; and

(d) use hypothetical portfolios to ensure that the model is able to account for structural features which may arise, including –

(i) where the Reporting Bank maps positions to proxy data, ensuring that the proxy data produces conservative results under relevant market scenarios;

(ii) ensuring that significant basis risks are adequately captured. This may include mismatches between long and short positions by maturity or by issuer; and

(iii) ensuring that the model captures concentration risk which may arise in an undiversified portfolio.

8.3.103 A Reporting Bank should test the model by comparing the results of the model against those of an identical model which is independently constructed (i.e. the 2 models should be constructed by separate parties). If the model is working as expected, the results of the 2 models would coincide.

8.3.104 If independent construction of an identical model cannot be done, a Reporting Bank should compare model results to the results of a "benchmark" model which has already been validated. The Reporting Bank should identify a suitable "benchmark" model and ensure that the model inputs and theory of the benchmark model are similar to the Reporting Bank's model according to its analysis.

8.3.105 In validating the reporting component, a Reporting Bank shall –

(a) validate the reports in view of their context. Senior management should understand the context in which the model results are generated; and

(b) have a system of checks to ensure that the flow of information from the model outputs to the final production of the reports is error-free.

**Sub-division 10: Risk Monitoring**

Overview

8.3.106 A Reporting Bank shall have a process to monitor its market risks on an ongoing basis and to ensure that any change in its risk profile is promptly addressed. The monitoring process shall include a mechanism for reviewing and reporting compliance with established policies, controls and procedures and for addressing exceptions.

8.3.107 A Reporting Bank shall provide the Board, senior management and, where appropriate, individual business unit managers with reports on a regular and timely basis. These reports shall include comparisons of risk taken against the corresponding limits.

8.3.108 A Reporting Bank shall ensure that any significant failures in complying with its policies, controls or procedures are reported promptly to the Board.

8.3.109 In addition to the reports referred to in paragraph 8.3.107, a Reporting Bank shall ensure that the Board is given a report at least annually on the extent to which the Reporting Bank has complied with its risk management policies, controls and procedures, and the effectiveness in managing its market risk.

Independent Review

8.3.110 A Reporting Bank shall have an IA which is independent of the activities of the market risk-taking units and the risk management unit or units.

8.3.111 A Reporting Bank shall ensure that the IA is subject to appropriate oversight by the Audit Committee.

8.3.112 A Reporting Bank shall carry out an independent review of its market risk management process and system at least annually as part of its own internal auditing process. This review shall include both the activities of the trading units and of the independent risk management unit or units and shall address, at a minimum, the following:

(a) adequacy of the documentation of the market risk management process and system;

(b) organisation of the independent risk management unit or units;

(c) integration of market risk measures into daily risk management;

(d) approval process for market risk pricing models and valuation systems used by front- and back-office staff;

(e) validation of any significant change in the market risk measurement process;

(f) scope of market risks captured by the market risk measurement model;

(g) integrity of the management information system;

(h) accuracy and completeness of position data;

(i) verification of the consistency, timeliness and reliability of data sources used to run internal models, including the independence of such data sources;

(j) appropriateness of volatility and correlation assumptions;

(k) accuracy of valuation and risk transformation calculations; and

(l) verification of the accuracy of the internal models through frequent backtesting.

8.3.113 In performing the independent review, a Reporting Bank shall ensure that the IA takes into account any changes in its risk profile. The Reporting Bank shall update the audit programme used by the IA to reflect any changes to the workflow processes of the trading units and risk management unit or units.

8.3.114 A Reporting Bank shall ensure that the findings of any independent review are reported directly to the Board. If there are corrective actions to be taken, the Reporting Bank shall carry out such actions within a reasonable time.

8.3.115 The depth and frequency of internal audits should be increased if significant issues are discovered, or if significant changes have been made to product lines, modelling methodologies, the risk oversight process, internal controls or the overall risk profile of the Reporting Bank.

8.3.116 Staff of the Reporting Bank should not be involved in the internal audit of a trading unit or independent risk management unit if they have been involved in the activities of that respective unit in the preceding 12 months.

Backtesting

8.3.117 Backtesting is the comparison of daily profit or loss (“trading outcomes”) with model-generated risk measures. A Reporting Bank shall have a backtesting framework which conforms to the following standards:

(a) the backtests to be applied shall compare whether the observed percentage of outcomes covered by the risk measure is consistent with a $99^{th}$ percentile, one-tailed confidence interval calibrated to a one-day holding period;

(b) trading outcomes used for backtesting shall be based on the hypothetical changes in portfolio values which would occur if end-of-day positions were to remain unchanged over the one-day holding period. This hypothetical profit and loss does not account for other factors such as fees, commissions, bid-ask spreads, net interest income and intra-day trading;

(c) backtesting shall be performed on a daily basis using at least 250 business days of observed results. On a monthly basis, a Reporting Bank shall analyse the backtesting exceptions and submit a report to senior management;

(d) the results of backtesting and any follow-up action taken shall be clearly documented. All backtesting exceptions, i.e. where trading outcomes are not covered by the risk measure, shall be investigated and accounted for on a timely basis;

(e) backtesting exceptions generated shall be classified as follows:

(i) basic integrity of the model;

(ii) model accuracy can be improved;

(iii) market moved in a fashion unanticipated by the model;

(f) backtesting exceptions relating to the basic integrity of the risk measurement model shall be reported to the Board and senior management immediately and rectified as soon as possible; and

(g) a backtesting report shall be prepared for the Board and senior management on a monthly basis, incorporating an analysis of the backtesting results and exceptions and any implications for the Reporting Bank.

8.3.118 A Reporting Bank shall classify its backtesting outcomes into three zones[550] depending on the number of exceptions arising from backtesting:

(a) if the backtesting results produce 4 or fewer exceptions, it falls within the Green Zone and the Reporting Bank shall not be required to hold additional capital;

(b) if the backtesting results produce 5 to 9 exceptions, it falls within the Yellow Zone and the Reporting Bank shall be required to hold additional capital. The table in Annex 8O of this Part sets out the increase in multiplication factor applicable to the market risk capital requirement calculated under the IMA; and

(c) if the backtesting results produce 10 or more exceptions, it falls within the Red Zone and the Reporting Bank shall be required to hold additional capital. The multiplication factor applicable to the capital required for market risk calculated under the IMA shall be increased by one (e.g. from 3 to 4). The Authority may require the Reporting Bank to stop adding new positions and wind down existing positions in order to reduce its market risks. When considering the action, if any, to be taken, the Authority will normally take into account, among other things, the outcome of the investigation of the Reporting Bank and the actions taken by the Reporting Bank to improve its models.

8.3.119 A Reporting Bank should perform backtests using actual trading outcomes. Should there be significant backtesting exceptions using actual trading outcomes, a Reporting Bank should implement additional risk measures to monitor its intra-day trading risk and stability of fees income in line with sound risk management practices.

8.3.120 A Reporting Bank should decide if it is prudent to continue trading in products or areas where the market risk measurement model is found to be inadequate for modelling the risks involved. Where the Reporting Bank continues trading in these products or areas, it should ensure that adequate model reserves are set aside. However,

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[550] This classification is based on the supervisory framework for the interpretation of backtesting results found in the "Supervisory framework for the use of 'backtesting' in conjunction with the internal models approach to market risk capital requirements" document issued by BCBS in January 1996.

if the problem with the model is significant, the Reporting Bank should cease trading in those products or areas.

8.3.121 The following are some examples which may be classified under the three exception categories described in paragraph 8.3.117(e):

(a) Basic integrity of the model;

(i) the systems of the Reporting Bank are not capturing the market risk of the positions (e.g. the positions of an overseas office are being reported incorrectly);

(ii) model volatilities or correlations are calculated incorrectly;

(b) Model accuracy can be improved;

the risk measurement model is not assessing the risk of some instruments with sufficient precision (e.g. too few maturity buckets or an omitted spread);

(c) Market moved in a fashion unanticipated by the model;

(i) random chance (i.e. a very low probability event);

(ii) market moved by more than the model predicted was likely (i.e. volatility was significantly higher than expected);

(iii) market did not move together as expected (i.e. correlations were significantly different than what was assumed by the model).

8.3.122 Although results within the Green Zone are preferred, a market risk measurement model which constantly yields little or no backtesting exceptions may suggest that the model is too conservative. If the model shows no exceptions for long periods of time, a Reporting Bank should reassess its model to determine if it overstates risk.

8.3.123 If a Reporting Bank has reason to believe that its model is robust in spite of the backtesting results falling within the Yellow Zone, it may apply to the Authority to exempt it from the requirement to increase capital. The Authority will consider granting an exemption only if the Reporting Bank can demonstrate that its model is robust, and that the backtesting exceptions are caused purely by outliers in market data.

Stress Testing

8.3.124 A Reporting Bank shall have in place a rigorous and comprehensive stress testing framework.

8.3.125 Stress testing is a key component of the assessment by a Reporting Bank of its capital levels and shall comprise three components:

(a) identifying events or influences which could have a significant impact on the Reporting Bank;

(b) evaluating the ability of the Reporting Bank's capital to absorb potential large losses; and

(c) identifying steps which the Reporting Bank can take to reduce its risk and conserve capital.

8.3.126 A Reporting Bank shall use stress testing as a means for setting its policies and limits, under both stressed and normal business conditions, and for monitoring new products where no historical data is available.

8.3.127 A Reporting Bank shall use its stress test results as a basis for identifying vulnerabilities in its portfolios.

8.3.128 A Reporting Bank shall incorporate stress testing in its day-to-day risk management process. Where stress tests reveal particular vulnerability to a given set of circumstances, the Reporting Bank shall take prompt steps to manage those risks appropriately, such as by hedging against that outcome or reducing the size of the exposures or increasing capital.

8.3.129 A Reporting Bank shall review the nature of its portfolios and the environment in which it operates when formulating stress scenarios. Stress scenarios shall cover a range of factors which can create extraordinary losses or gains in trading portfolios, or make the control of risk in those portfolios very difficult. Factors include low probability events in all major types of risks, including various components of market, credit, and operational risks. The stress scenarios of the Reporting Bank shall shed light on the impact of such events on all traded positions and parameters, including positions which display both linear and non-linear price characteristics.

8.3.130 A Reporting Bank shall identify plausible stress scenarios to which it may be exposed. In this regard, the Reporting Bank shall use stress scenarios which are developed internally and those which may be specified by the Authority.

8.3.131 A Reporting Bank shall conduct stress tests regularly. In general, stress tests on market-sensitive portfolios shall be run more frequently.

8.3.132 In designing its stress scenarios, a Reporting Bank shall consider the following broad areas:

(a) Scenarios requiring no simulations by the Reporting Bank;

the Reporting Bank shall document the five largest daily trading losses experienced over the last 12 months, computed on a rolling basis. This information shall be compared to the corresponding VaR measures which result from the internal risk measurement system of the Reporting Bank;

(b) Scenarios requiring a simulation by the Reporting Bank;

(i) the Reporting Bank shall test its portfolios against past periods of significant disturbance such as the 1997 Asian financial crisis or the 2007/2008 sub-prime crisis;

(ii) the Reporting Bank shall evaluate its market risk exposures to changes in the assumptions about volatilities and correlations. Applying this test would require an evaluation of the historical range of variation for volatilities and correlations and an evaluation of the positions of the Reporting Bank against the extreme values of the historical range; and

(iii) the Reporting Bank shall conduct ad-hoc stress tests on specific areas whenever this is warranted under special circumstances. For example, in light of rapidly deteriorating economic or political conditions in a country or industry, the Reporting Bank may need to make a quick assessment of the likely impact on its exposures to that country or industry;

(c) Scenarios to capture the specific characteristics of a portfolio;

a Reporting Bank shall develop its own stress scenarios which it identifies as most adverse based on the characteristics of the portfolio. The Reporting Bank shall document the methodology used to identify and carry out the stress scenarios as well as the results derived from those scenarios which shall be made available to the Authority upon request.

8.3.133 For each stress scenario, a Reporting Bank shall –

(a) incorporate the large price movements and sharp reduction in liquidity associated with the stress scenario;

(b) recognise the potential for feedback effects, which measure the second-round impact arising from its own activities;

(c) evaluate the impact of the failure of a major player in a concentrated market; and

(d) evaluate the impact if assumptions made in the internal model do not hold, for example, when a breakdown in historical correlation occurs.

8.3.134 Stress tests conducted should be meaningful and reasonably conservative. A Reporting Bank should construct stress test scenarios with input from trading units and review them for ongoing relevance and plausibility.

8.3.135 Stress tests should not be limited to quantitative exercises which compute potential losses or gains. They should also include more qualitative analyses of the actions that senior management might take under particular scenarios. Contingency plans outlining operating procedures and lines of communication, both formal and informal, are important products of such qualitative analyses.

8.3.136 A Reporting Bank should, in designing its stress tests, consider the following:

(a) the possibility of not being able to unwind some positions quickly during a crisis situation and that the values of these positions may be very volatile. Such considerations are particularly important for large positions or positions in emerging markets;

(b) possible linkages across different markets; and

(c) supplementing its scenario testing with sensitivity tests on individual risk factors.

**Sub-division 11: Risk Control**

8.3.137 A Reporting Bank shall have in place a comprehensive set of risk limits to align its business goals with its market risk threshold and to set boundaries for its risk-taking. The limit system shall be consistent with the effectiveness of the overall risk management process and system of the Reporting Bank and the adequacy of its capital levels. An appropriate limit system would allow the Reporting Bank to control exposures, to initiate discussion about opportunities and risks and to monitor actual risk-taking against predetermined tolerances.

8.3.138 A Reporting Bank shall ensure that its Board and senior management establish, approve and review the limit structure and high-level risk limits at least annually. The Reporting Bank shall reassess its limits when there are changes in market conditions or its resources.

8.3.139 The review of the limit structure shall compare limits to actual exposures and shall consider whether existing measures of exposures and limits are appropriate in view of the past performance and current capital levels of the Reporting Bank.

8.3.140 A Reporting Bank shall have a clear group-wide limit structure which is applied by its trading units. The Reporting Bank shall ensure consistency between the different types of limits. The Reporting Bank shall ensure that these limits are clearly communicated to all relevant staff and that positions which exceed certain predetermined levels receive prompt management attention.

8.3.141 A Reporting Bank shall establish procedures prescribing the course of action for limit excesses. These procedures shall include the actions required for the approval of temporary excesses and limit increases, the investigation of the reasons for the infringement of limits and the escalation of limit excesses to management.

8.3.142 A Reporting Bank should set risk limits for trading units or traders or both, which commensurate with the complexity of trading activities of the Reporting Bank, including its overseas branches and subsidiaries, by one or more of the following:

(a) products;

(b) tenors;

(c) concentrations; and

(d) markets.

8.3.143 A Reporting Bank should utilise its risk measurement system to quantify and allocate risk limits by individual portfolio, trading unit, activity and trader.

**Sub-division 12: Incremental Risk**

8.3.144 A Reporting Bank shall include in the IRC, all positions subject to a capital charge for specific interest rate risk according to the IMA to model specific market risk but not subject to the treatment outlined in paragraph 8.2.13(a), regardless of their perceived liquidity.[550A]

8.3.145 Subject to the Authority's approval, a Reporting Bank can choose consistently to include all listed equity and derivatives positions based on listed equity of a desk in its incremental risk model when such inclusion is consistent with how the Reporting Bank internally measures and manages this risk at the trading desk level. If equity securities are included in the computation of incremental risk, default is deemed to occur if the related debt defaults (as defined in Section 2 of Annex 7X).

8.3.146 A Reporting Bank shall not incorporate into its IRC model any securitisation positions even when securitisation positions are viewed as hedging underlying credit instruments held in the trading account.

8.3.147 For IRC-covered positions, the IRC captures -

(a) default risk which means the potential for direct loss due to an obligor's default as well as the potential for indirect losses that may arise from a default event; and

(b) credit migration risk which means the potential for direct loss due to an internal/ external rating downgrade or upgrade[550B] as well as the potential for indirect losses that may arise from a credit migration event.

Key supervisory parameters for computing IRC

*Soundness standard comparable to IRBA*

8.3.148 For all IRC-covered positions, a Reporting Bank's IRC model shall measure losses due to default and migration at the 99.9 percent confidence interval over a capital horizon of one year, taking into account the liquidity horizons applicable to individual trading positions or sets of positions. The Reporting Bank shall include losses captured by broader market-wide events affecting multiple issues or issuers in its model.

8.3.149 For each IRC-covered position, a Reporting Bank's model shall capture the impact of rebalancing positions at the end of their liquidity horizons so as to achieve a constant level of risk over a one-year capital horizon. The model may incorporate correlation effects among the modelled risk factors, subject to validation standards set forth in paragraph 8.3.165. The trading portfolio's IRC equals the IRC model's estimate of losses at the 99.9 percent confidence level.

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[550A] For the avoidance of doubt, where sovereign bonds are identified to be subject to default risk and credit migration risk, the capital charge under the IRC shall be determined accordingly.

[550B] The Reporting Bank may choose to determine credit migration risk on the basis of internal or external ratings, depending on which kind of ratings are more related to the changes of credit spreads that the Reporting Bank observes in the market. The chosen methodology shall be applied in a consistent and well-reasoned manner. Subject to this constraint, the Reporting Bank need not give priority to any particular ECAI.

*Constant level of risk over one-year capital horizon*

8.3.150 A Reporting Bank shall base its IRC model on the assumption of a constant level of risk over a one-year capital horizon. This constant level of risk assumption implies that the Reporting Bank rebalances, or rolls over, its trading positions over the one-year capital horizon in a manner that maintains the initial risk level, as indicated by a metric such as VaR or the profile of exposure by credit rating and concentration. This means incorporating the effect of replacing positions whose credit characteristics have improved or deteriorated over the liquidity horizon with positions that have risk characteristics equivalent to those that the original position had at the start of the liquidity horizon. The frequency of the assumed rebalancing must be governed by the liquidity horizon for a given position.

8.3.151 Rebalancing positions does not imply, as the IRBA for the banking book does, that the same positions will be maintained throughout the capital horizon. Particularly for more liquid and more highly rated positions, this provides a benefit relative to the treatment under the IRBA framework. However, the Reporting Bank may use a one-year constant position assumption, as long as it does so consistently across all portfolios.

*Liquidity horizon*

8.3.152 A Reporting Bank shall determine the appropriate liquidity horizon within their IRC models taking into account possible illiquidity during stressed credit market events. The liquidity horizon represents the time required to sell the position or to hedge all material risks covered by the IRC model in a stressed market.

8.3.153 A Reporting Bank shall measure the liquidity horizon under conservative assumptions, and specify a liquidity horizon sufficiently long such that the act of selling or hedging, in itself, does not materially affect market prices. The determination of the appropriate liquidity horizon for a position or set of positions may take into account a bank's internal policies relating to, for example, prudent valuation (as per the Guidelines on a Prudent Valuation Framework in Annex 8N), valuation adjustments[550C] and the management of stale positions.

8.3.154 A Reporting Bank shall apply a floor of three months on the liquidity horizon for a position or set of positions. In general, within a given product type, a non-investment-grade position is expected to have a longer assumed liquidity horizon than an investment-grade position. Conservative assumptions regarding the liquidity horizon for non-investment grade positions are warranted until further evidence is gained regarding the market's liquidity during systematic and idiosyncratic stress situations. The Reporting Bank shall apply conservative liquidity horizon assumptions for products, regardless of rating, where secondary market liquidity is not deep, particularly during periods of financial market volatility and investor risk aversion. The application of prudent liquidity assumptions is particularly important for rapidly growing product classes that have not been tested in a downturn.

8.3.155 A Reporting Bank may assess liquidity by position or on an aggregated basis. If an aggregated basis is used (e.g. investment-grade European corporate exposures not part of a core credit default swap index), the Reporting Bank should define the aggregation criteria in a way that meaningfully reflects differences in liquidity.

8.3.156 A Reporting Bank shall specify a greater liquidity horizon for positions that are concentrated, reflecting the longer period needed to liquidate such positions. This longer liquidity horizon for concentrated positions is necessary to provide adequate capital against issuer concentration and market concentration.

[550C] See also paragraphs 1.17 to 1.21 of Annex 8N.

*Correlations and diversification*

(a) Correlations between defaults and migrations

8.3.157 Economic and financial dependence among obligors causes a clustering of default and migration events. The IRC includes the impact of correlations between default and migration events among obligors. A Reporting Bank's IRC model shall include the impact of such clustering of default and migration events.

(b) Correlations between default or migration risks and other market factors

8.3.158 The impact of diversification between default or migration risks in the trading book and other risks in the trading book is not currently well understood. For the time being, a Reporting Bank shall not reflect the impact of diversification between default or migration events and other market variables in the computation of capital for incremental risk. This is consistent with the Basel II Framework, which does not allow for the benefit of diversification when combining capital requirements for credit and market risk. Accordingly, the capital charge for incremental default and migration losses is added to the VaR-based capital charge for market risk.

*Concentration*

8.3.159 A Reporting Bank shall appropriately reflect issuer and market concentrations in its IRC model. Other things being equal, a concentrated portfolio should attract a higher capital charge than a more granular portfolio (see also paragraph 8.3.156). The Reporting Bank shall also reflect concentrations that can arise within and across product classes under stressed conditions.

*Risk mitigation and diversification effects*

8.3.160 A Reporting Bank may net the exposure amounts within the IRC model only when long and short positions refer to the same financial instrument. Otherwise, the Reporting Bank shall capture exposure amounts on a gross (ie non-netted) basis. Hedging or diversification effects associated with long and short positions involving different instruments or different securities of the same obligor ("intra-obligor hedges"), as well as long and short positions in different issuers ("inter-obligor hedges"), may not be recognised through netting of exposure amounts. The Reporting Bank may only recognise such effects by capturing and modelling separately the gross long and short positions in the different instruments or securities.

8.3.161 A Reporting Bank should reflect significant basis risks by product, seniority in the capital structure, internal or external rating, maturity, vintage for offsetting positions as well as differences between offsetting instruments, such as different payout triggers and procedures, in its IRC model.

8.3.162 A Reporting Bank shall include, where material, the impact of potential risks that could occur during the interval between the maturity of an instrument and the liquidity horizon if the instrument has a shorter maturity than the liquidity horizon or if a maturity longer than the liquidity horizon is not contractually assured.

8.3.163 A Reporting Bank may recognise rebalancing of hedges within the liquidity horizon of the hedged positions for trading book risk positions that are typically hedged via dynamic hedging strategies if the Reporting Bank (a) chooses to model rebalancing of the hedge consistently over the relevant set of trading book risk positions, (b) demonstrates that the inclusion of rebalancing results in a better risk measurement, and (c) demonstrates that the markets for the instruments serving as hedge are liquid enough to allow for this kind of rebalancing even during periods of stress. The Reporting Bank

shall reflect any residual risks resulting from dynamic hedging strategies in the capital charge. The Reporting Bank should validate its approach to capture such residual risks to the satisfaction of the Authority.

*Optionality*

8.3.164 A Reporting Bank shall reflect the impact of optionality in its IRC model. The Reporting Bank's model should include the non-linear impact of options and other positions with material non-linear behaviour with respect to price changes. The Reporting Bank should also have due regard to the amount of model risk inherent in the valuation and estimation of price risks associated with such products.

Validation

8.3.165 A Reporting Bank shall apply the validation principles described in Sub-division 9 of this Part in designing, testing and maintaining their IRC models. This includes evaluating conceptual soundness, ongoing monitoring that includes process verification and benchmarking, and outcomes analysis. Some factors to be considered in the validation process include:

(a) Liquidity horizons should reflect actual practice and experience during periods of both systematic and idiosyncratic stresses.

(b) The IRC model for measuring default and migration risks over the liquidity horizon should take into account objective data over the relevant horizon and include comparison of risk estimates for a rebalanced portfolio with that of a portfolio with fixed positions[550CA].

(c) Correlation assumptions shall be supported by analysis of objective data in a conceptually sound framework. If the Reporting Bank uses a multi-period model to compute incremental risk, it should evaluate the implied annual correlations to ensure they are reasonable and in line with observed annual correlations. The Reporting Bank shall validate that its modelling approach for correlations is appropriate for its portfolio, including the choice and weights of its systematic risk factors. The Reporting Bank shall also ensure and be able to justify that the (joint) distributional assumptions used and the parameters employed within its IRC model are appropriate. The Reporting Bank shall maintain clear documentation of its modelling approach including its correlation and other modelling assumptions.

(d) Owing to the high confidence standard and long capital horizon of the IRC, direct validation of the IRC model through standard backtesting methods at the 99.9%, one-year soundness standard will not be possible. The Reporting Bank shall rely more heavily on indirect methods in validating its internal model including but not limited to stress tests, sensitivity analyses and scenario analyses, to assess its qualitative and quantitative reasonableness, particularly with regard to the model's treatment of concentrations. Given the nature of the IRC soundness standard, the Reporting Bank shall not limit such tests to the range of events

[550CA] Where a Reporting Bank is able to make assumptions of portfolio rebalancing in its assessment of its IRC model, it shall compare those results with the results that would have applied if the positions were held constant over the relevant liquidity horizon.

experienced historically. The validation of an IRC model represents an ongoing process in which the Authority and the Reporting Bank jointly determine the exact set of validation procedures to be employed.

(e) The Reporting Bank should develop relevant internal modelling benchmarks to assess the overall accuracy of its IRC model.

Use of internal risk measurement models to compute the IRC

8.3.166 There is no specific modelling approach for capturing incremental risk. The approach that a Reporting Bank uses to measure the IRC is subject to the "use test". Specifically, the approach shall be consistent with the bank's internal risk management methodologies for identifying, measuring, and managing trading risks.

8.3.167 In practice, a Reporting Bank's internal approach for measuring trading book risks may not map directly into the specifications above in terms of capital horizon, constant level of risk, rollover assumptions or other factors. In this case, the Reporting Bank shall demonstrate that the resulting internal capital charge would deliver a charge at least as high as the charge produced by a model that directly applies the supervisory principles set out in this Sub-division.

## DERIVATION OF NOTIONAL POSITIONS FOR INTEREST RATE-RELATED DERIVATIVES

Futures Contracts or Forwards on Debt Security

1.1 A Reporting Bank should treat a purchased (sold) futures contract or forward on a single debt security as –

(a) a notional long (short) position in the underlying debt security (or the cheapest to deliver, taking into account the conversion factor, where the contract can be satisfied by delivery of one from a range of securities); and

(b) a notional short (long) position in a zero coupon zero-specific-risk security with a maturity equal to the expiry date of the futures contract or forward.

Futures Contracts or Forwards on a Basket or Index of Debt Securities

1.2 A Reporting Bank should convert a futures contract or forward on a basket or index of debt securities into forwards on single debt securities as follows:

(a) in the case of a single currency basket or index of debt securities –

(i) a series of forwards, one for each of the constituent debt securities in the basket or index, of an amount which is a proportionate part of the total underlying instruments of the contract according to the weighting of the relevant debt security in the basket or index; or

(ii) a single forward on a hypothetical debt security; or

(b) in the case of multiple currency baskets or indices of debt securities –

(i) a series of forwards (using the method described in sub-paragraph (a)(i) above); or

(ii) a series of forwards, each one on a hypothetical debt security to represent one of the currencies in the basket or index, of an amount which is a proportionate part of the total underlying instruments of the contract according to the weighting of the relevant currency in the basket or index,

and treat the resulting positions according to paragraph 1.1 of this Annex.

1.3 A Reporting Bank should assign the hypothetical debt security in paragraph 1.2(a)(ii) a specific risk charge and a general market risk charge equal to the highest that would apply to the debt securities in the basket or index, even if they relate to different debt securities and regardless of the proportion of those debt securities in the basket or index.

Interest Rate Futures and FRAs

1.4 A Reporting Bank should treat a short (long) interest rate futures contract or a long (short) FRA as –

(a) a notional short (long) position in a zero coupon zero-specific-risk security with a maturity equal to the sum of the period to expiry of the futures contract or settlement date of the FRA and the maturity of the borrowing or deposit; and

(b) a notional long (short) position in a zero coupon zero-specific-risk security with maturity equal to the period to expiry of the futures contract or settlement date of the FRA.

Interest Rate Swaps or Foreign Exchange Swaps

1.5 A Reporting Bank should treat interest rate swaps or foreign exchange swaps[551] as two notional positions as follows –

| | **Notional position 1** | **Notional position 2** |
|---|---|---|
| Bank receives fixed and pays floating | A short position in a zero-specific-risk security with a coupon equal to the floating rate and a maturity equal to the reset date. | A long position in a zero-specific-risk security with a coupon equal to the fixed rate of the swap and a maturity equal to the maturity of the swap. |
| Bank receives floating and pays fixed | A short position in a zero-specific-risk security with a coupon equal to the fixed rate of the swap and a maturity equal to the maturity of the swap. | A long position in a zero-specific-risk security with a coupon equal to the floating rate and a maturity equal to the reset date. |
| Bank receives and pays floating | A short position in a zero-specific-risk security with a coupon equal to the floating rate and a maturity equal to the reset date. | A long position in a zero-specific-risk security with a coupon equal to the floating rate and a maturity equal to the reset date. |

551 For a foreign exchange swap, the two notional zero-specific-risk securities would be denominated in different currencies.

**TREATMENT OF CREDIT DERIVATIVES IN THE TRADING BOOK**

Credit Default Swaps

1.1 A Reporting Bank that is a protection seller (buyer) should treat its position in a credit default swap as –

(a) for the purpose of calculating the general market risk capital requirement where any periodic premiums or interest payments are due under the swap, a notional long (short) position in a zero-specific-risk security with a coupon equal to the appropriate fixed or floating rate and a maturity equal to the expiry date of the swap or the date on which the interest rate will be reset respectively; and

(b) for the purpose of calculating the specific risk capital requirement, a notional long (short) position in the reference obligation, or where the swap is a qualifying debt security[551AA], a long (short) position in the swap, with a maturity equal to the expiry date of the swap.

[MAS Notice 637 (Amendment No. 2) 2014]

Total Rate of Return Swaps

1.2 A Reporting Bank that is a protection seller (buyer) should treat its position in a total rate of return swap as –

(a) for the purpose of calculating the general market risk capital requirement –

(i) a notional long (short) position in the reference obligation with a maturity equal to the expiry date of the swap; and

(ii) where any periodic premiums or interest payments are due under the swap, a notional short (long) position in a zero-specific-risk security with a coupon equal to the appropriate fixed or floating rate and a maturity equal to the expiry date of the swap or the date on which the interest rate will be reset respectively; and

(b) for the purpose of calculating the specific risk capital requirement, a notional long (short) position in the reference obligation with a maturity equal to the expiry date of the swap.

[MAS Notice 637 (Amendment No. 2) 2014]

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[551AA] This refers to a security that falls under the "qualifying" category in footnote 553.
[MAS Notice 637 (Amendment No. 2) 2014]

Credit Linked Notes

1.3 A Reporting Bank that is a protection seller should treat its position in a credit linked note as –

(a) for the purpose of calculating the general market risk capital requirement, a long position in the note issuer with a coupon equal to the appropriate fixed or floating rate and a maturity equal to the expiry date of the note or the date on which the interest rate will be reset respectively; and

(b) for the purpose of calculating the specific risk capital requirement –

(i) in the case where the credit linked note is a qualifying debt security[551AB], a long position in the note issuer with a coupon equal to the appropriate fixed or floating rate and a maturity equal to the expiry date of the note or the date on which the interest rate will be reset respectively; and

(ii) in the case where the credit linked note is not a qualifying debt security, a long position in the note issuer with a coupon equal to the appropriate fixed or floating rate and a maturity equal to the expiry date of the note or the date on which the interest rate will be reset respectively, and either –

(A) for a single name credit linked note, a notional long position in the reference obligation with a maturity equal to the expiry date of the note; or

(B) for a multiple name credit linked note providing proportional protection, a notional long position in each of the reference obligations according to their respective proportions specified in the note.

[MAS Notice 637 (Amendment No. 2) 2014]

1.4 A Reporting Bank that is a protection buyer should treat its position in a credit linked note as –

(a) for the purpose of calculating the general market risk capital requirement, a short position in the note issuer with a coupon equal to the appropriate fixed or floating rate and a maturity equal to the expiry date of the note or the date on which the interest rate will be reset respectively; and

(b) for the purpose of calculating the specific risk capital requirement –

(i) in the case where the credit linked note is a qualifying debt security[551AC], a short position in the note issuer with a coupon equal

[551AB] This refers to a security that falls under the "qualifying" category in footnote 553.
[MAS Notice 637 (Amendment No. 2) 2014]

[551AC] This refers to a security that falls under the "qualifying" category in footnote 553.
[MAS Notice 637 (Amendment No. 2) 2014]

to the appropriate fixed or floating rate and a maturity equal to the expiry date of the note or the date on which the interest rate will be reset respectively; and

(ii) in the case where the credit linked note is not a qualifying debt security, either –

(A) for a single name credit linked note, a notional short position in the reference obligation with a maturity equal to the expiry date of the note; or

(B) for a multiple name credit linked note providing proportional protection, a notional short position in each of the reference obligations according to their respective proportions specified in the note.

[MAS Notice 637 (Amendment No. 2) 2014]

First-to-default Credit Derivatives

1.5 A Reporting Bank that is a protection seller (buyer) should treat its position in a first-to-default credit derivative as –

(a) for the purpose of calculating the general market risk capital requirement where any periodic premiums or interest payments are due under the credit derivative, a notional long (short) position in a zero-specific-risk security with a coupon equal to the appropriate fixed or floating rate and a maturity equal to the expiry date of the credit derivative or the date on which the interest rate will be reset respectively;

(b) for the purpose of calculating the specific risk capital requirement -

(i) in the case where the credit derivative is rated by a recognised ECAI, the protection seller (buyer) should treat the position as a long (short) position in the credit derivative[551A]; and

(ii) in all other cases, long (short) positions in each of the reference obligations in the contract, with the specific risk capital requirement capped at the maximum payout possible under the contract.

[MAS Notice 637 (Amendment No. 2) 2014]

1.6 Where a Reporting Bank holds a risk position in one of the reference obligations underlying a first-to-default credit derivative, and this credit derivative hedges the risk position, the Reporting Bank may reduce with respect to the hedged amount both the specific risk capital charge for the reference obligation and that part of the specific risk capital charge for the credit derivative that relates to this particular reference obligation. Where a Reporting Bank holds multiple risk positions in reference obligations underlying a

[551A] For such positions, the respective specific risk capital requirements for securitisation exposures as specified in paragraph 8.2.13(a) of this Part shall apply.

first-to-default credit derivative, this offset is only allowed for that underlying reference obligation having the lowest specific risk capital charge.

N-th-to-default Credit Derivatives (with N greater than 1)

1.7 A Reporting Bank that is a protection seller (buyer) should treat its position in an n-th-to-default credit derivative with n greater than 1 as –

(a) for the purpose of calculating the general market risk capital requirement where any periodic premiums or interest payments are due under the credit derivative, a notional long (short) position in a zero-specific-risk security with a coupon equal to the appropriate fixed or floating rate and a maturity equal to the expiry date of the credit derivative or the date on which the interest rate will be reset respectively;

(b) for the purpose of calculating the specific risk capital requirement -

(i) in the case where the credit derivative is rated by a recognised ECAI, the protection seller (buyer) should treat the position as a long (short) position in the credit derivative[551B]; and

(ii) in all other cases, long (short) positions in each of the reference obligations in the contract but disregarding the (n-1) obligations with the lowest specific risk capital charges, with the specific risk capital requirement capped at the maximum payout possible under the contract.

[MAS Notice 637 (Amendment No. 2) 2014]

1.8 For n-th-to-default credit derivatives with n greater than 1, no offset of the specific risk capital charges with any underlying reference obligation is allowed.

1.9 The capital charge against each net n-th-to-default credit derivative position (including first-to-default credit derivative positions) applies irrespective of whether the Reporting Bank provides or obtains protection.

[MAS Notice 637 (Amendment No. 2) 2014]

Summary of Treatment of Credit Derivatives in the Trading Book

| | | Protection seller | Protection buyer |
|---|---|---|---|
| Credit default swap | General market risk | Long position in a zero-specific-risk security if there are any payments that are due | Short position in a zero-specific-risk security if there are any premiums or interest payments to be paid |
| | Specific risk | Long position in the reference obligation, or long position in the swap if it is a qualifying debt security | Short position in the reference obligation, or short position in the swap if it is a qualifying debt security |

551B For such positions, the respective specific risk capital requirements for securitisation exposures as specified in paragraph 8.2.13(a) of this Part shall apply.

| | | Protection seller | Protection buyer |
|---|---|---|---|
| Total rate of return swap | General market risk | Long position in the reference obligation, and short position in a zero-specific-risk security if there are any payments that are due | Short position in the reference obligation, and long position in a zero-specific-risk security if there are any premiums or interest payments to be paid |
| | Specific risk | Long position in the reference obligation | Short position in the reference obligation |
| Credit linked notes | General market risk | Long position in the note issuer | Short position in the note issuer |
| | Specific risk | Long position in the note issuer and long position in the reference obligations, or long position in the note issuer if it is a qualifying debt security | Short position in the reference obligations, or short position in the note issuer if it is a qualifying debt security |
| First-to-default | General market risk | Long position in a zero-specific-risk security if there are any payments that are due | Short position in a zero-specific-risk security if there are any premiums or interest payments to be paid |
| | Specific risk | Long position in each of the reference obligations with the specific risk capital requirement capped at the maximum payout possible, or long position in the credit derivative if it is rated by a recognised ECAI.<br><br>Offsets for capital charges from exposures to underlying reference obligations allowed under certain conditions. | Short position in each of the reference obligations with the specific risk capital requirement capped at the maximum payout possible<br><br>Offsets for capital charges from exposures to underlying reference obligations allowed under certain conditions. |
| N-th-to-default | General market risk | Long position in a zero-specific-risk security if there are any payments that are due | Short position in a zero-specific-risk security if there are any premiums or interest payments to be paid |
| | Specific risk | Long position in each of the reference obligations with the specific risk capital requirement capped at the maximum payout possible, or long position in the credit derivative if it is rated by a recognised ECAI.<br><br>Offsets for capital charges from exposures to any underlying reference credit instrument not allowed. | Short position in each of the reference obligations with the specific risk capital requirement capped at the maximum payout possible.<br><br>Offsets for capital charges from exposures to any underlying reference credit instrument not allowed. |

[MAS Notice 637 (Amendment No. 2) 2014]

## APPLICABLE RISK CHARGES OR MATCHING FACTORS FOR CALCULATION OF SPECIFIC RISK AND GENERAL MARKET RISK CAPITAL REQUIREMENTS UNDER THE SA(MR)

### Table 8C-1 – Specific Risk Capital Requirement - Specific Risk Charges for Positions other than Securitisation Exposures

| Category | Credit Quality Grade as set out in Table 7R-1 | Residual term to final maturity | Specific risk charge |
|---|---|---|---|
| **Government**[552] | 1 | N.A. | 0.00% |
| | 2 or 3 | 6 months or less | 0.25% |
| | | more than 6 and up to and including 24 months | 1.00% |
| | | more than 24 months | 1.60% |
| | 4 or 5 | N.A. | 8.00% |
| | 6 | N.A. | 12.00% |
| | Unrated | N.A. | 8.00% |
| **Qualifying**[553] | | 6 months or less | 0.25% |

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552 The "government" category includes –
(a) all forms of government-issued securities, including bonds, treasury bills and other short-term instruments; and
(b) securities issued by PSEs which qualify for a 0% risk weight under the SA(CR).
An exposure to any security issued by –
(i) the Government or the Authority; or
(ii) other central governments with a credit quality grade of "3" or better as set out in Table 7R-1,
which is denominated in the domestic currency and funded by the Reporting Bank in the same currency shall be assigned a 0% specific risk charge.
The Authority may, at its discretion, assign a higher risk charge other than the above to securities issued by certain governments, especially in cases where the securities are denominated in a currency other than that of the issuing government.
[MAS Notice 637 (Amendment No. 2) 2017]

553 The "qualifying" category includes –
(a) any security that is issued by an MDB;
(b) any security issued by a PSE which has a credit quality grade of "3" or better as set out in Table 7R-1 or any unrated security issued by a PSE which belongs to a country with a credit quality grade of "1" as set out in Table 7R-1;
(c) any security which has a credit quality grade of "3" or better as set out in Table 7R-1, from external credit assessments by at least two recognised ECAIs; and
(d) subject to supervisory monitoring, any security which has a credit quality grade of "3" or better as set out in Table 7R-1.
Where a security has more than one external credit assessment and these map into different credit quality grades, paragraph 7.3.4 shall apply. A Reporting Bank adopting the IRBA may also include an unrated security in this category if the security is internally rated and associated with a PD equivalent to a credit

| Category | Credit Quality Grade as set out in Table 7R-1 | Residual term to final maturity | Specific risk charge |
|---|---|---|---|
| | | more than 6 and up to and including 24 months | 1.00% |
| | | more than 24 months | 1.60% |
| **Others**[554] | 4 | N.A. | 8.00% |
| | 5 or 6 | N.A. | 12.00% |
| | Unrated | N.A. | 8.00% |

[MAS Notice 637 (Amendment No. 2) 2017]

quality grade of "3" or better as set out in Table 7R-1 and the issuer has securities listed on any approved exchange in Singapore or any recognised group A exchange.

[MAS Notice 637 (Amendment No. 2) 2017]
[MAS Notice 637 (Amendment) 2018]

554 For securities which have a high yield to redemption relative to government debt securities issued in the same country, the Authority will have the discretion –
(a) to apply a higher specific risk charge to such instruments; and/or
(b) to disallow offsetting for the purpose of defining the extent of general market risk between such instruments and any other debt instruments.

554A [Deleted by MAS Notice 637 (Amendment No. 2) 2017]
554B [Deleted by MAS Notice 637 (Amendment No. 2) 2017]
554C [Deleted by MAS Notice 637 (Amendment No. 2) 2017]
554D [Deleted by MAS Notice 637 (Amendment No. 2) 2017]
554E [Deleted by MAS Notice 637 (Amendment No. 2) 2017]
554F [Deleted by MAS Notice 637 (Amendment No. 2) 2017]
554G [Deleted by MAS Notice 637 (Amendment No. 2) 2017]
554H [Deleted by MAS Notice 637 (Amendment No. 2) 2017]

**Table 8C-2 – General Market Risk Capital Requirement - Maturity Bands, General Risk Charges and Assumed Changes in Yield for the Maturity Method**

| Maturity Band | Coupon 3% or more | Coupon less than 3% | General Risk Charge | Assumed change in yield |
|---|---|---|---|---|
| | **Zone 1** | | | |
| 1 | Up to 1 month | Up to 1 month | 0.00% | 1.00 |
| 2 | More than 1 month but not more than 3 months | More than 1 month but not more than 3 months | 0.20% | 1.00 |
| 3 | More than 3 months but not more than 6 months | More than 3 months but not more than 6 months | 0.40% | 1.00 |
| 4 | More than 6 months but not more than 12 months | More than 6 months but not more than 12 months | 0.70% | 1.00 |
| | **Zone 2** | | | |
| 5 | More than 1 year but not more than 2 years | More than 1.0 year but not more than 1.9 years | 1.25% | 0.90 |
| 6 | More than 2 years but not more than 3 years | More than 1.9 years but not more than 2.8 years | 1.75% | 0.80 |
| 7 | More than 3 years but not more than 4 years | More than 2.8 years but not more than 3.6 years | 2.25% | 0.75 |
| | **Zone 3** | | | |
| 8 | More than 4 years but not more than 5 years | More than 3.6 years but not more than 4.3 years | 2.75% | 0.75 |
| 9 | More than 5 years but not more than 7 years | More than 4.3 years but not more than 5.7 years | 3.25% | 0.70 |
| 10 | More than 7 years but not more than 10 years | More than 5.7 years but not more than 7.3 years | 3.75% | 0.65 |
| 11 | More than 10 years but not more than 15 years | More than 7.3 years but not more than 9.3 years | 4.50% | 0.60 |
| 12 | More than 15 years but not more than 20 years | More than 9.3 years but not more than 10.6 years | 5.25% | 0.60 |
| 13 | More than 20 years | More than 10.6 years but not more than 12 years | 6.00% | 0.60 |
| 14 | | More than 12 years but not more than 20 years | 8.00% | 0.60 |
| 15 | | More than 20 years | 12.50% | 0.60 |

**Table 8C-3 – General Market Risk Capital Requirement - Duration Bands and Assumed Changes in Yield for the Duration Method**

| Duration Band | | Assumed change in yield |
|---|---|---|
| | **Zone 1** | |
| 1 | Up to 1 month | 1.00 |
| 2 | More than 1 month but not more than 3 months | 1.00 |
| 3 | More than 3 months but not more than 6 months | 1.00 |
| 4 | More than 6 months but not more than 12 months | 1.00 |
| | **Zone 2** | |
| 5 | More than 1.0 year but not more than 1.9 years | 0.90 |
| 6 | More than 1.9 years but not more than 2.8 years | 0.80 |
| 7 | More than 2.8 years but not more than to 3.6 years | 0.75 |
| | **Zone 3** | |
| 8 | More than 3.6 years but not more than 4.3 years | 0.75 |
| 9 | More than 4.3 years but not more than 5.7 years | 0.70 |
| 10 | More than 5.7 years but not more than 7.3 years | 0.65 |
| 11 | More than 7.3 years but not more than 9.3 years | 0.60 |
| 12 | More than 9.3 years but not more than 10.6 years | 0.60 |
| 13 | More than 10.6 years but not more than 12 years | 0.60 |
| 14 | More than 12 years but not more than 20 years | 0.60 |
| 15 | More than 20 years | 0.60 |

**Table 8C-4 – General Market Risk Capital Requirement - Matching Factors for the Maturity and Duration Methods**

| Maturity Band Matching Factor | Duration Band Matching Factor |
|---|---|
| 10% | 5% |

| Zone | Zone Matching Factor | Adjacent Zone Matching Factor | Non-adjacent Zone Matching Factor |
|---|---|---|---|
| **1** | 40% | 40% | 100% |
| **2** | 30% | | |
| **3** | 30% | | |

**Annex 8D**

**ILLUSTRATION ON THE CALCULATION OF THE GENERAL MARKET RISK CAPITAL REQUIREMENT FOR INTEREST RATE RISK UNDER THE MATURITY METHOD**

1.1 A Reporting Bank may have the following positions:

(a) a qualifying bond[554I], $13.33 million market value, remaining maturity 8 years, coupon 8%;

[MAS Notice 637 (Amendment No. 2) 2014]

(b) a government bond, $75 million market value, remaining maturity 2 months, coupon 7%;

(c) an interest rate swap, $150 million, in respect of which the Reporting Bank receives floating rate interest and pays fixed, next interest fixing after 9 months, remaining life of swap is 8 years (assume the current interest rate is identical to the one on which the swap is based); and

(d) a long position in an interest rate future, $50 million, delivery date after 6 months, life of underlying government security is 3.5 years (assume the current interest rate is identical to the one on which the interest rate future is based).

1.2 Assume that all the coupons or interest rates are more than 3%. A Reporting Bank should record these instruments as positions in a maturity slotting table and apply risk charges to them in accordance with Table 8C-2 of Annex 8C.

1.3 A Reporting Bank should calculate the maturity band requirement by multiplying the total amount matched within each maturity band by the maturity band matching factor of 10%. In this example, there are partially offsetting long and short positions in the 10th maturity band, the matched amount of which is equal to $500,000. This results in a vertical disallowance of $50,000.

1.4 A Reporting Bank should then calculate its horizontal disallowances comprising –

(a) the zone requirement, by multiplying the total amount matched within each zone by the corresponding zone matching factor in Table 8C-4 of Annex 8C. In this example, a zone requirement would be calculated for Zone 1 amounting to 40% of the total matched amount of $200,000. This results in a horizontal disallowance within the zones of $80,000. There is no zone requirement if offsetting does not occur within a zone;

(b) the adjacent zone requirement, by multiplying the total amount matched between adjacent zones by the adjacent zone factor in Table 8C-4 of Annex 8C. In this example, the following positions remain unmatched after sub-paragraph (a) above: Zone 1 +$1,000,000, Zone 2 +$1,125,000, Zone 3 -

[554I] This refers to a security that falls under the "qualifying" category in footnote 553.

[MAS Notice 637 (Amendment No. 2) 2014]

$5,125,000. The adjacent zone matching factor of 40% would apply to the matched amount of $1,125,000 between Zones 2 and 3. This results in a horizontal disallowance between adjacent zones of $450,000; and

(c) the non-adjacent zone requirement, by multiplying the total amount matched between Zones 1 and 3. In this example, the following positions remain unmatched after sub-paragraph (b) above: Zone 1 +$1,000,000, Zone 3 -$4,000,000. The non-adjacent zone factor of 100% would apply to the matched amount of $1,000,000 resulting in a horizontal disallowance between Zones 1 and 3 of $1,000,000.

1.5 Finally, the Reporting Bank should calculate a net position requirement for the residual unmatched amount. In this example this amounts to $3,000,000.

1.6 The general market risk capital requirement is the sum of the maturity band requirement, the zone requirement, the adjacent zone requirement, the non-adjacent zone requirement and the net position requirement. In this example, the general market risk capital requirement would be $50,000 + $80,000 + $450,000 + $1,000,000 + $3,000,000 = $4,580,000.

Tabular Illustration ($million)

| | Zone 1 (months) | | | | Zone 2 (years) | | | Zone 3 (years) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Maturity Band | 0-1 | 1-3 | 3-6 | 6-12 | 1-2 | 2-3 | 3-4 | 4-5 | 5-7 | 7-10 | 10-15 | 15-20 | > 20 |
| Position | | +75<br>Gov. | -50<br>Fut. | +150<br>Swap | | | +50 Fut. | | | -150<br>Swap<br>+13.33<br>Qual. | | | |
| General risk charge (%) | 0.00 | 0.20 | 0.40 | 0.70 | 1.25 | 1.75 | 2.25 | 2.75 | 3.25 | 3.75 | 4.50 | 5.25 | 6.00 |
| Risk-charged position | | +0.15 | -0.2 | +1.05 | | | +1.125 | | | -5.625<br>+0.5 | | | |
| Vertical (Para 1.3) | | | | | | | | | | 0.5 x<br>10% =<br>0.05 | | | |
| Horizontal (Para 1.4(a)) | 0.2 x 40% = 0.08 | | | | | | | | | | | | |
| Horizontal (Para 1.4(b)) | | | | | 1.125 x 40% = 0.45 | | | | | | | | |
| Horizontal (Para 1.4(c)) | 1.0 x 100% | | | | | | | | | | | | |

**DERIVATION OF NOTIONAL POSITIONS FOR EQUITY DERIVATIVE INSTRUMENTS**

Depository Receipts

1.1 A Reporting Bank should treat a depository receipt as a notional position in the underlying equity.

Convertibles

1.2 Where a Reporting Bank includes a convertible financial instrument in the equity position risk calculation, it should –

(a) treat the convertible financial instrument as a notional position in the equity into which it converts; and

(b) adjust its equity position risk by making –

(i) an addition equal to the current value of any loss which the Reporting Bank would make if it did convert to equity; or

(ii) a deduction equal to the current value of any profit which the Reporting Bank would make if it did convert to equity (subject to a maximum reduction equal to the equity position risk on the notional position underlying the convertible financial instrument).

Futures Contracts, Forwards and Contract for Differences ("CFD")[555] on a Single Equity

1.3 A Reporting Bank should treat a futures contract, forward or CFD on a single equity as a notional position in that equity.

Futures Contracts, Forwards and CFDs on Equity Indices or Baskets

1.4 A Reporting Bank should treat a futures contract, forward or CFD on an equity index or basket as either –

(a) a notional position in each of the underlying equities with a value reflecting that equity's contribution to the total market value of the equities in the index or basket; or

(b) if there is –

[555] Any interest rate risk arising from a futures contract, forward or contract for difference should be reported as set out in Sub-division 1 of Division 2.

(i) one country in the index or basket, a notional position in the index or basket with a value equal to the total market value of the equities in the index or basket; or

(ii) more than one country in the index or basket –

(A) several notional basket positions, one for each country basket with a value reflecting that country's contribution to the total market value of the equities in the index or basket; or

(B) one notional basket position in a separate, hypothetical country with a value equal to the total market value of the equities in the index or basket.

Equity Swaps

1.5 A Reporting Bank should treat an equity swap where the Reporting Bank is receiving an amount based on the change in value of a single equity or equity index and paying an amount based on the change in value of another equity or equity index as a notional long position in the former and a notional short position in the latter.[556]

[556] Where one of the legs involves receiving/paying a fixed or floating interest rate, that exposure shall be slotted into the appropriate re-pricing time-band for interest rate risk as set out in Sub-division 1 of Division 2 of Part VIII.

## QUALIFYING EQUITY INDICES

1.1 *[This paragraph has been intentionally left blank.]*

1.2 *[This paragraph has been intentionally left blank.]*

1.3 A "qualifying equity index" means an index listed in the table below:

| | **Qualifying equity indices** |
|---|---|
| Australia | S&P/ASX 200 Index |
| Canada | S&P/TSX Composite Index |
| Europe | STOXX Europe 50 Index<br>Euro STOXX 50 Index |
| France | CAC 40 Index |
| Germany | DAX Index |
| Hong Kong | Hang Seng China Enterprises Index<br>Hang Seng Index |
| Italy | FTSE MIB Index |
| Japan | Nikkei 225 |
| Malaysia | FTSE Bursa Malaysia KLCI Index |
| Netherlands | AEX Index |
| Singapore | MSCI Singapore Free Index<br>FTSE Straits Times Index |
| South Korea | KOSPI 200 Index |
| Sweden | OMX Stockholm 30 Index |
| Taiwan | MSCI Taiwan Index |
| United Kingdom | FTSE 100 Index |
| United States of America | S&P 500 Index<br>Dow Jones Industrial Average |

and any index that is approved by the Authority on an exceptional basis.

**Annex 8G**

## DERIVATION OF NOTIONAL POSITIONS FOR FOREIGN CURRENCY AND GOLD DERIVATIVE INSTRUMENTS

Foreign Exchange Forwards, Futures Contracts, Contract for Differences ("CFD"s)

1.1 A Reporting Bank should treat a foreign exchange forward, futures contract or CFD as two notional currency positions:

(a) a long notional position in the currency which the Reporting Bank has contracted to buy; and

(b) a short notional position in the currency which the Reporting Bank has contracted to sell,

where each notional position has a value equal to the present value[557] of the amount of each currency to be exchanged in the case of a forward or futures contract.

Foreign Exchange Swaps

1.2 A Reporting Bank should treat a foreign exchange swap as –

(a) a long notional position in the currency which the Reporting Bank has contracted to receive interest and principal; and

(b) a short notional position in the currency which the Reporting Bank has contracted to pay interest and principal,

where each notional position has a value equal to the present value amount of all cash flows in the relevant currency.

Gold Forwards, Futures Contract and CFDs

1.3 A Reporting Bank should treat a forward, futures contract or CFD on gold as a notional position in gold with a value equal to the amount of gold underlying the contract multiplied by the current spot price for gold, except in the case of a forward where the Reporting Bank, in accordance with industry norms, may use the net present value of each position, discounted using prevailing interest rates and valued at prevailing spot rates.

[557] This is normally equal to the amount underlying the contract multiplied by the current spot price, except in the case of a forward where the Reporting Bank, in accordance with industry norms, may use the net present value of each position, discounted using prevailing interest rates and valued at prevailing spot rates.

**Annex 8H**

## DERIVATION OF NOTIONAL POSITIONS FOR COMMODITY DERIVATIVE INSTRUMENTS

Futures Contract, Forwards and Contract for Differences ("CFD"s) on a Single Commodity[558]

1.1 A Reporting Bank should treat a forward, futures contract or CFD on a single commodity which settles according to the difference between the price set on trade date and that prevailing at the maturity date of the contract as a notional position equal to the total quantity of the commodity underlying the contract that has a maturity equal to the expiry date of the contract.

Commitment to Buy or Sell a Single Commodity at an Average of Spot Prices Prevailing in the Future

1.2 A Reporting Bank should treat a commitment to buy (sell) at the average spot price of a single commodity prevailing over some period between trade date and maturity date as a combination of –

(a) a long (short) position equal to the total quantity of the commodity underlying the contract with a maturity equal to the maturity date of the contract; and

(b) a series of short (long) notional positions, one for each of the reference dates where the contract price remains unfixed, each of which is a fractional share of the total quantity of the commodity underlying the contract and has a maturity equal to the relevant reference date.

Futures contract and CFDs on a Commodity Index

1.3 A Reporting Bank should treat a futures contract or CFD on a commodity index which settles according to the difference between the price set on trade date and that prevailing at the maturity date of the contract as either –

(a) a single notional commodity position (separate from all other commodities) equal to the total quantity of the commodities underlying the contract that has a maturity equal to the maturity date of the contract; or

(b) a series of notional positions, one for each of the constituent commodities in the index, each of which is a proportionate part of the total quantity of the commodities underlying the contract according to the weighting of the relevant commodity in the index and has a maturity equal to the maturity date of the contract.

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558 Where a commodity is part of a futures contract, forward or CFD, any interest rate or foreign exchange risk from the other leg of the contract shall be reported as set out in Sub-divisions 1 and 3 of Division 2.

Commodity Swaps

1.4 A Reporting Bank should treat a commodity swap[559] as a series of notional positions, one for each payment under the swap, each of which equals the total quantity of the commodity underlying the contract, has a maturity equal to the payment date and is long or short as follows:

| | Receiving amounts unrelated to any commodity's price | Receiving the price of commodity 'b' |
|---|---|---|
| Paying amounts unrelated to any commodity's price | N.A. | Long positions in commodity 'b' |
| Paying the price of commodity 'a' | Short positions in commodity 'a' | Short positions in commodity 'a' and long positions in commodity 'b' |

559 Where one of the legs involves receiving/paying a fixed or floating interest rate, that exposure shall be slotted into the appropriate re-pricing time-band for interest rate risk as set out in Sub-division 1 of Division 2.

## ILLUSTRATION ON THE CALCULATION OF THE MARKET RISK CAPITAL REQUIREMENT FOR COMMODITY RISK UNDER THE MATURITY LADDER APPROACH

Assuming that a Reporting Bank has the following positions in the same commodity which are converted at current spot rates into Singapore dollar, the total market risk capital requirement should be calculated as follows:

| Time-band | Position | Spread | Capital calculation |
|---|---|---|---|
| Up to 1 month | | 1.5% | |
| More than 1 month but not more than 3 months | | 1.5% | |
| More than 3 months but not more than 6 months | Long $800<br>Short $1000 | 1.5% | (1) 800 long + 800 short (matched)<br>Spread charge = $1,600*1.5% = $24<br><br>(2) 200 short carried forward to 1-2 years<br><br>Carry charge = $200*0.6%*2 = $2.40 |
| More than 6 months but not more than 12 months | | 1.5% | |
| More than 1 year but not more than 2 years | Long $600 | 1.5% | (2) 200 long + 200 short (matched)<br>Spread charge = $400*1.5% = $6<br><br>(3) 400 long carried forward to over 3 years<br><br>Carry charge = $400*0.6%*2 = $4.80 |
| More than 2 years but not more than 3 years | | 1.5% | |
| More than 3 years | Short $600 | 1.5% | (3) 400 long + 400 short (matched)<br>Spread charge = $800*1.5% = $12<br><br>(4) Net position = 200<br><br>Outright charge = $200*15% = $30 |
| | | | (5) Total market risk capital requirement = $79.20 |

**Annex 8J**

**ILLUSTRATION ON THE CALCULATION OF THE MARKET RISK CAPITAL REQUIREMENT FOR OPTIONS UNDER THE SIMPLIFIED APPROACH**

1.1 Assume a Reporting Bank holds 100 shares currently valued at $10 each and an equivalent put option with a strike price of $11, the market risk capital requirement would be $60: $1,000 x 16% (i.e. 8% specific risk + 8% general market risk) = $160, less the amount the option is in the money ($11 - $10) x 100 = $100.

1.2 A similar methodology applies for options whose underlying exposure or financial instrument is a foreign currency, an interest rate-related instrument or a commodity.

**Annex 8K**

**ILLUSTRATION ON THE CALCULATION OF THE MARKET RISK CAPITAL REQUIREMENT FOR OPTIONS UNDER THE DELTA-PLUS METHOD**

1.1 Assume a Reporting Bank has an European short call option on a commodity with an exercise price of 490 and a market value of the underlying commodity 12 months from the expiration of the option at 500; a risk-free interest rate at 8% per annum, and the volatility at 20%. The current delta for this position is according to the Black-Scholes formula -0.721 (i.e. the price of the option changes by -0.721 if the price of the underlying exposures or financial instruments moves by one). The gamma is -0.0034 (i.e. the delta changes by -0.0034 (from -0.721 to -0.7244) if the price of the underlying commodity moves by one). The current value of the option is 65.48.

1.2 The following example shows how the market risk capital requirement will be calculated according to the delta-plus method:

(a) The first step under the delta-plus method is to calculate the delta-weighted position by multiplying the current market value of the commodity by the absolute value of the delta.

$$500 \times 0.721 = 360.5$$

(b) The delta-weighted position is incorporated into the measure described in Sub-division 4 on Commodity Risk. If the Reporting Bank uses the maturity ladder approach and no other positions exist, the delta-weighted position has to be multiplied by the outright charge of 15% to calculate the capital requirement for delta.

$$360.5 \times 0.15 = 54.075$$

(c) The capital requirement for gamma is calculated in accordance with paragraphs 8.2.52 to 8.2.55 of Part VIII.

$$1/2 \times 0.0034 \times (500 \times 0.15)^2 = 9.5625$$

(d) The capital requirement for vega risk is calculated. The assumed current (implied) volatility is 20%. As only an increase in volatility carries a risk of loss for a short call option, the volatility has to be increased by a relative shift of 25%. This means that the vega risk capital requirement has to be calculated on the basis of a change in volatility of 5% from 20% to 25% in this example. According to the Black-Scholes formula used, the vega risk equals 168. Thus a 1% or 0.01 increase in volatility increases the value of the option by 1.68. Accordingly a change in volatility of 5% increases the value by

$$5 \times 1.68 = 8.4$$

which is the capital requirement for vega risk.

(e) The market risk capital requirement in this example would be 54.075 + 9.5625 + 8.4 = 72.0375.

**DETERMINING DELTA-WEIGHTED POSITIONS FOR INTEREST RATE OPTIONS**

1.1 In the case of a bought call option on a June 3-month interest rate future, the option will in April be considered to be a long position with a maturity of 5 months and a short position with a maturity of 2 months. A written option will similarly be entered as a long position with a maturity of 2 months and a short position with a maturity of 5 months. Both positions should be delta-weighted.

1.2 A 2-month call option on a 10-year bond future where delivery of the bond takes place in September would be considered in April as a long bond position with a maturity of 10 years 5 months and a short 5 months deposit. Both positions should be delta-weighted.

1.3 Caps and floors will be treated as a series of European-style options. For example, the buyer of a 2-year cap with semi-annual resets and a cap rate of 15% should treat the cap as a series of bought call options on a FRA with a reference rate of 15%, each with a negative sign at the maturity date of the underlying FRA and a positive sign at the settlement date of the underlying FRA.

**Annex 8M**

**EXAMPLE OF MATRICES FOR ANALYSING OPTION PORTFOLIOS UNDER THE SCENARIO APPROACH**

A Reporting Bank has purchased and sold options on interest rates, and options to purchase Japanese Yen and sell USD. The Reporting Bank may use the scenario approach to calculate the general market risk of these option portfolios by calculating the following matrices:

(a) Options on instruments maturing up to 3 months

| Yield / Volatility | - 100 basis points | - 66 basis points | - 33 basis points | Current yield | + 33 basis points | + 66 basis points | + 100 basis points |
|---|---|---|---|---|---|---|---|
| +25% | gain/loss | gain/loss | gain/loss | gain/loss | gain/loss | gain/loss | gain/loss |
| Current % volatility | gain/loss | gain/loss | gain/loss | market value | gain/loss | gain/loss | gain/loss |
| -25% | gain/loss | gain/loss | gain/loss | gain/loss | gain/loss | gain/loss | gain/loss |

Repeat the interest rate matrix above for each of the maturity bands.

(b) Options on Japanese Yen/USD exchange rate

| Exchange rate / Volatility | - 8% | - 5.33% | - 2.67% | Current exchange rate | + 2.67% | + 5.33% | + 8% |
|---|---|---|---|---|---|---|---|
| +25% | gain/loss | gain/loss | gain/loss | gain/loss | gain/loss | gain/loss | gain/loss |
| Current % volatility | gain/loss | gain/loss | gain/loss | market value | gain/loss | gain/loss | gain/loss |
| -25% | gain/loss | gain/loss | gain/loss | gain/loss | gain/loss | gain/loss | gain/loss |

**STANDARDS FOR A PRUDENT VALUATION FRAMEWORK**

1.1 This Annex sets out the standards for valuing positions in financial instruments and commodities for the purposes of calculating credit risk capital requirements under Part VII and market risk capital requirements under Part VIII. The standards are applicable to the valuation of financial instruments and commodities that are accounted for at fair value, whether they are recorded in the trading book or the banking book of a Reporting Bank.

1.1A These standards are especially important for positions without actual market prices or observable inputs to valuation, as well as less liquid positions, which raise supervisory concerns about prudent valuation. The standards are not intended to require a Reporting Bank to change valuation procedures for financial reporting purposes.

1.2 A Reporting Bank shall implement these standards in a manner commensurate with the market risks it assumes. However, the Authority may require a Reporting Bank to adopt particular sections of the standards where the market risks taken by the Reporting Bank render certain practices espoused by the standards essential for effective risk management.

1.3 The Authority will review the implementation of these standards by a Reporting Bank to assess the quality of its risk management systems, including assess whether the Reporting Bank has taken appropriate valuation adjustments for regulatory purposes under paragraphs 1.19A to 1.21 of this Annex. The degree of consistency between the Reporting Bank's valuation procedures and these standards will be a factor in the Authority's assessment of whether the Reporting Bank must take a valuation adjustment for regulatory purposes under paragraphs 1.19A to 1.21 of this Annex.

Governance Structure

1.4 A Reporting Bank shall have in place a clear and delineated governance structure that will facilitate the setting, implementation and review of its policies and procedures on valuation. This shall include the following key elements:

(a) approval by the Board for the overall valuation framework for positions of the Reporting Bank;

(b) periodic review by the Board on the valuation framework to ensure it remains appropriate, especially if any major acquisition, disposal or business changes have occurred;

(c) approval by the Board on all significant changes to a Reporting Bank's valuation policies and procedures;

(d) significant involvement by senior management of a Reporting Bank in the design and implementation of the controls and methodologies within the approved valuation framework; and

(e) proper oversight by senior management on any significant breach of valuation policies and other significant issues arising from the valuation process. All breaches of valuation policies and issues arising from the valuation process, and the actions taken, should be duly documented.

Policies, Systems and Controls

1.5 A Reporting Bank shall ensure that its senior management establishes and maintains adequate policies, systems and controls that will give the Board and the Authority the confidence that its valuation methodologies are robust and reliable. Where applicable, a Reporting Bank shall apply a measured, but not excessive, degree of prudence especially when valuing its positions using internally developed models.

1.6 A Reporting Bank shall maintain sufficient documentation on its valuation policies and procedures[560]. Such documentation shall contain the following key elements:

(a) responsibilities of the various units involved in the determination of the valuation;

(b) sources of market information and provisions for regular reviews of their appropriateness;

(c) policies for the use of unobservable inputs reflecting the Reporting Bank's assumptions of what market participants would use in pricing the position;

(d) frequency of independent valuation;

(e) timing for obtaining closing prices;

(f) procedures for adjusting valuations; and

(g) end-of-the-month and other ad-hoc verification procedures[561].

1.7 The units or departments accountable for the valuation process within a Reporting Bank shall maintain clear reporting lines which are independent of the market risk-taking function of the Reporting Bank. Such reporting lines shall ultimately be to the Board of the Reporting Bank.

1.8 A Reporting Bank shall integrate its valuation systems with other risk management systems within the Reporting Bank.

1.9 A Reporting Bank shall ensure that its IA department or external auditors conduct reviews of the independent price verification procedures and control processes on an annual basis.

560 This shall be maintained by the Reporting Bank over and above the requirements on policy statements for trading book.

561 This may include collateral reconciliations to position values, a review of similar recent transactions and early termination analysis.

Marking-to-Market

1.10 A Reporting Bank shall mark-to-market using readily available close out prices that are sourced independently. Examples of readily available close out prices include exchange prices, screen prices, or quotes from several independent reputable brokers.

1.11 A Reporting Bank shall mark-to-market on a regular and consistent basis and this shall be done at least daily. The more prudent side of bid and offer should be used unless the Reporting Bank is a significant market maker in a particular position type and has the ability to close out at mid-market. A Reporting Bank should maximise the use of relevant observable inputs and minimise the use of unobservable inputs when estimating fair value using a valuation technique. However, observable inputs or transactions may not be relevant, such as in a forced liquidation or distressed sale, or transactions may not be observable, such as when markets are inactive. In such cases, the observable data should be considered, but may not be determinative.

Marking-to-Model

1.12 Only if marking-to-market is not possible should a Reporting Bank mark-to-model, but this shall be demonstrated to be prudent and reflect the economic substance of the transactions, using market-determined inputs or parameters, wherever possible.

1.13 For the purposes of these standards, marking-to-model refers to any valuation which has to be benchmarked, extrapolated or otherwise calculated from a market input. When marking to model, a Reporting Bank shall remain cognisant of the limitations of the model, and an extra degree of conservatism is appropriate.

1.14 A Reporting Bank should meet all of the following when implementing its marked-to-model valuation framework:

(a) senior management should be aware of the elements of the trading book or of other fair-valued positions which are marked-to-model and understand the materiality of the uncertainty this creates in the reporting of the risk or performance of the business;

(b) market inputs should be sourced externally and the appropriateness of market inputs for a particular position being valued should be reviewed on a regular basis;

(c) generally accepted valuation methodologies for particular products should be used as far as possible;

(d) where the model is developed by the Reporting Bank, it should be based on reasonable and appropriate assumptions, which have been documented, assessed and challenged by suitably qualified parties independent of the development process. The model, and any significant changes made to an existing model, should be validated and approved by a unit or department independent of the front office. This includes validating the mathematics, the assumptions and the software implementation;

(e) there should be formal change control procedures in place and a secure copy of the model should be maintained and periodically used to check valuations;

(f) the Reporting Bank should be aware of the weaknesses of the models used and make appropriate valuation adjustments to cover the uncertainty of the model valuation;

(g) the model should be subject to periodic review[562] to ascertain the accuracy of its performance[563] and when there are changes in models or in the assumptions resulting from developments in market conditions; and

(h) valuation adjustments should be made as appropriate, for example, to cover the uncertainty of a model valuation (see also paragraphs 1.17 to 1.21 of this Annex).

Independent Price Verification

1.15 Independent price verification is a process by which market prices or model inputs are regularly and independently verified for accuracy. Market prices and model inputs used for marking-to-market and marking-to-model respectively shall be regularly verified for appropriateness and accuracy. Price verification should be performed by a unit independent of the market risk-taking function at least monthly (or, depending on the nature of the market or trading activity, more frequently). Independent price verification need not be performed as frequently as daily mark-to-market, since the independent marking of positions should reveal any error or bias in pricing, which should result in the elimination of inaccurate daily marks.

1.16 A Reporting Bank should consider making independent unscheduled (e.g. mid-month) price verification of its positions. This should be performed especially if the result of other procedures identifies potential or actual significant problems or inaccuracies in its valuation process and results respectively. Independent price verification entails a higher standard of accuracy in that the market prices or model inputs are used to determine profit and loss figures, whereas daily marks are used primarily for management reporting in between reporting dates. In the case where pricing sources are more subjective, e.g. only one available broker quote, prudent measures such as valuation adjustments may be appropriate.

Valuation Adjustments

1.17 As part of its procedures for marking-to-market, a Reporting Bank shall establish and maintain procedures for considering valuation adjustments.

1.18 A Reporting Bank using third-party valuations or mark-to-model valuations shall consider whether valuation adjustments are necessary.

[562] Each model's review status, date of last review and the scheduled date for a subsequent review should be duly documented.

[563] This would include the completeness of position data, the accuracy of volatility, valuation and risk factor calculations, the reasonableness of assumptions made, analysis of profit and loss versus risk factors and comparison of actual close out values to model outputs.

1.19 While the list below is not intended to be exhaustive, a Reporting Bank shall consider, where relevant, making valuation adjustments[564] for the following:

(a) unearned credit spreads;

(b) close-out costs;

(c) operational risks;

(d) early termination;

(e) investing and funding costs;

(f) future administrative costs; and

(g) model risk.

Adjustment to the current valuation of less liquid positions for regulatory capital purposes

1.19A A Reporting Bank shall establish and maintain procedures for judging the necessity of and calculating an adjustment to the current valuation of less liquid positions for regulatory capital purposes. This adjustment may be in addition to any changes to the value of the position required for financial reporting purposes and should be designed to reflect the illiquidity of the position. A Reporting Bank shall consider the need for an adjustment to a position's valuation to reflect current illiquidity whether the position is marked-to-market using market prices or observable inputs, third-party valuations or marked-to-model.

1.20 Bearing in mind that assumptions made about liquidity in the market risk capital requirements may not be consistent with the Reporting Bank's ability to sell or hedge out less liquid positions, a Reporting Bank shall make an adjustment to the current valuation of these positions, where appropriate, and review their continued appropriateness on an ongoing basis. Reduced liquidity may have arisen from market events, concentrated positions and/or stale positions. The Reporting Bank shall consider all relevant factors and, at a minimum, the following factors when determining the appropriateness of the valuation adjustment for less liquid positions:

(a) the amount of time it would take to hedge out the risks within the position;

(b) the average volatility of bid and offer spreads;

(c) the availability of independent market quotes[565];

(d) the average trading volume and volatility of trading volumes (including trading volumes during periods of market stress);

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[564] Where possible, these valuation adjustments should be made via the profit and loss account of the financial statements of the Reporting Bank. The Reporting Bank should review the continued appropriateness of the valuation adjustments on an ongoing basis.

[565] This would include taking note of the number and identity of market makers.

(e) market concentrations;

(f) the ageing of positions;

(g) the extent to which valuation relies on marking-to-model; and

(h) the impact of other model risks not included in paragraph 1.19A of this Annex.

1.20A For complex products including, but not limited to, securitisation exposures and n-th-to-default credit derivatives, a Reporting Bank shall explicitly assess the need for valuation adjustments to reflect two forms of model risk: the model risk associated with using a possibly incorrect valuation methodology and the risk associated with using unobservable (and possibly incorrect) calibration parameters in the valuation model.

1.21 In some circumstances, it is possible that the adjustments to the current valuation of less liquid positions made under paragraph 1.19A of this Annex may exceed those valuation adjustments made under financial reporting standards and paragraphs 1.17 to 1.19 of this Annex. Where this occurs, the difference shall be deducted in the calculation of CET1 Capital.

**DEFINITION OF THE GREEN, YELLOW AND RED ZONES**

| Zone | Number of exceptions | Increase in multiplication factor | Cumulative Probability |
|---|---|---|---|
| **Green Zone** | 0 | 0.00 | 8.1% |
| | 1 | 0.00 | 28.58% |
| | 2 | 0.00 | 54.32% |
| | 3 | 0.00 | 75.81% |
| | 4 | 0.00 | 89.22% |
| **Yellow Zone** | 5 | 0.40 | 95.88% |
| | 6 | 0.50 | 98.63% |
| | 7 | 0.65 | 99.60% |
| | 8 | 0.75 | 99.89% |
| | 9 | 0.85 | 99.97% |
| **Red Zone** | 10 or more | 1.00 | 99.99% |

The table defines the Green, Yellow and Red Zones used to assess backtesting results in conjunction with the IMA to calculate the market risk capital requirement of the Reporting Bank. The boundaries shown in the table are based on a sample of 250 observations. For other sample sizes, the Yellow Zone begins at the point where the cumulative probability equals or exceeds 95%, and the Red Zone begins at the point where the cumulative probability equals or exceeds 99.99%. The cumulative probability is the probability of obtaining equal or less than a given number of exceptions in a sample of 250 observations when the true coverage level is 99%. For example, the cumulative probability shown for 4 exceptions is the probability of obtaining between 0 and 4 exceptions.

**Annex 8P**

## GUIDELINES ON STRESS TESTING FOR THE CORRELATION TRADING PORTFOLIO (CTP)

### Introduction

1.1 Subject to the Authority's approval, a Reporting Bank may calculate specific risk capital charges for the CTP using a comprehensive risk modelling approach. One of these conditions is that a Reporting Bank using the comprehensive risk modelling approach must conduct, at least weekly, a set of pre-determined stress tests for the CTP encompassing shocks to default rates, recovery rates, credit spreads and correlations. This Annex provides guidance on the stress testing that the Reporting Bank should undertake to satisfy the requirement.

### Overview

1.2 The goal of the stress testing standards described below is to provide estimates of the mark-to-market changes that would be experienced by the current CTP in the event of credit-related shocks. The standards encompass both prescribed regulatory stress scenarios and high-level principles governing a bank's internal stress testing. The prescribed scenarios are not intended to capture all potential sources of stress. Rather, their primary focus is on valuation changes involving large, broad-based movements in spreads for single-name bonds and credit default swaps, which could accompany major systemic financial or macroeconomic shocks, and associated spillovers to prices for index and bespoke tranches and other complex correlation positions. In addition to the prescribed scenarios, a Reporting Bank is expected to implement a rigorous internal stress testing process to address other potential correlation trading risks, including bank-specific risks related to its underlying business model and hedging strategies.

### Prescribed stress tests

1.3 The prescribed stress scenarios below are framed in terms of risk factor movements affecting credit spreads over specific historical reference periods. The term 'risk factor' encompasses any parameter or input within the pricing model that can vary over time. Examples include, but are not limited to, single-name risk-neutral default rates or intensities, recovery rates, market-implied correlations for index tranches, parameters used to infer market-implied correlations for bespoke tranches from those for index tranches, index-single name basis risks and index-tranche basis risks.

#### Historical reference periods

1.4 The prescribed stress tests refer to specific historical reference periods. These periods correspond to historical intervals of three months or less over which spreads for single-name and tranched credit products have exhibited very large, broad based increases or decreases. As described more fully in subsequent sections of these guidelines, the historical reference period is used to calibrate the sizes of the assumed shocks to credit-related risk factors for each stress test. This approach of calibrating the sizes of shocks is intended to accommodate the wide range of pricing models observed in practice.

1.5 The specific historical reference periods are as follows:

- Periods of sharply rising credit spreads
  - (a) 4 June 2007 through 30 July 2007;
  - (b) 10 December 2007 through 10 March 2008;
  - (c) 8 September 2008 through 5 December 2008.

- Periods of sharply falling credit spreads
  - (d) 14 March 2008 through 13 June 2008;
  - (e) 12 March 2009 through 11 June 2009.

1.6 In the future, the Authority may modify the above historical reference periods, or specify additional reference periods, as it deems appropriate in light of developments in correlation trading markets. This does not preclude a Reporting Bank from including additional reference periods if it is aware of periods which exhibit very large, broad-based increases or decreases in the spreads for single-name and tranched credit products.

Historical stress tests

1.7 For each historical reference period, several stress tests are to be undertaken. Each stress scenario involves replicating historical movements in all credit-related risk factors over the reference period. In these exercises, only credit-related risk factors are shocked; for example, non-credit-related risk factors driving default-free term structures of interest rates and foreign exchange rates should be fixed at current levels.

1.8 This description presumes that a Reporting Bank's pricing model can be used to decompose historical movements in credit spreads into changes in risk factors. If the pricing model does not take this form explicitly, the Reporting Bank will need to translate the stress scenarios into equivalent risk factor representations that are compatible with the structure of its pricing model. As with all aspects of the standards set forth in these guidelines, such translations should be made in consultation with the Authority and are subject to approval.

Jumps to default

1.9 The preceding stress scenarios encompass changes in credit spreads, but do not consider defaults of individual firms. The final set of stress tests incorporates assumptions of actual defaults into the sector shock scenarios. For each historical scenario in paragraph 1.7 above, four JTD stress tests should be performed. In the first, the Reporting Bank should assume an instantaneous JTD with zero recovery of that corporate name in the current CTP having the largest JTD01 measure. In the second stress test, the Reporting Bank should assume JTDs with zero recovery of the two corporate names having the largest JTD01 measures. Similarly, in the third and fourth stress tests, the Reporting Bank should assume JTDs with zero recovery of the three and four corporate names having the largest JTD01 measures respectively.

Additional technical guidance

1.10 A given historical reference period is identified by its start date (t) and end date (t+M).

1.11 When calculating movements in risk factors over the historical reference period, the values of risk factors on dates t and t+M should be calibrated to be consistent with the Reporting Bank's current pricing model and with actual market prices on those days.

1.12 In carrying out the stress tests, a Reporting Bank's methodology should reflect the current credit quality of specific names, rather than the name's credit quality during the historical reference period. For example, if the current credit quality of a particular firm is worse than during the historical reference period, the shocks to risk factors for that firm should be consistent with those for similar quality firms over the reference period. Subject to the Authority's approval, proxies for credit quality may be based on external ratings, implied ratings from credit spreads, or possibly other methods.

1.13 The current CTP's stressed mark-to-market loss should be calculated as the difference between its current mark-to-market value and its stressed mark-to-market value.

1.14 Mark-to-market values should be based on full portfolio revaluation (e.g., no delta approximations).

1.15 Stress tests should be performed under the following assumptions:

(a) portfolio positions are held static at their current levels (e.g., no recognition of dynamic hedging within the period);

(b) all credit-related risk factors are instantaneously shocked;

(c) risk factors not directly related to credit risk (e.g. foreign exchange rates, commodity prices, risk-free term structures of interest rates, etc.) are fixed at current levels; and

(d) in general, within the prescribed stress tests, the difference between the shocked value and the current value of each risk factor should be set equal to its absolute (as opposed to relative) change between dates t and t+M. Exceptions are to be approved by the Authority.

This treatment presumes that each stress scenario generates price effects that are internally consistent (e.g. positive spreads, no arbitrage opportunities). If this is not the case, a simple rescaling of certain risk factors may address the issue (e.g. a re-parameterisation to ensure that implied correlations and risk-neutral default rates and recoveries remain bounded between zero and one).

1.16 In cases where the historical value of a risk factor at date t or t+M is not known (perhaps because the current pricing model differs from that used over the interval t to t+M), the risk factor value will need to be 'backfilled'. Subject to the Authority's approval, the backfilling method used by the bank should be consistent with the current pricing model and observed historical prices at t and t+M.

**Internal stress testing**

1.17 In addition to the prescribed stress tests mentioned above, a Reporting Bank applying the comprehensive risk measure approach is expected to implement a rigorous

internal stress testing process for the CTP. The Reporting Bank's internal stress testing for the CTP should identify stress scenarios and then assess the effects of the scenarios on the mark-to-market value of the CTP. The framework is intended to be flexible. Scenarios may be historical, hypothetical, or model-based, and may be deterministic or stochastic. Key variables specified in a scenario may include, for example, default rates, recovery rates, credit spreads and correlations, or they might focus directly on price changes for CTP positions. The Reporting Bank may apply the scenarios to the entire correlation trading portfolio, or it may identify scenarios specific to sub-portfolios of the correlation trading portfolio.

1.18 The internal stress tests should be economically meaningful, taking into account the current composition of the CTP, the Reporting Bank's business model for this desk, and the nature of its hedging activities. The form and severity of the stress scenarios should be developed with an eye toward their applicability to the unique characteristics (and vulnerabilities) of the current CTP including, but not limited to, concentration risks associated with particular geographic regions, economic sectors, and individual corporate names.

1.19 Taking into account the specific nature of the Reporting Bank's CTP, the internal stress tests should not be limited to the historical reference periods used for the prescribed stress tests described in paragraphs 1.4 and 1.5. The Reporting Bank should consider relevant historical experience over other time intervals, as well, including periods within, around, or subsequent to the historical reference periods specified above.

## PART IX: OPERATIONAL RISK

### Division 1: Overview of Operational RWA Calculation

Sound Practices of Operational Risk Management

9.1.1 A Reporting Bank should adopt the practices set out in the report "Principles for the Sound Management of Operational Risk" issued by the BCBS in June 2011.

9.1.2 A Reporting Bank should adopt an approach for calculating its operational risk capital requirement that is commensurate with the complexity and sophistication of its businesses and operations. A Reporting Bank with significant operational risk exposures should use an approach that is more sophisticated than the BIA. A Reporting Bank is also encouraged to adopt a more advanced approach as it develops more sophisticated operational risk measurement systems and practices.

Approaches for Calculating Operational RWA

9.1.3 A Reporting Bank shall use the BIA, SA(OR), ASA or AMA to calculate its operational RWA. The operational RWA of a Reporting Bank shall be the operational risk capital requirement calculated using -

(a) the BIA in accordance with Division 2 of this Part;

(b) the SA(OR) in accordance with Division 3 of this Part;

(c) the ASA in accordance with Division 4 of this Part; or

(d) the AMA in accordance with Division 5 of this Part,

multiplied by 12.5.

9.1.4 A Reporting Bank which has adopted the SA(OR), the ASA or the AMA shall not subsequently use a simpler approach without the prior approval of the Authority.

9.1.5 If the Authority is not satisfied that a Reporting Bank which has adopted the SA(OR), the ASA or the AMA complies with the requirements specified in this Part for that approach, the Authority may require the Reporting Bank to use a simpler approach for some or all of its operations. The Reporting Bank shall not return to using the more advanced approach without the prior approval of the Authority. The Authority may further require the Reporting Bank to comply with other conditions before it may return to using the more advanced approach.

**Division 2: BIA**

9.2.1 A Reporting Bank using the BIA shall calculate its operational risk capital requirement as follows:

$$K_{BIA} = [\ \sum(GI_{1\ldots n} \times \alpha)\ ]/n$$

where -

(a) $K_{BIA}$ = operational risk capital requirement under the BIA;

(b) GI = annual gross income of the Reporting Bank, where positive, over the preceding three years[601] as set out in paragraph 9.2.3;

(c) n = number of years in the preceding three years when annual gross income was positive; and

(d) $\alpha$ = 15%.

9.2.2 A Reporting Bank shall calculate its gross income[602] as the sum of its net interest income[603] and non-interest income[604], taking into account the following adjustments:

(a) gross of any allowances (including for unpaid interest);

(b) gross of operating expenses, including any fees paid for outsourced services[605],

but excluding –

(i) any realised profits or losses arising from the sale of securities in the banking book;

(ii) any income or expense item not derived from the ordinary activities of the Reporting Bank and not expected to recur frequently or regularly [607]; and

601 If the annual gross income for any given year is negative or zero, the figure shall not be included for the purpose of calculating the operational risk capital requirement.

602 Audited gross income figures shall be used where available. Where audited figures are not available, unaudited gross income figures may be used, provided that the Reporting Bank shall reconcile, on a timely basis, such unaudited gross income figures with its audited financial statements (as well as any quarterly and half-yearly financial statement which has been reviewed by external auditors, where available), and use the latest reconciled numbers for future calculations. If a Reporting Bank does not have sufficient income data to meet all or part of the three-year requirement, the Reporting Bank shall, with the approval of the Authority, use an appropriate method, which considers gross income estimates, for calculating the operational risk capital requirement.

603 Net interest income is defined as interest income less interest expense.

604 Non-interest income includes fees and commissions income after deducting fees and commissions expense.

605 In contrast to fees paid for outsourced services, any fee received by any Reporting Bank for its outsourcing services shall be included in the definition of gross income.

606 [Deleted by MAS Notice 637 (Amendment No. 3) 2017]

607 Such items may include income or expenses arising from – (a) the sale of fixed assets; (b) expropriation of assets; or (c) earthquakes or other natural disasters.

(iii) any income derived from any insurance recoveries.

An example of the calculation of gross income is set out in Annex 9A of this Part.

9.2.3 A Reporting Bank shall calculate its annual gross income for the most recent year by aggregating the gross income of the last four financial quarters. A Reporting Bank shall calculate its annual gross income for each of the two years preceding the most recent year in the same manner[608]. Table 9-1 sets out an illustration of the calculation of the annual gross income for the previous three years, for a Reporting bank calculating its operational RWA as at end Nov 2008:

Table 9-1: Illustration of Calculation of Annual Gross Income

| | **Year 3** | **Year 2** | **Year 1** |
|---|---|---|---|
| Gross Income for financial quarter ending | Sep'08 ($GI_{3a}$) | Sep'07 ($GI_{2a}$) | Sep'06 ($GI_{1a}$) |
| | Jun'08 ($GI_{3b}$) | Jun'07 ($GI_{2b}$) | Jun'06 ($GI_{1b}$) |
| | Mar'08 ($GI_{3c}$) | Mar'07 ($GI_{2c}$) | Mar'06 ($GI_{1c}$) |
| | Dec'07 ($GI_{3d}$) | Dec'06 ($GI_{2d}$) | Dec'05 ($GI_{1d}$) |
| Total | $GI_3 = GI_{3a} + GI_{3b} + GI_{3c} + GI_{3d}$ | $GI_2 = GI_{2a} + GI_{2b} + GI_{2c} + GI_{2d}$ | $GI_1 = GI_{1a} + GI_{1b} + GI_{1c} + GI_{1d}$ |

where GI = Gross Income

[608] A Reporting Bank shall consult the Authority on the appropriate method for calculating the operational risk capital requirement if – (a) it is currently undertaking an acquisition or merger; or (b) it has completed an acquisition or merger within the last three years from the date on which the Reporting Bank is required to comply with Part IX.

**Division 3: SA(OR)**

9.3.1 A Reporting Bank using the SA(OR) shall calculate its operational risk capital requirement by taking the three-year average of the simple summation of the operational risk capital requirements across the eight business lines set out in paragraph 9.3.2 in each year. The operational risk capital requirement in each year shall be calculated as follows:

$$K_{SA(OR)} = [\sum_{years\ 1\text{-}3} \max\{\Sigma (GI_{1\text{-}8} \times \beta_{1\text{-}8}),0\}] / 3$$

where -

(a) $K_{SA(OR)}$ = operational risk capital requirement under the SA(OR);

(b) $GI_{1\text{-}8}$ = annual gross income[609] in a given year calculated in accordance with paragraph 9.2.2, for each of the eight business lines set out in Table 9-2; and

(c) $\beta_{1\text{-}8}$ = fixed beta factor[610] as set out in Table 9-2.

Table 9-2: Beta Factors for the Business Lines

| Business Lines | Beta Factors |
|---|---|
| Corporate Finance ($\beta_1$) | 18% |
| Trading and Sales ($\beta_2$) | 18% |
| Payment and Settlement ($\beta_3$) | 18% |
| Agency Services ($\beta_4$) | 15% |
| Asset Management ($\beta_5$) | 12% |
| Retail Brokerage ($\beta_6$) | 12% |
| Retail Banking ($\beta_7$) | 12% |
| Commercial Banking ($\beta_8$) | 15% |

In any given year, negative operational risk capital requirements (resulting from negative gross income) in any business line may offset positive operational risk capital requirements in other business lines. Where the aggregate operational risk capital requirement across the eight business lines in a given year is negative, then the operational risk capital requirement for the Reporting Bank for that year is deemed to be zero.

9.3.2 A Reporting Bank using the SA(OR) shall classify its business activities into the eight business lines set out in Table 9-2 (referred to in this Part as "business lines") in a mutually exclusive and jointly exhaustive manner.

9.3.3 A Reporting Bank shall develop specific policies and have documented criteria for mapping its current business activities to the appropriate business lines in accordance

[609] Within each business line, gross income is a broad indicator that serves as a proxy for the scale of business operations and thus the likely scale of operational risk exposure within each of these business lines

[610] Each beta factor serves as a proxy for the industry-wide relationship between the operational risk loss experience for a given business line and the aggregate level of gross income for that business line.

with paragraph 9.3.4 and Annex 9B of this part. The Reporting Bank shall ensure that senior management is responsible for the mapping policy, which shall be subject to approval by the Board. The Reporting Bank shall ensure that written business line definitions are sufficiently clear and detailed to allow third parties to replicate the business line mapping. Any exceptions or overrides shall be documented by the Reporting Bank. The Reporting Bank shall review and adjust these policies and criteria for new or changing business activities as appropriate.

9.3.4 A Reporting Bank shall comply with the following when mapping its business activities to the appropriate business lines:

(a) subject to sub-paragraph (b) below, each activity or product shall be mapped into a business line. A Reporting Bank shall have processes in place to substantiate the mapping of any new activities or products;

(b) any activity which cannot be readily mapped into any business line and which is ancillary to and supports a business line ("ancillary activity") shall be allocated to the business line it supports. If the activity supports more than one business line, an objective criterion shall be used to allocate the annual gross income derived from that activity to the relevant business lines;

(c) any activity which cannot be readily mapped into any business line and which is not an ancillary activity shall be allocated to the business line with the highest associated beta factor (i.e. 18%). Any ancillary activity to that activity shall be treated in the same manner;

(d) once an activity has been mapped to a particular business line, the activity and any ancillary activity shall be mapped to the same business line consistently over time[611];

(e) a Reporting Bank may use an internal pricing method to allocate gross income between business lines provided that the total gross income for the Reporting Bank (calculated in accordance with paragraph 9.2.2) equals the sum of gross income for the eight business lines; and

(f) the mapping process shall be subject to regular independent reviews by the internal or external auditors of the Reporting Bank.

9.3.5 A Reporting Bank shall not use the SA(OR) to calculate its operational risk capital requirement unless[612] -

(a) the Reporting Bank has an operational risk management system that is conceptually sound and is implemented with integrity, and with clear responsibilities assigned to an operational risk management function. The Reporting Bank shall ensure that the operational risk management function -

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611 A Reporting Bank shall ensure that the mapping of activities into business lines is consistent with the definitions of business lines used for regulatory capital calculations for credit and market risk. The reasons for any deviations from this principle shall be valid, clearly articulated and documented by the Reporting Bank.

612 The Authority may impose a requirement on the Reporting Bank to monitor its implementation of the SA(OR) Approach for a specified period and for the results of the monitoring to be subject to review by the Authority before the Reporting Bank may use the SA(OR) for regulatory capital purposes.

(i) develops strategies to identify, assess, monitor, control and mitigate operational risk;

(ii) codifies bank-level policies and procedures concerning operational risk management and controls;

(iii) designs and implements the operational risk assessment methodology and operational risk-reporting system of the Reporting Bank; and

(iv) has sufficient resources for the use of the SA(OR), as well as the control and audit areas.

(b) as part of its internal operational risk assessment system, the Reporting Bank systematically tracks relevant operational risk data including material losses by business line[613];

(c) the Reporting Bank has a process for ensuring compliance with a set of internal policies, procedures and controls concerning its operational risk management system, that is well documented and implemented, including policies for the treatment of non-compliance issues and for taking appropriate action according to the information conveyed in the reports;

(d) there is regular reporting of operational risk exposures, including material operational losses, to business unit management, senior management and to its Board; and

(e) the operational risk management processes and assessment system of the Reporting Bank, including the activities of the business units and of the operational risk management function, are subject to validation and regular independent reviews by external auditors or the Authority.

9.3.6 In addition, a Reporting Bank using the SA(OR) shall ensure that its Board or senior management, or both, as the case may be, are actively involved in the oversight of the operational risk management framework.

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[613] The Reporting Bank shall ensure that its operational risk assessment system is closely integrated into its risk management processes. The Reporting Bank shall ensure that its output is an integral part of the process of monitoring and controlling the operational risk of the Reporting Bank. For example, this information shall play a prominent role in risk reporting, management reporting, and risk analysis. The Reporting Bank shall have techniques for creating incentives to improve operational risk management.

**Division 4: ASA**

9.4.1 A Reporting Bank may, with the prior approval of the Authority, use the ASA to calculate its operational risk capital requirement. A Reporting Bank shall not use the ASA to calculate its operational risk capital requirement unless it meets all requirements set out in paragraph 9.3.5 and any other criteria to be determined by the Authority, and satisfies the Authority that using the ASA provides an improved basis over the SA(OR) for assessing its operational risk (e.g. in avoiding double counting of risks). A Reporting Bank which has adopted the ASA shall not return to using the SA(OR) without the permission of the Authority.

9.4.2 A Reporting Bank using ASA shall calculate the operational risk capital requirement in the same way as under the SA(OR) as set out in paragraph 9.3.1 to 9.3.4, except for the retail banking and commercial banking business lines. The Reporting Bank shall calculate the operational risk capital requirement as follows -

$$K_{ASA} = [\sum_{years\ 1\text{-}3} \max\{\Sigma(GI_{1\text{-}6} \times \beta_{1\text{-}6}),0\}] / 3 + (\beta_7 \times m \times LA_r) + (\beta_8 \times m \times LA_c)$$

where -

(a) $K_{ASA}$ = operational risk capital requirement under the ASA;

(b) $\beta_{1\text{-}8}$ = fixed beta factor as set out in Table 9-2;

(c) $m$ = 0.035;

(d) $GI_{1\text{-}6}$ = annual gross income in a given year calculated in accordance with paragraph 9.2.2, for each of the eight business lines set out in Table 9-2, except for retail banking and commercial banking;

(e) $LA_r$ = total outstanding loans and advances of the retail banking business line[614]; and

(f) $LA_c$ = total outstanding loans and advances of the commercial banking business line[615].

9.4.3 For the purpose of determining $LA_r$ and $LA_c$, a Reporting Bank shall take a simple average of the total outstanding loans and advances of the relevant business line over the 12 most recent financial quarters without any risk-weighting and gross of any allowances.

[614] For retail banking, total loans and advances consist of the total drawn amounts in the following credit portfolios: residential mortgages, QRRE, other retail and purchased retail receivables.

[615] For commercial banking, total loans and advances consist of drawn amounts in the following credit portfolios: corporate, corporate small business, sovereign, bank, SL, HVCRE, purchased corporate receivables and purchased corporate small business receivables. The book value of securities held in the banking book shall also be included.

## Division 5: AMA

### Sub-division 1: General Requirements

9.5.1 A Reporting Bank shall comply with the requirements and should meet the guidelines in this Division and in the report "Operational Risk – Supervisory Guidelines for the Advanced Measurement Approaches" issued by the BCBS in June 2011 before applying for approval from the Authority to adopt the AMA.

9.5.2 A Reporting Bank shall perform an internal assessment against the requirements and guidelines in this Division and in the report "Operational Risk – Supervisory Guidelines for the Advanced Measurement Approaches" issued by the BCBS in June 2011 to ascertain its readiness to adopt the AMA before applying for approval from the Authority.

9.5.3 A Reporting Bank which complies with the requirements in this Division will not automatically qualify for AMA adoption. The Authority has to be satisfied that the intention of the Reporting Bank in adopting the AMA is to seek continual improvements in its risk management practices. The Reporting Bank should not regard these standards as an exhaustive checklist to be satisfied in order to adopt the AMA. As part of its approval process, the Authority will consider the willingness and ability of the Reporting Bank to maintain and improve its systems to ensure the continuing appropriateness of the operational risk capital requirements.

9.5.4 The overarching principles behind these standards are as follows:

(a) the process of the Reporting Bank for deriving operational risk estimates of the AMA elements shall generate consistent and predictive estimates of the AMA elements suitable for use under the AMA to calculate minimum operational risk capital requirements;

(b) operational risk estimates of the AMA elements shall be used pervasively in internal operational risk management and other significant business decisions relating to the operational risk of the Reporting Bank; and

(c) the Reporting Bank has set up and is able to maintain a governance framework, including the appropriate organisational structures and control mechanisms, to ensure that it is able to continue to derive consistent and predictive estimates of the AMA elements.

9.5.5 A Reporting Bank shall ensure that the AMA methodology is comprehensive and results in an operational risk capital requirement that reflects the operational risk experience of the Reporting Bank. A Reporting Bank shall ensure that the estimate is fundamentally sound and consistent with the scope of operational risk defined in this document.

9.5.6 A Reporting Bank adopting the AMA shall comply with the requirements, and should meet the guidelines, in this Division on an ongoing basis.

### Sub-division 2: Application to Adopt the AMA

9.5.7 A Reporting Bank which intends to adopt the AMA to calculate its operational risk capital requirement shall apply in writing to the Authority for approval-no less than 30

months prior to its proposed AMA adoption date or such other shorter time as may be permitted by the Authority.

9.5.8 The application under paragraph 9.5.7 shall contain the following:

(a) a written confirmation from the executive officer responsible for risk management in the Reporting Bank that -

(i) the Reporting Bank has conducted an internal assessment and has ascertained that it fulfils the requirements set out in this Division;

(ii) the use of AMA forms an integral part of the process and system of the Reporting Bank for managing operational risk;

(iii) the Reporting Bank has carefully considered the implications of the use of AMA on operational risk assessment and capital management;

(iv) the Reporting Bank has a process for continually determining the suitability of its ORM framework and its ORMS, taking into account such regulations, Notices and guidelines that the Authority may issue from time to time;

(v) the Reporting Bank has a process to calculate the operational risk capital requirement for any AMA exposure using the SA(OR) or ASA within a reasonable timeframe[616] if required by the Authority;

(vi) the Reporting Bank has policies, procedures and controls to calculate its operational risk capital requirement under the AMA accurately and that those policies, procedures and controls are subject to internal audit at least annually; and

(vii) the AMA rollout plan of the Reporting Bank is in accordance with Annex 9D. Where a Reporting Bank is unable to comply with Annex 9D, it shall demonstrate to the satisfaction of the Authority that it faces exigencies that are material and relevant;

(b) a written confirmation from the executive officer responsible for internal audit of the Reporting Bank that -

(i) he agrees with the confirmation by the executive officer responsible for risk management pursuant to sub-paragraph (a) above; and

(ii) the Reporting Bank has conducted an internal validation pursuant to this Division and has ascertained that it has the systems, processes and controls necessary for adopting AMA[617]; and

[616] In general, the Authority would expect Reporting Banks to be able to calculate the operational risk capital requirement for any AMA exposure using the SA(OR) or ASA within a 3-month period.

[617] In areas where a Reporting Bank does not fully meet the Authority's expectations, it shall conduct self-assessments to identify the key shortcomings and develop comprehensive action plans to address them before supervisory validation begins. Such action plans shall include identifying the personnel responsible for specific actions, resource needs and a schedule for completion.

(c) a report on the latest internal assessment conducted by the Reporting Bank prior to the application and any relevant supporting documentation relating to the adoption of the AMA.

**Sub-division 3: Recognised Parallel Run**

9.5.9 A Reporting Bank intending to adopt the AMA shall conduct a recognised parallel run immediately prior to its AMA adoption date for at least two years or such other shorter period as the Authority may approve.

9.5.10 The Authority will recognise a parallel run only if it is based on an operational risk measurement and management framework assessed by the Authority to be sufficiently satisfactory for the parallel run.[618] The Authority may grant approval for a Reporting Bank to commence a recognised parallel run subject to such conditions or restrictions as the Authority may impose.

9.5.11 During the recognised parallel run, the Reporting Bank shall calculate its CET1 CAR, Tier 1 CAR and Total CAR using both the AMA and the prevailing capital requirements that are applicable to the Reporting Bank under this Notice.

[MAS Notice 637 (Amendment No. 2) 2014]

9.5.12 A Reporting Bank shall submit to the Authority the CET1 CAR, Tier 1 CAR and Total CAR calculations pursuant to paragraph 9.5.11 at both the Solo and Group levels as at the end of each quarter during the recognised parallel run, no later than the 30th of the following month.

[MAS Notice 637 (Amendment No. 2) 2014]

9.5.13 If a Reporting Bank becomes aware during the recognised parallel run that the confirmations made pursuant to paragraph 9.5.8(a) and (b) above are no longer valid or that it no longer complies with any of the conditions or restrictions imposed by the Authority pursuant to paragraph 9.5.10 above, it shall -

(a) inform the Authority as soon as practicable;

(b) assess the effect of the situation in terms of the risk posed to the Reporting Bank;

(c) prepare a plan to rectify the situation and inform the Authority of its plan as soon as practicable; and

(d) undertake prompt corrective action in accordance with the plan prepared pursuant to sub-paragraph (c) above.

9.5.14 During the parallel run, the Authority will continue to evaluate the readiness of the Reporting Bank to adopt the AMA in order to reach a decision, towards the end of the parallel run, on whether to grant or withhold approval for the Reporting Bank to adopt the AMA. The Authority may withhold such approval if, during the parallel run, it becomes aware of information that materially affects its assessment of the readiness of the Reporting Bank or if any outstanding issue identified prior to the start of the parallel run has not been addressed. The Authority may also require the Reporting Bank to extend the parallel run to allow more time for the Reporting Bank to take corrective actions.

[618] Where there are outstanding issues, the Reporting Bank shall satisfy the Authority that it would be able to address them within a reasonable time so that the results of the parallel run would remain meaningful.

**Sub-division 4: Approval to Adopt the AMA**

Adoption of the AMA

9.5.15 The Authority may grant approval for a Reporting Bank to adopt the AMA, subject to such conditions or restrictions as the Authority may impose.

9.5.16 In the case where a Reporting Bank adopting the AMA is a subsidiary of a bank incorporated outside Singapore that is not significant relative to its parent's consolidated group of companies, the Reporting Bank may use an allocation mechanism for the purpose of determining its operational RWA, subject to the approval of the Authority and support of the home bank regulatory agency of the Reporting Bank. The Authority will not grant its approval unless —

(a) the Reporting Bank is able to demonstrate to the satisfaction of the Authority that the allocation mechanism is appropriate and can be supported empirically. The stage of development of risk-sensitive allocation techniques and the extent to which it reflects the level of operational risk in the related corporations of the Reporting Bank and across the banking group will be taken into account by the Authority in determining the appropriateness of the allocation mechanism[619]; and

(b) the Reporting Bank ensures that the Board and senior management of the Reporting Bank are ultimately responsible for conducting their own assessment of its operational risks and controls and ensuring that the Reporting Bank is adequately capitalised in respect of those risks.

9.5.17 A Reporting Bank may, with the prior approval of the Authority, incorporate an estimate of diversification benefits[620], referred to in paragraph 9.5.100.

[MAS Notice 637 (Amendment No. 2) 2014]

9.5.18 The focus of the operational risk capital requirements is to ensure that a Reporting Bank has adequate capital to meet losses resulting from operational risk. A Reporting Bank shall put in place a comprehensive framework for this purpose, taking into account the scale and complexity of its activities and the adoption of best practices for its management of operational risk[621].

9.5.19 If a Reporting Bank becomes aware after adopting the AMA that any of the confirmations made pursuant to paragraph 9.5.8(a) and 9.5.8(b) are no longer valid or that it no longer complies with any of the conditions or restrictions imposed by the Authority pursuant to paragraph 9.5.15, the Reporting Bank shall -

(a) inform the Authority as soon as practicable;

(b) assess the effect of the situation in terms of the risk posed to the Reporting Bank;

[619] A Reporting Bank should continue efforts to develop increasingly risk-sensitive operational risk allocation techniques.

[620] A Reporting Bank that is a subsidiary of a bank outside Singapore and not using an allocation mechanism for the purpose of determining its operational RWA, shall not incorporate group-wide diversification benefits in its AMA (e.g. the banking subsidiary may incorporate the diversification benefits of its own operations but not that of its parent).

[621] A Reporting Bank shall adopt the practices set out in the report "Principles for the Sound Management of Operational Risk" issued by the BCBS in June 2011.

(c) prepare a plan to rectify the situation and inform the Authority of its plan as soon as practicable; and

(d) undertake prompt corrective action within a reasonable time in accordance with the plan prepared pursuant to sub-paragraph (c) above.

9.5.20 The Authority may suspend or revoke its approval for a Reporting Bank to adopt the AMA, subject the Reporting Bank to higher bank-specific capital requirements pursuant to section 10(3) of the Banking Act, or take any other actions if -

(a) the Reporting Bank has not fulfilled any of the conditions or restrictions imposed by the Authority pursuant to paragraph 9.5.15;

(b) the Reporting Bank fails to comply with paragraph 9.5.19;

(c) the Authority subsequently becomes aware that the Reporting Bank has furnished information that is false or misleading in a material manner to the Authority in connection with its application for approval to adopt AMA;

(d) where applicable, the Reporting Bank has not executed its AMA rollout in accordance with the rollout parameters in Annex 9D; or

(e) the Authority is not satisfied that the risk management process and system of the Reporting Bank is adequate to support the AMA.

9.5.21 A Reporting Bank shall inform the Authority no less than 3 months prior to the expected date of implementation of any significant change to its ORM framework (including its ORMS) subsequent to the commencement of a recognised parallel run or the Authority granting approval for the Reporting Bank to adopt the AMA, unless the Authority has directed that the Reporting Bank seeks prior approval for any such change.

**Sub-division 5: Systems and Processes**

9.5.22 The Reporting Bank should ensure that the AMA evolves as the Reporting Bank gains experience with operational risk management and measurement techniques and solutions. The Reporting Bank shall ensure that the AMA supports and enhances the management and control of operational risk within the Reporting Bank.

9.5.23 A Reporting Bank should develop a more sophisticated ORMS over time to better manage and measure operational risk.

9.5.24 A Reporting Bank seeking AMA approval from the Authority shall demonstrate to the satisfaction of the Authority the processes it has undertaken to establish an ORM framework and to ensure the ORM framework is continually relevant to the operations of the Reporting Bank.

**Sub-division 6: Independent Regular Review of the ORM Framework**

9.5.25 A Reporting Bank shall ensure that its ORM framework, including its approach to the ORMS, is subject to effective and comprehensive on-going review by functionally independent, appropriately trained and competent personnel. A Reporting Bank shall ensure that its IA, or any independent person engaged by the IA (for example, external auditors), facilitates this review.

9.5.26 Independence, in the context of paragraph 9.5.25, does not mean that the person conducting the review has to be external to the Reporting Bank. However, the Reporting Bank shall ensure that the person is not involved in the development, implementation, on-going maintenance or use of the ORM framework.

9.5.27 The Reporting Bank shall develop and adhere to procedures for reviewing the ORM framework that covers all significant activities (including any outsourced activity) that would expose the Reporting Bank to material operational risk. A Reporting Bank shall ensure that the procedures are regularly updated and include the following areas:

(a) assessing the overall adequacy and effectiveness of the ORM framework, including the activities of the business lines and of the ORMF;

(b) ensuring consistency of the AMA methodology across the business lines of the Reporting Bank;

(c) complying with the standards relating to the ORM framework and the policies and procedures of the Reporting Bank, as well as adhering to the overarching principles set out in paragraph 9.5.4;

(d) developing internal processes for identifying, assessing, monitoring, controlling and mitigating operational risk;

(e) defining the scope of operational risks captured by the ORMS and assessing whether the ORMS captures all material activities and exposures from all appropriate sub-systems and geographic locations;

(f) assessing the reasonableness of any assumptions made in the ORMS;

(g) integrating the ORMS into the day-to-day risk management processes. The Reporting Bank shall ensure that the ORMS is an integral part of the process of monitoring and controlling the bank’s operational risk profile and the information plays a prominent role in risk reporting, management reporting, internal capital allocation and risk analysis. The Reporting Bank shall have techniques for allocating operational risk capital to major business lines and for creating incentives to improve the management of operational risk throughout the firm;

(h) ensuring the integrity of the ORMS, including the appropriateness, accuracy and adequacy of technical documentation supporting the ORMS and management reports;

(i) implementing new products, processes and systems which expose the Reporting Bank to material operational risk;

(k) dealing with issues such as the adequacy of the IT infrastructure, data collections, data input processes and data maintenance; and

(l) conducting specific examinations in order to assess the degree of independence of the ORMF.

**Sub-division 7: Internal Validation**

9.5.28 Internal validation encompasses a range of processes and activities that contribute to the internal assessment of a Reporting Bank of whether it is capable of

deriving consistent and predictive estimates of AMA parameters. A Reporting Bank has primary responsibility for internal validation and shall demonstrate to the satisfaction of the Authority that its internal validation is robust and likely to remain so. A Reporting Bank shall perform an internal validation of the ORMS at least annually.

9.5.29 The Reporting Bank shall be able to ensure the validity of the ORMS, and its underlying assumptions at the development stage and following significant changes in methodology and assumptions, and it shall be able to ensure the validity of the inputs and outputs on an ongoing basis. The Reporting Bank shall ensure that the internal validation processes are operating in a satisfactory manner. The Reporting Bank shall also ensure that data flows and processes associated with the ORMS are transparent and accessible, and that auditors and the Authority are in a position to have access to the ORMS' specifications and parameters.

9.5.30 A Reporting Bank may use independent internal units (e.g. ORMF and quality assurance) or external parties to perform internal validation, as long as it retains ultimate responsibility. The Reporting Bank shall ensure that the internal validation function, whether internally or externally performed, is staffed by qualified persons.

9.5.31 A Reporting Bank shall establish a clear methodology for internal validation. The Reporting Bank shall ensure that this methodology is appropriate for the Reporting Bank and its ORM framework. The Reporting Bank shall be able to explain and justify its methodology.

9.5.32 A Reporting Bank shall periodically analyse its internal validation methodology to ensure that it remains appropriate. In particular, a Reporting Bank shall revalidate certain parts of the ORM framework at least annually and whenever there is a significant change in the operational risk profile of the Reporting Bank and in the ORMS methodology or assumptions.

9.5.33 The Reporting Bank shall ensure that the internal validation is clearly documented, and that this documentation provides a detailed outline of the internal validation methodology (including its frequency) and outlines any identified weaknesses.

9.5.34 The Reporting Bank shall ensure that the internal validation techniques take into account the changing market and operating conditions.

9.5.35 The Reporting Bank shall ensure that the internal validation encompasses both quantitative and qualitative estimates of the AMA elements and cover key operational risk processes and systems.

9.5.36 The Reporting Bank shall ensure that the internal validation processes and outcomes are subject to independent review.

9.5.37 The Reporting Bank shall ensure that the internal validation of the ORMS by the Reporting Bank, at the minimum, comprises the following elements:

(a) regular comparison of realised outcomes with estimates of the AMA elements, using historical data over as long a period as possible;

(b) use of appropriate validation methodology and tools, quantitative or otherwise, and comparison with relevant (i.e. in terms of appropriateness, timeliness and time period) external data sources where applicable;

(c) well-articulated internal validation standards for the input of data into the ORMS to ensure the accuracy, completeness and relevance of the

estimates of the AMA elements, data feeds and processes associated with the ORMS, and to distinguish situations where deviations in realised outcomes from estimates of the AMA elements become significant enough to call into question the predictiveness of the estimates of the AMA elements;

(d) monitoring the performance and stability of the ORMS and reviewing the inherent statistical relationships and assumptions of the ORMS;

(e) ORMS validation shall ensure that the relationship between the inputs and outputs of the ORMS are stable and logical, and that the techniques underlying the ORMS are transparent and intuitive;

(f) validation of material data above the thresholds to ensure that they are comprehensive, appropriate and accurate. Validation shall cover all data types including actual data, constructed data, figures generated by scenario analysis and BE&IC. Particularly for constructed data, the validation shall ensure that the assumptions are unbiased and the results are realistic; and

(g) internal validation shall include testing and verifying adjustments to operational risk capital requirement estimates, including operational risk exposure as well as assumptions underlying operational risk exposure, AMA models and operational risk capital requirement.

**Sub-division 8: Independent Review and Oversight of Internal Validation**

9.5.38 The Reporting Bank shall ensure that the IA reporting to the Audit Committee reviews the internal validation processes of the ORM framework and is responsible for ensuring that validation processes are implemented as designed and are effective. In performing this role, the IA of a Reporting Bank may seek the assistance of other internal or third-party specialists, so long as overall responsibility remains with IA.

9.5.39 In the event where IA has sought assistance from internal or external specialists in the review process, the Reporting Bank shall ensure that the specialists involved in performing substantive assessment of internal validation are not involved in or responsible for -

(a) the design, selection or implementation of the ORMS;

(b) the process for deriving and using estimates of the AMA elements; and

(c) the origination of risk exposures.

9.5.40 The Reporting Bank shall ensure that the IA –

(a) conducts reviews of the internal validation of the ORM framework of the Reporting Bank at least annually. The review shall at least cover aspects of the internal validation related to the operations and processes of the ORMF;

(b) conducts checks to attest to the depth, scope and quality of the work of ORMF to ensure that its findings are well founded. In particular, the checks shall cover the process of the Reporting Bank for estimating,

documenting and justifying the estimates of the AMA elements used to calculate minimum operational risk capital requirements under the AMA, given that it is an important area which affects regulatory capital requirements.

(c) ensures that the person or group of persons involved in internal validation of the ORM framework is independent from those involved in developing that framework and is able to provide objective and effective challenge.

9.5.41 The Reporting Bank shall ensure that the IA -

(a) documents the scope of its review, its assessment of the ORM framework of the Reporting Bank and the findings and recommendations in respect of its oversight of internal validation;

(b) proactively discusses its findings and recommendations in respect of its oversight of internal validation with senior management of the Reporting Bank;

(c) reports important findings to the Audit Committee on a timely basis; and

(d) monitors the implementation of the recommendations accepted by the Audit Committee and report incidences of non-implementation to the Audit Committee.

9.5.42 The Reporting Bank shall ensure that –

(a) the Audit Committee of a Reporting Bank ensures that the IA is adequately qualified and trained to assume oversight responsibilities of the internal validation process. It is important that the IA is familiar with the strategy and processes of the Reporting Bank for identifying, assessing, monitoring, controlling, and mitigating operational risk; and

(b) no person responsible for some or all aspects of the ORM framework within the Reporting Bank is to participate in the oversight of internal validation relating to these aspects.

**Sub-division 9: Qualitative Standards for the ORM Framework**

9.5.43 A Reporting Bank shall have an ORM framework that combines the management and measurement of operational risk within the Reporting Bank.

9.5.44 The Reporting Bank shall ensure that its ORM framework -

(a) establishes a process to identify the nature and types of operational risk and their causes and measure their resulting effects on the Reporting Bank;

(b) identifies the appetite for operational risk of the Reporting Bank and specified levels of acceptable risk;

(c) provides the overall operational risk strategies;

(d) sets out the responsibilities of the Board, senior management, business unit management and persons that have responsibility for managing operational risk;

(e) includes operational risk management policies and procedures that clearly describe the major elements and activities of the ORM framework;

(f) ensures that effective operational risk management and measurement processes are adopted;

(g) ensures that proper organisational structure of control and reporting functions is in place;

(h) includes independent review and internal validation processes and procedures, as well as independent oversight of the internal validation function; and

(i) includes review and approval processes for significant policy and procedural changes and exceptions.

9.5.45 The Reporting Bank shall ensure that there is proper operational risk identification and measurement so that the Board, senior management and the management of business units ("business unit management") are fully aware of the sources of emerging operational risk loss events.

9.5.46 The Reporting Bank shall ensure that all material aspects of the ORM framework, including the ORMS, are reviewed and approved by the Board.

**Sub-division 10: Oversight of the ORM Framework**

Board oversight

9.5.47 The Reporting Bank shall ensure that the Board –

(a) has ultimate responsibility for the overall operational risk profile and ORM framework of a Reporting Bank;

(b) has ultimate responsibility for the continuing appropriateness of the ORMS of the Reporting Bank, the process for deriving estimates of the AMA elements, the use of the ORMS and the estimates of the AMA elements. This includes responsibility for the adequacy of control processes in respect of these areas. Accordingly, a Reporting Bank should equip the Board with a general understanding of the objectives and basis of the ORMS of the Reporting Bank, and the process for deriving and using estimates of the AMA elements. A Reporting Bank shall provide adequate information to the Board to enable it to perform its roles effectively;

(c) is responsible for reviewing and approving all important aspects of the ORMS of a Reporting Bank, the process for deriving estimates of the AMA elements, the use of the ORMS and the estimates of the AMA elements;

(d) establishes the appetite for operational risk for the Reporting Bank and is responsible for the implementation of sound fundamental risk

governance principles that facilitate the identification, assessment, monitoring, controlling and mitigation of operational risk; and

(e) is informed of significant changes to and controls in respect of the ORM framework. The Reporting Bank shall ensure that the Board is also informed of significant deviations from established policies and procedures, weaknesses in the design and operation of the ORMS of the Reporting Bank, the process for deriving estimates of the AMA elements, the use of the ORMS and the estimates of the AMA elements.

9.5.48 The Reporting Bank shall ensure that its Board is responsible for establishing comprehensive and adequate written policies and procedures relating to the oversight and control of the ORM framework of the Reporting Bank, the design and operation of its ORMS, the process for deriving estimates of the AMA elements, the use of the ORMS and estimates of the AMA elements. At a minimum, these policies and procedures shall include -

(a) the roles and responsibilities of the Board, senior management, business unit management and other personnel involved in the design and approval of the ORM framework of the Reporting Bank, ORMS and the process for deriving and using estimates of the AMA elements;

(b) the internal control processes and independent oversight of the design and operation of the ORM framework of the Reporting Bank, the ORMS, the process for deriving estimates of the AMA elements, the use of the ORMS and estimates of the AMA elements;

(c) the matters which the Reporting Bank considers material and the authority and approval levels for these matters; and

(d) the frequency and level of detail of reporting to the Board and senior management on the ORM framework of the Reporting Bank, the ORMS and the estimates of the AMA elements used by the Reporting Bank to calculate minimum operational risk capital requirements under the AMA.

9.5.49 The Board shall ensure that the ORMS of a Reporting Bank is closely integrated into the day-to-day risk management processes.

9.5.50 A Reporting Bank shall ensure that the Board understands significant risks and strategic implications and how operational risk affects a Reporting Bank.

[MAS Notice 637 (Amendment No. 2) 2014]

9.5.51 The Reporting Bank shall ensure that the Board and senior management assign responsibilities and reporting relationships to encourage and maintain accountability and ensure the availability of necessary resources to manage operational risk. This includes evaluating and ensuring that the staff responsible for any aspect of the ORM framework, the ORMS, operational risk control and internal validation, are adequately qualified and trained to undertake their respective roles.

9.5.52 The Reporting Bank shall ensure that the Board reviews the scope and frequency of the independent review program to ensure its continued effectiveness.

<u>Senior management oversight</u>[622]

[622] The Authority expects the involvement of senior management in respect of these areas, as set out in paragraphs 9.5.58 to 9.5.66, to exceed the level of involvement by the Board.

9.5.53 The Reporting Bank shall ensure that senior management –

(a) exercises active oversight over the ORM framework and translates the ORM framework into specific policies and procedures that can be implemented and verified within the business lines, products and activities of a Reporting Bank;

(b) meets regularly with staff in the ORMF to discuss the performance of the ORM framework, areas needing improvement and the status of efforts to improve previously identified deficiencies;

(c) informs the Board of issues and changes or deviations from established policies that will significantly impact the operations of the ORM framework, including the operational risk profile and capital allocated to operational risk on a regular and timely basis;

(d) ensures the continuing appropriateness and effectiveness of the ORM framework, the ORMS, the process for deriving estimates of the AMA elements, the use of the ORMS and the estimates of the AMA elements. The Reporting Bank shall ensure that senior management articulates its expectations and provide guidance for the technical and operational aspects in respect of these areas; and

(e) has a good understanding of the design and operation of the ORMS, the process for deriving estimates of the AMA elements, the use of the ORMS and the estimates of the AMA elements. The Reporting Bank shall ensure that senior management also has a good understanding of the operational risk policies and procedures of the Reporting Bank. The Reporting Bank shall ensure that senior management approves the areas, as set out in this paragraph, and differences between documented procedures and actual practices.

9.5.54 The Reporting Bank shall ensure that senior management ensures, on an ongoing basis, that the ORMS and the process for deriving and using estimates of the AMA elements -

(a) provide for a meaningful assessment of the operational risk exposures of the Reporting Bank and generate consistent and predictive estimates of the AMA elements suitable for use to calculate minimum operational risk capital requirements; and

(b) are consistent with all applicable rules and regulations as well as established internal policies and procedures.

9.5.55 The Reporting Bank shall ensure that senior management –

(a) assesses the operational risk inherent in new areas (e.g. products, activities, processes and systems) before they are introduced, and identify risks tied to new or existing product development and significant changes in order to ensure that the risk profiles of product lines are updated regularly;

(b) is responsible for effective communication of the operational risk management approach of the Reporting Bank to staff. When all staff are aware of relevant policies and procedures and understand their responsibilities with respect to operational risk management, this will ensure consistent treatment of operational risk across the Reporting

Bank. The Reporting Bank shall also ensure that senior management is responsible for the communication of operational risk issues to appropriate staff responsible for managing credit, market and other risks, as well as those responsible for purchasing insurance and managing third-party outsourcing arrangements; and

(c) is responsible for closely integrating the ORMS of the Reporting Bank and practices into the day-to-day risk management processes and operations of the Reporting Bank through steps taken by staff at all levels.

Business unit management oversight

9.5.56 The Reporting Bank shall ensure that the business unit management is responsible for the day-to-day management of operational risk within each business line and for the appropriateness and effectiveness of operational risk policies and procedures and controls within their area of operation.

9.5.57 The Reporting Bank shall ensure that the business unit management ensures consistency of internal controls and practices within their business lines with bank-wide policies and procedures to support the management and measurement of the operational risk of the Reporting Bank.

9.5.58 The Reporting Bank should ensure that the business unit management implements the ORM framework within each business line to reflect the scope of that business and its inherent operational complexity and operational risk profile.

**Sub-division 11: Independent ORMF**

9.5.59 The Reporting Bank shall have an ORMF that is responsible for the design, selection, monitoring and ongoing development of the ORM framework of the Reporting Bank, including the operational risk management and measurement processes and ORMS. A Reporting Bank shall ensure that the ORMF is also responsible for ensuring consistency of implementation of the ORM framework across all business lines.

9.5.60 A Reporting Bank shall ensure that the ORMF has reporting lines and responsibilities that are structurally and functionally independent from the personnel and management functions responsible for originating exposures and of the activities that contribute to the operational risk profile. All roles and responsibilities of people and functions involved in operational risk management shall be clearly defined and documented.

9.5.61 A Reporting Bank shall ensure that the ORMF codifies, establishes and ensures the consistent application of appropriate bank-wide policies and procedures concerning operational risk management, for all material business activities, processes and systems.

9.5.62 A Reporting Bank shall ensure that the ORMF is responsible for the design and implementation of the operational risk measurement methodology of a Reporting Bank, risk monitoring and reporting system as well as the development of strategies to identify, assess, monitor, control and mitigate operational risk.

9.5.63 A Reporting Bank should ensure that the ORMF assesses industry best practices with a view to improving the activities, processes and systems of a Reporting Bank.

9.5.64 A Reporting Bank shall ensure that the ORMF has oversight and supervision responsibilities for any systems used in the AMA, and has ultimate responsibility for the

ongoing assessment of the performance of and alterations to the ORMS. A Reporting Bank shall ensure that the ORMF reviews and documents any changes to the operational risk policies and procedures and the ORMS, including the reasons for the changes.

9.5.65 A Reporting Bank shall ensure that the ORMF is responsible for the process related to the definition, documentation, collection and application of the estimates of the AMA elements needed to calculate the operational risk exposure of a Reporting Bank. A Reporting Bank shall ensure that the ORMF ensures the reliability and consistency of the estimates of the AMA elements, including implementing procedures to verify that definitions are consistently applied across business lines and geographic areas. In this regard, the Reporting Bank shall implement internal standards for the estimates of the AMA elements and associated remedial actions to be taken when such standards are not met.

9.5.66 A Reporting Bank shall ensure that the ORMF periodically reviews and considers the effects of loss experience, external market changes, other environmental factors, and the potential for new or changing operational risks associated with new products, activities or systems on the ORM framework.

9.5.67 A Reporting Bank shall ensure that the ORMF produces, reviews and analyses operational risk data and reports.

9.5.68 A Reporting Bank shall ensure that the ORMF is responsible for verifying the fulfillment of the AMA qualifying criteria, and, in particular, ensuring the ORMS is closely integrated into the day-to-day risk management processes and operations.

9.5.69 Where a Reporting Bank has a central operational risk unit and some of the staff managing the operational risk of the Reporting Bank are located in other business units, business lines, geographical groups or legal entities, the Reporting Bank shall ensure that the staff follow the guidelines set by the central operational risk unit. A Reporting Bank shall ensure that there are clear responsibilities and reporting lines for the staff.

9.5.70 The Reporting Bank shall ensure that the person responsible for internal validation of the ORM framework is not the person responsible for the design or implementation. Where any person or group of persons of the ORMF is involved in the validation work relating to the ORM framework designed or implemented by another person or group of persons of the same unit, the Reporting Bank shall ensure that there is no conflict of interest, and that the person or group of persons involved in the validation work can provide objective and effective challenge to the person or group of persons responsible for the design or implementation of the ORM framework.

9.5.71 A Reporting Bank shall ensure that the ORMF is responsible for ensuring appropriate regular reporting of relevant bank-wide operational risk information to the Board and senior management.

9.5.72 The Reporting Bank shall ensure that the evaluation of the performance and remuneration of the ORMF take into consideration how well operational risks are managed (e.g. reliability, consistency and predictiveness of estimates of the AMA elements and other risk estimates).

**Sub-division 12: Sufficient Resources in the Use of the AMA**

9.5.73 To effectively manage and measure operational risk throughout a Reporting Bank, a Reporting Bank shall have sufficient resources in the use of the AMA in the business lines, ORMF, internal validation functions as well as audit areas, so as to sufficiently monitor and enforce compliance with the operational risk policies and procedures.

9.5.74 A Reporting Bank shall ensure that there are appropriate, adequate and qualified staff with the necessary experience and technical capabilities and adequate technical resources allocated to support the ORM framework.

**Sub-division 13: ORMS**

9.5.75 A Reporting Bank shall ensure that the ORMS of a Reporting Bank is conceptually sound and implemented with integrity. A Reporting Bank shall ensure that the ORMS is also sufficiently robust to facilitate quantitative estimates of the operational risk capital requirement of the Reporting Bank. The Reporting Bank shall ensure that the ORMS adopted is implemented consistently across the Reporting Bank and the ORMS should have a reasonable track record in measuring operational risk.

9.5.76 A Reporting Bank shall ensure that the ORMS is closely integrated into the day-to-day risk management processes of the Reporting Bank. A Reporting Bank shall ensure that the output of the ORMS is an integral part of the process of identifying, assessing, monitoring, controlling and mitigating the operational risk of the Reporting Bank. For example, this output shall play a prominent role in risk analysis, risk reporting, management reporting, as well as in decision-making, corporate governance and internal capital allocation. A Reporting Bank shall ensure that each business line is able to clearly articulate the drivers of its operational risk and demonstrate how the individual parts of the ORMS are used to supplement its day-to-day decision-making activities.

9.5.77 A Reporting Bank shall demonstrate, through its internal risk management and decision-making processes that the estimates of the AMA elements produced from internal models do not result in an understatement of risk elements.

9.5.78 A Reporting Bank shall have techniques for allocating operational risk capital to business lines and for creating incentives to improve the management of operational risk, processes and practices throughout the Reporting Bank. The Reporting Bank should be able to demonstrate that the allocation will enhance transparency, risk awareness and operational risk management expertise in the Reporting Bank.

**Sub-division 14: Regular Reporting to the Board, Senior Management and Business Unit Management**

9.5.79 A Reporting Bank shall ensure that there is regular and comprehensive reporting of its operational risk profile, risk exposures and loss experience to the Board, senior management and business unit management, to enable them to understand, assess, monitor and control operational risk and losses, systemic lines of business risk issues and other corporate risk issues. These reports would also serve as a basis for related mitigation strategies and could create incentives to improve operational risk management throughout the Reporting Bank.

9.5.80 The Reporting Bank should ensure that the content, depth, frequency and format of reporting depend on the recipient and how the information will be used. It should also be consistent with the level of risk and commensurate with the nature, size, risk profile and degree of complexity of the business operations of the Reporting Bank.

9.5.81 The Reporting Bank shall ensure that regular reports to the Board, senior management and business unit management include the following:

(a) the operational risk profile and type of exposures of the Reporting Bank giving rise to operational risk (e.g. description of key operational risk events and drivers);

(b) estimates of regulatory and economic capital and changes in regulatory capital requirements and economic capital over time;

(c) information on, including changes to, the inputs (e.g. estimates of the AMA elements) and outputs of the ORMS and the approach of the Reporting Bank to managing and measuring operational risk;

(d) appropriate indicators that provide early warnings of potential operational risk-related losses or increased risk of future losses and management assessment of these factors;

(e) risk reduction and risk transfer strategies (e.g. the effect of any expected loss deductions, cost benefit analysis of the mitigation and corrective actions on the business line (as listed in Annex 9B) or exposures to loss event types (as listed in Annex 9C) and losses);

(f) reports from IA and ORMF on material issues with respect to the ORM framework of the Reporting Bank; and

(g) results of internal validation.

9.5.82 A Reporting Bank shall have a process in place for taking appropriate action according to the information within management reports. This shall include escalation procedures for key operational risk issues to facilitate the taking of appropriate action between formal reporting cycles.

9.5.83 A Reporting Bank shall document the outcomes of independent reviews, exception reporting including identified problem areas and timely corrective action on outstanding issues.

**Sub-division 15: A Comprehensive and Well-documented ORM Framework**

9.5.84 A Reporting Bank shall have a process for ensuring compliance with its ORM framework in the form of a documented set of policies and procedures in place to identify, assess, monitor, control and mitigate operational risk.

9.5.85 A Reporting Bank should consider and review the adequacy and completeness of its documentation for managing its operational risk, including how documentation is developed, maintained, and distributed (referred to as "documentation" in this Part). As part of the design and implementation of the ORM framework, the importance of documentation should be emphasised. The Authority would expect to see evidence of this as part of the AMA application and ongoing supervision of the Reporting Bank.

9.5.86 The Reporting Bank should ensure that the level of documentation is commensurate with the needs and culture of the Reporting Bank and is appropriate to the operational risk it takes and its operational risk management and measurement process. The Reporting Bank should ensure that the documentation explains the approach that has been adopted and the rationale for that approach.

9.5.87 The Reporting Bank shall ensure that the documentation is timely and up to date.

9.5.88 The Reporting Bank shall ensure that the documentation includes the following broad areas:

(a) internal governance – clearly documented reporting lines;

(b) internal control – decision-making processes should be clear and transparent; and

(c) compliance – clear records to ensure compliance with all relevant requirements.

9.5.89 A Reporting Bank shall ensure that documentation on the ORM framework includes the following:

(a) a definition of operational risk that is consistent with the definition set out in this Division, and loss event types that will be monitored;

(b) roles and responsibilities of the Board, senior management, business unit management and ORMF, including documented levels of approval and authorisation to ensure accountability to an appropriate level of management;

(c) outline of the operational risk reporting framework, the type of information to be included, treatment and resolution of non-compliance issues;

(d) situations where exceptions and overrides can be used and the approving authorities for such exceptions and overrides; and

(e) internal validation and oversight of internal validation processes and procedures.

<u>Documentation on all material aspects of its ORMS</u>

9.5.90 The Reporting Bank shall ensure that the documentation on the ORMS is comprehensive and provide a level of detail sufficient to ensure that the approach of a Reporting Bank to determine its ORMS is transparent and capable of independent review and validation.

9.5.91 A Reporting Bank shall ensure that documentation on the ORMS includes the following:

(a) rationale for the development, operation and assumptions underpinning its framework, including the choice of inputs, distributional assumptions, and the weighting across qualitative and quantitative elements;

(b) overview of the analytical approach (e.g. description of the model or statistical technique used, ORMS inputs and outputs, how different inputs are combined and weighted, and steps taken to ensure the integrity of the data used in the estimation process);

(c) the assumptions and specifications underpinning the ORMS and their rationale and limitations;

(d) details and rationale for establishing thresholds and their use;

(e) the analytics and relevant theory behind all calculations;

(f) details of the parameters and assumptions of the ORMS including the justification for their use and the process undertaken for checking and validating those assumptions;

(g) justification for the weighting of estimates of the AMA elements and in instances where an estimate has been given a zero weight, details of how this decision will be kept under review;

(h) comparison between the operational risk exposure estimate and actual loss experience over time, to assess the framework's performance and the reasonableness of its outputs;

(i) an explanation of how the Reporting Bank ensures that the ORMS achieves the soundness standard (as set out in paragraph 9.5.103);

(j) details of any explicit and implicit dependence structures utilised in the ORMS, including evidence supporting their use;

(k) details of the proposed methodology for measuring and accounting for expected loss; and

(l) details of the methodology relating to the use of insurance for risk mitigation, including how the level of insurance mitigation is derived and the types of insurance contracts utilised.

**Sub-division 16: General Quantitative Standards**

9.5.92 Given the continuing evolution of approaches for operational risk, the Authority is not specifying the approach, methodology, measurement technique or distributional assumptions used to generate the operational risk measure for the purposes of determining the operational risk capital requirement of a Reporting Bank. However, the Reporting Bank shall have a comprehensive AMA and be able to demonstrate that it captures potentially severe 'tail' loss events. The Reporting Bank shall demonstrate to the satisfaction of the Authority that its operational risk measure meets a soundness standard comparable to a one-year holding period and a $99.9^{th}$ percentile, one-tailed confidence interval.

9.5.93 The Authority recognises that the AMA soundness standard provides significant flexibility to a Reporting Bank in the development of the methodology. This flexibility is intended to encourage the Reporting Bank to implement a methodology which -

(a) best suits the nature, size and complexity of the activities, operations, business environment, and internal controls of the Reporting Bank;

(b) has regard to its historical and the industry's experience in respect of operational risk losses and the assessment of its planned future operational risk profile; and

(c) allows for future evolution and innovation where industry practices evolve and improve over time.

9.5.94 A Reporting Bank shall have, and maintain, rigorous procedures for the development, implementation, review and validation of the ORM framework. A Reporting Bank shall ensure that the ORMS -

(a) is comprehensive, consistently implemented and transparent;

(b) is independently reviewed and validated; and

(c) captures all material sources of operational risk across the Reporting Bank, including events that can lead to rare and severe operational risk losses.

9.5.95 There may be subjectivity and uncertainty in the ORM framework because of the evolving nature of operational risk management and measurement practices. Therefore, the Reporting Bank shall build in a degree of conservatism into its approach to reflect the evolutionary status of ORMS and its impact on data capture and modeling.

9.5.96 A Reporting Bank shall ensure that its ORMS is consistent with the scope of operational risk defined by the Authority in the Glossary and the loss event types listed in Annex 9C.

9.5.97 A Reporting Bank shall calculate its operational risk capital requirement as the sum of expected loss ("EL") and unexpected loss ("UL").

9.5.98 To base the minimum operational risk capital requirement on UL alone, a Reporting Bank shall demonstrate, consistent with the standards set out in this Part and to the satisfaction of the Authority, that it has appropriately measured and accounted for its EL and is adequately capturing EL in its internal business practices by way of EL offsets[623].

9.5.99 A Reporting Bank shall ensure that its ORMS and AMA model are sufficiently 'granular' to capture the major drivers of operational risk affecting the shape of the tail of the loss estimates.

9.5.100 A Reporting Bank shall add the operational risk measures for different operational risk estimates of the AMA elements for purposes of calculating the minimum operational risk capital requirement. Where the AMA model assumes a dependence structure across operational risk measures, by way of internally determined correlation[624] estimates across operational risk losses or business lines, the Reporting Bank may be permitted to incorporate those estimates into its aggregation of individual operational risk measures, provided it can demonstrate to the satisfaction of the Authority that its systems for determining correlations are sound, implemented with integrity, and take into account the uncertainty surrounding any such correlation estimates, particularly in periods of stress.

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[623] The Reporting Bank should refer to the principles issued in the Operational Risk Subgroup of the Basel Committee's Accord Implementation Group (AIGOR) Accord newsletter dated 7 Nov 2005 in evaluating the eligibility of EL offsets to the operational risk regulatory requirement.

[624] "Correlation" refers to the relationships between actual or constructed data belonging to different operational risk classes. It may arise because of the presence of common factors that can influence the observed frequency or severity of losses in more than one operational risk class. The term correlation should be used broadly to mean any form of dependence across two or more operational risk classes, caused by internal or external factors, or both.

9.5.101 A Reporting Bank shall document how its chosen AMA model accounts for dependence or correlation across operational risk losses or business lines. The Reporting Bank shall demonstrate to the satisfaction of the Authority that its dependence or correlation assumptions are appropriate. A Reporting Bank shall ensure that the AMA model documentation identifies and justifies the assumptions as well as evaluates the AMA model's sensitivity to these assumptions.

9.5.102 A Reporting Bank shall validate its dependence or correlation assumptions using appropriate quantitative and qualitative techniques.

9.5.103 If the dependence or correlation assumptions are uncertain, a Reporting Bank shall be conservative and implement an appropriate adjustment to the AMA model to take that uncertainty into account.

9.5.104 A Reporting Bank shall include in its ORMS the use of AMA elements, in accordance with the following:

(a) the Reporting Bank shall have a credible, transparent, well-documented and verifiable approach for weighting the estimates of the AMA elements[625];

(b) the AMA elements shall be combined in a manner that most effectively enables the Reporting Bank to quantify its operational risk. The approach of the Reporting Bank to incorporating the estimates of the AMA elements should be comprehensive, internally consistent and avoid the double or multiple counting of qualitative assessments or risk mitigants already recognised in other areas of the ORM framework;

(c) the Reporting Bank shall determine and justify how the AMA elements are weighted and combined;

(d) the Reporting Bank shall demonstrate that it has established a consistent and comprehensive process, and has defined responsibilities for capturing the AMA elements;

(e) the Reporting Bank shall take into account available information related to the AMA elements in a timely and consistent manner; and

(f) the Reporting Bank shall have clear standards for the modification of the estimates of the AMA elements. Policies and procedures should address the issue of overriding the data capture systems and should clearly delineate who has authority to override the systems and under what circumstances.

**Sub-division 17: Estimates of the AMA Elements**

Internal Loss Data

[625] For example, there may be cases where estimates of the 99.9th percentile confidence interval based primarily on internal and external loss event data would be unreliable for business lines with a heavy-tailed loss distribution and a small number of observed losses. In such cases, scenario analysis, and business environment and control factors, may play a more dominant role in the risk measurement system. Conversely, operational loss event data may play a more dominant role in the risk measurement system for business lines where estimates of the 99.9th percentile confidence interval based primarily on such data are deemed reliable.

9.5.105 The tracking and use of internal loss data is an essential prerequisite to the development and functioning of a credible and robust ORMS.

9.5.106 The Reporting bank shall use its internal loss data to tie its operational risk measure to its actual loss experience. This can be achieved, in a number of ways, including using internal loss data as

(a) the foundation of empirical risk estimates;

(b) a means of validating the inputs and outputs of the ORMS; or

(c) the link between loss experience and operational risk management and control decisions.

9.5.107 The Reporting Bank shall have documented policies and procedures for assessing the ongoing relevance of historical internal loss data, including situations where scaling, judgment overrides or other methods may be used, to what extent they may be used and who is authorised to make such decisions. The policies and procedures should identify when an operational risk event becomes an operational risk loss for the purpose of collection within the operational risk loss database and when it is to be included in the calculation data set. The policies and procedures should provide for consistent treatment across the Reporting Bank.

9.5.108 A Reporting Bank adopting the AMA shall have a minimum five-year observation period of internal loss data requirement for internally generated operational risk measures used for regulatory capital purposes, whether the internal loss data is used to build the operational risk measure or to validate it.[626]

9.5.109 When granting a Reporting Bank approval to adopt the AMA, the Authority may require a Reporting Bank to apply additional margins of conservatism if it is of the view that the data series of the Reporting Bank is insufficient.

9.5.110 A Reporting Bank shall ensure that its internal loss data collection processes meet the following standards:

(a) the Reporting Bank shall be able to map its internal loss data into the relevant Level 1 business lines defined in Annex 9B and the relevant Level 1 loss event type categories defined in Annex 9C and to provide these data to the Authority upon request;

(b) the Reporting Bank shall document the objective criteria for allocating losses to the specified business lines and loss event type categories;

(c) its internal loss data of the Reporting Bank shall be comprehensive;

(d) its internal loss data of the Reporting Bank shall capture all material activities and exposures from all appropriate sub-systems, business activities and geographic locations; and

(e) the Reporting Bank shall document and be able to explain and justify that any excluded activities or exposures, both individually and in combination, would not have a material impact on the overall risk estimates of the operational risk capital requirement.

[626] A Reporting Bank shall comply with this requirement from 1 Jan 2011. A Reporting Bank adopting the AMA at 1 Jan 2008 or 1 Jan 2009 shall have at least three years' of internal loss data. A Reporting Bank adopting the AMA at 1 Jan 2010 shall have four years' of internal loss data.

9.5.111 The internal capture of near miss events (where no financial loss was incurred), while not generally required to be included in the calculation of operational risk capital requirements data set, could nevertheless be useful in increasing awareness of the operational risk profile and improving ORM processes. A Reporting Bank should therefore develop procedures to identify such events.

9.5.112 A Reporting Bank shall establish one or more appropriate *de minimis* gross loss thresholds, which may vary in the Reporting bank across business lines or loss event types, for the collection of internal loss data in accordance with the following:

(a) the Reporting Bank is responsible for defining the thresholds for an operational risk class. The Reporting Bank shall be able to demonstrate that the established thresholds -

(i) are reasonable and appropriate for the operational risk management and measurement principles;

(ii) do not adversely impact the credibility and accuracy of the operational risk measure (i.e. any internal loss data below the *de minimis* gross loss threshold not captured, both individually and in combination, would not have a material impact on the overall operational risk estimates);

(iii) will result in a significant proportion of the internal operational risk losses being captured; and

(iv) are broadly consistent with the thresholds used by peer banks;

(b) in determining a threshold, the Reporting Bank should also take into account its approach to operational risk management and measurement for regulatory capital purposes, the use of the internal loss data for ORM, the data needed to justify the predictability and stability of EL offset amounts, and the administrative requirements placed on the business lines and operational risk resources as a consequence of the data collection and management processes. The Authority will review the thresholds set by the Reporting Bank against these factors and with relevant external sources including peer Reporting Banks; and

(c) the Reporting Bank shall be able to demonstrate that it avoids potential biases in the estimation of model parameters, explicitly taking into account the incompleteness of the calculation data set due to the presence of thresholds.

9.5.113 Aside from information on gross operational loss amount, a Reporting Bank shall collect information about the date of the operational loss event, any recoveries of gross operational loss amount, as well as some descriptive information about the drivers or causes of the operational loss event. The level of detail of any descriptive information should commensurate with the size of the gross operational loss amount. The Reporting Bank may consider including the following additional information:

(i) description of loss event;

(ii) loss event type category;

(iii) discovery date of the loss;

(iv) where the loss is reported and expensed;

(v) event end date;

(v) management actions;

(vi) adjustments to the loss estimate.

9.5.114 A Reporting Bank should be able to identify operational risk events related to existing insurance policies in the regulatory capital calculation data set.

9.5.115 A Reporting Bank shall develop specific criteria for assigning loss data arising from an operational risk loss event in a centralised function (e.g. information technology department) or an activity that spans more than one business line, as well as from related events over time, in accordance with the following:

(a) when capturing losses that span more than one business line, the Reporting Bank may decide to assign the entire loss to one business line, for example, where the impact is the greatest, or apportion the loss across several affected business lines. Regardless of the treatment, the method used should be well reasoned and sufficiently documented; and

(b) the Reporting Bank shall have policies in place to describe the identification, capture and treatment, for the purpose of its operational risk loss database and operational risk management and modeling, of a series of operational loss events that are related events over time.

9.5.116 A Reporting Bank shall have a clear policy that allows for the consistent treatment of loss event classifications (e.g. credit, market or operational risk) across the Reporting Bank. It is essential for the Reporting Bank that captures loss events that are treated differently for regulatory capital and management purposes to demonstrate that -

(a) loss events are being captured consistently across the Reporting Bank; and

(b) data systems are sufficiently advanced to allow for this differential treatment of loss events.

9.5.117 A Reporting Bank shall continue to treat operational risk losses that are related to or have characteristics of credit risk, and have historically been included in the credit risk databases of the Reporting Bank (e.g. collateral management failures) as credit risk for the purposes of calculating the minimum regulatory capital requirement under this framework. These losses will not be subject to the operational risk capital requirement[627], provided that these losses are subject to the credit risk regulatory capital framework.

9.5.118 For the purposes of internal operational risk management, a Reporting Bank shall identify all material operational risk losses consistent with the scope of the definition of operational risk as set out in the Glossary and the loss event types listed in Annex 9C, including those related to credit risk. Such material operational risk-related credit risk losses should be flagged separately within the operational loss database of the Reporting Bank. The materiality of these losses may vary between Reporting Banks as well as within a Reporting Bank across business lines or loss event types. Materiality thresholds should be broadly consistent with those used by peer Reporting Banks and set with reference to the credit risk management processes of the Reporting Bank.

[627] This applies to all Reporting Banks, including those that may only now be designing their credit risk and operational risk databases.

9.5.119 A Reporting Bank shall ensure that operational risk losses related to market risk are treated as operational risk for the purposes of calculating the minimum regulatory capital requirement under this framework and will therefore be subject to the operational risk capital requirement.

<u>Relevant external data</u>

9.5.120 A Reporting Bank shall use relevant external data (either public data or pooled industry data or both), especially when there is reason to believe that the Reporting Bank is exposed to infrequent, yet potentially severe, operational risk losses.

9.5.121 Where internal loss data is limited, relevant external data may be a useful input in determining the level of operational risk exposure of a Reporting Bank. Even where relevant external data is not an explicit input to the calculation data set of the Reporting Bank, such data provides a means for the Reporting Bank to understand industry experience, and in turn, provides a means for assessing the adequacy of its internal loss data. A Reporting Bank may use relevant external data to enhance scenario analysis, fit severity distributions or benchmark operational risk exposure results.

9.5.122 A Reporting Bank shall have policies and procedures that provide for the use of relevant external data.

9.5.123 A Reporting Bank shall have a systematic and robust process for -

(a) collecting, assessing and incorporating relevant external data into the ORMS;

(b) determining situations for which relevant external data should be used; and

(c) determining the methodologies used to incorporate the data (e.g. scaling, qualitative adjustments or enhancing scenario analysis).

9.5.124 The Reporting Bank should ensure that the relevant external data include data on actual loss amounts, information on the scale of business operations where the event occurred, information on the causes and circumstances of the loss events, or other available information that would assist in assessing the relevance of the loss event to the Reporting Bank.

9.5.125 A Reporting Bank should ensure that the external data used is appropriate, unbiased and relevant to the business and operational risk profile of the Reporting Bank.

9.5.126 A Reporting Bank shall regularly review, document and conduct periodic independent reviews on the conditions and practices for the use of relevant external data.

<u>Scenario analysis</u>

9.5.127 A Reporting Bank shall use scenario analysis of expert opinions in conjunction with relevant external data to evaluate its exposure to high-severity loss events.

9.5.128 Scenario analysis is a systematic process of drawing on the knowledge and obtaining expert opinions from experienced business line managers and risk management experts to derive reasoned assessments of the likelihood and impact of plausible high-severity operational losses. For instance, these expert assessments could be expressed as parameters of an assumed statistical loss distribution.

9.5.129 Scenario analysis is especially relevant for business lines, activities or operational loss event types where internal and relevant external loss data or assessments of the BE&IC do not provide a sufficiently robust estimate of the exposure of the Reporting Bank to operational risk.

9.5.130 A Reporting Bank should use scenario analysis to assess the impact of deviations from the dependence or correlation assumptions embedded in the ORM framework, in particular, to evaluate potential losses arising from multiple simultaneous operational risk loss events.

9.5.131 A Reporting Bank should ensure that the set of developed scenarios are comprehensive and capture all material sources of operational risk across business activities and geographic locations.

9.5.132 A Reporting Bank shall have a robust process in place for developing scenarios and apply the process consistently across the Reporting Bank.

9.5.133 A Reporting Bank shall ensure that there are policies and procedures in place for determining the methodologies for incorporating scenario analysis into the ORMS. They shall cover key elements of scenario analysis, such as the manner in which the scenarios are generated, the assumptions used, the frequency with which they are updated and the scope and coverage of operational risk loss events they are intended to reflect. The process for conducting scenario analysis and the results shall also be clearly documented.

9.5.134 A Reporting Bank should ensure that the process by which the scenarios are determined is designed to reduce as much as possible subjectivity and biases. In particular -

(a) the assumptions used in the scenarios should be based, as much as possible, on empirical evidence. Relevant internal and external data available should be used in building the scenario; and

(b) the Reporting Bank should explain the rationale for the level or the units at which the scenarios are analysed, or both.

9.5.135 A Reporting Bank shall have a process in place for regularly reviewing the developed scenarios and assumptions to ensure that they continue to adequately reflect the operational risk profile of the Reporting Bank. A Reporting Bank shall ensure that scenarios are regularly validated and re-assessed through comparison to actual loss experience to ensure their reasonableness[628].

Business environment and internal control factors (“BE&IC”)

9.5.136 In addition to using operational risk loss data, whether actual or scenario-based, a Reporting Bank shall ensure that its ORM framework captures key BE&IC which have a significant influence, and can change its operational risk profile. The incorporation of BE&IC is intended to ensure that the ORM framework of the Reporting Bank is more forward-looking and more directly reflects the quality of the operating and control environments.

9.5.137 The Reporting Bank shall ensure that the use of BE&IC assessments in the ORM framework -

(a) is responsive to changes in the profile of a Reporting Bank and reflect potential sources of operational risk;

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[628] This includes the assessments as set out in paragraph 9.5.130.

(b) is sufficiently flexible to encompass the range and complexity of current and planned activities or changes in internal control systems of the Reporting Bank;

(c) identify positive and negative trends in operational risk management and reflect both improvements and deterioration in the operational risk profile of the Reporting Bank, such as potential increases in operational risk due to greater complexity of activities, increased business volumes, the introduction of new products and improvements in internal controls. A Reporting Bank shall ensure that changes in internal processes and risk management procedures is taken into account; and

(d) help align assessments of the operational risk regulatory capital with risk management objectives.

9.5.138 To qualify for the purpose of calculating operational risk capital requirements, a Reporting Bank shall ensure that its use of BE&IC in its ORM framework meets the following standards:

(a) the Reporting Bank has in place a framework to identify and assess BE&IC as well as policies and procedures for the development and use of BE&IC. The Reporting Bank documents where BE&IC are used in the ORM measurement framework and the rationale for doing so;

(b) the Reporting Bank is able to justify the choice of each BE&IC as a relevant and meaningful driver of operational risk, based on considerations of historical experience and involving the expert judgment of the respective business areas;

(c) the sensitivity of the operational risk estimates of the Reporting Bank to changes in BE&IC and the relative weighting of the BE&IC need to be well reasoned;

(d) the Reporting Bank monitors its BE&IC. A Reporting Bank shall ensure that the frequency of such monitoring reflect the operational risks involved and the frequency and nature of changes in the operating environment. A Reporting Bank shall ensure that the results of monitoring activities are included in regular reports to the Board and senior management;

(e) the framework, application of BE&IC and the outcomes, including the supporting rationale for any adjustments to empirical estimates, is documented and subject to independent review and validation. Where possible, the BE&IC should be translated into quantitative measures that can be verified; and

(f) the process and outcomes is regularly validated through comparison to actual internal loss experience, relevant external data with appropriate adjustments made.

**Sub-division 18: Risk Mitigation**

9.5.139 A Reporting Bank may recognise the risk mitigating effect of insurance when calculating operational risk capital requirements, subject to approval from the Authority.

The Reporting Bank may only recognise the risk mitigating effect of insurance for up to 20% of the total operational risk capital requirement calculated under the AMA.

9.5.140 A Reporting Bank shall ensure that the following criteria are met before recognising the risk mitigating effect of insurance:

(a) the insurer has a minimum claims paying ability grade of "1" as set out in Table 7R-5 of Annex 7R of Part VII throughout the life of the insurance policy;

(b) the insurance policy has an initial term of no less than one year. For a policy with residual term of less than one year, the Reporting Bank makes appropriate haircuts reflecting the declining residual term of the policy, up to a full 100% haircut for policy with a residual term of 90 days or less;

(c) the insurance policy has a minimum notice period for cancellation of 90 days;

(d) the insurance policy has no exclusions or limitations triggered by any action of any regulatory authority or, in the case of a failed Reporting Bank, that preclude the Reporting Bank, receiver or liquidator from recovering for damages suffered or expenses incurred by the Reporting Bank, except in respect of events occurring after the initiation of receivership or liquidation proceedings in respect of the Reporting Bank. The insurance policy may exclude any fine, penalty, or punitive damages resulting from action of any regulatory authority;

(e) the risk mitigation approach and calculations reflects the insurance coverage of the Reporting Bank in a manner that is transparent in its relationship to, and consistent with, the actual likelihood, impact and severity of operational loss used in the overall determination of the Reporting Bank of its operational risk capital requirement;

(f) the insurance is provided by a third party. In the case of insurance provided by captive insurers, related corporations and affiliates of the Reporting Bank, the exposure has to be laid off to an independent third party, for example through re-insurance that fulfils the requirements as set out in this Division;

[MAS Notice 637 (Amendment No. 2) 2014]

(g) the Reporting Bank has in place policies and procedures for determining the risk mitigating effects of insurance within its ORMS. The framework for recognising insurance shall be well reasoned and documented; and

(h) the Reporting Bank discloses a description of its use of insurance for the purpose of mitigating operational risk in the policies and procedures.

9.5.141 A Reporting Bank shall ensure that the methodology of a Reporting Bank for recognising insurance risk mitigation under the AMA also captures the following elements through appropriate discounts or haircuts in the amount of insurance recognition:

(a) the residual term of a policy, where less than one year, as noted above;

(b) a policy’s cancellation terms, where less than one year, including the possibility that the policy can be cancelled before the contractual expiration;

(c) the uncertainty of payment, including the willingness and ability of the insurer to pay on a claim in a timely manner and the legal risk that a claim may be disputed; and

(d) any mismatches in coverage of insurance policies.

9.5.142 A Reporting Bank shall keep the use of insurance for risk mitigating purposes under review and recalculate the operational risk capital requirement, if appropriate, in the event that the nature of the insurance or the coverage changes significantly. The Reporting Bank shall notify the Authority of material changes in the coverage of the risk mitigating effect of insurance under the AMA.

[MAS Notice 637 (Amendment No. 2) 2014]

**Annex 9A**

## EXAMPLE OF GROSS INCOME COMPUTATION

| | $ | $ |
|---|---|---|
| Interest Income | 100 | 100 |
| Less: Interest Expense | (70) | (70) |
| **Net Interest Income** | **30** | **30** |
| Fee and Commission Income | 7 | 7 |
| Dividend Income | 5 | 5 |
| Rental Income | 3 | 3 |
| Profit/loss from Trading | 2 | 2 |
| Realised gains/losses from sale of banking book securities | 5 | |
| Other Non-interest Income | 3 | 3 |
| **Non-interest Income** | **25** | **20** |
| Less: Operating expenses | (20) | |
| Less: Allowances | (3) | |
| Less: Taxes | (7) | |
| **Net Income as per Profit & Loss** | **25** | |
| **Gross Income as per paragraph 9.2.2** | | **50** |

## MAPPING OF BUSINESS LINES

**Table 9B-1 - Mapping of Business Lines**

| Level 1 | Level 2 | Activity Groups |
|---|---|---|
| Corporate Finance | Corporate Finance | Mergers and acquisitions, Underwriting, Privatisations, Securitisation, Research, Debt (Government, High Yield), Equity, Syndications, Initial Public Offerings, Secondary Private Placements |
| | Municipal / Government Finance | |
| | Merchant Banking | |
| | Advisory Services | |
| Trading & Sales | Sales | Fixed Income, Equity, Foreign Exchanges, Commodities, Credit, Funding, Own Position Securities, Lending and Repurchase Agreements, Brokerage, Debt, Prime Brokerage |
| | Market Making | |
| | Proprietary Positions | |
| | Treasury | |
| Payment & Settlement[629] | External Clients | Payments and Collections, Funds Transfers, Clearing and Settlement |
| Agency Services | Custody | Escrow, Depository Receipts, Securities Lending (Customers) Corporate Actions |
| | Corporate Agency | Issuer and Paying Agents |
| | Corporate Trust | |
| Asset Management | Discretionary Fund Management | Pooled, Segregated, Retail, Institutional, Closed, Open, Private Equity |
| | Non-Discretionary Fund Management | Pooled, Segregated, Retail, Institutional, Closed, Open |
| Retail Brokerage | Retail Brokerage | Execution and Full Service |
| Retail Banking | Retail Banking | Retail Lending and Deposits, Banking Services, Trust and Estates |
| | Private Banking | Private Lending and Deposits, Banking Services, Trust and Estates, Investment Advice |
| | Card Services | Merchant / Commercial / Corporate Cards, Private Labels and Retail |
| Commercial Banking | Commercial Banking | Project Finance, Real Estate, Export Finance, Trade Finance, Factoring, Leasing, Lending, Guarantees, Bills of Exchange |

[629] Payment and settlement losses related to a Reporting Bank's own activities would be incorporated in the loss experience of the affected business lines.

## LOSS EVENT TYPE CLASSIFICATION

**Table 9C-1 – Loss Event Type Classification**

| Loss Event Type Category (Level 1) | Definition | Loss Event Type Category (Level 2) | Activity Examples (Level 3) |
|---|---|---|---|
| Internal fraud | Losses due to acts of a type intended to defraud, misappropriate property or circumvent regulations, the law or company policy, excluding diversity/discrimination events, which involves at least one internal party. | Unauthorised Activity | Transactions not reported (intentional)<br>Transaction type unauthorised (with monetary loss)<br>Mismarking of position (intentional) |
| | | Theft and Fraud | Fraud/credit fraud/worthless deposits<br>Theft/extortion/embezzlement/robbery<br>Misappropriation of assets<br>Malicious destruction of assets<br>Forgery<br>Cheque kiting<br>Smuggling<br>Account take-over/impersonation etc.<br>Tax non-compliance/evasion (wilful)<br>Bribes/kickbacks<br>Insider trading (not on Reporting Bank's account) |
| External fraud | Losses due to acts of a type intended to defraud, misappropriate property or circumvent the law, by a third party. | Theft and fraud | Theft/robbery<br>Forgery<br>Cheque kiting |
| | | Systems Security | Hacking damage<br>Theft of information (with monetary loss) |
| Employment practices and workplace safety | Losses arising from act that are inconsistent with employment, health or safety laws or agreements, from payment of | Employee Relations | Compensation, benefit, termination issues, organised labour activity |
| | | Safe Environment | General liability (e.g. accident claims)<br>Employee health and safety rules events<br>Workers compensation |

| Loss Event Type Category (Level 1) | Definition | Loss Event Type Category (Level 2) | Activity Examples (Level 3) |
| --- | --- | --- | --- |
| | personal injury claims or from diversity/ discrimination events. | Diversity and Discrimination | All discrimination types |
| Clients, products and business practices | Losses arising from an unintentional or negligent failure to meet a professional obligation to specific clients, including fiduciary and suitability requirements, or from the nature of a product. | Suitability, Disclosure and Fiduciary | Fiduciary breaches/guideline violations<br>Suitability/disclosure issues (e.g. Know Your Client (KYC) requirements)<br>Retail customer disclosure violations<br>Breach of privacy<br>Aggressive sales<br>Account churning<br>Misuse of confidential information<br>Lender liability |
| | | Improper Business or Market Practices | Antitrust<br>Improper trade/market practices<br>Market manipulation<br>Insider trading (on the Reporting Bank's account)<br>Unlicensed activity<br>Money laundering |
| | | Product Flaws | Product defects (unauthorised etc)<br>Model errors |
| | | Selection, Sponsorship and Exposure | Failure to investigate client per guidelines<br>Exceeding client exposure limits |
| | | Advisory Activities | Disputes over performance of advisory activities |
| Damage to physical assets | Losses arising from loss or damage to physical assets from natural disaster or other events. | Disasters and other events | Natural disaster losses<br>Human losses from external sources (for example, terrorism or vandalism) |
| Business disruption and system failures | Losses arising from disruption of business or system failures. | Systems | Hardware<br>Software<br>Telecommunications<br>Utility outage/disruptions |

| Loss Event Type Category (Level 1) | Definition | Loss Event Type Category (Level 2) | Activity Examples (Level 3) |
|---|---|---|---|
| Execution, delivery and process management | Losses arising from failed transaction processing, process management, relations with trade counterparties and vendors. | Transaction Capture, Execution and Maintenance | Miscommunication<br>Data entry, maintenance or loading error<br>Missed deadline or responsibility<br>Model/system mis-operation<br>Accounting error/entity attribution error<br>Other task misperformance<br>Delivery failure<br>Collateral management failure<br>Reference Data Maintenance |
| | | Monitoring and Reporting | Failed mandatory reporting obligation<br>Inaccurate external report (loss incurred) |
| | | Customer Intake and Documentation | Client permission/disclaimers missing<br>Legal documents missing/incomplete |
| | | Customer/Client Account Management | Unapproved access given to accounts<br>Incorrect client records (loss incurred)<br>Negligent loss or damage of client assets |
| | | Trade Counterparties | Non-client counterparty misperformance<br>Miscellaneous non-client counterparty disputes |
| | | Vendors and Suppliers | Outsourcing<br>Vendor disputes |

**Annex 9D**

## AMA ROLLOUT PARAMETERS

### Section 1: AMA Coverage

1.1 This Annex sets out the parameters which a Reporting Bank shall observe in its AMA rollout.

1.2 Subject to paragraph 1.3 of this Annex, a Reporting Bank which intends to adopt the AMA shall adopt the AMA across the entire banking group.

1.3 The Authority may, on an exceptional basis, permit a Reporting Bank to use the AMA for some parts of its operations and a different approach (i.e. BIA or SA(OR)) for the remaining parts of the banking group provided the conditions for such partial use are met and the Reporting Bank is able to demonstrate to the satisfaction of the Authority that the partial use is not to avoid or reduce regulatory capital which the Reporting Bank would otherwise be required to maintain. In the decision by the Authority to grant such an approval, considerations of data availability and the level of risk management sophistication within the banking group are included.

1.4 A Reporting Bank intending to partially use the AMA shall be subject to the following conditions:

(a) all operational risks of the global, consolidated operations of the Reporting Bank are captured in the AMA;

(b) all of the operations of the Reporting Bank that are covered by the AMA meet the qualifying criteria for using an AMA, while those parts of its operations that are using one or more of the simpler approaches meet the qualifying criteria for those approaches;

(c) on the date of the implementation of AMA, a significant part of the operational risks of the Reporting Bank are captured by the AMA; and

(d) the Reporting Bank provides a plan that is approved by the Authority, specifying the timetable and the extent to which it intends to rollout the AMA across all but an immaterial part of its operations. The plan should be driven by only the practicality and feasibility of moving to the AMA over time.

1.5 A Reporting Bank applying for partial use shall demonstrate to the Authority the methodology for determining which parts of its operations (based on business line, legal structure, geography, or other internally determined basis) will use the AMA.

1.6 In adopting partial use, the Reporting Bank shall exclude diversification benefits for any part of its operations which is not using the AMA.

1.7 The Authority may impose additional conditions on partial use and additional capital requirements, if deemed appropriate.

1.8 A Reporting Bank which does not meet the conditions pursuant to paragraph 1.4(c) and (d) of this Annex and intends to implement an approach other than the AMA on a global consolidated basis may, with the approval of the Authority, implement the AMA at one or more of its foreign subsidiaries and include in its global consolidated operational risk capital requirements the results of its AMA calculations at such subsidiary, where the

AMA has been approved by the foreign bank regulatory agency of that subsidiary and is acceptable to the Authority. The Authority may grant approvals of such nature only on an exceptional basis and would be limited to circumstances where the relevant subsidiary is required and approved by its foreign bank regulatory agency to implement the AMA.

**Section 2: AMA Rollout Relative To Advanced Approaches For Other Risks**

2.1 In line with the principle that the use of more sophisticated operational risk management by a Reporting Bank cannot be considered in isolation from the broader context of improvements in the management of all significant risks, the adoption of the AMA by a Reporting Bank should be made together with or after the adoption of advanced approaches for credit and market risk (if market risk is significant to the Reporting Bank).

## PART X: SUPERVISORY REVIEW PROCESS

### Division 1: Introduction

10.1.1 Part X sets out the key principles of the supervisory review process, risk management guidance, and supervisory transparency and accountability with respect to banking risks. It seeks to encourage a Reporting Bank to develop and use better risk management techniques in monitoring and managing its risks, and to ensure that a Reporting Bank has in place a rigorous process for determining the adequacy of its capital to support all risks to which it is exposed. This process is known as the ICAAP. A thorough and comprehensive ICAAP is a vital component of a strong risk management programme. A Reporting Bank shall develop its own ICAAP and maintain capital levels that are commensurate with its risk profile and control environment.

10.1.2 The review of the ICAAP of a Reporting Bank by the Authority is to evaluate how well the Reporting Bank is assessing its capital needs relative to its risks. While the Authority recognises that increased capital is not the substitute for proper controls and risk management processes, higher regulatory capital requirements may be required to buffer the Reporting Bank against the higher risk of unexpected losses resulting from inadequate controls or risk management process weaknesses.[701] Aside from requiring additional capital, the Authority may also apply other supervisory measures to address the heightened risk or risk management deficiencies of the Reporting Bank. The Authority may intervene at an early stage to prevent capital levels of a Reporting Bank from falling below the appropriate levels required to support the risk characteristics of the Reporting Bank, and to require swift remedial action from the Reporting Bank if the appropriate level of capital is not maintained or restored by the Reporting Bank.

10.1.3 Pillar 1 capital requirements represent minimum requirements. A Reporting Bank shall maintain an appropriate level of capital above minimum Pillar 1 requirements so that all risks of the Reporting Bank – both on- and off-balance sheet – are adequately covered, particularly those related to complex capital market activities. This will help ensure that a Reporting Bank maintains sufficient capital for risks not adequately addressed through Pillar 1 and that it will be able to operate effectively throughout a severe and prolonged period of financial market stress or an adverse credit cycle.

[701] Notwithstanding, a Reporting Bank is required to address weaknesses in internal controls or risk management processes, as higher regulatory capital requirements cannot be the permanent solution to address such weaknesses.

## Division 2: ICAAP

### Sub-division 1: General Requirements

10.2.1 The primary responsibility for developing an ICAAP lies with a Reporting Bank. A Reporting Bank shall be able to demonstrate to the Authority that its ICAAP is comprehensive and that its chosen internal capital targets are well founded and consistent with its overall risk profile and operating environment, and that its capital levels are adequate in view of its overall risk profile and operating environment.

10.2.2 A Reporting Bank shall ensure that the outcome of the ICAAP is not a static capital target. A Reporting Bank shall ensure the following:

(a) the ICAAP takes into account the current stage of the business cycle of the Reporting Bank and be a forward-looking process capable of timely response to changes in the risk profile and business strategies of a Reporting Bank, as well as its external environment;

(b) the ICAAP addresses both short- and long-term needs and consider the prudence of building excess capital over benign periods of the credit cycle and also to withstand a severe and prolonged market downturn;

(c) the ICAAP incorporates rigorous stress testing and scenario analysis that identify possible events or changes in market conditions that could adversely impact the Reporting Bank; and

(d) the results of these stress tests and analyses are incorporated, where applicable, into the capital adequacy assessment of a Reporting Bank.

10.2.3 A Reporting Bank shall implement its ICAAP in a methodical manner and ensure that the ICAAP is comprehensively documented in the policies, processes and procedures of a Reporting Bank. The sophistication of the ICAAP of each Reporting Bank may vary according to the size, complexity, and business strategy of the Reporting Bank. At a minimum, a Reporting Bank shall have the following features in its ICAAP:

(a) Board and senior management oversight;

(b) comprehensive assessment of risks;

(c) sound capital assessment;

(d) monitoring and reporting; and

(e) independent review.[702]

[702] In assessing the comprehensiveness and rigour of its ICAAP, the Reporting Bank shall refer to further details set out in Annex 10A.

**Sub-division 2: Board and Senior Management Oversight**

10.2.4 A sound risk management framework is the foundation for the effective assessment of the adequacy of the capital position of a Reporting Bank. A Reporting Bank shall ensure that the Board and senior management understand the nature and level of risks being taken by the Reporting Bank, and put in place appropriate risk management processes to mitigate the risks. The Reporting Bank shall maintain adequate capital beyond the regulatory minimum to support such risks and to take into account the following considerations -

(a) level of creditworthiness of the Reporting Bank to be achieved in markets, that is higher than that indicated by the minimum regulatory capital requirements;

(b) fluctuations in capital adequacy ratios, as a result of changes in type and volume of activities and risk exposures in the normal course of business;

(c) cost of capital raising, especially in situations where capital injections need to be done quickly or at a time when market conditions are unfavourable;

(d) potential breach of the minimum regulatory capital requirements and regulatory actions in such an event;

(e) risks arising from the features of the jurisdictions and markets in which the Reporting Bank operates.

10.2.5 The ultimate responsibility for ensuring a sound risk management framework and a robust ICAAP, setting capital targets that are commensurate with the Reporting Bank's risk profile and control environment, and ensuring that a Reporting Bank has adequate capital to support its risks beyond the regulatory requirements resides with the Board and senior management of a Reporting Bank. In this regard, the Reporting Bank shall ensure that the Board defines the Reporting Bank's risk appetite and establishes an acceptable level of risks that the Reporting Bank may take, as well as the capital strategy of the Reporting Bank. The Reporting Bank shall ensure that senior management -

(a) performs an analysis of the current and future capital requirements of the Reporting Bank in relation to its strategic objectives;

(b) establishes a strategic plan which clearly outlines the Reporting Bank's capital needs, anticipated capital expenditures, desired capital levels, and external capital sources;

(c) establishes frameworks for assessing the categories of risks facing the Reporting Bank and develops systems for relating these risks to the capital level of the Reporting Bank;

(d) ensure that the Reporting Bank's risk management framework includes detailed policies that set specific firm-wide prudential limits on the banks' activities, which are consistent with its risk taking appetite and capacity;

(e) establishes a method for monitoring compliance with internal policies on risk assessment and the processes for relating risks to capital levels;

(f) institutes a strong internal control culture throughout the Reporting Bank, including the adoption of written policies and procedures; and

(g) communicates the internal controls and written policies and procedures throughout the Reporting Bank.

10.2.6 A Reporting Bank shall ensure that the Board reviews and approves the target level and composition of capital, and the process for setting and monitoring such targets at least annually, to ensure congruence between the risk profile and capital adequacy of the Reporting Bank.

10.2.7 A Reporting Bank shall ensure that senior management is responsible for developing a risk management framework and ensuring that the formality and sophistication of the risk management processes are appropriate in light of the risk profile and business strategy of a Reporting Bank, and integrating the ICAAP with the capital planning and management processes of the Reporting Bank.

10.2.8 In this regard, a Reporting Bank shall ensure that senior management, at a minimum -

(a) establishes robust policies and procedures to identify, measure and report all material risks;

(b) evaluates the level and trend of material risks and their effect on capital levels;

(c) evaluates the sensitivity and reasonableness of key assumptions used in the capital assessment and measurement system;

(d) determines if the Reporting Bank holds sufficient capital against the risks facing the Reporting Bank;

(e) assesses future capital needs based on the risk profile of the Reporting Bank and make necessary adjustments to its strategic plan; and

(f) subjects the ICAAP to annual independent review for robustness and integrity.

10.2.9 A Reporting Bank shall ensure that every subsidiary (including subsidiaries that are excluded from consolidation) of a Reporting Bank that is a financial institution regulated by the Authority or a financial services regulatory authority outside Singapore complies with the regulatory capital requirements imposed on that subsidiary by the Authority or the financial services regulatory authority of that subsidiary, and such subsidiary is adequately capitalised at all times.

**Sub-division 3: Comprehensive Risk Assessment**

10.2.10 A Reporting Bank shall ensure that its ICAAP identifies and assesses all material risks. In this respect, a Reporting Bank shall ensure that the ICAAP addresses -

(a) credit risk, market risk and operational risk, captured under Pillar 1;

(b) risks not fully captured under Pillar 1 (e.g. credit concentration risk);

(c) risks that are not taken into account by Pillar 1 (e.g. interest rate risk in the banking book, liquidity risk, business risk, reputational risk, strategic risk and concentration risk); and

(d) external factors outside the direct control of the Reporting Bank, including changes in regulations, accounting rules and the economic environment (e.g. business cycle effects).

10.2.11 A Reporting Bank shall ensure that senior management put in place risk management systems and processes that are robust and comprehensive, and be capable of capturing the nature and magnitude of all material risks faced by the Reporting Bank, not limited to credit, market, liquidity, operational, reputational, legal and strategic risks. The Reporting Bank shall consider risks that do not appear to be significant in isolation, but when combined with other risks could lead to material losses. A Reporting Bank shall identify the various risk factors inherent in its business and determine how these risks should be incorporated into its ICAAP.

10.2.12 A Reporting Bank shall fully document the risk assessment process and the Reporting Bank shall be able to demonstrate to the Authority that all material aspects of risks have been considered and accounted for in its ICAAP.

10.2.13 A Reporting Bank shall perform regular reviews of its ICAAP to ensure that all the risks identified continue to be relevant and accounted for, and that new risks are incorporated into the ICAAP on a timely basis. A Reporting Bank is also expected to make adjustments to its ICAAP in light of changes in its operating profile or operating environment.

10.2.14 For each material risk identified in its ICAAP, a Reporting Bank shall incorporate the following into its risk assessment and management process:

(a) a Reporting Bank shall conduct detailed analyses to determine the effectiveness and appropriateness of risk management techniques in controlling the risks identified;

(b) a Reporting Bank shall ensure that the risk assessments are consistent and objective;

(c) a Reporting Bank shall incorporate changes in its risk profile into its risk assessments on a timely basis. These changes may result from the introduction of new products or activities, changes in business volumes, or changes in the operating environment;

(d) a Reporting Bank shall not rely solely on quantitative methods to assess its capital adequacy. Some material risks, such as reputational risk and strategic risk, cannot be easily quantified and would require the use of qualitative methods of assessment and mitigation; and

(e) a Reporting Bank shall ensure the integrity of data used in its risk measurement process and such data is verifiable.

**Sub-division 4: Sound Capital Assessment**

10.2.15 A Reporting Bank shall state its objectives in deciding how much capital to hold. The Reporting Bank shall ensure that the capital objectives go beyond meeting the regulatory capital requirements set out in Part IV. The capital objectives may include the desired level of risk coverage, credit rating or degree of creditworthiness (hence funding access) of the Reporting Bank. In particular, a Reporting Bank shall explicitly state its expected future capital requirements and how it plans to meet those requirements (including under stressed situations). The Reporting Bank shall ensure that the capital management process make allowances for divergences and unexpected events.

10.2.16 A Reporting Bank shall assess whether its long-run capital objectives differ significantly from its short-run capital objectives. As it may take time for a Reporting Bank to raise new capital, the Reporting Bank shall make allowances for unexpected events, including putting in place contingency plans for raising additional capital.

10.2.17 A Reporting Bank shall hold capital for uncertainties in the precision of risk measures and volatility of exposures.

10.2.18 A Reporting Bank shall be able to demonstrate that its approach of relating its capital to the risks it is exposed to is conceptually sound, and that the output and results of the ICAAP are reasonable, taking into account the Reporting Bank's strategic focus and business plans.

**Sub-division 5: Independent Review**

10.2.19 A Reporting Bank shall ensure that the systems for assessing the risks to which it is exposed and for relating those risks to the capital level of the Reporting Bank are reviewed independently by persons other than those responsible for the design or implementation of the ICAAP. The Reporting Bank shall also ensure that its risk management processes are frequently monitored and tested independently. The aim is to ensure that the information on which decisions are based is accurate so that processes fully reflect management policies and that regular reporting, including the reporting of limit breaches and other exception-based reporting, is undertaken effectively. A Reporting Bank shall conduct a high level review[703] at least annually.

10.2.20 A Reporting Bank shall ensure the following:

[703] Arising from this high level review, the Reporting Bank shall identify those risk factors that must be reviewed for the current year as well as those risk factors that can be deferred for review to the next 2−3 years. The Reporting Bank is expected to provide full justifications for its priority of review. The Authority expects that a full cycle for the independent review should be completed within a period of 3 years.

(a) the team responsible for the independent review is not in a position of conflict and does not stand to gain from particular review outcomes;

(b) policies and processes are established to ensure that the independent review team is insulated from influence and pressure from others who stand to gain from particular review outcomes;

(c) the independent review team possesses the necessary technical capabilities to perform the independent review in order to provide an effective challenge to persons responsible for the design and implementation of the ICAAP; and

(d) the results of the independent review are reported to the Board and senior management of the Reporting Bank.

10.2.21 A Reporting Bank shall ensure that the independent review covers the appropriateness of the capital assessment process, identification of large exposures and risk concentrations, the accuracy and completeness of data inputs, the reasonableness and validity of scenarios used, stress testing and analysis of assumptions and inputs of the Reporting Bank.

**Division 3: Supervisory Review**

10.3.1 The Authority shall review and assess the following as part of its risk-based approach to supervision:

(a) the ICAAP of a Reporting Bank;

(b) compliance by a Reporting Bank with the requirements set out in this Notice; and

(c) the adequacy of capital maintained by a Reporting Bank.

10.3.2 The supervisory review of a Reporting Bank by the Authority includes the following areas:

(a) reviewing and evaluating a Reporting Bank's ICAAP and strategies, as well as a Reporting Bank's ability to monitor and ensure compliance with regulatory capital adequacy ratios;

(b) assessing whether a Reporting Bank complies with the minimum standards, qualifying criteria and requirements, including risk management standards and disclosure requirements, set out in this Notice for the use of internal methodologies, CRM techniques and securitisations to be recognised for regulatory capital purposes, on an ongoing basis;

(c) assessing whether a Reporting Bank complies with requirements and conditions set out in this Notice for the use of standardised approaches, and whether the use of various instruments that can reduce Pillar 1 capital requirements are utilised and understood as part of a sound, tested and properly documented risk management process; and

(d) assessing a Reporting Bank's application of definition of default under IRBA set out in Annex 7X of Part VII and its impact on the adequacy of capital maintained by a Reporting Bank, focussing on the impact of deviations from the definition of default arising from the use of external data or internal data in accordance with paragraph 1.2 of Annex 7X of Part VII.

10.3.3 The Authority may place more reliance on the ICAAP results of a Reporting Bank if it has assessed the ICAAP to be robust and comprehensive. If the Authority is not satisfied with the outcomes from its review, the Authority may, among other things:

(a) require the Reporting Bank to take action to improve its risk management processes or lower the risks which it assumes;

(b) require the Reporting Bank to maintain additional capital;

(c) restrict the payment of dividends by the Reporting Bank;

(d) require the Reporting Bank to implement a satisfactory capital adequacy restoration plan, including plans to correct capital shortfalls in subsidiaries that are financial institutions regulated by the Authority or financial services regulatory authorities outside Singapore; and

(e) apply other supervisory measures to address the heightened risk or risk management deficiencies of the Reporting Bank (e.g. intensifying supervisory monitoring of the Reporting Bank or requiring the Reporting Bank to strengthen risk management, apply internal limits, strengthen the level of provisions and reserves, or improve internal controls).

10.3.4 The assessment process of the Authority generally involves a review of the documentation of the Reporting Bank on the ICAAP, discussions between the Authority and the key management personnel of the Reporting Bank, on-site examinations and other methods the Authority may identify as appropriate for evaluating the robustness of the ICAAP of a Reporting Bank[704]. Following the assessment, a Reporting Bank should notify and engage the Authority in discussions if it plans to make material changes to its ICAAP.

10.3.5 A Reporting Bank shall furnish to the Authority such other information relating to the capital adequacy ratios and capitalisation level of the Reporting Bank, as may be requested by the Authority.

[704] This is intended to foster dialogue between Reporting Banks and the Authority, so that when deficiencies are identified, prompt and decisive action may be taken by the Authority to reduce risk or restore capital.

**Annex 10A**

## SPECIFIC ISSUES IN ICAAP FOR MAIN RISK CATEGORIES AND TOPICS

### Section 1: Introduction

1.1 This Annex sets out additional details on the expectations of the Authority with regard to the ICAAP of a Reporting Bank. While this document is intended to help a Reporting Bank in assessing the comprehensiveness and rigour of its ICAAP, it shall not be construed as an exhaustive compliance checklist. A Reporting Bank should refer to the Pillar 2 principles and guidance set out in "International Convergence of Capital Measurement and Capital Standards: A Revised Framework – Comprehensive Version", "Enhancements to the Basel II Framework" and "A Sound Capital Planning Process: Fundamental Elements" issued by the BCBS in June 2006, July 2009 and January 2014 respectively. A Reporting Bank should also refer to other relevant risk management publications issued by the BCBS and the Authority[705]. The following material risk categories and topics are covered in this Annex:

(a) Section 3 – Credit Risk, Concentration Risk and Securitisation Risk;

(b) Section 4 – Market Risk and Valuation Practices;

(c) Section 5 – Interest Rate Risk in the Banking Book;

(d) Section 6 – Operational Risk;

(e) Section 7 – Liquidity Risk;

(f) Section 8 – Reputational Risk;

(g) Section 9 – Other Risk Factors; and

(h) Section 10 – Stress Testing Practices.

[MAS Notice 637 (Amendment No. 2) 2014]

### Section 2: General

2.1 Notwithstanding the specific issues covered in the respective sections, a Reporting Bank shall observe the following with regard to each main risk category it identifies in its ICAAP:

(a) a Reporting Bank shall have a comprehensive risk management framework for each risk category. The risk management framework for each risk category shall set out clearly the policies and procedures of the Reporting Bank for the identification, assessment, monitoring and control

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[705] For example, the "Guidelines on Risk Management Practices" issued by the Authority, "Range of Practices and Issues in Economic Capital Frameworks" issued by the BCBS in March 2009, and "Supervisory guidance for managing risks associated with the settlement of foreign exchange transactions" issued by the BCBS in February 2013.

[MAS Notice 637 (Amendment No. 2) 2018]

or mitigation of each material risk, and be adequately documented. A Reporting Bank shall set specific bank-wide prudential limits on material risks relevant to the Reporting Bank's activities, which are consistent with its risk taking appetite and capacity. A Reporting Bank shall define the limits in relation to its capital, total assets, earnings or, where adequate measures exist, its overall risk level. The Reporting Bank should also take into consideration its role in the financial system in defining the limits. The Reporting Bank shall implement a process for reviewing the policies, procedures and limits and for updating them as appropriate. With respect to new or complex products and activities[706], the Reporting Bank shall ensure that senior management understands the underlying assumptions regarding business models, valuation and risk management practices and evaluate the potential risk exposure if those assumptions fail;

(b) a Reporting Bank shall ensure that its Board and senior management have a sufficient understanding of each risk category and risk exposures on a firm-wide basis, and that its senior management possesses in-depth knowledge of these risk categories and is responsible for the effective implementation of the risk management framework, including its approval and regular review. The Reporting Bank shall also ensure that the Board and senior management have the necessary expertise to understand the capital markets activities in which the Reporting Bank is involved in – such as securitisation and off-balance sheet activities – and the associated risks;

(c) a Reporting Bank shall set out the responsibilities of senior management, business line managers and functional units managing the material risk, including clearly defined risk limits and reporting thresholds, in each risk management framework. A Reporting Bank shall clearly delineate the accountability and lines of authority. A Reporting Bank shall ensure that its risk function and its chief risk officer or equivalent position is independent of the individual business lines and reports directly to the chief executive officer and the Board;

(d) a Reporting Bank shall ensure regular monitoring of risk exposures and regular reporting of significant risk concerns to the Board. The Reporting Bank shall have in place procedures for reporting deviations from established policies to the Board or senior management, as appropriate; and

(e) a Reporting Bank shall subject each risk management framework to regular independent reviews.

2.2 A Reporting Bank shall ensure that appropriate members of senior management bring together the perspectives of the key business and control functions to achieve an understanding of risk exposures on a firm-wide basis and develop an integrated bank-wide

[706] A Reporting Bank shall ensure that the Board and senior management is responsible for identifying and reviewing the changes in bank-wide risks arising from these potential new products or activities and ensuring that the infrastructure and internal controls necessary to manage the related risks are in place, before a Reporting Bank embarks on introducing new products or activities. In the review, the Reporting Bank shall also consider the possible difficulty in valuing the new products and how they might perform in a stressed economic environment.

perspective on risk. A Reporting Bank shall ensure that senior management overcome organisational silos between business lines and share information on market developments, risks and risk mitigation techniques.

2.3 To enable proactive management of risk, the Reporting Bank shall have appropriate management information systems at the business and bank-wide level. The Reporting Bank shall ensure that the Board and senior management are responsible for implementing management information systems that are capable of providing regular, accurate and timely information on the Reporting Bank's aggregate risk profile, as well as the main assumptions used for risk aggregation. The Reporting Bank shall ensure that the management information systems are adaptable and responsive to changes in the Reporting Bank's underlying risk assumptions and incorporate multiple perspectives of risk exposure to account for uncertainties in risk measurement. The Reporting Bank shall ensure that the relevant information concerning the Reporting Bank's risk profile includes all risk exposures, including those that are off-balance sheet. The Reporting Bank shall subject third-party inputs or other tools used within the management information systems such as credit ratings, risk measures and models to initial and ongoing validation. The Reporting Bank shall ensure that the management information systems are sufficiently flexible to:

(a) allow for aggregation of exposures and risk measures across business lines;

(b) support customised identification of concentrations and emerging risks;

(c) support forward-looking bank-wide scenario analyses that capture management's interpretation of evolving market conditions and stressed conditions; and

(d) capture limit breaches.

2.4 A Reporting Bank shall ensure that the Board and senior management are responsible for mitigating the risks arising from remuneration policies in order to ensure effective bank-wide risk management. For a broad and deep risk management culture to develop and be maintained over time, the Reporting Bank shall ensure that compensation practices and policies are not unduly linked to short-term accounting profit generation. The Reporting Bank shall ensure that compensation policies are linked to longer-term capital preservation and the financial strength of the Reporting Bank and shall consider risk-adjusted performance measures. For further guidance, a Reporting Bank should refer to relevant publications issued by the BCBS and the Authority.

## Section 3: Credit Risk, Concentration Risk and Securitisation Risk

Introduction

3.1 A Reporting Bank shall, at a minimum, cover the following areas in its credit risk assessment for the purpose of capital adequacy:

(a) risk rating systems;

(b) portfolio analysis and aggregation;

(c) large exposures and risk concentrations;

(d) country and transfer risk; and

(e) securitisation and complex credit derivatives.

3.2 A Reporting Bank shall have internal credit risk rating systems capable of assessing credit risk exposures both on an individual obligor basis, as well as systems in place to analyse credit risk on a portfolio level. The Reporting Bank shall ensure that internal risk ratings are able to identify and measure risk from all credit exposures, and are integrated into the overall analysis of credit risk and capital adequacy of the Reporting Bank. The Reporting Bank shall ensure that the credit review process is comprehensive and, at a minimum, has the ability to -

(a) generate detailed ratings for all credit exposures;

(b) determine an adequate level of loan loss reserves;

(c) identify credit weakness at the portfolio level, especially large exposures and credit risk concentrations; and

(d) consider the risks involved in securitisation and complex credit derivative transactions.

3.3 A Reporting Bank using the SA(CR) shall assess exposures, regardless of whether they are rated or unrated, and determine whether the risk weights applied to such exposures under the SA(CR) are appropriate for their inherent risk. In those instances where it determines that the inherent risk of such an exposure, particularly if it is unrated, is significantly higher than that implied by the risk weight to which it is assigned, the Reporting Bank shall consider the higher degree of credit risk in the evaluation of its overall capital adequacy.

Concentration Risk

3.4 A risk concentration is a single exposure or group of exposures of similar risk characteristics (e.g. to the same borrower or counterparty, including protection providers, geographic area, industry or other risk factors) with the potential to produce –

(a) losses large enough (relative to a Reporting Bank’s earnings, capital, total assets or overall risk level) to threaten a Reporting Bank’s credit worthiness or ability to maintain its core operations; or

(b) a material change in a Reporting Bank’s risk profile.

3.5 Risk concentrations can arise from the assets, liabilities or off-balance sheet items of a Reporting Bank, through the execution or processing of transactions (either product or service), or through a combination of exposures across these broad categories. A Reporting Bank shall aggregate all similar direct and indirect exposures across its different business lines, regardless of where the exposures have been booked.

3.6 Risk concentrations, by their nature, are dependent on common vulnerabilities, which if realised, can have an adverse impact on individual exposures making up the

concentration. While concentration risk often arises due to direct exposures to obligors, a Reporting Bank may also incur a risk concentration to a particular asset type indirectly through investments backed by such assets (e.g. collateralised debt obligations) as well as exposure to protection providers guaranteeing the performance of specific asset types.

3.7 There are various types of credit risk concentration, including -

(a) significant credit exposures to an individual counterparty or group of related counterparties, commonly referred to as large exposures;

(b) credit exposures to counterparties in the same economic sector, industry, or geographic region;

(c) credit exposures to counterparties whose financial performance is dependent on the same activity or commodity or other common risk factors; and

(d) indirect credit exposures arising from investment and CRM activities of a Reporting Bank, for example, exposures to similar asset or collateral types or to credit protection provided by a single or closely related counterparty.

3.8 The growth of market-based intermediation has also increased the possibility that different areas of a Reporting Bank are exposed to a common set of products, risk factors or counterparties. Through its risk management processes and management information systems, a Reporting Bank shall be able to identify and aggregate similar risk exposures across the Reporting Bank, including across legal entities, asset types (e.g. loans, derivatives, structured products and off-balance sheet exposures), risk areas (e.g. exposures in the banking book and trading book) and geographic regions.

3.9 A Reporting Bank shall consider risks arising from concentrations that are based on common or correlated risk factors, such as correlations between market, credit and liquidity risks. A Reporting Bank should employ a number of techniques, as appropriate, to measure these concentrations. The techniques include shocks to various risk factors, use of business level and bank-wide scenarios, use of integrated stress testing and economic capital models.

3.10 For its concentration risk management programme, a Reporting Bank shall, amongst other things -

(a) ensure that the senior management of a Reporting Bank is responsible for developing policies and procedures for identifying, measuring, monitoring and controlling concentration risk in a timely manner. This shall be done at both the Solo and Group levels, and be commensurate with the overall risk appetite and strategic initiatives of the Reporting Bank. The Reporting Bank shall clearly assign responsibilities for the measurement and monitoring of risks and risk concentrations to a person or unit that is independent of any person or unit originating such risk exposures. The Reporting Bank shall ensure that the risk management framework for concentration risk is clearly documented;

(b) ensure that the Board reviews and endorses the risk management framework for concentration risk proposed by the management of the

Reporting Bank. The Reporting Bank shall regularly apprise the Board of the risk exposure and vulnerability of the Reporting Bank to risk concentrations, and ensure that adequate resources are devoted to effectively manage risk concentrations;

(c) clearly define risk concentrations relevant to the Reporting Bank, along with how these concentrations and their corresponding limits are to be measured. A Reporting Bank shall also have in place comprehensive management information and reporting systems to facilitate the identification and monitoring of risk concentrations across portfolios;

(d) have credible risk mitigation strategies in place that have senior management approval. This may include altering business strategies, reducing limits or increasing capital buffers in line with the desired risk profile. While a Reporting Bank implements risk mitigation strategies, it should be aware of possible concentrations that might arise as a result of employing risk mitigation techniques. A Reporting Bank shall have in place adequate, systematic procedures for identifying high correlation between the credit worthiness of a protection provider and the obligors of the underlying exposures due to their performance being dependent on common factors beyond systematic risk;

(e) establish internal limits that are reasonable in relation to its capital, total assets or, where adequate measures exist, its overall risk level. A Reporting Bank shall not set its internal limits based solely on regulatory capital requirements without regard for its own risk appetite;

(f) give attention to qualitative factors in the assessment of risk concentrations. This includes analysing how political, legal, regulatory, societal and market conditions might impact the borrowers of a Reporting Bank and the industries and countries in which the Reporting Bank operates;

(g) perform periodic scenario analysis and stress testing of material risk concentrations and analyse the results, to identify potential changes in key risk factors such as economic cycles, interest rate movements, liquidity and market conditions and to assess the ability of a Reporting Bank to withstand such changes. Possible stress scenarios that may have an impact on the performance and exposure of a Reporting Bank include a recession, a bird flu pandemic, an oil price hike or a natural disaster. In addition, the Reporting Bank shall ensure that scenarios consider possible concentrations arising from contractual and non-contractual contingent claims. Stress testing can also help to identify concentrations in the portfolios or different exposures of a Reporting Bank as seemingly uncorrelated exposures during normal market conditions may become correlated under stressed conditions. Individual Reporting Banks may develop different approaches to undertake such scenario analysis and stress tests, depending on their circumstances and risk profiles; and

(h) put in place adequate internal controls in the concentration risk management framework, including an independent review, to ensure the integrity of the information used by the Board and senior management.

3.11 Although risk concentrations are mitigated to some extent by the imposition of internal limits or supervisory limits, such risk is not explicitly taken into account under the Pillar 1 regulatory capital requirements. A Reporting Bank shall therefore consider the extent of its risk concentrations in its assessment of capital adequacy and, where appropriate, set aside additional capital to address such risk.

3.12 A Reporting Bank should observe the principles on credit concentration risk management set out in the BCBS document "Principles for the Management of Credit Risk (September 2000)", and any other relevant publications issued by the BCBS and the Authority in this area.

Residual Credit Risk Arising From CRM

3.13 CRM, such as collateral, guarantees and credit derivatives, can reduce Pillar 1 regulatory capital requirements for Reporting Banks. However, such techniques can give rise to other risks including legal, documentation, operational, liquidity and market risks (collectively known as "residual risk") that may reduce the effectiveness of CRM. Examples of such residual risk include the inability to realise in a timely manner the collateral pledged, the refusal or delay by a guarantor to pay and the legal enforceability of contracts.

3.14 While a Reporting Bank may meet the regulatory capital requirements under Pillar 1, such residual risks could result in the Reporting Bank having a greater than expected credit risk exposure to an underlying counterparty.

3.15 A Reporting Bank shall have in place an effective framework to manage residual risks from the use of CRM, including appropriate written CRM policies and procedures to manage and control residual risks. A Reporting Bank shall submit these policies and procedures to the Authority, where required by the Authority, and shall regularly review the appropriateness, effectiveness and operation of the policies and procedures. A Reporting Bank shall, amongst other things, do the following to ensure that the framework is effective:

(a) a Reporting Bank shall ensure that the Board and senior management are aware of and understand the CRM used by the Reporting Bank. A Reporting Bank shall clearly assign the responsibility for the management and monitoring of CRM to a person, unit or department within the Reporting Bank. A Reporting Bank shall ensure that procedures and controls to implement such policies are approved by senior management, who should possess adequate product knowledge for proper management of all material risks (e.g. credit, market, counterparty, legal and liquidity risks) associated with credit derivatives;

(b) a Reporting Bank shall have sound written policies and procedures covering strategy, consideration of the underlying credit, valuation, systems and management of concentration risk arising from the use of CRM and its interaction with the overall credit risk profile of the Reporting Bank. These shall clearly specify the acceptable types of CRM, the purposes for which such transactions are to be undertaken, as well as lending policies (e.g. advance rates). They shall be integrated into the overall risk management processes of the Reporting Bank;

(c) a Reporting Bank shall ensure that sound policies and procedures are accompanied by effective internal controls for the management of CRM activities. A Reporting Bank shall conduct sufficient legal review and have a well-founded legal basis to satisfy itself that the documentation used in CRM are binding on all parties and legally enforceable in all relevant jurisdictions. A Reporting Bank shall regularly monitor CRM activities and report significant concerns to its Board and senior management;

(d) when calculating capital requirements, a Reporting Bank shall consider whether it is appropriate to recognise the full value of the credit risk mitigant as permitted under Pillar 1. A Reporting Bank shall demonstrate that its CRM management policies and procedures are appropriate to the level of capital benefit it recognises; and

(e) a Reporting Bank shall implement regular independent reviews of the risk management process for CRM in accordance with paragraph 10.2.19. This helps ensure that policies and procedures are adhered to as well as facilitate the timely identification of internal control weaknesses or system deficiencies. This also helps to ensure compliance with the minimum operational requirements for CRM set out in Part VII.

3.16 A Reporting Bank shall evaluate its capital adequacy taking into account the residual risks arising from CRM and, where appropriate, set aside additional capital to address such risk.

3.17 For further guidance, a Reporting Bank should refer to "Risk Management Guidelines for Derivatives" issued by the BCBS in July 1994, Newsletter No. 16 on "High Cost Credit Protection" issued by the BCBS in December 2011, and any other relevant publications issued by the BCBS and the Authority in this area.

Counterparty Credit Risk ("CCR")

3.18 CCR is the risk of a counterparty to a transaction defaulting before the final settlement of the transaction. CCR generally refers to the bilateral credit risk of transactions with uncertain exposures that can vary over time with the movement of underlying market factors.

3.19 A Reporting Bank shall employ sound practices in managing all aspects of its exposures which give rise to CCR ("CCR exposures"), regardless of the methods used to compute its regulatory capital requirements under Pillar 1. As CCR represents a form of credit risk, a Reporting Bank shall observe, in relation to its CCR exposures, the requirements on stress testing, credit concentrations and residual risks associated with CRM set out in this Notice.

3.20 A Reporting Bank shall have in place CCR management policies, processes and systems that are conceptually sound and implemented with integrity relative to the sophistication and complexity of its CCR exposures. In order to have sound CCR policies, processes and systems, a Reporting Bank shall, amongst other things -

(a) ensure that its Board and senior management are actively involved in the CCR control processes of the Reporting Bank and regard this as an

essential aspect of the business to which significant resources are devoted to effectively manage CCR. Where the Reporting Bank is using an internal model for CCR, a Reporting Bank shall ensure that senior management is aware of the limitations and assumptions of the model used and the impact these can have on the reliability of the output, and also considers the uncertainties of the market environment (e.g. timing of realisation of collateral) and operational issues (e.g. pricing feed irregularities) and how these are reflected in the model. A Reporting Bank shall ensure that daily reports prepared on the CCR exposures are reviewed by a level of management with sufficient seniority and authority to enforce both reductions of positions taken by individual credit managers or traders and reductions in the overall CCR exposure of the Reporting Bank;

(b) establish sound and well-documented CCR management policies and procedures for identifying, measuring, approving, managing, monitoring and internal reporting of CCR exposures. For example, a Reporting Bank shall ensure that the CCR management manual of the Reporting Bank sets out the basic principles of the risk management system as well as provides an explanation of the empirical techniques used to measure CCR;

(c) ensure that its CCR management policies take account of the market, liquidity, legal and operational risks that can be associated with CCR and, to the extent practicable, inter-relationships among those risks. Before undertaking business with a counterparty, a Reporting Bank shall assess the creditworthiness of the counterparty and take due account of both settlement and pre-settlement credit risk. A Reporting Bank shall aggregate all credit exposures to each counterparty and manage these at the banking group level (i.e. aggregating credit exposures to the same counterparty across all the entities in the banking group);

(d) ensure that the CCR management system of a Reporting Bank is used in conjunction with internal credit and trading limits. A Reporting Bank shall relate credit and trading limits to the risk measurement model of the Reporting Bank, in a manner consistent over time and that is well understood by credit managers, traders and senior management;

(e) ensure that the measurement of CCR includes the monitoring of daily and intra-day usage of credit lines. A Reporting Bank shall measure current exposure gross and net of collateral held where such measures are appropriate and meaningful (e.g. OTC derivatives, SFTs). A Reporting Bank shall include the measurement and monitoring of peak exposure or potential future exposure at a confidence level chosen by the Reporting Bank at both the portfolio and counterparty levels in its limit monitoring system. A Reporting Bank shall take into account large or concentrated positions, including concentrations by groups of related counterparties, industry, market, customer investment strategies;

(f) monitor the appropriate risks and have processes to adjust its estimation of EPE when those risks become significant, in the case where a Reporting Bank has received approval from the Authority to use an internal model to estimate its exposure amount or EAD for CCR exposures. This includes the following:

(i) a Reporting Bank shall identify and manage its exposures to specific wrong-way risk;

(ii) for exposures with a rising risk profile after one year, a Reporting Bank shall compare on a regular basis the estimate of EPE over one year with the EPE over the life of the exposure; and

(iii) for exposures with maturities below one year, a Reporting Bank shall compare on a regular basis the replacement cost (current exposure) and the realised exposure profile, or store such data that would allow comparisons;

(g) have in place a routine and rigorous programme of stress testing as a supplement to the CCR analysis based on the day-to-day output of the risk measurement model of the Reporting Bank. A Reporting Bank shall ensure that stress-testing results are reviewed periodically by senior management and taken into account when setting the CCR policies and limits. Where stress tests reveal particular vulnerability to a given set of circumstances, a Reporting Bank shall ensure that management explicitly considers appropriate risk management strategies (e.g. hedging against that outcome or reducing the size of the exposures);

(h) have procedures in place for ensuring compliance with a documented set of internal policies, procedures and controls concerning the operation of the CCR management system; and

(i) conduct an independent review through its internal auditing process in accordance with Sub-division 5 of Part X of its CCR management system and process at regular intervals.[707] A Reporting Bank shall include both the activities of the business credit and trading units and of the independent CCR control unit in the independent review. A Reporting Bank shall ensure that, at a minimum, the review specifically addresses:

(i) the adequacy of the documentation of the CCR management system and process;

(ii) the organisation of the CCR control unit;

(iii) the integration of CCR measures into daily risk management;

(iv) the approval process for risk pricing models and valuation systems used by front and back-office personnel;

(v) the validation of any significant change in the CCR measurement process;

(vi) the scope of CCR captured by the risk measurement model;

(vii) the integrity of the management information system;

[707] The review should ideally be conducted not less than once a year.

(viii) the accuracy and completeness of CCR data;

(ix) the verification of the consistency, timeliness and reliability of data sources used to run internal models, including the independence of such data sources;

(x) the accuracy and appropriateness of volatility and correlation assumptions;

(xi) the accuracy of valuation and risk transformation calculations;

(xii) the verification of the accuracy of the model through frequent backtesting;

(xiii) the organisation of the collateral management unit; and

(xiv) the accurate reflection of legal terms in collateral and netting agreements into exposure measurements.

3.21 A Reporting Bank shall consider the extent of its CCR in its assessment of capital adequacy and, where appropriate, set aside additional capital to address such risk.

Securitisation

3.22 Securitisation provides a means for transforming relatively illiquid financial assets into liquid, tradable capital market instruments. A Reporting Bank shall implement an effective framework to manage risks from securitisation which includes the following elements:

(a) a Reporting Bank shall assign clearly responsibility for the management and monitoring of securitisations. A Reporting Bank shall ensure that its Board and senior management are aware of and understands the effect of securitisation on its risk profile as well as the legal, accounting, risk-based capital and potential reputational impact of this activity. A Reporting Bank shall ensure that senior management is responsible for the participation of the Reporting Bank in securitisations and provides direction on the strategy of the Reporting Bank for securitisation as well as its development of policies and procedures for managing, monitoring and controlling risks arising from securitisation activities;

(b) a Reporting Bank shall understand the credit quality and risk characteristics of the underlying exposures and have securitisation policies and procedures in place to ensure that prudent standards of credit assessment and approval relevant to its role in a securitisation are adhered to. A Reporting Bank shall conduct analyses of the underlying risks when investing in the structured products and shall not solely rely on the external credit ratings assigned to securitisation exposures by credit rating agencies. A Reporting Bank shall conduct credit analysis of a

securitisation exposure at acquisition and on an ongoing basis[708]. A Reporting Bank providing credit enhancement shall assess the risk thereof on an arm's length basis in accordance with its normal credit assessment and approval processes;

(c) a Reporting Bank with securitisation exposures shall take into account the credit risk arising from the underlying exposures in determining its overall exposures to any particular obligor, industry or geographic area for the purpose of managing concentration risks[709];

(d) a Reporting Bank undertaking a role in a securitisation shall satisfy itself that it is not subject to reputational risk, and where appropriate, disclose its obligations in order to mitigate that risk;

(e) a Reporting Bank shall have in place appropriate internal systems and controls to identify, monitor and manage the risks that arise from its involvement in securitisations. These risks include credit, market, liquidity and reputational risks of each exposure, potential delinquencies and losses on the underlying securitised exposures, exposures from credit lines or liquidity facilities to special purpose entities, and exposures from guarantees provided by monolines and other third parties. A Reporting Bank shall ensure that its securitisation exposures are monitored on an ongoing basis and that significant concerns are reported to its Board and senior management on a timely basis[710];

(f) a Reporting Bank shall assess the adequacy of the regulatory capital requirements stated in Part VII and all relevant and prevailing legislation and Notices as may be in force from time to time, for its securitisation exposures, whether retained or repurchased, taking into account the economic substance of those securitisation exposures. A Reporting Bank shall take account of the appropriateness of credit protection recognised against first loss credit enhancements or purchased on first loss retained securitisation positions in determining its economic capital[711];

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708 A Reporting Bank should have in place the necessary quantitative tools, valuation models and stress tests of sufficient sophistication to reliably assess all relevant risks, including any risk concentrations and correlation between underlying exposures. In addition, a Reporting Bank shall review the maturity of the exposures underlying structured credit transactions relative to the issued liabilities in order to assess potential maturity mismatches, in its assessment of economic capital.

709 A Reporting Bank shall track credit risk in securitisation exposures at the transaction level, and across securitisation exposures within each business line and across business lines, and produce reliable measures of aggregate risk. A Reporting Bank shall also track meaningful concentrations in securitisation exposures, such as name, product and sector concentrations, and feed this information to firm-side risk aggregation systems that track, for example, credit exposure to a particular obligor.

710 Securitisation exposures shall be included in the Reporting Bank's management information system to help ensure that senior management understands the implications of such exposures for liquidity, earnings, risk concentration and capital. A Reporting Bank shall have the necessary processes in place to capture, in a timely manner, updated information on securitisation transactions. This shall include market data, if available, and updated performance data from the securitisation trustee and servicer.

711 On such positions, expected loss is less likely to be a significant element of the risk and is likely to be retained by the protection buyer through the pricing. For example, the cost of protection may be equal to the recorded value of the first loss securitisation position, or the terms and conditions of the contract ensure that the premiums paid throughout the life of the contract equal the amount of the realised loss. The Reporting Bank shall consider the material costs of credit protection purchased that has not yet been recognised in earnings as a retained position of the Reporting Bank. If the Authority is not satisfied that the Reporting Bank's approach to recognising credit protection is adequate, action taken by the Authority may

(g) a Reporting Bank shall identify the various types of triggers[712], credit events and other legal provisions that may affect the performance of its on- and off-balance sheet exposures. A Reporting Bank shall integrate these triggers and provisions into its funding, liquidity, credit and balance sheet management and consider the impact on its liquidity and capital positions. A Reporting Bank shall consider the effects that changes in portfolio management or business strategies may have on the levels of excess spread and on the likelihood of an early amortisation event. For example, marketing strategies or underwriting changes that result in lower finance charges or higher charge-offs, might also lower excess spread levels and increase the likelihood of an early amortisation event;

(h) a Reporting Bank shall have in place reasonable methods for allocating economic capital against the economic substance of the credit risk arising from revolving securitisations and use techniques (e.g. static pool cash collections analyses and stress tests) to understand pool performance. A Reporting Bank shall have in place capital and liquidity contingency plans to evaluate the probability of an early amortisation occurring and to address the implications of scheduled and early amortisations of revolving securitisation as well as adverse and unanticipated changes and market disruptions (e.g. a market-wide disruption can prevent a Reporting Bank from securitising warehoused or pipeline exposures)[713]. The contingency plans shall also address how the Reporting Bank would address valuation challenges for potentially illiquid positions held for sale or for trading;

[MAS Notice 637 (Amendment No. 2) 2017]

(i) a Reporting Bank shall conduct a proper review, taking into consideration the rationale for the decision of the Reporting Bank to exercise a call and the impact of the call on the CET1 CAR, Tier 1 CAR and Total CAR of the Reporting Bank, prior to exercising a call; and

(j) a Reporting Bank shall subject the risk management process of the Reporting Bank for securitisation to regular independent review.

3.23 Where the Authority is not satisfied that the credit risk transfer arising from a securitisation is sufficient or existent, or that the risks arising from the securitisation are adequately addressed in the minimum capital requirement, action taken by the Authority

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include, but is not limited to, increasing the capital requirement against a particular transaction or class of transactions.

712 For example, the following factors affecting excess spread levels should be considered:
(a) Interest payments made by borrowers on the underlying receivable balances;
(b) Other fees and charges to be paid by the underlying obligors (e.g. late-payment fees, cash advance fees, over-limit fees);
(c) Gross write-offs;
(d) Principal payments;
(e) Recoveries on loans written off;
(f) Interchange fees;
(g) Interest paid on securitisation exposures held by investors;
(h) Macroeconomic factors such as bankruptcy rates, interest rate movements, unemployment rates; etc.

713 The sophistication of the Reporting Bank's system in monitoring the probability and risks of an early amortisation event shall be commensurate with the size and complexity of its securitisation activities that involve early amortisation provisions.

may include requiring a Reporting Bank to maintain capital additional to that required under Pillar 1, or directing a Reporting Bank to obtain a dedicated liquidity facility. Where a Reporting Bank retains or repurchases significant securitisation exposures based on the proportion of risk held by the Reporting Bank, the intent of a securitisation to transfer credit risk is undermined. A Reporting Bank shall transfer a significant portion of the credit risk and of the nominal value of the pool to at least one independent third party at inception and on an ongoing basis. Where the Reporting Bank repurchases risk for market making purposes, these positions should not be a whole tranche and should be resold within an appropriate period.

[MAS Notice 637 (Amendment No. 2) 2017]

3.24 The provision of implicit support[714] by a Reporting Bank to a securitisation signals to the market that the risk is still with the Reporting Bank and has not in effect been transferred[715]. Examples of implicit support to a securitisation include purchase of deteriorating credit risk exposures from the underlying pool, the sale of discounted credit risk exposures into the pool of securitised credit risk exposures, the purchase of underlying exposures at above market price or an increase in the first loss position according to the deterioration of the underlying exposures.

3.25 As set out in paragraph 7.6.10 of Part VII, where a Reporting Bank provides implicit support to a securitisation, it shall include all the underlying exposures of the securitisation in its calculation of credit RWA as if those exposures were on the balance sheet of the Reporting Bank. The aim is to require a Reporting Bank to hold capital against exposures for which the Reporting Bank assumes the credit risk, and to discourage the Reporting Bank from providing implicit support. If a Reporting Bank is found to have provided implicit support on more than one occasion, action taken by the Authority may include -

(a) requiring a Reporting Bank to hold capital against all securitised assets of a Reporting Bank, for example, by applying a conversion factor to the securitised assets as if the Reporting Bank has created a commitment to them, or requiring the Reporting Bank to treat all securitised assets of the Reporting Bank as if the underlying exposures were on the balance sheet of the Reporting Bank;

(b) requiring a Reporting Bank to maintain additional capital above the capital adequacy ratio requirements set out in Part IV; or

(c) disallowing a Reporting Bank from gaining capital relief on securitised assets for a period of time to be determined by the Authority.

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[714] Support to a transaction, whether contractual (i.e. credit enhancements provided at the inception of a securitised transaction) or non-contractual (implicit support) can take numerous forms, For example, contractual support can include over collateralisation, credit derivatives, spread accounts, contractual recourse obligations, subordinated notes, credit risk mitigants provided to a specific tranche, the subordination of fee or interest income or the deferral of margin income, and clean-up calls that exceed 10 percent of the initial issuance

[715] The provision of implicit support undermines the clean break criteria, which when satisfied would allow Reporting Banks to exclude the securitised assets from regulatory capital calculations.

The Authority may disallow a Reporting Bank from gaining capital relief for planned securitisation transactions pending investigations by the Authority to determine implicit support provided by a Reporting Bank to a securitisation[716].

3.26 A Reporting Bank shall not make use of clauses that entitle the Reporting Bank to call the securitisation transaction or the coverage of credit protection prematurely where the Reporting Bank's exposure to losses or deterioration in the credit quality of the underlying exposures would be increased. A Reporting Bank should only execute clean-up calls for economic business purposes, such as when the cost of servicing the outstanding credit exposures exceeds the benefits of servicing the underlying credit exposures. Where the calls are date-related, the calls shall be set at a date no earlier than the duration or the weighted average life of the underlying securitisation exposures.

3.27 A Reporting Bank shall evaluate its capital adequacy taking into account the risks arising from securitisation, including new features of securitisation as they arise, and, where appropriate, set aside additional capital to address such risk.

## Section 4: Market Risk and Valuation Practices

<u>General Principles for the Management of Market Risk</u>

4.1 A Reporting Bank shall use methodologies that enable it to assess and actively manage all material market risks, wherever they arise - at position, desk, business line and bank group-wide level. For further guidance, a Reporting Bank should refer to relevant publications on the management of market risk issued by the BCBS and the Authority[717].

4.2 A Reporting Bank shall, in its assessment of the adequacy of the capital it maintains for market risk, base its assessment, at a minimum, on both VaR modelling and appropriate stress testing. This is especially relevant to banks with significant treasury trading activities. A Reporting Bank shall also assess the market concentration risk these instruments might pose and the impact of market illiquidity of such instruments under stressful market scenarios.

[MAS Notice 637 (Amendment No. 2) 2014]

4.3 A Reporting Bank shall ensure that the VaR model is adequate for identifying and measuring risks arising from all its trading activities and is integrated into the overall internal capital assessment of the Reporting Bank and subjected to rigorous ongoing validation. The Reporting Bank shall also ensure that estimates of its VaR model are sensitive to changes in the trading book risk profile.

4.4 While VaR is an important tool in monitoring aggregate market risk exposures and provides a common metric for comparing the risk being run by different desks and business lines, it has its limitations. A Reporting Bank shall supplement its VaR model

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[716] The aim of the supervisory response in such cases would be to change the Reporting Bank's behaviour with regards to the provision of implicit support, and to correct market perception as to the willingness of the Reporting Bank to provide future recourse beyond contractual obligations.

[717] For example, the "Supervisory guidance for managing risks associated with the settlement of foreign exchange transactions" issued by the BCBS in February 2013.

[MAS Notice 637 (Amendment No. 2) 2017]

with stress tests (e.g. factor shocks or integrated scenarios, whether historic or hypothetical) and other appropriate risk management techniques.

4.5 In the internal capital assessment of the Reporting Bank, the Reporting Bank shall demonstrate that it has enough capital to not only meet the regulatory capital requirements under Pillar 1, but also to withstand a range of severe but plausible market shocks. In particular, it shall factor in, where appropriate -

(a) market illiquidity and pricing gaps;

(b) concentrated positions (in relation to market turnover);

(c) one-way markets;

(d) non-linear products or deep out-of-the money positions;

(e) events and jumps-to-defaults;

(f) significant shifts in correlations; and

(g) other risks that may not be captured appropriately in VaR (e.g. recovery rate uncertainty, implied correlations or skew risk).

4.6 The stress tests applied by a Reporting Bank and, in particular, the calibration of those tests (e.g. the parameters of the shocks or types of events considered) should be reconciled back to a clear statement setting out the premise upon which the internal capital assessment of the Reporting Bank is based (e.g. ensuring there is adequate capital to manage the traded portfolios within stated limits through what may be a prolonged period of market stress and illiquidity, or that there is adequate capital to ensure that, over a given time horizon to a specified confidence level, all positions can be liquidated or the risk hedged in an orderly fashion).

4.7 A Reporting Bank shall ensure that the market shocks applied in the stress tests reflect the nature of portfolios and the time it would take to hedge out or manage risks under severe market conditions. In particular, the Reporting Bank shall pro-actively manage and assess concentration risk. The Reporting Bank shall routinely report concentrated positions to senior management.

4.8 A Reporting Bank shall design its market risk management process and system, including the VaR methodology and stress tests, to properly measure the material risks in the instruments it trades as well as the trading strategy it pursues. As products and trading strategy change, the Reporting Bank shall ensure that the VaR methodology and stress tests also evolve to accommodate the changes.

4.9 A Reporting Bank shall demonstrate how it combines its risk measurement approaches to arrive at the overall internal capital for market risk.

4.10 A Reporting Bank shall maintain sufficient capital to meet the regulatory capital requirements under Pillar 1 and to cover the results of its market risk stress tests. The Authority shall consider whether a Reporting Bank has sufficient capital for these purposes, where required, taking into account the nature and scale of the Reporting Bank's trading activities, and any other relevant factors such as valuation adjustments made by the

Reporting Bank. To the extent that a Reporting Bank does not have sufficient capital to meet the regulatory capital requirements under Pillar 1 and to cover the results of its market risk stress tests, or if the Authority is not satisfied with the premise upon which the Reporting Bank's internal capital assessment for market risk is based, the Authority shall take appropriate action, which may include instructing the Reporting Bank to reduce its risk exposures or maintain additional capital, so that it meets the regulatory capital requirements under Pillar 1 and results of a stress test acceptable to the Authority.

[MAS Notice 637 (Amendment No. 2) 2014]

Policies and Procedures for Trading Book Eligibility

4.11 In order to ensure consistency and integrity in the computation of regulatory capital for the trading book of a Reporting Bank, the Reporting Bank shall establish clear policies and procedures to determine those exposures that may be included in, and those that shall be excluded from, the trading book. In addition, a Reporting Bank shall ensure that transfers of positions between banking and trading books occur only in a very limited set of circumstances.

4.12 A Reporting Bank shall demonstrate to the Authority that its policies and procedures clearly delineate the boundaries of its trading book, and is consistent with its risk management capabilities and practices.

Valuation

4.13 Prudent valuation policies and procedures are the foundation on which a robust assessment of market risk capital adequacy should be built. In this regard, a Reporting Bank shall establish sound valuation policies and procedures adopting international best practices wherever possible.

4.14 A Reporting Bank shall have adequate governance structures and control processes, that explicitly cover the role of the Board and senior management, for the fair valuation of exposures for risk management and financial reporting purposes. The Reporting Bank shall ensure that the valuation governance structures and processes are consistent for both risk management and reporting purposes. A Reporting Bank shall also have clear and robust governance structures for the production, assignment and verification of financial instrument valuations. The Reporting Bank shall ensure that its Board receive reports from senior management on the valuation oversight and valuation model performance issues that are brought to senior management for resolution, and all significant changes to valuation policies. A Reporting Bank shall ensure that the approvals of all valuation methodologies are well documented. In addition, the Reporting Bank shall set forth the range of acceptable practices for initial pricing, marking-to-market, valuation adjustments and periodic independent revaluation in its policies and procedures. The Reporting Bank shall also include all internal stakeholders relevant to risk measurement, risk control, and the assignment and verification of valuations of financial instruments as part of the new product approval process.

4.15 A Reporting Bank shall apply control processes for measuring and reporting valuations consistently across the Reporting Bank and integrate these control processes with risk measurement and management processes. In particular, the Reporting Bank shall ensure that valuation controls are applied consistently across similar instruments and risks, and across business lines. The Reporting Bank shall subject these controls to

internal audit. Regardless of the booking location of a new product, the Reporting Bank shall ensure that reviews and approval of valuation methodologies are guided by a minimum set of considerations. Furthermore, the Reporting Bank shall ensure that the approval process is supported by a transparent, well-documented inventory of acceptable valuation methodologies that are specific to products and businesses.

4.16 The Reporting Bank shall demonstrate to the Authority that it has maintained sufficient capital to close out or hedge its positions within ten days in an orderly fashion even in adverse market conditions.

4.17 A Reporting Bank shall consider whether additional capital should be maintained for portfolios exhibiting certain characteristics such as -

(a) less well diversified portfolios;

(b) portfolios containing less liquid instruments;

(c) portfolios with concentrations in relation to market turnover; and

(d) portfolios which contain large numbers of positions that are marked-to-model.

4.18 A Reporting Bank shall ensure that it maintains sufficient capital for portfolios with limited liquidity or price transparency as these characteristics undermine the effectiveness of the model that the Reporting Bank may use to capture the specific risk of such instruments.

4.19 A Reporting Bank shall have adequate capacity, including during periods of stress, to establish and verify valuations for instruments and transactions in which it engages. The Reporting Bank shall ensure that this capacity is commensurate with the importance, riskiness and size of the exposures in the context of the business profile of the institution. In addition, for those exposures that represent material risk, a Reporting Bank shall have the capacity to produce valuations using alternative methods in the event that primary inputs and approaches become unreliable, unavailable or not relevant due to market discontinuities or illiquidity. A Reporting Bank shall test and review the performance of its models under stress conditions so that it understands the limitations of the models under stress conditions.

4.20 The relevance and reliability of valuations is directly related to the quality and reliability of the inputs. A Reporting Bank shall apply the accounting guidance provided to determine the relevant market information and other factors likely to have a material effect on an instrument's fair value when selecting the appropriate inputs to use in the valuation process. Where values are determined to be in an active market, a Reporting Bank shall maximise the use of relevant observable inputs and minimise the use of unobservable inputs when estimating fair value using a valuation technique. However, where a market is deemed inactive, observable inputs or transactions may not be relevant, such as in a forced liquidation or distress sale, or transactions may not be observable, such as when markets are inactive. In such cases, accounting fair value guidance provides assistance on what should be considered, but may not be determinative. In assessing whether a source is reliable and relevant, a Reporting Bank shall consider, among other things:

(a) the frequency and availability of the prices and quotes;

(b) whether those prices represent actual regularly occurring transactions on an arm's length basis;

(c) the breadth of the distribution of the data and whether it is generally available to the relevant participants in the market;

(d) the timeliness of the information relative to the frequency of valuations;

(e) the number of independent sources that produce the quotes/prices;

(f) whether the quotes/prices are supported by actual transactions;

(g) the maturity of the market; and

(h) the similarity between the financial instrument sold in a transaction and the instrument held by the Reporting Bank.

4.21 A Reporting Bank's public disclosures shall provide timely, relevant, reliable and decision-useful information that promotes transparency. The Reporting Bank shall ensure that senior management consider whether disclosures around valuation uncertainty can be made more meaningful. For instance, the Reporting Bank may describe the modelling techniques and the instruments to which they are applied; the sensitivity of fair values to modelling inputs and assumptions; and the impact of stress scenarios on valuations. A Reporting Bank shall regularly review its disclosure policies to ensure that the information disclosed continues to be relevant to its business model and products, and to current market conditions.

4.22 For further guidance, a Reporting Bank should refer to "Supervisory Guidance for Assessing Banks' Financial Instrument Fair Value Practices" issued by the BCBS in April 2009, and any other relevant publications issued by the BCBS and the Authority in this area.

**Section 5: Interest Rate Risk in the Banking Book**

[MAS Notice 637 (Amendment No. 2) 2018 (Replacement of this Section in its entirety)]

5.1 IRRBB is the risk to the Reporting Bank's capital and earnings arising from adverse movements in interest rates that affect the Reporting Bank's banking book positions.

5.2 There are three main types of IRRBB that may potentially change the value or earnings of interest rate-sensitive assets, liabilities and off-balance sheet items in a way, or at a time, that can adversely affect the Reporting Bank's financial condition –

(a) gap risk, which describes the risk arising from the term structure of banking book instruments, and the timing of interest rate changes;

(b) basis risk, which describes the risk arising from relative changes in interest rates for banking book instruments that have similar tenors but are priced using different interest rate indices; and

(c) option risk, which describes the risk arising from option derivative positions or from optionalities embedded in a Reporting Bank's assets, liabilities and off-balance sheet items in the banking book, where the Reporting Bank or counterparty can alter the level and timing of their cash flows. Option risk can be further characterised into automatic option risk and behavioural option risk.

5.3 A Reporting Bank shall identify its sources of IRRBB, IRRBB exposures and take appropriate steps to measure, monitor and control IRRBB.

5.4 A Reporting Bank shall –

(a) identify any IRRBB inherent in the products held or offered by it, and the activities carried out by it; and

(b) ensure that such products and activities are subject to adequate procedures and controls.

5.5 A Reporting Bank shall –

(a) ensure that its internal policies require the approval of significant hedging or risk management strategies to be obtained before being implemented;

(b) ensure that the approval of its significant hedging or risk management strategies is obtained in accordance with its internal policies;

(c) conduct a pre-acquisition review of all products and activities that are new to it to ensure that it understands the IRRBB associated with such products and activities;

(d) subject such products and activities to a predetermined test phase before fully rolling out the product or commencing the activity;

(e) put in place adequate operational procedures and risk control systems to measure, monitor and control IRRBB prior to introducing a new product, hedging or risk-taking strategy; and

(f) ensure that the management of its IRRBB is integrated within its broader risk management framework and aligned with its business planning and budgeting activities.

5.6 CSRBB refers to any kind of asset or liability spread risk of instruments with credit risk that is not explained by IRRBB or by the expected credit or jump to default risk. A Reporting Bank should monitor and assess CSRBB in their interest rate risk management framework.

IRRBB Management Framework and Risk Appetite

5.7 A Reporting Bank shall –

(a) have in place an adequate IRRBB management framework to effectively manage IRRBB; and

(b) ensure that the framework is reviewed and evaluated for effectiveness by an independent party on a regular basis.

5.8 Notwithstanding paragraph 5.9 of this Annex, a Reporting Bank shall ensure that the Board is responsible for oversight of –

(a) the IRRBB management framework referred to in paragraph 5.7 of this Annex; and

(b) the Reporting Bank's risk appetite for IRRBB.

5.9 The Board may delegate the task of developing IRRBB policies and practices to the senior management of the Reporting Bank or an asset and liability management committee ("ALCO") (collectively referred to in this Section as "delegates").

5.10 Where the Board has made a delegation under paragraph 5.9 of this Annex, the Reporting Bank shall do the following –

(a) where the task for developing IRRBB policies and practices is delegated to an ALCO, ensure that the ALCO meets regularly and includes representatives from each major department connected to IRRBB[718];

(b) ensure that the Board clearly identifies the delegates for managing IRRBB and oversees the adequate separation of responsibilities in key elements of the risk management process to avoid potential conflicts of interest;

(c) ensure that the delegates have clear lines of authority over the units responsible for establishing and managing IRRBB positions and that there is a clear communication channel to convey the delegates' directives to these units;

(d) ensure that the Board puts in place an organisational structure that enables the delegates to carry out their responsibilities effectively and facilitates effective decision-making and good governance. The Board should encourage discussions between its members and the delegates, as well as between the delegates and others in the bank, regarding the IRRBB management process.

5.11 For the purposes of paragraph 5.8 of this Annex, a Reporting Bank shall do the following –

[718] For example, this includes a department which is –
(a) responsible for the risk identification, measurement, monitoring or control of IRRBB; or
(b) responsible for risk-taking functions that contribute to the Reporting Bank's IRRBB.

(a) ensure that the Board –

   (i) understands the nature and the level of the Reporting Bank's IRRBB exposure;

   (ii) approves broad business strategies and overall policies with respect to IRRBB; and

   (iii) provides clear guidance regarding the acceptable level of IRRBB, given the Reporting Bank's business strategies;

(b) ensure that the Board is responsible for ensuring that senior management has the capability and skills to understand IRRBB, and that adequate resources are devoted to IRRBB management;

(c) ensure that the Board oversees the steps taken to identify, measure, monitor and control IRRBB and ensure that they are consistent with the approved strategies and policies of the Reporting Bank;

(d) ensure that the Board or, where the Board has made a delegation under paragraph 5.9 of this Annex, the delegates, establishes the following –

   (i) appropriate limits on IRRBB, including the definition of specific procedures and approvals necessary for exceptions, and ensuring compliance with those limits;

   (ii) adequate systems and standards for measuring IRRBB;

   (iii) standards for measuring IRRBB, valuing positions and assessing performance, including procedures for updating interest rate shock and stress scenarios and key underlying assumptions driving the Reporting Bank's IRRBB analysis;

   (iv) a comprehensive IRRBB reporting and review process; and

   (v) effective internal controls and management information system;

(e) ensure that the Board or, where the Board has made a delegation under paragraph 5.9 of this Annex, the delegates, oversees the approval, implementation and review of IRRBB management policies, procedures and limits. The Reporting Bank should inform the Board regularly (at least semi-annually) on the level and trend of the Reporting Bank's IRRBB exposures;

(f) where the Board has made a delegation under paragraph 5.9 of this Annex, ensure that the Board regularly reviews timely information that is sufficiently detailed to allow it to understand and assess the performance of the delegates in monitoring and controlling IRRBB in compliance with policies approved by the Board. The Reporting Bank shall carry out such reviews more frequently when the Reporting Bank runs significant IRRBB exposures or has positions in complex IRRBB instruments;

(g) ensure that the Board understands the implications of the Reporting Bank's IRRBB strategies, including the potential linkages with, and impact on, market, liquidity, credit and operational risks;

(h) ensure that more than one member of the Board has sufficient technical knowledge to be able to question and challenge any report concerning IRRBB that is presented to the Board;

(i) have IRRBB identification, measurement, monitoring and control functions with clearly defined responsibilities that are sufficiently independent from risk-taking functions of the Reporting Bank and that report IRRBB exposures directly to the Board or its delegates;

(j) ensure that its risk management and strategic planning areas communicate regularly to facilitate evaluations of risk arising from future business.

5.12 For the purposes of paragraph 5.7 of this Annex, a Reporting Bank shall do the following as part of its IRRBB management process –

(a) implement adequate internal controls that promote effective and efficient operations, reliable financial and regulatory reporting, and compliance with relevant laws, regulations and bank policies;

(b) with regard to IRRBB control policies and procedures, implement appropriate approval processes, exposure limits, reviews and other mechanisms designed to provide a reasonable assurance that risk management objectives are being achieved;

(c) ensure that evaluations and reviews of the Reporting Bank's internal control system and risk management processes, including that personnel comply with established policies and procedures, are conducted on a regular basis by individuals who, or units which, are independent of the functions that they are assigned to evaluate and review;

(d) ensure that the evaluations and reviews done pursuant to sub-paragraph (c) address any significant change, including any change in market conditions, personnel, technology and structures of compliance with exposure limits, which may affect the effectiveness of controls and that there are appropriate escalation procedures for any exceeded limits;

(e) where revisions or enhancements to internal controls are warranted, ensure that an internal review mechanism is in place to ensure that such revisions or enhancements to internal controls are implemented in a timely manner;

(f) ensure that its IRRBB identification, measurement, monitoring and control processes are reviewed by an independent auditing function (such as an internal or external auditor) on a regular basis;

(g) where a written report has been produced in respect of a review under sub-paragraph (f), by the internal or external auditors or other equivalent

external parties (such as consultants) which conducted the review, make the written report available to the Authority.

5.13 A Reporting Bank should have clearly defined risk appetite statements[718A] that are approved by the Board and implemented through comprehensive risk appetite frameworks[718B].

5.14 The Reporting Bank should articulate its risk appetite for IRRBB in terms of the risk to both economic value and earnings.

5.15 The Reporting Bank should ensure that the risk appetite framework referred to in paragraph 5.13 of this Annex –

(a) delineates delegated powers, lines of responsibility and accountability over IRRBB management decisions; and

(b) clearly defines authorised instruments, hedging strategies and risk-taking opportunities.

5.16 The Reporting Bank shall ensure that all IRRBB policies are periodically reviewed[718C].

5.17 A Reporting Bank shall implement policy limits set by the Board that target maintaining IRRBB exposures that are consistent with the Reporting Bank's risk appetite.

5.18 For the purposes of paragraph 5.17 of this Annex, the Reporting Bank shall do the following –

(a) before implementing the policy limits set by the Board, ensure that such limits are consistent with the Reporting Bank's overall approach for measuring IRRBB;

(b) apply aggregate risk limits, clearly articulating the amount of IRRBB acceptable to the Board, on a consolidated basis and, as appropriate, at the level of individual affiliates. Limits may be associated with specific scenarios of changes in interest rates or term structures, such as an increase or decrease of a particular size or a change in shape. The interest rate movements used in developing these limits shall represent meaningful shock and stress situations, taking into account historical interest rate volatility and the time required by management to mitigate those risk exposures;

(c) ensure that policy limits to be implemented are appropriate to the nature, size, complexity and capital adequacy of the Reporting Bank, as well as its ability to measure and manage its risks. Depending on the nature of the Reporting Bank's activities and business model, the Reporting Bank may also identify sub-limits for individual business units, portfolios, instrument types or specific instruments. The Reporting Bank shall ensure that the

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[718A] A risk appetite statement is a written articulation of the aggregated level and types of IRRBB exposures that a Reporting Bank will accept, or avoid, in order to achieve its business objectives.

[718B] A risk appetite framework refers to policies and procedures for limiting and controlling IRRBB.

[718C] A Reporting Bank should review its IRRBB policies at least annually, and revise its IRRBB policies as needed.

level of detail of risk limits reflects the characteristics of the Reporting Bank's holdings, including the various sources of the Reporting Bank's IRRBB exposures. A Reporting Bank with significant exposures to gap risk, basis risk or positions with explicit or embedded options should establish risk tolerances appropriate for these risks;

(d) ensure that the Board or its delegates, as the case may be, approve major hedging or risk-taking initiatives in advance of implementation. The Reporting Bank should develop a dedicated set of risk limits to monitor the evolution of hedging strategies that rely on instruments such as derivatives, and to control mark-to-market risks in instruments that are accounted for at market value. The Reporting Bank should assess proposals to use new instrument types or new strategies (including hedging) to ensure that the resources required to establish sound and effective IRRBB management of the product or activity have been identified, that the proposed activities are in line with the Reporting Bank's overall risk appetite, and procedures to identify, measure, monitor and control the risks of the proposed product or activity have been established. The Reporting Bank shall ensure that positions related to internal risk transfers between the banking book and the trading book are properly documented;

(e) put in place systems to ensure that positions that exceed, or are likely to exceed, limits defined by the Board or its delegates are escalated to the Board or the delegates without delay and receive prompt management attention. The Reporting Bank shall ensure that there is a clear policy on who will be informed, how the communication will take place and the actions which will be taken in response to an exception[718D].

IRRBB Measurement

5.19 Except where paragraph 5.20 of this Annex applies, a Reporting Bank shall –

(a) have in place its own IMS to measure its IRRBB;

(b) adopt the SA(IR) wholly as its IMS; or

(c) adopt the SA(IR) in part as its IMS, and have in place its own IMS to measure its IRRBB in the parts where the SA(IR) is not adopted.

5.20 The Authority may, as it considers necessary, require a Reporting Bank to adopt the SA(IR), wholly or in part, as its IMS. Where the Authority requires a Reporting Bank to adopt the SA(IR) in part as its IMS, the Reporting Bank shall have in place its own IMS to measure its IRRBB in the parts where the SA(IR) is not adopted.

5.21 A Reporting Bank shall capture all material sources of IRRBB and assess the effect of market changes on the scope of its activities through its IMS.

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[718D] A Reporting Bank may set limits that are absolute in the sense that they should never be exceeded or in a manner where, under specific circumstances, breaches of such limits are tolerated for a predetermined short period of time.

5.22 A Reporting Bank should ensure that its IRRBB policy takes into account the impact of an interest rate shock on its economic value, as well as the Reporting Bank's ability to generate stable earnings sufficient to maintain its normal business operations. A Reporting Bank should pay attention to the complementary nature of economic value and earnings-based measures in their risk and internal capital assessments, in particular in terms of –

(a) outcomes, where economic value measures compute a change in the net present value of the Reporting Bank's assets, liabilities and off-balance sheet items subject to specific interest rate shock and stress scenarios, while earnings-based measures focus on changes to future profitability within a given time horizon eventually affecting future levels of the Reporting Bank's own equity capital;

(b) assessment horizons, where economic value measures reflect changes in value over the remaining life of the Reporting Bank's assets, liabilities and off-balance sheet items, that is, until all positions have run off, while earnings-based measures cover only the short to medium term, and therefore do not fully capture those risks that will continue to impact profit and loss accounts beyond the period of estimation; and

(c) future business or production, where economic value measures consider the net present value of repricing cash flows of instruments on the Reporting Bank's balance sheet or accounted for as an off-balance sheet item (that is, a run-off view). In addition to a run-off view, earnings measures may assume rollover of maturing items (that is, a constant balance sheet view), or assess the scenario-consistent impact on the Reporting Bank's future earnings inclusive of future business (that is, a dynamic view[718E]), or both.

5.23 A Reporting Bank shall measure its IRRBB by assessing the potential impact of interest rate shock and stress scenarios on its economic value and earnings[718F].

5.24 For the purposes of paragraph 5.23 of this Annex, a Reporting Bank shall ensure that its IMS for IRRBB is able to calculate the impact on its economic value and earnings of multiple scenarios, based on the following –

(a) interest rate shock scenarios selected by the Reporting Bank addressing the Reporting Bank's risk profile, according to its ICAAP;

(b) historical and hypothetical interest rate stress scenarios, which tend to be more severe than shock scenarios;

(c) the six standardised interest rate shock scenarios set out in Annex 10C;

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[718E] A dynamic view can be useful for business planning and budgeting purposes. However, dynamic approaches are dependent on key variables and assumptions that are extremely difficult to project with accuracy over an extended period and can potentially hide certain key underlying risk exposures.

[718F] While the economic value and earnings-based measures share certain commonalities, it is important to manage IRRBB through both measures. If a Reporting Bank solely minimises its economic value risk by matching the repricing of its assets with liabilities beyond the short term, it could run the risk of earnings volatility.

(d) any additional interest rate shock scenarios required by the Authority.

5.25 For the purposes of paragraph 5.23 of this Annex, the Reporting Bank shall carry out the following –

(a) measure its vulnerability to loss under stressful market conditions, which should include conditions under which key business assumptions and parameters break down, and consider those results when establishing and reviewing their policies and limits for IRRBB;

(b) develop and implement an effective stress testing framework for IRRBB as part of its broader risk management and governance processes which shall feed into the decision-making process at the appropriate management level, including strategic decisions (for example, business and capital planning decisions) of the Board or its delegates;

(c) ensure that IRRBB stress testing is considered in its ICAAP, and is rigorous, forward-looking and identifies events of severe changes in market conditions which could adversely impact the Reporting Bank's capital or earnings, including through changes in the behaviour of its customer base;

(d) develop a stress testing framework for IRRBB that includes clearly defined objectives, scenarios tailored to the Reporting Bank's businesses and risks, well-documented assumptions and sound methodologies, and is commensurate with the Reporting Bank's nature, size and complexity as well as business activities and overall risk profile;

(e) use the framework to assess the potential impact of the scenarios on the Reporting Bank's financial condition, enable ongoing and effective review processes for stress tests and recommend actions based on the stress test results;

(f) ensure that IRRBB stress tests are used in the communication of risks, within the Reporting Bank, with the Authority, and with the market through appropriate disclosures.

5.26 A Reporting Bank should have in place a selection process for its internal interest rate shock and stress scenarios by doing the following –

(a) have in place a stress testing framework for IRRBB which ensures that the opinions of the various experts on IRRBB in the Reporting Bank are taken into account. The identification of relevant shock and stress scenarios for IRRBB, the application of sound modelling approaches and the appropriate use of the stress testing results require the collaboration of different experts[718G] within a Reporting Bank;

(b) determine, by currency, a range of potential interest rate movements against which the Reporting Bank will measure its IRRBB exposures, and

[718G] This could include for example, traders, the treasury department, the finance department, the ALCO, the risk management and risk control departments and the Reporting Bank's economists.

ensure that risk is measured under a reasonable range of potential interest rate scenarios, including some containing severe stress elements. In developing the scenarios, the Reporting Bank should consider a variety of factors, such as the shape and level of the current term structure of interest rates and the historical and implied volatility of interest rates. In low interest rate environments, the Reporting Bank should also consider negative interest rate scenarios and the possibility of asymmetrical effects of negative interest rates on their assets and liabilities;

(c) consider the nature and sources of its IRRBB exposures, the time it would need to take action to reduce or unwind unfavourable IRRBB exposures, and its capability and willingness to withstand accounting losses in order to reposition its risk profile. The Reporting Bank should select scenarios that provide meaningful estimates of risk and include a range of shocks that is sufficiently wide to allow the Board or its delegates, as the case may be, to understand the risks inherent in the Reporting Bank's products and activities. When developing interest rate shock and stress scenarios for IRRBB, the Reporting Bank should –

(i) have scenarios which are sufficiently wide-ranging to identify parallel and non-parallel gap risk, basis risk and option risk. In many cases, static interest rate shocks may be insufficient to assess IRRBB exposure adequately. A Reporting Bank should ensure that the scenarios are both severe and plausible, in light of the existing level of interest rates and the interest rate cycle;

(ii) give special consideration to instruments or markets where concentrations exist, because those positions may be more difficult to liquidate or offset in a stressful market environment;

(iii) assess the possible interaction of IRRBB with its related risks, as well as other risks (for example, credit risk and liquidity risk);

(iv) assess the effect of adverse changes in the spreads of new assets and liabilities which are replacing those assets and liabilities maturing over the horizon of the forecast on their NII;

(v) where the Reporting Bank has significant option risk, include scenarios that capture the exercise of such options. For example, a Reporting Bank that has products with sold caps or floors should include scenarios that assess how the risk positions would change should those caps or floors move into the money. Given that the market value of options fluctuates with changes in the volatility of interest rates, a Reporting Bank should develop interest rate assumptions to measure its IRRBB exposures to changes in interest rate volatilities; and

(vi) specify the assumptions used in building its interest rate shock and stress scenarios such as the term structure of interest rates that will be incorporated and the basis relationship between yield curves and between rate indices. The Reporting Bank should also estimate how interest rates that are administered or managed (for example, prime

rates or retail deposit rates, as opposed to those that are purely market-driven) might change, and should document how these assumptions are derived;

(d) incorporate into forward-looking scenarios –

(i) changes in portfolio composition due to factors under the control of the Reporting Bank (for example, its acquisition and production plans), as well as external factors (for example, changing competitive, legal or tax environments);

(ii) the introduction of new products where only limited historical data are available; and

(iii) new market information and new emerging risks that are not necessarily covered by historical stress episodes;

(e) perform qualitative and quantitative reverse stress tests[718H] in order to –

(i) identify interest rate scenarios that could severely threaten the Reporting Bank's capital and earnings; and

(ii) reveal vulnerabilities arising from its hedging strategies and the potential behavioural reactions of its customers.

5.27 In measuring IRRBB, a Reporting Bank shall ensure that its key behavioural and modelling assumptions are fully understood, conceptually sound and reasonable, consistent with historical experience, and documented.

5.28 The Reporting Bank should ensure that all behavioural and modelling assumptions in measuring IRRBB are rigorously tested and aligned with the Reporting Bank's business strategies.

5.29 A Reporting Bank shall –

(a) when assessing its IRRBB exposure, make judgments and assumptions[718I] about how an instrument's actual maturity or repricing behaviour may vary from the instrument's respective contractual terms because of behavioural optionalities, for the following products –

(i) fixed rate loans subject to prepayment risk;

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718H Refer to Principle 9 of "Principles of sound stress testing practices and supervision" issued by the BCBS in May 2009.

718I Both economic value and earnings-based measures of IRRBB can be significantly impacted by a number of assumptions made for the purposes of risk quantification, namely –
(a) expectations for the exercise of interest rate options (explicit and embedded) by both the Reporting Bank and its customers under specific interest rate shock and stress scenarios;
(b) treatment of balances and interest flows arising from non-maturity deposits (NMDs);
(c) treatment of own equity in economic value measures; and
(d) the implications of accounting practices for IRRBB.

(ii) fixed rate loan commitments[718J];

(iii) term deposits subject to early redemption risk;

(iv) NMDs;

(v) any other product that the Reporting Bank considers relevant;

(b) assess exposures in each currency since yield curves vary from currency to currency and a Reporting Bank with positions denominated in different currencies may be exposed to IRRBB in each of those currencies. Where a Reporting Bank uses its own IMS pursuant to paragraph 5.19(a) or 5.19(c) of this Annex, a Reporting Bank with the necessary skills and sophistication, and with material multicurrency exposures, may choose to include, in its own IMS, methods to aggregate its IRRBB in different currencies using assumptions about the correlation between interest rates in different currencies;

(c) consider the materiality of the impact of behavioural optionalities within floating rate loans. For example, the Reporting Bank should consider the potential impact of the behaviour of prepayments arising from embedded caps and floors on the Reporting Bank's EVE;

(d) where a Reporting Bank uses its own IMS pursuant to paragraph 5.19(a) or 5.19(c) of this Annex, test the appropriateness of key behavioural assumptions, and document all changes to the assumptions of key parameters (for example, by comparing the economic value of equity measured under its own IMS, with the SA(IR) set out in Annex 10B). A Reporting Bank should periodically perform sensitivity analyses with reference to both economic value and earnings-based measures for key assumptions to monitor their impact on measured IRRBB; and

(e) ensure that the most significant assumptions underlying the system are documented and clearly understood by the Board or its delegates. The Reporting Bank should ensure that such documentation includes descriptions on how those assumptions could potentially affect the Reporting Bank's hedging strategies. A Reporting Bank should review significant measurement assumptions at least annually and more frequently during rapidly changing market conditions, as market conditions, competitive environments and strategies change over time. For example, if the competitive market has changed such that consumers now have lower transaction costs available to them for refinancing their residential mortgages, the Reporting Bank should consider that prepayments may become more sensitive to smaller reductions in interest rates.

[718J] For fixed rate loan commitments, a Reporting Bank may sell options to retail customers (for example, prospective mortgage buyers or renewers) whereby, for a limited period, the customers can choose to draw down a loan at a committed rate. Unlike loan commitments to corporates, where drawdowns strongly reflect characteristics of automatic interest rate options, mortgage commitments (that is, pipelines) to retail customers are impacted by other drivers.

5.30 Where the product is a fixed rate loan subject to prepayment risk mentioned in paragraph 5.29(a)(i) of this Annex, a Reporting Bank should –

(a) understand the nature of prepayment risk for its portfolios and make reasonable and prudent estimates of the expected prepayments; and

(b) document the assumptions underlying the estimates. This should include assumptions of how prepayment penalties or other contractual features affect the embedded optionality effect.

5.31 A Reporting Bank shall assess the expected average prepayment speed of a product that is a fixed rate loan subject to prepayment risk mentioned in paragraph 5.29(a)(i) of this Annex under each interest rate shock and stress scenario.

5.32 Where the product is a term deposit subject to early redemption risk[718K] referred to in paragraph 5.29(a)(iii) of this Annex, a Reporting Bank should document the classification scheme, whether a term deposit is deemed to be subject to redemption penalties or to other contractual features that preserve the cash flow profile of the instrument.

5.33 Where the product is an NMD referred to in paragraph 5.29(a)(iv) of this Annex, a Reporting Bank should document, monitor and regularly update key assumptions[718L] for NMD balances and behaviour used in its IMS. To determine the appropriate assumptions for its NMDs, a Reporting Bank should analyse its depositor base in order to identify the proportion of core deposits (that is, NMDs which are unlikely to reprice even under significant changes in interest rate environment). Assumptions should vary according to depositor characteristics (for example, retail or wholesale) and account characteristics (for example, transactional or non-transactional).

5.34 A Reporting Bank shall carefully consider how the exercise of behavioural options will vary under –

(a) interest rate shock and stress scenarios; and

(b) any other applicable dimension,

in respect of products set out in column (A) of Table 10A-1 and any other product with behavioural options.

5.35 In respect of the products set out in column (A) of Table 10A-1, the other dimensions referred to under paragraph 5.34(b) may include the dimensions set out in column (B) of Table 10A-1.

[718K] An example of a term deposit subject to early redemption risk is one where the Reporting Bank attracts deposits with a contractual maturity term or with step-up clauses that enable the depositor at different time periods to modify the speed of redemption.

[718L] Behavioural assumptions for deposits that have no specific repricing date can be a major determinant of IRRBB exposures under the economic value and earnings-based measures.

**Table 10A-1 – Dimensions influencing the exercise of embedded behavioural options**

| (A)<br>Product | (B)<br>Dimensions influencing the exercise of the embedded behavioural options |
|---|---|
| **Fixed rate loans subject to prepayment risk** | Loan size, loan-to-value (LTV) ratio, borrower characteristics, contractual interest rates, seasoning, geographical location, original and remaining maturity, other historical factors, and other macroeconomic variables such as stock indices, unemployment rates, GDP, inflation and housing price indices. |
| **Fixed rate loan commitments** | Borrower characteristics, geographical location (including competitive environment and local premium conventions), customer relationship with bank as evidenced by cross-products, remaining maturity of the commitment, seasoning and remaining term of the mortgage. |
| **Term deposits subject to early redemption risk** | Deposit size, depositor characteristics, funding channel (for example, direct or brokered deposit), contractual interest rates, seasonal factors, geographical location and competitive environment, remaining maturity, other historical factors and other macroeconomic variables such as stock indices, unemployment rates, GDP, inflation and housing price indices. |
| **Non-maturity deposits (NMDs)** | Responsiveness of product rates to changes in market interest rates, current level of interest rates, spread between the Reporting Bank's offer rate and market rate, competition from other firms, the Reporting Bank's geographical location and demographic and other relevant characteristics of its customer base. |

5.36 A Reporting Bank shall ensure that any measurement system and model used for the calculation of IRRBB –

(a) is based on accurate data; and

(b) is subject to appropriate documentation, testing and controls to give assurance on the accuracy of the calculation.

5.37 The Reporting Bank should do the following –

(a) for accurate and timely measurement of IRRBB for effective risk management and control, ensure that its risk measurement system is able to identify and quantify the major sources of IRRBB exposure. The Reporting Bank should select the most appropriate form of measurement system by considering the mix of its business lines and the risk characteristics of its activities;

(b) rely on more than one measure of risk, given that risk management systems tend to vary in how they capture the components of IRRBB. The Reporting Bank should use a variety of methodologies to quantify their IRRBB exposures under both the economic value and earnings-based measures, ranging from simple calculations based on static simulations using current holdings to more sophisticated dynamic modelling techniques that reflect potential future business activities;

(c) ensure that its management information system allows it to retrieve accurate IRRBB information in a timely manner and captures interest rate risk data on all the Reporting Bank's material IRRBB exposures. The Reporting Bank should also ensure that there is sufficient documentation of the major data sources used in the Reporting Bank's risk measurement process;

(d) use data inputs that are automated as much as possible to reduce administrative errors. The Reporting Bank should periodically review and test the data mapping against an approved model version, and should monitor the type of data extracts and set appropriate controls;

(e) ensure that, where cash flows are slotted into different time buckets (for example, for gap analyses) or assigned to different vertex points to reflect the different tenors of the interest rate curve, the slotting criteria is stable over time to allow for a meaningful comparison of risk figures over different periods.

5.38 A Reporting Bank shall ensure that its IMS –

(a) is able to calculate economic value and earnings-based measures of IRRBB, as well as other measures of IRRBB prescribed by the Authority, based on the interest rate shock and stress scenarios set out in paragraph 5.24 of this Annex; and

(b) is sufficiently flexible to incorporate any constraints imposed by the Authority on the Reporting Bank's internal risk parameter estimates.

5.39 A Reporting Bank shall ensure that its models used to measure IRRBB are comprehensive and covered by governance processes for model risk management, including a validation function that is independent of the development process. The Reporting Bank should –

(a) ensure that the validation of IRRBB measurement methods and assessment of corresponding model risk is included in a formal policy process that is reviewed and approved by the Board or its delegates. The Reporting Bank should specify the management roles and designate the parties responsible for the development, implementation and use of models in the policy. In addition, the Reporting Bank should specify and integrate, within the governance processes for model risk management, the model oversight responsibilities and policies including the development of initial and ongoing validation procedures, evaluation of results, approval, version control, exception, escalation, modification and decommission processes;

(b) have in place an effective IRRBB validation framework, which should include three core elements, namely –

   (i) evaluation of conceptual and methodological soundness, including developmental evidence;

   (ii) ongoing model monitoring, including process verification and benchmarking; and

   (iii) outcomes analysis, including backtesting of key internal parameters (for example, stability of deposits, prepayments, early redemptions, pricing of instruments);

(c) address the expected initial and ongoing model validation activities, establish in the policy set out in sub-paragraph (a) a hierarchical process for determining model risk soundness based on both quantitative and qualitative dimensions such as size, impact, past performance and familiarity with the modelling technique employed;

(d) ensure that model risk management for IRRBB measures follows a holistic approach that begins with motivation, development and implementation by model owners and users. The Reporting Bank should ensure that the process for determining model inputs, assumptions, modelling methodologies and outputs is reviewed and validated independently of the development of IRRBB models, prior to the model receiving authorisation for usage. The Reporting Bank should present the review and validation results and any recommendations on model usage to the Board or its delegates for approval, and upon approval, subject the model to ongoing review, process verification and validation at a frequency that is consistent with the level of model risk determined and approved by the Reporting Bank;

(e) ensure that the ongoing validation process establishes a set of exception trigger events that obligate the model reviewers to notify the Board or its delegates in a timely fashion, in order to determine any corrective actions or restrictions on model usage. The Reporting Bank should designate clear version control authorisations, where appropriate, to model owners. With the passage of time and due to observations and new information gained over time, the Reporting Bank may modify or decommission an approved model. The Reporting Bank should have in place policies for model transition, including change and version control authorisations and documentation;

(f) include in the validation process model inputs or assumptions which may be sourced from IRRBB models developed by third-party vendors, related modelling processes or sub-models (both in-house and vendor-sourced). The Reporting Bank should document and explain model specification choices as part of the validation process;

(g) where a Reporting Bank purchases IRRBB models, ensure adequate documentation of its use of those models, including any specific

customisation. If vendors provide input for market data, behavioural assumptions or model settings, the Reporting Bank should have a process in place to determine if those inputs are reasonable for its business and the risk characteristics of its activities; and

(h) ensure that its IA review the model risk management process as part of its annual risk assessment and audit plans, where such audit activity should not duplicate model risk management processes, but should review the integrity and effectiveness of the risk management system and the model risk management process.

5.40 A Reporting Bank shall ensure that the measurement outcomes of IRRBB and hedging strategies are reported to the Board or its delegates on a regular basis, at relevant levels of aggregation, by consolidation level and currency. The Reporting Bank should –

(a) report risk measures to the Board or its delegates regularly, and should compare current exposure with policy limits. In particular, the Reporting Bank should report the results of the periodic model reviews and audits as well as comparisons of past forecasts or risk estimates with actual results to inform the Board or its delegates of potential modelling shortcomings on a regular basis. The Reporting Bank should clearly identify portfolios that may be subject to significant mark-to-market movements within the Reporting Bank's management information system and subject such portfolios to oversight in line with any other portfolios exposed to market risk;

(b) ensure that the reports prepared for the Board or its delegates, as the case may be, include the following –

(i) summaries of the Reporting Bank's aggregate IRRBB exposures, and explanatory text that highlights the assets, liabilities, cash flows, and strategies that are driving the level and direction of IRRBB;

(ii) reports demonstrating the Reporting Bank's compliance with policies and limits;

(iii) key modelling assumptions such as NMD characteristics, prepayments on fixed rate loans and currency aggregation;

(iv) results of stress tests, including assessment of sensitivity to key assumptions and parameters;

(v) summaries of the reviews of IRRBB policies, procedures and adequacy of the measurement systems, including any findings of internal and external auditors, or other equivalent external parties (such as consultants); and

(c) ensure that reports detailing its IRRBB exposures are provided to the Board or its delegates, as the case may be, on a timely basis and reviewed regularly. The Reporting Bank should ensure that such IRRBB reports provide aggregate information as well as sufficient supporting detail to enable the Board or its delegates, as the case may be, to assess the

sensitivity of the Reporting Bank to changes in market conditions, with particular reference to portfolios that may potentially be subject to significant mark-to-market movements. The Board or its delegates, as the case may be, should review the bank's IRRBB management policies and procedures in light of the reports, to ensure that they remain appropriate and sound. The Board or its delegates, as the case may be, should also ensure that analysis and risk management activities related to IRRBB are conducted by competent staff with technical knowledge and experience, consistent with the nature and scope of the Reporting Bank's activities.

Internal Assessment of Capital Adequacy for IRRBB

5.41 A Reporting Bank shall –

(a) evaluate its capital adequacy for IRRBB, which must be in line with its risk appetite, as part of its ICAAP approved by the Board;

(b) ensure that it has adequate capital and earnings that are commensurate with its level of short-term and long-term IRRBB exposures; and

(c) consider the potential risk that such exposures mentioned in sub-paragraph (b) may pose to its future financial performance.

5.42 For the purposes of evaluating its capital adequacy for IRRBB, a Reporting Bank should take the following into account –

(a) the size and tenor of internal limits on IRRBB exposures, and whether these limits are reached at the point of capital calculation;

(b) the effectiveness and expected cost of hedging open positions that are intended to take advantage of internal expectations of the future level of interest rates;

(c) the sensitivity of the internal measures of IRRBB to key modelling assumptions[718M];

(d) the impact of interest rate shock and stress scenarios set out in paragraph 5.24 of this Annex on positions priced off different interest rate indices;

(e) the impact on economic value and NII of mismatched positions in different currencies;

(f) the impact of embedded losses;

(g) the distribution of capital relative to risks across different entities in the banking group, in addition to overall Group level capital adequacy;

[718M] This includes the impact of key assumptions on ΔEVE such as the inclusion or exclusion of commercial margins, the Reporting Bank's actual equity allocation profile, the stability of NMDs and prepayment optionality.

(h) the drivers of the underlying risk;

(i) the circumstances under which the risk might crystallise.

5.43 The Reporting Bank should –

(a) ensure that the contribution of IRRBB to its overall internal capital assessment is based on the Reporting Bank's IMS outputs, taking account of key assumptions and risk limits. The Reporting Bank should also ensure that the overall level of capital is commensurate with its actual measured level of risk (including for IRRBB) and its risk appetite, and is duly documented in its ICAAP report;

(b) develop its own methodologies for capital allocation, based on its risk appetite. In determining the appropriate level of capital, a Reporting Bank should consider both the amount and the quality of capital needed;

(c) consider its capital adequacy for IRRBB in relation to the risks to economic value, given that such risks are embedded in the Reporting Bank's assets, liabilities and off-balance sheet items. For risks to future earnings, given the possibility that future earnings may be lower than expected, a Reporting Bank should consider capital buffers. The Reporting Bank should consider –

(i) the ΔEVE under a variety of interest rate shock and stress scenarios. Where the Reporting Bank's EVE is significantly sensitive to interest rate shock and stress scenarios, the Reporting Bank should assess the impact on its capital adequacy arising from financial instruments held at market value, and the potential impact in the case where banking book positions held at historical cost become subject to market valuation; and

(ii) the strength and stability of the earnings stream and the level of income needed to generate and maintain normal business operations. Where the Reporting Bank has a high level of IRRBB exposures, that could under a plausible range of market scenarios, result in the Reporting Bank reporting losses or curtailing normal dividend distribution and business operations, the Reporting Bank should ensure that it has sufficient capital to withstand the adverse impact of such events until it can implement mitigating actions such as reducing IRRBB exposures or increasing capital; and

(d) ensure that its evaluation of its capital adequacy for IRRBB as part of its ICAAP flows through to assessments of capital associated with business lines.

5.44 A Reporting Bank shall inform the Authority whenever there is any significant change to the Reporting Bank's IMS on IRRBB measurement or any policy change to its IRRBB management under its ICAAP.

5.45 A Reporting Bank shall include in its ICAAP report the outputs of its IMS, including the Reporting Bank's IRRBB exposures for EVE and NII using the interest rate shock scenarios set out in paragraph 5.24 of this Annex.

Supervisory Review

5.46 For the purpose of the Authority's supervisory review[718N], the Authority may require from a Reporting Bank the following information relating to the Reporting Bank's IRRBB –

(a) the modelling of NMDs for IMS purposes and the sensitivity of a Reporting Bank's economic value and earnings to changes in NMD assumptions;

(b) the impact of assumptions used regarding products with behavioural options;

(c) the treatment of own equity in internal calculations and the extent to which this impacts the ΔEVE number disclosed under Part XI of this Notice;

(d) repricing gaps of cash flows associated with their interest rate-sensitive assets, liabilities and off-balance sheet items (by significant currencies);

(e) exposures to automatic interest rate options;

(f) the types of yield curve used for IMS purposes;

(g) the level of ΔEVE if calculated using the SA(IR) set out in Annex 10B;

(h) economic value and earnings-based measures for interest rate shock and stress scenarios in addition to those prescribed in Annex 10C (including results based on banks' internally developed or other interest rate shock or stress scenarios).

5.47 A Reporting Bank that has been identified as an outlier bank by the Authority in accordance with paragraph 5.48 of this Annex shall be subject to further review by the Authority on the Reporting Bank's management of IRRBB and adequacy of capital relative to the Reporting Bank's IRRBB exposures.

5.48 For the purpose of determining if a Reporting Bank is an outlier bank, the Authority will compare the Reporting Bank's maximum ΔEVE calculated in accordance with paragraph 5.49 of this Annex, under the six interest rate shock scenarios set out in Annex 10C, with 15% of the Reporting Bank's Tier 1 capital.

5.49 A Reporting Bank shall compute and report to the Authority its ΔEVE on the following bases –

(a) exclude its own equity from the computation of the exposure level;

[718N] In its supervisory review, the Authority would consider the matters listed under paragraphs 80 to 85 of the "Standards - Interest Rate Risk in the Banking Book" issued by BCBS in April 2016.

(b) include all cash flows from all interest rate-sensitive assets[718O], liabilities and off-balance sheet items in the banking book in the computation of their exposure;

(c) discount cash flows using –

(i) a risk-free rate; or

(ii) where the Reporting Bank has included commercial margins and other spread components in its cash flows, a risk-free rate including such commercial margins and other spread components.

The Reporting Bank shall ensure that the risk-free rate used for discounting purposes is representative of a risk-free zero coupon rate[718P];

(d) calculate ΔEVE with the assumption of a run-off balance sheet, where existing banking book positions amortise and are not replaced by any new business.

5.50 Where the Authority is of the view that a Reporting Bank's management of IRRBB is inadequate or that the Reporting Bank has excessive IRRBB[718Q] relative to its capital or earnings, or its general risk profile, the Authority may require the Reporting Bank to take one or more of the following actions, within a specified time frame[718R] –

(a) reduce its IRRBB exposures (for example, by hedging);

(b) raise additional capital;

(c) set constraints on the internal risk parameters related to IRRBB used by the Reporting Bank;

(d) improve its IRRBB management framework.

5.51 Where the Authority determines that a Reporting Bank's IMS is deficient in its measurement of IRRBB, the Authority may require the Reporting Bank to improve its IMS or use the SA(IR) set out in Annex 10B to compute its ΔEVE.

5.52 For further guidance, a Reporting Bank should refer to "Standards – Interest rate risk in the banking book" issued by the BCBS in April 2016, and any other relevant publications issued by the BCBS and the Authority in this area.

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718O Interest rate-sensitive assets are assets which are not deducted from CET1 capital and which exclude (i) fixed assets such as real estate or intangible assets and (ii) equity exposures in the banking book.

718P An example of an acceptable yield curve is a secured interest rate swap curve.

718Q In making this determination, the Authority may consider other factors than the outlier threshold set out in paragraph 5.48 of this Annex. This could include the case where a Reporting Bank's shocked ΔNII is such that the Reporting Bank may not have sufficient income to maintain its normal business conditions.

718R In imposing this time frame, the Authority may consider factors such as the prevailing financial and economic conditions, as well as the causes that led to a Reporting Bank's IRRBB exceeding the supervisory threshold.

**Section 6: Operational Risk**

6.1 In assessing its capital adequacy for operational risk, the Reporting Bank shall consider risk factors that may not have been adequately assessed under the Pillar 1 process. A Reporting Bank should adopt the practices set out in the report "Principles for the Sound Management of Operational Risk" issued by the BCBS in June 2011, and any other relevant publications issued by the BCBS and the Authority in this area.

Operational Risk Management

6.2 The Board and senior management should be familiar with the major aspects of the operational risk of the Reporting Bank, and be responsible for the effective implementation of the operational risk management framework, including the approval and regular review of the risk management framework.

6.3 The Reporting Bank shall have a comprehensive bank-wide operational risk management framework which forms an integral part of its overall risk management process. The Reporting Bank shall ensure that the framework takes into account the appetite and tolerance for operational risk of the Reporting Bank, including the extent and manner in which operational risk is impacted by activities such as outsourcing.

6.4 A Reporting Bank shall set out clearly the policies and procedures of the Reporting Bank for the identification, assessment, monitoring, and control and mitigation of operational risk inherent in all material products, activities, processes and systems, in its operational risk management framework. Any deviation from the established policies should be reported to the senior management or the Board, as appropriate.

6.5 A Reporting Bank shall ensure that senior management consistently implements the operational risk management framework throughout the organisation and allocates adequate resources to the risk management function. The Reporting Bank shall continually monitor operational risk exposures and report significant operational risk concerns to the Board. The Reporting Bank shall conduct regular independent review of its operational risk management framework and risk assessment processes

6.6 The Reporting Bank shall have in place appropriate reporting mechanisms to keep the Authority apprised of developments affecting the operational risk profile of the Reporting Bank.

Operational Risk Measurement

6.7 Under the BIA and SA(OR), gross income is used as a proxy for the scale of the operational risk exposure of a Reporting Bank. While gross income is an indicator of exposure to operational risk, it may not accurately reflect the level of such exposure. AMA requires considerable amounts of data, and the measurement techniques and methodologies continue to evolve and are therefore largely untested. A Reporting Bank should understand that the measurement of operational risk would generally not be as precise as the quantification of other risks like market and credit risks.

6.8 In view of the above, a Reporting Bank shall choose an operational risk approach that is commensurate with the complexity and sophistication of its activities. Regardless of the approach chosen for calculating minimum operational risk capital requirements under Pillar 1, the Reporting Bank shall review the capital computed and assess if the amount is consistent with its operational risk exposure. When assessing the measurement of operational risk in the ICAAP of a Reporting Bank, the Authority may require a Reporting Bank to apply additional margins of conservatism if it is of the view that the data series of the Reporting Bank is insufficient, that the Pillar 1 charge under the BIA or SA(OR) is distorted by negative gross income, or that the credibility of the operational risk capital requirement is lacking in relation to the Reporting Bank's peers.

**Section 7: Liquidity Risk**

7.1 A Reporting Bank shall adopt sound liquidity risk management practices that are commensurate with its size and sophistication, and with the risk and complexity of its activities. Liquidity is crucial to the ongoing viability of any banking organisation. A Reporting Bank shall manage its liquidity risk and maintain sufficient liquidity to withstand a range of stress events and to weather prolonged periods of financial market stress and illiquidity. A Reporting Bank shall consider the relationship between liquidity and capital since liquidity risk can impact capital adequacy which, in turn, can aggravate a Reporting Bank's liquidity profile. In addition, a Reporting Bank's capital position can have an effect on its ability to obtain liquidity, especially in a crisis. A Reporting Bank shall evaluate its capital adequacy taking into account its liquidity profile and the liquidity of the markets in which it operates. For any size or scope of operation, the liquidity risk management framework of a Reporting Bank shall cover, at a minimum, the following elements:

(a) a Reporting Bank shall have in place a liquidity strategy. This shall set out specific liquidity management policies, such as the composition of assets and liabilities, the approach to managing liquidity across currencies and locations, the use of specific financial instruments and the liquidity and marketability of assets. The Reporting Bank shall ensure that its policies and processes for managing liquidity include the consideration of how other risks (e.g. credit, market, operational and reputation risk) impact the banks' overall liquidity strategy;

(b) a Reporting Bank shall ensure that the Board approves the strategy and significant policies related to the management of liquidity risk. The Reporting Bank shall also ensure that the Board determines the risk appetite of the Reporting Bank for liquidity risk that is communicated throughout the Reporting Bank and is reflected in the strategy and policies that are set to manage liquidity risk. The Reporting Bank shall ensure that senior management takes the necessary steps to monitor and control liquidity risk, including putting in place appropriate policies and procedures, and setting and reviewing limits on the size of liquidity positions over particular time horizons. The Reporting Bank shall inform the Board regularly of the liquidity situation of the Reporting Bank. The Reporting Bank shall also inform the Board immediately of any material changes in the current or prospective liquidity position of the Reporting Bank;

(c) a Reporting Bank shall have adequate information systems for measuring, monitoring, controlling and reporting liquidity risk, including liquidity risks from complex products and contingent commitments. The Reporting Bank shall provide reports on a timely basis to the Board, senior management and other appropriate personnel. A Reporting Bank shall utilise early warning indicators to identify the emergence of increased risk or vulnerabilities in its liquidity position or funding needs. A Reporting Bank shall be able to control liquidity risk exposure and funding needs, within and across legal entities, business lines and currencies, taking into account any legal, regulatory and operational limitations to transferability of liquidity. A Reporting Bank's management of intraday liquidity risk shall be considered as a crucial part of liquidity risk management. A Reporting Bank shall also be able to calculate and manage its collateral positions. A Reporting Bank shall also appropriately price the costs, benefits and risks of liquidity into the internal pricing, performance measurement and new product approval process of all significant business activities;

(d) a Reporting Bank shall conduct analyses of net funding requirements under alternative scenarios. The Reporting Bank shall review the assumptions utilised in managing liquidity frequently to determine whether they continue to be valid;

(e) a Reporting Bank shall ensure a diversification of both the tenor and sources of funding to manage its liquidity risk. In this respect, a Reporting Bank needs to examine the level of reliance on particular sources, nature of the provider of funds and geographic market, and periodically review its efforts to establish and maintain relationships with liability holders to maintain the diversification of liabilities as well as ensure that it is able to sell its assets;

(f) a Reporting Bank shall have contingency plans that address the strategy for handling liquidity crises and include procedures for making up cash flow shortfalls in emergency situations. A Reporting Bank shall maintain a liquidity cushion, made up of unencumbered, high quality liquid assets, to protect against liquidity stress events, including potential losses of unsecured and typically available secured funding sources;

(g) a Reporting Bank shall measure, monitor and control its liquidity positions in the major currencies in which it is active. In addition to assessing its aggregate foreign currency liquidity needs and the acceptable mismatch in combination with its domestic currency commitments, the Reporting Bank shall also undertake separate analysis of its strategy for each currency individually. Where appropriate, the Reporting Bank shall set and regularly review limits on the size of its cash flow mismatches over particular time horizons for foreign currencies in aggregate and for each significant individual currency in which it operates;

(h) a Reporting Bank shall perform stress tests or scenario analyses on a regular basis in order to identify and quantify its exposures to possible future liquidity stresses, analysing possible impacts on the Reporting Bank's cash flows, currency mismatches, liquidity positions, profitability, and solvency. The Reporting Bank shall include a variety of short-term

and protracted bank-specific and market-wide liquidity stress scenarios (individually and in combination). The Reporting shall use conservative assumptions in its stress test scenarios and regularly review the assumptions. The Reporting Bank shall ensure that senior management discusses the results of these stress tests, and take remedial or mitigating actions to limit the Reporting Bank's exposures, build up a liquidity cushion, and adjust its liquidity profile to fit its risk tolerance. The Reporting Bank shall use the results of these stress tests to shape the Reporting Bank's contingency funding plans; and

(i) a Reporting Bank shall have adequate internal controls to ensure the integrity of its liquidity risk management process. A fundamental component of the internal control system involves regular independent reviews and evaluations of the effectiveness of the system to ensure that appropriate revisions or enhancements to internal controls are made where necessary.

7.2 A Reporting Bank shall consider the extent of its liquidity risk in its assessment of capital adequacy and, where appropriate, set aside additional capital to address such risk.

7.3 For further guidance, a Reporting Bank should refer to "Basel III: International framework for liquidity risk measurement standards and monitoring" issued by the BCBS in December 2010, "Principles for Sound Liquidity Risk Management and Supervision" issued by the BCBS in September 2008, and any other relevant publications issued by the BCBS and the Authority in this area.

**Section 8: Reputational Risk**

8.1 Reputational risk can be defined as the risk arising from negative perception on the part of customers, counterparties, shareholders, investors, debt-holders, market analysts, other relevant parties or regulators that can adversely affect a Reporting Bank's ability to maintain existing, or establish new, business relationships and continued access to sources of funding (e.g. through the interbank or securitisation markets). Furthermore, it exists throughout a Reporting Bank and exposure to reputational risk is essentially a function of the adequacy of the Reporting Bank's internal risk management processes, as well as the manner and efficiency with which bank management responds to external influences on bank-related transactions.

8.2 A Reporting Bank shall identify potential sources of reputational risk to which it is exposed. These include the Reporting Bank's business lines, liabilities, affiliated operations, off-balance sheet vehicles and the markets in which it operates. A Reporting Bank shall also have appropriate policies in place to identify sources of reputational risk, and to consider such risks in the approval processes for entering new markets, products, lines of activities or strategic initiatives. Reputational risk[719] may in turn give rise to credit,

[719] For example, reputational risk may arise from a Reporting Bank's involvement in asset management. In the event that the financial instruments issued, managed or distributed by the Reporting Bank are not correctly priced or the main risk drivers not adequately disclosed, the Reporting Bank may feel some responsibility to its customers, or be economically compelled, to cover any losses or to support the value of shares or units held by investors even though it is not contractually required to provide the support. Reputational risk can

liquidity, market and legal risks – all of which can have a negative impact on a Reporting Bank's earnings, liquidity and capital position. The Reporting Bank shall incorporate risks that arise from reputational risk into its risk management processes and appropriately address these risks in its ICAAP and liquidity contingency plans. In the case of securitisation or off-balance sheet vehicles that could give rise to reputational risk, a Reporting Bank shall assess whether the requirements under the securitisation framework have been met and the potential adverse impact of providing implicit support.

8.3 Where appropriate, a Reporting Bank shall also identify potential exposures arising from reputational concerns and evaluate the amount of support it might have to provide (including implicit support, e.g. for securitisations) or losses it might experience in adverse market conditions. In particular, in order to evaluate the potential impact of actions taken to avoid reputational damage and to maintain market confidence, a Reporting Bank shall develop methodologies to measure, to the extent possible, the effect of reputational risk in terms of other risk types (e.g. credit, liquidity, market or operational risk) to which it may be exposed. This can be accomplished by including reputational risk scenarios in regular stress tests. For instance, non-contractual off-balance sheet exposures could be included in the stress tests to determine the effect on a Reporting Bank's credit, market and liquidity risk profiles[720].

**Section 9: Other Risk Factors**

9.1 The risk categories set out in this Annex are not exhaustive. The Authority expects a Reporting Bank to have in place a rigorous process for determining the adequacy of its capital to support all risks to which it is exposed.

**Section 10: Stress Testing Practices**

10.1 Stress testing is an important tool that can be used as part of a Reporting Bank's internal risk management that alerts bank management to adverse unexpected outcomes related to a broad variety of risks, and provides an indication of how much capital might be needed to absorb losses should large shocks occur. Moreover, stress testing provides a complementary risk perspective and supplements other risk management approaches and measures so that bank management may have a more complete understanding of the Reporting Bank's risks and the interaction of those risks under stressed conditions. It plays a particularly important role in -

(a) providing forward looking assessments of risk;

(b) overcoming limitations of models and historical data;

also lead to the provision of implicit support, which arises when a Reporting Bank provides post-sale support to a securitisation transaction in excess of any contractual obligation. Such non-contractual support exposes the Reporting Bank to the risk of loss, such as loss arising from deterioration in the credit quality of the underlying assets of the securitisation.

[720] Methodologies could include comparing the actual amount of exposure carried on the balance sheet versus the maximum amount of exposure held off-balance sheet, that is, the potential amount to which the Reporting Bank could be exposed. A Reporting Bank should also pay particular attention to the effects of reputational risk on its overall liquidity position, taking into account both possible increases in the asset side of the balance sheet and possible restrictions on funding, should the loss of reputation result in various counterparties' loss of confidence.

(c) supporting internal and external communication;

(d) feeding into capital and liquidity planning procedures;

(e) informing the setting of a Reporting Bank's risk tolerance;

(f) addressing existing or potential, bank-wide risk concentrations; and

(g) facilitating the development of risk mitigation or contingency plans across a range of stressed conditions.

Stress testing is especially important after long periods of benign risk, which can lead to complacency and the underpricing of risk, and when innovation leads to the rapid growth of new products for which there is limited or no loss data.

10.2 Board and senior management involvement in setting stress testing objectives, defining scenarios, discussing the results of stress tests, assessing potential actions and decision-making is critical in ensuring the appropriate use of stress testing in banks' risk governance and capital planning. The Reporting Bank shall ensure that senior management takes an active interest in the development and operation of stress testing. The results of stress tests should contribute to strategic decision-making and foster internal debate regarding assumptions, such as the cost, risk and speed with which new capital could be raised or that positions could be hedged or sold. Board and senior management involvement in the stress testing programme is essential for its effective operation.

10.3 A Reporting Bank shall incorporate rigorous, forward-looking stress testing that identifies a range of possible events or changes in market conditions that could adversely impact the Reporting Bank in its capital planning process. The Reporting Bank shall ensure that the sophistication of techniques and stress tests used are commensurate with the Reporting Bank's activities. A Reporting Bank, under its ICAAP, shall perform a careful analysis of its capital instruments and their potential performance during times of stress, including their ability to absorb losses and support ongoing business operations. It shall also examine its future capital resources and capital requirements under adverse scenarios. In particular, the Reporting Bank shall consider the results of forward-looking stress testing when evaluating the adequacy of a Reporting Bank's capital buffer. The Reporting Bank shall assess capital adequacy under stressed conditions against a variety of capital ratios, including regulatory ratios, as well as ratios based on the Reporting Bank's internal definition of capital resources. In addition, the Reporting Bank shall consider the possibility that a crisis impairs the ability of even very healthy banks to raise funds at reasonable cost. A Reporting Bank shall also consider scenarios to assess risks associated with securitisation, where appropriate (e.g. risks associated with pipeline and warehoused exposures may emerge when a Reporting Bank is unable to access the securitisation market)[721].

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[721] A Reporting Bank should consider pipeline and warehoused exposures in its risk management processes and in its stress tests, regardless of the probability of securitising the exposures. It should consider scenarios that may prevent it from securitising the exposures, and the potential effect on its liquidity, earnings and capital adequacy. A Reporting Bank should also consider whether it would provide support to securitisation structures in stressed scenarios, due to its reliance on securitisation as a funding tool. A Reporting Bank should also assess the risks with respect to commitments to off-balance sheet vehicles and third-party firms and the possibility that assets will need to be taken on balance sheet for reputational reasons. Therefore, a Reporting Bank should include, in its stress testing programme, scenarios assessing the size and soundness

10.4 A Reporting Bank shall complement risk management models that are based on complex, quantitative models using backward looking data and estimated statistical relationships with stress tests. In particular, stress testing outcomes for a particular portfolio can provide insights about the validity of statistical models at high confidence intervals, used to determine, for example, VaR.

10.5 A Reporting Bank shall ensure that it has sufficient capital to meet the regulatory capital requirements under Pillar 1 and to cover the results of its credit stress tests performed under the requirement in paragraph 6.1 and 6.2 of Annex 7AB[722]. To the extent that this is not met, the Authority shall take appropriate action, which may include instructing the Reporting Bank to take action to lower the risks which it assumes or maintain additional capital or provisions, or both, so that existing capital resources can cover the Pillar 1 capital requirements plus the results of a recalculated stress test.

10.6 For further guidance, a Reporting Bank should refer to "Principles for Sound Stress Testing Practices and Supervision" issued by the BCBS in May 2009 and any other relevant publications issued by the BCBS and the Authority in this area.

of such vehicles and firms relative to its own financial, liquidity and regulatory capital positions. This analysis should include structural, solvency, liquidity and other risk issues, including the effects of covenants and triggers.

[722] The Authority may review how the stress test was carried out. The results of the stress test contribute directly to the expectation that a Reporting Bank will operate above the Pillar 1 regulatory capital ratios.

**Annex 10B**

## STANDARDISED APPROACH FOR INTEREST RATE RISK IN THE BANKING BOOK (SA(IR))

[MAS Notice 637 (Amendment No. 2) 2018 (Insertion of this Annex)]

### Section 1: Overview

1.1 A Reporting Bank shall carry out the following steps to measure its IRRBB under SA(IR), based solely on the EVE –

(a) Step 1: Allocate interest rate-sensitive positions in the banking book set out in paragraph 2.2 of this Annex to one of the following three categories –

(i) amenable to standardisation;

(ii) less amenable to standardisation; or

(iii) not amenable to standardisation.

(b) Step 2: Slot cash flows arising from interest rate-sensitive positions in the banking book set out in paragraph 2.2 of this Annex that are amenable to standardisation based on their repricing maturities using the approach set out in paragraphs 2.8 to 2.12 of this Annex. The Reporting Bank shall exclude cash flows arising from positions less amenable to standardisation from this step. The Reporting Bank shall ignore the optionality of positions with embedded automatic interest rate options for the purposes of slotting of notional repricing cash flows[723]. The Reporting Bank shall slot cash flows arising from positions that are not amenable to standardisation using the approaches set out in paragraphs 3.1 to 3.7 of this Annex for NMDs and paragraphs 4.1 to 4.14 of this Annex for behavioural options respectively.

(c) Step 3: Determine the ΔEVE for the relevant interest rate scenarios for each currency, where ΔEVE is measured per currency for all six interest rate scenarios in accordance with paragraphs 6.1 and 6.2 of this Annex. In doing so, the Reporting Bank shall include the add-ons for changes in the value of automatic interest rate options (whether explicit or embedded), calculated using the approach in paragraphs 5.1 to 5.5 of this Annex, under each interest rate scenario on a per currency basis.

(d) Step 4: Calculate the ΔEVE under SA(IR) as the maximum of the worst aggregated reductions to EVE across the six supervisory interest rate shocks as set out in paragraph 6.3 of this Annex.

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723 The embedded automatic interest rate option is stripped out from the process of slotting notional repricing cash flows set out in paragraph 1.1(b) of this Annex and treated together with other automatic interest rate options as set out in paragraph 1.1(c) of this Annex.

**Section 2: Components of SA(IR)**

Cash Flow Bucketing

2.1 A Reporting Bank shall project all future notional repricing cash flows arising from the interest rate-sensitive positions[724] in the banking book onto –

(a) the time buckets as set out in Table 10B-1 according to their repricing dates; or

(b) the time bucket midpoints as set out in Table 10B-1, retaining the notional repricing cash flows' maturity. Where time bucket midpoints are used, the Reporting Bank shall split the notional repricing cash flows between two adjacent time bucket midpoints[725].

2.2 The interest rate-sensitive positions in the banking book mentioned in paragraph 2.1 of this Annex are –

(a) assets, excluding assets which are deducted from CET1 capital, fixed assets such as real estate or intangible assets, and equity exposures in the banking book;

(b) liabilities, including all non-remunerated deposits; and

(c) off-balance sheet items.

2.3 For the purposes of this Annex –

(a) "time bucket" means the time bucket set out in Table 10B-1;

(b) "time bucket midpoint" means the time bucket midpoints set out in Table 10B-1;

(c) "notional repricing cash flow" means –

(i) repayment of principal or part of it, at any time;

(ii) any repricing of principal where repricing is said to occur at the earliest date at which the Reporting Bank or its counterparty is entitled to unilaterally change the interest rate, or at which the rate on a floating rate instrument changes automatically in response to a change in an external benchmark; or

(iii) any interest payment on a tranche of principal that has not yet been repaid or repriced; and

[724] For the avoidance of doubt, CET1 Capital is excluded.

[725] For example, for a notional repricing cash flow of $100 with a maturity of 3Y, the cashflow is to be split into the adjacent time bucket midpoints of 2.5Y and 3.5Y, while retaining the dollar-weighted average maturity of the notional repricing cash flow. An amount of $50 is to be allocated to the time bucket midpoint of 2.5Y and the remaining $50 to the time bucket midpoint of 3.5Y.

(d) “repricing date” means the date of each repayment, repricing or interest payment.

2.4 A Reporting Bank may choose whether to deduct commercial margins and other spread components from the notional repricing cash flows, using a prudent and transparent methodology.

2.5 Where a Reporting Bank has chosen not to deduct commercial margins and other spread components of interest payments from the notional repricing cash flows, the Reporting Bank shall slot the commercial margins and other spread components of interest payments on a tranche of principal that has not yet been repaid and which do not reprice until their contractual maturity, irrespective of whether the non-amortised principal has been repriced or not.

**Table 10B-1 – Maturity schedule with 19 time buckets for notional repricing cash flows repricing at $t^{CF}$**

| Short-term rates | | | Medium-term rates | | | Long-term rates | | |
|---|---|---|---|---|---|---|---|---|
| k | Time bucket (M: months, Y: years) | Time bucket midpoint (years) | k | Time bucket (M: months, Y: years) | Time bucket midpoint (years) | k | Time bucket (M: months, Y: years) | Time bucket midpoint (years) |
| 1 | Overnight | 0.0028 | 9 | 2Y< $t^{CF}$ ≤3Y | 2.5 | 14 | 7Y< $t^{CF}$ ≤8Y | 7.5 |
| 2 | Overnight< $t^{CF}$ ≤1M | 0.0417 | 10 | 3Y< $t^{CF}$ ≤4Y | 3.5 | 15 | 8Y< $t^{CF}$ ≤9Y | 8.5 |
| 3 | 1M< $t^{CF}$ ≤3M | 0.1667 | 11 | 4Y< $t^{CF}$ ≤5Y | 4.5 | 16 | 9Y< $t^{CF}$ ≤10Y | 9.5 |
| 4 | 3M< $t^{CF}$ ≤6M | 0.375 | 12 | 5Y< $t^{CF}$ ≤6Y | 5.5 | 17 | 10Y< $t^{CF}$ ≤15Y | 12.5 |
| 5 | 6M< $t^{CF}$ ≤9M | 0.625 | 13 | 6Y< $t^{CF}$ ≤7Y | 6.5 | 18 | 15Y< $t^{CF}$ ≤20Y | 17.5 |
| 6 | 9M< $t^{CF}$ ≤1Y | 0.875 | | | | 19 | $t^{CF}$ >20Y | 25 |
| 7 | 1Y< $t^{CF}$ ≤1.5Y | 1.25 | | | | | | |
| 8 | 1.5Y< $t^{CF}$ ≤2Y | 1.75 | | | | | | |

Process for Slotting and Decomposing Banking Book Instruments

2.6 Paragraphs 2.8 to 2.14 of this Annex set out the process for slotting and decomposing banking book instruments for –

(a) fixed rate positions or floating rate positions that are amenable to standardisation[726];

(b) positions that are less amenable to standardisation; and

(c) positions that are not amenable to standardisation.

2.7 For the purposes of this Annex –

(a) “fixed rate positions” mean positions which generate cash flows that are certain till the point of contractual maturity[727]; and

726 Positions amenable to standardisation would also include positions with embedded automatic interest rate options.

727 Examples are fixed rate loans without embedded prepayment options, term deposits without redemption risk and other amortising products such as mortgage loans.

(b) “floating rate positions” mean positions generate cash flows that are not predictable past the next repricing date other than that the present value would be reset to par.

Process for Positions that are Amenable to Standardisation

2.8 The Reporting Bank shall –

(a) in respect of fixed rate positions, allocate repricing cash flows either to time buckets or time bucket midpoints based on contractual maturity of such cash flows; and

(b) in respect of floating rate positions, treat such positions as a series of coupon payments until the next repricing and a par notional cash flow at the time bucket or time bucket midpoints closest to the next reset date, with no additional slotting of notional repricing cash flows to later time buckets or time bucket midpoints (other than the spread component which is not repriced).

2.9 Where a Reporting Bank allocates repricing cash flows based on time bucket midpoints for fixed rate positions, the Reporting Bank shall allocate, all coupon cash flows and periodic or final principal repayments to the two adjacent time bucket midpoints closest to the contractual maturity.

2.10 Where a Reporting Bank allocates repricing cash flows based on time buckets midpoints for floating rate positions, the Reporting Bank shall allocate all coupon and notional repricing cash flows to the two adjacent time bucket midpoints closest to the next reset date.

2.11 A Reporting Bank shall ignore the optionality (whether sold or bought) arising from positions with embedded automatic interest rate options for the purposes of slotting notional repricing cash flows[728] under paragraph 2.8 of this Annex, and shall treat the stripped-out embedded automatic interest rate options as if they are explicit automatic interest rate options.

2.12 A Reporting Bank may, with the Authority’s approval, categorise other positions as being amenable to standardisation and ignore any optionality associated with such positions if the Reporting Bank can demonstrate that such optionality is of immaterial consequence.

[728] For example, a floating rate loan or debt security with a floor shall be treated as if there were no floor; hence, it shall be treated as if it was fully repriced at the next reset date, and its full outstanding balance slotted into the corresponding time band. Similarly, a callable bond issued by a bank at a fixed yield shall be treated as if it matured at its longest contractual term, ignoring the call option.

Process for Positions that are Less Amenable to Standardisation[729]

2.13 A Reporting Bank shall use the methodology provided in paragraphs 5.1 to 5.5 of this Annex to treat explicit automatic interest rate options[730] and embedded automatic interest rate options that are separated or stripped out from the Reporting Bank's assets or liabilities.

Process for Positions that are Not Amenable to Standardisation

2.14 A Reporting Bank shall use the methodology provided in paragraphs 3.1 to 4.14 of this Annex for positions not amenable to standardisation. Positions not amenable to standardisation include –

(a) NMDs;

(b) fixed rate loans subject to prepayment risk; and

(c) term deposits subject to early redemption risk.

**Section 3: Treatment of NMDs**

3.1 A Reporting Bank shall carry out the following steps in the order set out below for the treatment of NMDs –

(a) segment its NMDs according to the nature of the deposit and depositor in accordance with paragraph 3.2 of this Annex;

(b) identify, for each NMD category, the core and non-core deposits in accordance with paragraphs 3.3 and 3.4 of this Annex, up to the caps on proportion of core deposits specified in Table 10B-2;

(c) determine an appropriate cash flow slotting for each NMD category in accordance with paragraphs 3.5 to 3.7 of this Annex and the average maturity limits specified in Table 10B-2.

NMD Categories

3.2 A Reporting Bank shall –

(a) segment NMDs into the retail and wholesale NMD categories set out in Table 10B-2;

729 For positions that are less amenable to standardisation, a common feature is optionality that makes the timing of notional repricing cash flows uncertain. Such optionality introduces a non-linearity, which suggests that delta-equivalent approximations are imprecise for large interest rate shock scenarios.

730 An example of a product with embedded automatic interest rate options is a floating rate mortgage loan with embedded caps and/or floors. Notional repricing cash flows for these loans are treated as fixed rate loans until the next repricing date, thereby ignoring the option, which is treated like a separate automatic interest rate option.

(b) treat deposits placed with it by a natural person as retail deposits, and deposits from legal entities, sole proprietorships or partnerships as wholesale deposits;

(c) treat deposits made by small business customers[731] and managed as retail exposures as retail deposits;

(d) where regular transactions are carried out of the account of a small business customer and managed as retail exposure, classify such retail deposits as being held in a transactional account[732]; and

(e) classify all other retail deposits as being held in a non-transactional account.

Separation of NMDs

3.3 A Reporting Bank shall distinguish between the stable and non-stable parts of each NMD category using observed volume changes over the past 10 years. The stable NMD portion refers to the portion that is found to remain undrawn with a high degree of likelihood.

3.4 A Reporting Bank shall estimate its level of core deposits based on the proportion of stable NMDs which are unlikely to reprice even under significant changes in the interest rate environment and subject to the cap as shown in Table 10B-2 for each NMD category. The Reporting Bank shall estimate non-core NMDs as the remainder of NMDs not treated as core deposits.

Cash Flow Slotting

3.5 A Reporting Bank shall slot NMDs into the appropriate time bucket or time bucket midpoint.

3.6 A Reporting Bank shall treat the non-core deposits mentioned in paragraph 3.4 of this Annex as overnight deposits and accordingly slot such non-core deposits into the overnight time bucket or overnight time bucket midpoint.

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731 "Small business customers" are defined in line with the definition of loans extended to small businesses in footnote 124 of Part VII that are managed as retail exposures and are generally considered as having similar interest rate risk characteristics to retail accounts provided the total aggregated liabilities raised from one small business customer is less than S$2 million (on a consolidated basis where applicable). Where a bank does not have any exposure to a small business customer that would enable it to use the definition under footnote 124 of Part VII, the bank may include such a deposit in this category provided that the total aggregated liabilities raised from the customer is less than S$2 million (on a consolidated basis where applicable) and the deposit is managed as a retail deposit. This means that the bank treats such deposits in its internal risk management systems consistently over time and in the same manner as other retail deposits, and that the deposits are not individually managed in a way comparable to larger corporate deposits.

732 Examples of transactional retail deposits are ones where salaries are automatically credited or when the deposit is non-interest bearing. For non-interest bearing deposits, a Reporting Bank may introduce a specific category for non-remunerated deposits, subject to the Authority's approval.

3.7 A Reporting Bank shall determine the appropriate cash flow slotting procedure for each category of core deposits, up to the maximum average maturity for each category as specified in Table 10B-2.

**Table 10B-2: Caps on Core Deposits and Average Maturity by Category**

| NMD category | Cap on proportion of core deposits (%) | Cap on average maturity of core deposits (years) |
|---|---|---|
| Retail / Transactional | 90 | 5 |
| Retail / Non-transactional | 70 | 4.5 |
| Wholesale | 50 | 4 |

**Section 4: Treatment of Positions with Behavioural Options other than NMDs**

4.1 The treatment set out in paragraphs 4.2 to 4.14 of this Annex applies only to behavioural options related to retail customers. In the case where a wholesale customer has a behavioural option that may change the pattern of notional repricing cash flows, a Reporting Bank shall use the methodology provided in paragraph 5.5 of this Annex.

Positions with Behavioural Options other than NMDs

4.2 In the case of fixed rate loans subject to prepayments and term deposits subject to early redemption risk, the customer has an option, which, if exercised, will alter the timing of a Reporting Bank's cash flows. The customer's exercise of the option is, among other factors, influenced by changes in interest rates. In the case of a fixed rate loan, the customer has an option to repay the loan early, that is to prepay; and for a fixed-term deposit, the customer may have the option to withdraw the deposit before the scheduled date.

4.3 A Reporting Bank shall calculate the optionality of positions with behavioural options other than NMDs.

4.4 In paragraph 4.3 of this Annex, "optionality of positions with behavioural options other than NMDs" means the amount ascertained by the formula A x B, where –

(a) A is the baseline estimate of loan prepayments and early withdrawal of fixed-term deposits given the prevailing term structure of interest rates; and

(b) B is the scenario-dependent scalar that reflects the likely behavioural changes in the exercise of the options.

4.5 A Reporting Bank shall –

(a) determine the value of A referred to in paragraph 4.4(a) of this Annex; and

(b) where the Reporting Bank adopts the SA(IR) under paragraph 5.19(b) of Annex 10A, obtain the Authority's prior approval of the value of A.

Fixed Rate Loans Subject to Prepayment Risk

4.6 Any prepayments, or any part thereof, for which the economic cost is not charged to the borrower, is referred to as uncompensated prepayment.

4.7 For any loan product where the economic cost of prepayments is never charged, or charged only for prepayments above a certain threshold, a Reporting Bank shall use the steps set out in paragraphs 4.8 to 4.10 of this Annex to assign notional repricing cash flows.

4.8 A Reporting Bank shall compute the CPR for each portfolio as –

$$CPR_{i,c}^{p} = \min(1, \gamma_i \cdot CPR_{0,c}^{p})$$

where –

(a) $CPR_{i,c}^{p}$ is the CPR for a portfolio *p* of homogenous prepayment-exposed loans denominated in currency *c* under an interest rate shock scenario *i* as set out in Table 10B-3;

(b) $CPR_{0,c}^{p}$ is the constant baseline CPR[733] under the current interest rate yield curve of the portfolio *p* of homogenous prepayment-exposed loans denominated in currency *c*. The Reporting Bank shall determine $CPR_{0,c}^{p}$ based on the prevailing term structure of interest rates; and

(c) $\gamma_i$ is a multiplier applied for scenario *i* as given in Table 10B-3.

**Table 10B-3: CPRs under the Shock Scenarios**

| Scenario number (i) | Interest rate shock scenarios | $\gamma_i$ (scenario multiplier) |
|---|---|---|
| 1 | Parallel up | 0.8 |
| 2 | Parallel down | 1.2 |
| 3 | Steepener | 0.8 |
| 4 | Flattener | 1.2 |
| 5 | Short rate up | 0.8 |
| 6 | Short rate down | 1.2 |

4.9 A Reporting Bank shall reflect the prepayments on the fixed rate loans in the relevant cash flows (for example scheduled payments on the loans, prepayments and interest payments[734]), as follows –

(a) where time buckets are used –

$$CF_{i,c}^{p}(k) = CF_{i,c}^{S}(k) + CPR_{i,c}^{p} \cdot N_{i,c}^{p}(k-1);$$ or

(b) where time bucket midpoints are used –

[733] Alternatively, the baseline CPR may also vary over the life of each loan in the portfolio. In that case, it is denoted as $CPR(k)_{0,c}^{p}$ for each time bucket *k* or $CPR(t_k)_{0,c}^{p}$ for each time bucket midpoint $t_k$.

[734] The Reporting Bank may separate such payments into scheduled payments adjusted for prepayment and uncompensated prepayments.

$$CF^{p}_{i,c}(t_k) = CF^{S}_{i,c}(t_k) + CPR^{p}_{i,c} \cdot N^{p}_{i,c}(t_{k-1}),$$

where –

(i) $CF^{p}_{i,c}(k)$ and $CF^{p}_{i,c}(t_k)$ refers to the notional repricing cashflows arising from a portfolio p of homogenous prepayment-exposed loans denominated in currency c under an interest rate shock scenario i as set out in Table 10B-3;

(ii) $CF^{S}_{i,c}(k)$ and $CF^{S}_{i,c}(t_k)$ refers to the scheduled interest and principal repayment for each interest rate shock scenario i and currency c;

(iii) k and tk refers to the time bucket and time bucket midpoint respectively, that the scheduled interest and principal repayment is slotted into;

(iv) $N^{p}_{i,c}(k-1)$ and $N^{p}_{i,c}(t_{k-1})$ denotes the notional outstanding of portfolio p at time bucket k-1 and time bucket midpoint tk-1 respectively, for each interest rate scenario i and currency c; and

(v) The base cash flows (that is given the current interest rate yield curve and base CPR) are given by i=0.

4.10 Where a Reporting Bank has in place annual limits on uncompensated prepayments, it shall apply these annual limits in the relevant cash flows referred to in paragraph 4.9 of this Annex.

Term Deposits Subject to Early Redemption Risk

4.11 A Reporting Bank shall treat term deposits as being subject to early redemption risk, subject to paragraph 4.12 of this Annex.

4.12 A Reporting Bank may treat term deposits as fixed rate liabilities and slot the notional repricing cash flows of such deposits into the time buckets or time bucket midpoints up to their corresponding contractual maturity dates if the Reporting Bank can show to the satisfaction of the Authority that –

(a) the depositor has no legal right to withdraw the deposit; or

(b) an early withdrawal results in a significant penalty that at least compensates for the loss of interest between the date of withdrawal and the contractual maturity date and the economic cost of breaking the contract[735].

4.13 A Reporting Bank shall compute the TDRR for each portfolio as –

$$TDRR^{p}_{i,c} = \min(1, u_i \cdot TDRR^{p}_{0,c})$$

[735] However, penalties often do not reflect such an economic calculation but are instead based on a simpler formula such as a percentage of accrued interest. In such cases, there is potential for changes to profit or loss arising from differences between the penalty charged and the actual economic cost of early withdrawal.

where –

(a) $TDRR_{i,c}^{p}$ is the TDRR that is applicable to each homogenous portfolio *p* of term deposits in currency *c* for each interest rate shock scenario *i* set out in Table 10B-4;

(b) $TDRR_{0,c}^{p}$ is the baseline TDRR under the current interest rate yield curve that is applicable to each homogenous portfolio *p* of term deposits in currency *c* and is to be determined by the Reporting Bank; and

(c) $u_i$ is the scalar multiplier applied for interest rate shock scenario *i* as given in Table 10B-4.

**Table 10B-4: TDRR Scalars under the Shock Scenarios**

| Scenario number (i) | Interest rate shock scenarios | $u_i$ (Scalar multiplier) |
|---|---|---|
| 1 | Parallel up | 1.2 |
| 2 | Parallel down | 0.8 |
| 3 | Steepener | 0.8 |
| 4 | Flattener | 1.2 |
| 5 | Short rate up | 1.2 |
| 6 | Short rate down | 0.8 |

4.14 A Reporting Bank shall calculate the notional repricing cash flows for term deposits which are expected to be redeemed early under any interest rate shock scenario *i* in accordance with the formula below, and slot such cash flows into the overnight time bucket ($k$=1) or time bucket midpoint ($t_1$) as follows –

(a) where time buckets are used –

$$CF_{i,c}^{p}(1) = TD_{0,c}^{p} \cdot TDRR_{i,c}^{p}; \text{ or}$$

(b) where time bucket midpoints are used –

$$CF_{i,c}^{p}(t_1) = TD_{0,c}^{p} \cdot TDRR_{i,c}^{p}$$

where –

(i) $CF_{i,c}^{p}(1)$ refers to the notional repricing cashflows arising from each homogenous portfolio p of term deposits in currency c for each interest rate shock scenario i set out in Table 10B-4, which are expected to be redeemed early and slotted into the overnight time bucket;

(ii) $CF_{i,c}^{p}(t_1)$ refers to the notional repricing cashflows arising from each homogenous portfolio p of term deposits in currency c for each interest rate shock scenario *i* set out in Table 10B-4, which are expected to be redeemed early and slotted into the overnight time bucket midpoint; and

(iii) $TD_{0,c}^{p}$ refers to the outstanding amount of term deposits for portfolio *p* and currency *c*.

## Section 5: Automatic Interest Rate Options

5.1 A Reporting Bank shall calculate an add-on for sold automatic interest rate options, whether explicit or embedded[736]. A Reporting Bank may calculate an add-on for all bought automatic interest rate options or only for bought automatic interest rate options used for hedging sold automatic interest rate options.

5.2 For the purposes of paragraph 5.1 of this Annex, a Reporting Bank shall calculate the add-on based on the following –

(a) for each sold automatic option *o* in currency *c*, the value change denoted $\Delta FVAO_{i,c}^{o}$ is calculated for each interest rate shock scenario *i*. The value change is given by –

(i) an estimate of the value of the option to the option holder, given –

(A) a yield curve in currency *c* under the interest rate shock scenario *i*; and

(B) a relative increase in the implicit volatility of 25%;

minus

(ii) the value of the sold option to the option holder, given the yield curve in currency *c* at the valuation date;

(b) for each bought automatic interest rate option *q* in currency *c*, the Reporting Bank shall determine the change in value of the option, $\Delta FVAO_{i,c}^{q}$, between interest rate shock scenario *i* and the current interest rate term structure combined with a relative increase in the implicit volatility of 25%;

(c) the Reporting Bank's total measure for automatic interest rate option risk, $KAO_{i,c}$, under interest rate shock scenario *i* in currency *c* is calculated as –

$$KAO_{i,c} = \sum_{o=1}^{n_c} \Delta FVAO_{i,c}^{o} - \sum_{q=1}^{m_c} \Delta FVAO_{i,c}^{q}$$

where $n_c(m_c)$ is the number of sold (bought) options in currency *c*.

5.3 For the purposes of paragraphs 5.2(a) and 5.2(b) of this Annex, the Reporting Bank shall –

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[736] The most important interest rate options that are likely to occur in the banking book are caps and floors, which are often embedded in banking products. Swaptions, such as prepayment options on non-retail products, may also be treated as automatic interest rate options as, in cases where such options are held by sophisticated financial market counterparties, the option holder will almost certainly exercise the option if it is in their financial interest to do so.

(a) calculate the value of the option to the option holder based on an internally-selected methodology; and

(b) where the Reporting Bank adopts the SA(IR) under paragraph 5.19(b) of Annex 10A, obtain the Authority's prior approval of the methodology.

5.4 Where a Reporting Bank calculates an add-on only for bought automatic interest rate options that are used for hedging sold automatic interest rate options, the Reporting Bank shall, in respect of remaining bought interest rate options, add any change in market value that is reflected in regulatory capital to the total automatic interest rate option risk measure $KAO_{i,c}$.

5.5 For the purposes of paragraphs 5.2 to 5.4 of this Annex, the Reporting Bank shall treat any behavioural option positions with wholesale customers that may change the pattern of notional repricing cash flows as embedded automatic interest rate options[737]. A Reporting Bank may treat wholesale term deposits as fixed rate liabilities and slot their notional repricing cashflows into the time buckets or time bucket midpoints up to their corresponding contractual maturity dates if the Reporting Bank can demonstrate to the satisfaction of the Authority that –

(a) the depositor has no legal right to withdraw the deposit; or

(b) an early withdrawal results in a significant penalty that at least compensates for the loss of interest between the date of withdrawal and the contractual maturity date and the economic cost of breaking the contract[735].

**Section 6: Calculation of the Standardised EVE Measure**

6.1 A Reporting Bank shall calculate the loss in economic value of equity, $\Delta EVE_{i,c}$ under scenario *i* and currency *c* for each currency with material exposures, that is, currencies that account for more than 5% of its banking book assets or liabilities, as follows –

(a) slot all notional repricing cash flows into their respective time buckets $k \in \{1,2,\ldots,K\}$ or time bucket midpoints $t_k, k \in \{1,2,\ldots,K\}$ for each scenario *i*. Within a given time bucket *k* or time bucket midpoint $t_k$, the Reporting Bank shall net[738] all positive and negative notional repricing cash flows to form a single long or short position, with the netted parts removed from the calculation. This process applied across all time buckets or time bucket midpoints leads to a set of notional repricing cash flows $CF_{i,c}(k)$ or $CF_{i,c}(t_k), k \in \{1,2,\ldots,K\}$[739];

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737 An example of such an option would be a puttable fixed coupon bond issued by the Reporting Bank in the wholesale market, for which the owner has the right to sell the bond back to the Reporting Bank at a fixed price at any time.

738 Intra-bucket mismatch risk arises as notional repricing cash flows with different maturity dates, but falling within the same time bucket or time bucket midpoint, are assumed to match perfectly. This is mitigated by the high number of time buckets available.

739 Depending on the approach the Reporting Bank takes for NMDs, prepayments and product with other embedded behavioral options, the notional repricing cash flows may vary by scenario *i* (scenario-dependent cash flow products).

(b) weigh the net notional repricing cash flows in each time bucket *k* or time bucket midpoints $t_k$ calculated in sub-paragraph (a) above by $DF_{i,c}(t_k)$ a continuously compounded discount factor –

$$DF_{i,c}(t_k) = \exp(-R_{i,c}(t_k) \cdot t_k)$$

where –

(i) $R_{i,c}(t_k)$ is the post-shock risk-free rate or risk-free rate including commercial margins and other spreads (only if the Reporting Bank has included commercial margins and other spread components in its cash flows) in currency *c* under interest rate shock scenario *i* as set out in Annex 10C; and

(ii) $t_k$ is the midpoint of time bucket *k*.

(c) sum the risk-weighted net positions computed in sub-paragraph (b) above to determine $EVE_{i,c}^{nao}$ , the EVE in currency *c* under scenario *i* (excluding automatic interest rate positions) –

(i) where time buckets are used –

$EVE_{i,c}^{nao} = \sum_{k=1}^{K} \mathrm{CF}_{i,c}(k) \cdot DF_{i,c}(t_k)$; or

(ii) where time bucket midpoints are used –

$EVE_{i,c}^{nao} = \sum_{k=1}^{K} \mathrm{CF}_{i,c}(t_k) \cdot DF_{i,c}(t_k)$;

(d) obtain the ΔEVE in currency *c* associated with scenario *i* by subtracting $EVE_{i,c}^{nao}$ from the EVE under the current interest rate term structure $EVE_{0,c}^{nao}$ and by adding the total measure for automatic interest rate risk $KAO_{i,c}$, as follows -

(i) where time buckets are used –

$\Delta EVE_{i,c} = \sum_{k=1}^{K} \mathrm{CF}_{0,c}(k) \cdot DF_{0,c}(t_k) - \sum_{k=1}^{K} \mathrm{CF}_{i,c}(k) \cdot DF_{i,c}(t_k) + KAO_{i,c}$; or

(ii) where time bucket midpoints are used –

$\Delta EVE_{i,c} = \sum_{k=1}^{K} \mathrm{CF}_{0,c}(t_k) \cdot DF_{0,c}(t_k) - \sum_{k=1}^{K} \mathrm{CF}_{i,c}(t_k) \cdot DF_{i,c}(t_k) + KAO_{i,c}$;

6.2 A Reporting Bank shall ensure that the risk-free rate used for discounting purposes is representative of a risk-free zero coupon rate[740].

[740] An example of an acceptable yield curve is a secured interest rate swap curve.

6.3 A Reporting Bank shall compute the standardised EVE risk measure by aggregating the EVE losses $\Delta EVE_{i,c} > 0$ under a given interest rate scenario *i*, and taking the maximum loss across all interest rate shock scenarios –

$$\text{Standardised EVE risk measure} = \max_{i \in \{1,2,\ldots,6\}} \left\{ \max\left( 0; \sum_{c:\Delta \mathrm{EVE}_{i,c} > 0} \underbrace{\Delta \mathrm{EVE}_{i,c}}_{loss\ in\ currency\ c} \right) \right\}$$

**Annex 10C**

## STANDARDISED INTEREST RATE SHOCK SCENARIOS

[MAS Notice 637 (Amendment No. 2) 2018 (Insertion of this Annex)]

1 A Reporting Bank shall apply the interest rate shock scenarios –

(a) as set out in paragraphs 2(a) to (f) of this Annex to calculate parallel and non-parallel gap risks for EVE; and

(b) as set out in paragraphs 2(a) and (b) of this Annex for the calculation of NII,

in respect of each currency for which the Reporting Bank has material positions[741].

2 The interest rate shock scenarios referred to in paragraph 1 of this Annex are –

(a) parallel shock up;

(b) parallel shock down;

(c) steepener shock (short rates down and long rates up);

(d) flattener shock (short rates up and long rates down);

(e) short rates shock up; and

(f) short rates shock down.

3 The instantaneous interest rate shocks, $\overline{R}_{shocktyp\ ,c}$ to the risk-free rate for each shock type (parallel, short and long) and for each currency *c*, are provided in Table 10C-1 and given in basis points.

**Table 10C-1: Specified Size of Interest Rate Shocks $\overline{R}_{shocktype,c}$**

| | Argentina Peso (ARL) | Australian Dollar (AUD) | Brazilian Real (BRL) | Canadian Dollar (CAD) | Swiss Franc (CHF) | Chinese Yuan (CNY) | Euro (EUR) |
|---|---|---|---|---|---|---|---|
| Parallel | 400 | 300 | 400 | 200 | 100 | 250 | 200 |
| Short | 500 | 450 | 500 | 300 | 150 | 300 | 250 |
| Long | 300 | 200 | 300 | 150 | 100 | 150 | 100 |

| | British Pound (GBP) | Hong Kong Dollar (HKD) | Indonesian Rupiah (IDR) | Indian Rupee (INR) | Japanese Yen (JPY) | Korean Won (KRW) | Mexican Peso (MXN) |
|---|---|---|---|---|---|---|---|
| Parallel | 250 | 200 | 400 | 400 | 100 | 300 | 400 |
| Short | 300 | 250 | 500 | 500 | 100 | 400 | 500 |
| Long | 150 | 100 | 350 | 300 | 100 | 200 | 300 |

[741] Currencies that account for more than 5% of its banking book assets or liabilities

| | Russian Ruble (RUB) | Saudi Riyal (SAR) | Swedish Krona (SEK) | Singapore Dollar (SGD) | Turkish Lira (TRY) | United States Dollar (USD) | South African Rand (ZAR) |
|---|---|---|---|---|---|---|---|
| Parallel | 400 | 200 | 200 | 150 | 400 | 200 | 400 |
| Short | 500 | 300 | 300 | 200 | 500 | 300 | 500 |
| Long | 300 | 150 | 150 | 100 | 300 | 150 | 300 |

4 For currencies not specified in Table 10C-1, a Reporting Bank shall use the following steps to derive their instantaneous interest rate shocks –

(a) Step 1: generate a 16-year time series of daily interest rates for the currencies not available in Table 10C-1 from the year 2000 (3 January 2000) to the year 2015 (31 December 2015), or based on such other historical period that is approved by the Authority. The Reporting Bank shall determine the average local percentile of the rate series by calculating the average rate across all daily rates in time buckets 3M, 6M, 1Y, 2Y, 5Y, 7Y, 10Y, 15Y and 20Y.

(b) Step 2: apply the baseline global interest rate shock parameters specified in Table 10C-2 to the average long-term rates derived in sub-paragraph (a) to obtain the interest rate shocks by currency for the parallel, short and long segments of the yield curve.

**Table 10C-2: Baseline global interest rate shock parameters**

| | |
|---|---|
| Parallel | 60% |
| Short | 85% |
| Long | 40% |

(c) Step 3: apply the following caps and floors to the interest rate shocks derived in sub-paragraph (b) above to obtain the final set of instantaneous interest rate shocks, $\overline{R}_{shocktype,c}$ for each shock type (parallel, short and long) and for each currency $c$ –

(i) parallel – floor of 100bps, Cap of 400bps;

(ii) short – floor of 100bps, Cap of 500bps; and

(iii) long – floor of 100bps, Cap of 300bps.

5 A Reporting Bank shall maintain relevant documents and proper audit trails for the derivation of instantaneous shock rates for currencies not specified in Table 10C-1 to facilitate reviews by the Authority.

6 Subject to paragraph 7 of this Annex, a Reporting Bank shall calculate the interest rate shocks and apply such shocks to each of the six interest rate shock scenarios referred to in paragraph 2 of this Annex as follows –

(a) parallel shock for currency $c$, $\Delta R_{parallel,c}(t_k)$, that refers to a constant parallel shock up or down across all time buckets –

$$\Delta R_{parallel,c}(t_k) = \pm\bar{R}_{parallel,c}$$

where –

(i) $\bar{R}_{parallel,c}$ refers to the instantaneous interest rate shock for currency *c* and the parallel shock type specified in paragraph 3 of this Annex or, in the case of currencies not specified in Table 10C-1, paragraph 4(c)(i) of this Annex;

(ii) $t_k$ refers to the midpoint (in time) of the $k^{th}$ bucket;

(b) short rate shock for currency *c,* $\Delta R_{short,c}(t_k)$, that refers to a shock up or down that is greatest at the shortest tenor midpoint –

$$\Delta R_{short,c}(t_k) = \pm\bar{R}_{short,c} \cdot S_{short}(t_k) = \pm\bar{R}_{shor\ ,c} \cdot e^{\frac{-t_k}{x}}$$

where –

(i) $\bar{R}_{short,c}$ refers to the instantaneous interest rate shock for currency *c* and the short shock type computed in paragraph 3 of this Annex or, in the case of currencies not specified in Table 10C-1, paragraph 4(c)(ii) of this Annex; and

(ii) $S_{sho}\ (t_k)$ refers to the shaping scalar and is defined as $(e^{\frac{-t_k}{x}})$, where *x* = 4, and *e* refers to the exponential function. The shaping scalar diminishes towards zero at the tenor of the longest point in the term structure[742,743];

(c) long rate shock for currency *c*[744], $\Delta R_{long,c}(t_k)$, that refers to a shock up or down that is greatest at the longest tenor midpoint –

$$\Delta R_{long,c}(t_k) = \pm\bar{R}_{long,c} \cdot S_{long}(t_k) = \pm\bar{R}_{long,c} \cdot (1 - e^{\frac{-t_k}{x}})$$

where –

(i) $\bar{R}_{long,c}$ refers to the instantaneous interest rate shock for currency *c* and the long shock type computed in paragraph 3 of this Annex or, in the case of currencies not specified in Table 10C-1, paragraph 4(c)(iii) of this Annex; and

(ii) $S_{long}(t_k)$ is related to the shaping scalar referred to in sub-paragraph (b)(ii) via the following relationship: $S_{long}(t_k) = 1 - S_{short}(t_k)$;

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742 The value of x in the denominator of the function $e^{\frac{-t_k}{x}}$ controls the rate of decay of the shock.

743 $t_k$ is the midpoint (in time) of the $k^{th}$ bucket. There are 19 buckets in the standardised framework, but the analysis may be generalised to any number of buckets.

744 The long rate shock is only used for the computing steepener and flattener shocks set out in paragraph 6(d) of this Annex.

(d) steepener shock, $\Delta R_{steepener,c}(t_k)$, and flattener shock, $\Delta R_{flattener,c}(t_k)$, for currency *c* that involves rotations to the term structure of the interest rates where both the long and short rates are shocked to derive the steepener and flattener interest rate scenarios respectively. The shift in interest rates at each tenor midpoint is obtained by applying the following formulas to those shocks[745] –

$$\Delta R_{steepener,c}(t_k) = -0.65 \cdot \left|\Delta R_{short,c}(t_k)\right| + 0.9 \cdot \left|\Delta R_{long,c}(t_k)\right|$$

$$\Delta R_{flattener,c}(t_k) = +0.8 \cdot \left|\Delta R_{short,c}(t_k)\right| - 0.6 \cdot \left|\Delta R_{long,c}(t_k)\right|$$

7 For the avoidance of doubt, where the post-shock interest rates under the six interest rate shock scenarios set out in paragraph 2 of this Annex is negative, a Reporting Bank shall not floor such post-shock interest rates at zero or any negative lower bound.

[745] In all cases, $\Delta R_{shor\ ,c}(t_1)$ and $\Delta R_{long,c}(t_1)$ cannot exceed 500 basis points, and $\Delta R_{short,c}(t_k)$ and $\Delta R_{long,c}(t_k)$ cannot exceed 300 basis points.

## PART XI: PUBLIC DISCLOSURE REQUIREMENTS

[MAS Notice 637 (Amendment) 2016 (Replacement of this Part in its entirety)]

### Division 1: Introduction

11.1.1 The public disclosure requirements set out in this Part complement the minimum capital requirements under Pillar 1 and the supervisory review process set out in Part X. The purpose of the requirements in this Part is to promote market discipline by requiring disclosures of key information relating to a Reporting Bank's regulatory capital and risk exposures on a consistent and comparable basis. Some disclosures also serve as a qualifying criterion for more advanced approaches under Pillar 1 (i.e. disclosures marked with an asterisk in this Part are conditions for use of a particular approach for the calculation of regulatory capital).

Guiding principles for disclosures

11.1.2 A Reporting Bank should apply the following principles in making its disclosures:

(a) Disclosures should be clear. A Reporting Bank should present the disclosures in a form that is understandable and communicate the disclosures through an accessible medium. A Reporting Bank should highlight important messages which should be easily located. A Reporting Bank should explain complex issues in simple language with key terms defined. A Reporting Bank should present related risk information together;

(b) Disclosures should be comprehensive. A Reporting Bank should disclose its main activities and all significant risks, supported by relevant data and information. A Reporting Bank should describe significant changes in risk exposures between reporting periods, together with the management's response. A Reporting Bank should provide sufficient qualitative and quantitative information on its processes and procedures for identifying, measuring and managing those risks. The level of detail of such disclosures should be proportionate to the complexity of the Reporting Bank. A Reporting Bank's disclosures should reflect how the Board and senior management internally assess and manage risks and strategy, helping users to better understand the risk tolerance or appetite of the Reporting Bank;

(c) Disclosures should provide meaningful or relevant information to users. A Reporting Bank should highlight its most significant current and emerging risks and how these risks are managed, including information that is likely to receive market attention; and

(d) Disclosures should be consistent over time. This is to enable users to identify trends in the risk profile of a Reporting Bank across all significant

aspects of its business. A Reporting Bank should highlight and explain additions, deletions and important changes in disclosures from previous reports, including those arising from bank's specific, regulatory or market developments.

These principles aim to strengthen the transparency and quality of risk disclosures that will enable users to better understand and compare a Reporting Bank's business and its risks.

## Division 2: General Requirements

### Sub-division 1: Scope of Application

11.2.1 This Part shall apply to a Reporting Bank at the Group level, in accordance with paragraph 3.1.1(b) of Part III unless otherwise stated.

11.2.2 A Reporting Bank need not comply with the requirements in this Part if it is a subsidiary of –

(a) another Reporting Bank which is subject to the requirements in this Part; or

(b) a financial holding company which is subject to requirements similar to that set out in this Part.

### Sub-division 2: Frequency and Timing of Disclosures

11.2.3 A Reporting Bank shall make the disclosures required under –

(a) Sub-divisions 2 to 7 and 10 to 13 of Division 3 of this Part according to the frequency of disclosure for each disclosure requirement set out in Table 11-1, except for the disclosures required under Table 11-45 which a Reporting Bank shall make on a quarterly basis;

(b) Sub-division 8 of Division 3 of this Part on an annual basis; and

(c) Sub-division 9 of Division 3 of this Part at least on an annual basis and where such disclosures are made only on an annual basis, explain why this is appropriate. To enhance market discipline, the Reporting Bank is encouraged to make more frequent quantitative disclosures, e.g. on a semi-annual basis.

(d) [Deleted by MAS Notice 637 (Amendment No. 3) 2017]

[MAS Notice 637 (Amendment No. 3) 2017]

11.2.4 For disclosures required to be made on a quarterly or semi-annual basis in this Part, a Reporting Bank which issues quarterly financial statements shall publish the information concurrently with the publication of its quarterly financial statements, and no later than 45 days after the end of each quarter. A Reporting Bank which does not issue quarterly financial statements shall publish the information no later than 45 days after the end of each quarter.

11.2.5 For disclosures required to be made annually in this Part, a Reporting Bank which issues an annual report shall publish the information concurrently with the publication of its annual report, and no later than 4 months after the end of each financial year. A Reporting Bank which does not issue an annual report shall publish the information no later than 4 months after the end of each financial year.

11.2.6 A Reporting Bank shall make the disclosures required under Sub-divisions 2 to 7 and 10 to 13 of Division 3 of this Part with effect from the corresponding implementation date set out in Table 11-1.

[MAS Notice 637 (Amendment No. 3) 2017]

**Sub-division 3: Location and Form of Disclosures**

11.2.7 Subject to paragraphs 11.3.18 and 11.3.33, a Reporting Bank shall disclose the information required in Division 3 of this Part, in a standalone document ("standalone Pillar 3 report"), which may be appended to, or form a discrete section of its annual report or periodic financial statements. The Reporting Bank shall ensure that the standalone Pillar 3 report is easily identifiable to users. A Reporting Bank shall make available on its website, an archive of a minimum of five years, of information disclosed pursuant to this Part relating to prior reporting periods.

11.2.8 A Reporting Bank may disclose items set out in the tables marked as having a flexible format in Division 3 of this Part in a separate document from the standalone Pillar 3 report, provided that –

(a) the level of assurance on the reliability of data in the separate document is equivalent to, or greater than, the internal assurance level required for the standalone Pillar 3 report, as set out in paragraphs 11.2.16 to 11.2.18; and

(b) it includes in the standalone Pillar 3 report, the following information –

[800] [Deleted by MAS Notice 637 (Amendment No. 3) 2017]

(i) the title and the number of the disclosure requirement;

(ii) the full name of the separate document in which the disclosure requirement has been published;

(iii) a URL to such disclosure of information on its website, where relevant; and

(iv) the page and paragraph number of the separate document where the disclosure requirement can be located.

11.2.9 A Reporting Bank shall complete the quantitative data required under the tables in Sub-divisions 2 to 7 and 10 to 13 of Division 3 of this Part in accordance with the definitions provided. A Reporting Bank shall present narrative commentaries to supplement such required quantitative disclosures in a format at the Reporting Bank's discretion and to explain any significant changes between reporting periods and any other issues of interest to market participants.

[MAS Notice 637 (Amendment No. 3) 2017]

Tables with a fixed format in Sub-divisions 2 to 7, 11 and 12 of Division 3 of this Part

11.2.10 Where the format of a table in Sub-divisions 2 to 7, 11 and 12 of Division 3 of this Part is described as fixed, a Reporting Bank shall complete the fields in accordance with the instructions given in the table. Subject to paragraph 11.2.14, a Reporting Bank may delete rows or columns from the table but shall not alter the numbering of subsequent rows and columns. A Reporting Bank may add additional sub-rows and sub-columns to the table to provide additional details to a disclosure requirement. However, the Reporting Bank shall not alter the numbering of prescribed rows and columns in the table.

[MAS Notice 637 (Amendment No. 3) 2017]

Tables with a flexible format in Sub-divisions 2 to 7, 10, 11 and 13 of Division 3 of this Part

11.2.11 Where the format of a table in Sub-divisions 2 to 7, 10, 11 and 13 of Division 3 of this Part is described as flexible, a Reporting Bank may present the required information either in the format provided in the table, or in one that is more suitable for the Reporting Bank. However, where a customised presentation of the information is used, the Reporting Bank shall provide information that is comparable (i.e. at a similar level of granularity) with the disclosure requirements set out in the table.

Disclosure requirements in Table 11-45 and Sub-divisions 8 and 9 of Division 3 of this Part

11.2.12 For the disclosure requirements in Table 11-45 and Sub-divisions 8 and 9 of Division 3 of this Part, a Reporting Bank has the discretion to determine the form of the

disclosures required in this Part, and may choose to use either graphical or such other forms or both, that the Reporting Bank deems appropriate to assist users in forming an opinion on the risk profile and capital adequacy of the Reporting Bank.

[MAS Notice 637 (Amendment No. 3) 2017]

**Sub-division 4: Omissions**

11.2.13 A Reporting Bank may omit certain disclosures in this Part if the omitted item is proprietary or confidential in nature, where "*proprietary*" and "*confidential*" are defined, respectively, as follows:

(a) proprietary information refers to information that if shared with the public would undermine the competitive position of the Reporting Bank; and

(b) confidential information refers to information that if shared with the public would cause the Reporting Bank to breach the terms of a legal agreement.

11.2.13A The Reporting Bank shall identify the specific information that it has omitted to disclose in the narrative commentary to the disclosure requirement and provide a reason for the omission. The Reporting Bank shall also disclose general qualitative information about the subject matter of the requirement.

11.2.14 In line with the principle set out in paragraph 11.1.2(c), a Reporting Bank may omit part or all of the disclosures in the tables in Sub-divisions 2 to 7 and 10 to 13 of Division 3 of this Part, if the information required to be disclosed is assessed not to provide meaningful or relevant information to users. In particular, a Reporting Bank shall assess if the information required to be disclosed in Tables 11-13, 11-14, 11-15, 11-16, 11-20, 11-25, 11-26, 11-37, 11-38 and 11-41 would provide meaningful or relevant information to users in accordance with the requirements set out in the scope of application fields in these tables. A Reporting Bank which omits disclosures in the tables in Sub-divisions 2 to 7 and 10 to 13 of Division 3 of this Part on the basis that the disclosure of the information is not meaningful or relevant shall state clearly in a narrative commentary why such information is considered not to be meaningful or relevant to users. Where applicable, the Reporting Bank shall describe the portfolios excluded from the disclosures and the aggregate total RWA of those portfolios.

[MAS Notice 637 (Amendment No. 3) 2017]

11.2.15 A Reporting Bank may omit disclosures required under any item in this Part, marked as qualitative disclosures, if -

(a) the ultimate holding company as defined under section 5A of the Companies Act (Cap. 50) of the Reporting Bank is incorporated, formed or established outside Singapore and disclosure requirements similar to

those set out in this Part apply to the ultimate parent company on a consolidated basis that is inclusive of the operations of the Reporting Bank; and

(b) the Reporting Bank makes clear reference in the standalone Pillar 3 report to the location of the relevant disclosures made by the ultimate parent company.

**Sub-division 5: Disclosure Policy**

11.2.16 A Reporting Bank shall ensure that the information it discloses in accordance with Division 3 of this Part is subject, at a minimum, to the same level of internal review and internal control processes as the information provided by the Reporting Bank for its financial reporting, if applicable, and the level of assurance shall be the same as for information provided within the management discussion and analysis part of its annual report.

11.2.17 A Reporting Bank shall have in place a written disclosure policy which sets out the approach of the Reporting Bank for determining which disclosures it will make and the internal controls over the disclosure process, and the Reporting Bank shall ensure that this policy is approved by the Board of the Reporting Bank.

11.2.18 A Reporting Bank shall describe the key elements of the disclosure policy in the year-end standalone Pillar 3 report or cross-reference to another location (e.g. the Reporting Bank's website or publicly available regulatory reports) where they are available. A Reporting Bank shall ensure that the Board and senior management of the Reporting Bank are responsible for establishing and maintaining effective internal control processes over the disclosure of financial information, including the disclosures required under this Part, and the appropriate review of the disclosures. The Reporting Bank shall ensure that one or more senior officers of the Reporting Bank, ideally a Board member or equivalent, attest in writing that the disclosures required under the Part have been prepared in accordance with the internal control processes approved by the Board of the Reporting Bank.

11.2.19 A Reporting Bank may disclose additional quantitative and qualitative information to provide users with a broader picture of the Reporting Bank's risk position and promote market discipline. If a Reporting Bank discloses additional quantitative and qualitative information, it should ensure that such information provides sufficient meaningful or relevant information to enable users to understand and analyse any figures provided, and is accompanied by a qualitative discussion.

**Division 3: Specific Disclosure Requirements**

**Sub-division 1: Introduction**

11.3.1 Table 11-1 presents a summary of the disclosure requirements set out in Sub-divisions 2 to 7 and 10 to 13 of this Division.

[MAS Notice 637 (Amendment No. 3) 2017]

11.3.2 Sub-divisions 8 and 9 of this Division set out the disclosure requirements in the following areas -

(a) Operational Risk in Sub-division 8 of this Division; and

(b) Interest Rate Risk in the Banking Book in Sub-division 9 of this Division.

(c) [Deleted by MAS Notice 637 (Amendment No. 3) 2017]

(d) [Deleted by MAS Notice 637 (Amendment No. 3) 2017]

(e) [Deleted by MAS Notice 637 (Amendment No. 3) 2017]

[MAS Notice 637 (Amendment No. 3) 2017]

Table 11-1: Summary of disclosure requirements

| | Tables | Fixed format | Flexible format | Quarterly | Semi-annually | Annually | Implementation date |
|---|---|---|---|---|---|---|---|
| Sub-division 2: Overview of key prudential metrics, risk management and RWA | Table 11-1A: Key Metrics | ✓ | | ✓ | | | 1 January 2018 |
| | Table 11-2: Risk Management Approach | | ✓ | | | ✓ | 1 January 2017 |
| | Table 11-3: Overview of RWA | ✓ | | ✓ | | | 1 January 2017 |
| | Table 11-3B: Overview of RWA | ✓ | | ✓ | | | 31 December 2018 |
| Sub-division 3: Linkages between financial statements and regulatory exposures | Table 11-4: Differences between Accounting and Regulatory Scopes of Consolidation and Mapping of Financial Statement Categories with Regulatory Risk Categories | | ✓ | | | ✓ | 1 January 2018 |
| | Table 11-5: Main Sources of Differences between Regulatory Exposure Amounts and Carrying Amounts in Financial Statements | | ✓ | | | ✓ | 1 January 2018 |
| | Table 11-6: Qualitative Disclosure of Differences between Carrying Amounts in Financial Statements and Regulatory Exposure Amounts | | ✓ | | | ✓ | 1 January 2018 |
| | Table 11-6A: Prudent Valuation Adjustments | ✓ | | | | ✓ | 31 December 2018 |
| Sub-division 4: Credit Risk | Table 11-7: General Qualitative Disclosures on Credit Risk | | ✓ | | | ✓ | 1 January 2017 |
| | Table 11-8: Credit Quality of Assets | ✓ | | | ✓ | | 1 January 2017 |
| | Table 11-9: Changes in Stock of Defaulted Loans and Debt Securities | ✓ | | | ✓ | | 1 January 2017 |
| | Table 11-10: Additional Disclosures related to the Credit Quality of Assets | | ✓ | | | ✓ | 1 January 2017 |
| | Table 11-11: Qualitative Disclosures related to CRM Techniques | | ✓ | | | ✓ | 1 January 2017 |

| | Tables | Fixed format | Flexible format | Quarterly | Semi-annually | Annually | Implementation date |
|---|---|---|---|---|---|---|---|
| | Table 11-12: Overview of CRM Techniques | ✓ | | | ✓ | | 1 January 2018 |
| | Table 11-13: Qualitative Disclosures on the use of external credit ratings under the SA(CR) | | ✓ | | | ✓ | 1 January 2017 |
| | Table 11-14: SA(CR) and SA(EQ) - Credit Risk Exposure and CRM Effects | ✓ | | | ✓ | | 1 January 2017 |
| | Table 11-15: SA(CR) and SA(EQ) – Exposures by Asset Classes and Risk Weights | ✓ | | | ✓ | | 1 January 2017 |
| | Table 11-16: Qualitative Disclosures for IRBA Models | | ✓ | | | ✓ | 1 January 2017 |
| | Table 11-17: IRBA - Credit Risk Exposures by Portfolio and PD Range | ✓ | | | ✓ | | 1 January 2017 |
| | Table 11-18: IRBA - Effect on RWA of Credit Derivatives used as CRM | ✓ | | | ✓ | | 1 January 2017 |
| | Table 11-19: IRBA– RWA Flow Statement for Credit Risk Exposures | ✓ | | ✓ | | | 1 January 2018 |
| | Table 11-20: IRBA – Backtesting of PD per Portfolio | | ✓ | | | ✓ | 1 January 2017 |
| | Table 11-21: IRBA - Specialised Lending and Equities under the Simple Risk Weight Method | | ✓ | | ✓ | | 1 January 2017 |
| Sub-division 5: CCR | Table 11-22: Qualitative Disclosures related to CCR | | ✓ | | | ✓ | 1 January 2017 |
| | Table 11-23: Analysis of CCR Exposure by Approach | ✓ | | | ✓ | | 1 January 2017 |
| | Table 11-24: CVA Risk Capital Requirements | ✓ | | | ✓ | | 1 January 2017 |
| | Table 11-25: Standardised Approach - CCR Exposures by Portfolio and Risk Weights | ✓ | | | ✓ | | 1 January 2017 |
| | Table 11-26: IRBA - CCR Exposures by Portfolio and PD Range | ✓ | | | ✓ | | 1 January 2017 |
| | Table 11-27: Composition of Collateral for CCR Exposure | | ✓ | | ✓ | | 1 January 2018 |

| | Tables | Fixed format | Flexible format | Quarterly | Semi-annually | Annually | Implementation date |
|---|---|---|---|---|---|---|---|
| | Table 11-28: Credit Derivative Exposures | | ✓ | | ✓ | | 1 January 2017 |
| | Table 11-29: RWA Flow Statements under the CCR Internal Models Method | ✓ | | ✓ | | | 1 January 2017 |
| | Table 11-30: Exposures to Central Counterparties | ✓ | | | ✓ | | 1 January 2018 |
| Sub-division 6: Securitisation | Table 11-31: Qualitative Disclosures related to Securitisation Exposures | | ✓ | | | ✓ | 1 January 2017 |
| | Table 11-32: Securitisation Exposures in the Banking Book | | ✓ | | ✓ | | 1 January 2017 |
| | Table 11-33: Securitisation Exposures in the Trading Book | | ✓ | | ✓ | | 1 January 2017 |
| | Table 11-34: Securitisation Exposures in the Banking Book and associated Regulatory Capital Requirements – A Reporting Bank acting as Originator or as Sponsor | ✓ | | | ✓ | | 1 January 2017 |
| | Table 11-35: Securitisation Exposures in the Banking book and associated Regulatory Capital Requirements – A Reporting Bank acting as Investor | ✓ | | | ✓ | | 1 January 2017 |
| Sub-division 7: Market Risk | Table 11-36: Qualitative Disclosures related to Market Risk | | ✓ | | | ✓ | 1 January 2017 |
| | Table 11-37: Qualitative Disclosures related to IMA | | ✓ | | | ✓ | 1 January 2017 |
| | Table 11-38: Market Risk under Standardised Approach | ✓ | | | ✓ | | 1 January 2017 |
| | Table 11-39: RWA Flow Statements of Market Risk Exposures under IMA | ✓ | | ✓ | | | 1 January 2017 |
| | Table 11-40: IMA Values for Trading Portfolios | ✓ | | | ✓ | | 1 January 2017 |
| | Table 11-41: Comparison of VaR Estimates with Gains or Losses | | ✓ | | ✓ | | 1 January 2017 |

| | Tables | Fixed format | Flexible format | Quarterly | Semi-annually | Annually | Implementation date |
|---|---|---|---|---|---|---|---|
| Sub-division 10: Remuneration | Table 11-44: Remuneration Policy | | ✓ | | | ✓ | 31 December 2017 |
| | Table 11-44A: Remuneration Awarded during the Financial Year | | ✓ | | | ✓ | 31 December 2017 |
| | Table 11-44C: Special Payments | | ✓ | | | ✓ | 31 December 2017 |
| | Table 11-44E: Deferred Remuneration | | ✓ | | | ✓ | 31 December 2017 |
| Sub-division 11: Composition of Capital | Table 11B-1: Composition of Regulatory Capital | ✓ | | | ✓ | | 1 January 2018 |
| | Table 11C-1: Reconciliation of Regulatory Capital to Balance Sheet | | ✓ | | ✓[800A] | | 31 December 2017 |
| | Table 11D-1: Main Features of Regulatory Capital Instruments | | ✓ | | ✓ | | 31 December 2017 |
| Sub-division 12: Leverage Ratio | Table 11F-1: Leverage Ratio Summary Comparison Table | ✓ | | ✓[800B] | | | 31 December 2017 |
| | Table 11G-1: Leverage Ratio Common Disclosure Template | ✓ | | ✓ | | | 31 December 2017 |
| Sub-division 13: Macroprudential Supervisory Measures | Table 11-46: Geographical Distribution of Credit Exposures Used in the Countercyclical Capital Buffer | | ✓ | | ✓ | | 31 December 2017 |

[800A] The frequency of disclosure may, with the prior approval of the Authority, be made with at least the same frequency as the publication of the Reporting Bank's financial statements.

[MAS Notice 637 (Amendment No. 3) 2017]

[800B] The frequency of disclosure may, with the prior approval of the Authority, be made with at least the same frequency as the publication of the Reporting Bank's financial statements.

[MAS Notice 637 (Amendment No. 3) 2017]

**Sub-division 2: Overview of key prudential metrics, risk management and RWA**

11.3.3 A Reporting Bank shall disclose all items set out in the following tables –

(a) Table 11-1A for reporting periods ending on or after 1 January 2018;

(b) Table 11-2 for reporting periods ending on or after 1 January 2017;

(c) Table 11-3 for reporting periods ending prior to 31 December 2018; and

(d) Table 11-3B for reporting periods ending on or after 31 December 2018.

[MAS Notice 637 (Amendment No. 3) 2017]

Table 11-1A: Key Metrics

| Purpose | To provide an overview of a Reporting Bank's prudential regulatory metrics. |
|---|---|
| Scope of application | This table is mandatory for all Reporting Banks. |
| Content | Key prudential metrics related to regulatory capital, leverage ratio and liquidity standards. Reporting Banks are required to disclose each metric's value using the corresponding standard's specifications for the reporting period-end (designated by T in the template below) as well as the four previous quarter-end figures (T-1 to T-4). |
| Frequency | Quarterly |
| Format | Fixed. If Reporting Banks wish to add rows to provide additional regulatory or financial metrics, they must provide definitions for these metrics and a full explanation of how the metrics are calculated (including the scope of consolidation and the regulatory capital used if relevant). The additional metrics must not replace the metrics in this disclosure requirement. |
| Accompanying narrative | A Reporting Bank shall supplement the template with a narrative commentary to explain any significant change in each metric's value compared with previous quarters, including the key drivers of such changes.[800C] |

| | | (a) | (b) | (c) | (d) | (e) |
|---|---|---|---|---|---|---|
| | | T | T-1 | T-2 | T-3 | T-4 |
| | **Available capital (amounts)** | | | | | |
| 1 | CET1 capital | | | | | |
| 2 | Tier 1 capital | | | | | |
| 3 | Total capital | | | | | |
| | **Risk weighted assets (amounts)** | | | | | |
| 4 | Total RWA | | | | | |

[800C] For example, whether the changes are due to changes in the regulatory framework, or the group structure or business model of the Reporting Bank.

[MAS Notice 637 (Amendment No. 3) 2017]

| | **Risk-based capital ratios as a percentage of RWA** | | | | | |
|---|---|---|---|---|---|---|
| 5 | CET1 ratio (%) | | | | | |
| 6 | Tier 1 ratio (%) | | | | | |
| 7 | Total capital ratio (%) | | | | | |
| | **Additional CET1 buffer requirements as a percentage of RWA** | | | | | |
| 8 | Capital conservation buffer requirement (2.5% from 2019) (%) | | | | | |
| 9 | Countercyclical buffer requirement (%) | | | | | |
| 10 | Bank G-SIB and/or D-SIB additional requirements (%) | | | | | |
| 11 | Total of bank CET1 specific buffer requirements (%) (row 8 + row 9 + row 10) | | | | | |
| 12 | CET1 available after meeting the Reporting Bank's minimum capital requirements (%) | | | | | |
| | **Leverage Ratio** | | | | | |
| 13 | Total Leverage Ratio exposure measure | | | | | |
| 14 | Leverage Ratio (%) (row 2 / row 13) | | | | | |
| | **Liquidity Coverage Ratio** | | | | | |
| 15 | Total High Quality Liquid Assets | | | | | |
| 16 | Total net cash outflow | | | | | |
| 17 | Liquidity Coverage Ratio (%) | | | | | |
| | **Net Stable Funding Ratio** | | | | | |
| 18 | Total available stable funding | | | | | |
| 19 | Total required stable funding | | | | | |
| 20 | Net Stable Funding Ratio (%) | | | | | |

[MAS Notice 637 (Amendment No. 3) 2017]

Table 11-1B: Explanatory Notes to Key Metrics

| **Definitions** | |
|---|---|
| (a) | *CET1 available after meeting the Reporting Bank's minimum capital requirements (in row 12)*: This is to be calculated as the CET1 of the Reporting Bank (as a percentage of floor-adjusted risk weighted assets), less any CET1 capital used to meet the Reporting Bank's CET1, Tier 1 and total capital requirements.<br><br>See Explanatory Notes in Table 11B-2, row 68. |
| (b) | *Total Leverage Ratio exposure measure (in row 13)*: This is in accordance with Sub-division 12 of Division 3 of this Part. |
| (c) | *Liquidity Coverage Ratio metrics: (in rows 15, 16 and 17)*: A Reporting Bank shall disclose the total adjusted values in accordance with MAS Notice 651. |
| (d) | *Net Stable Funding Ratio metrics (in rows 18, 19 and 20)*: These are in accordance with MAS Notice 653. |

| Linkages across tables | |
|---|---|
| (e) | Amount in [Table 11-1A:1/a] is equal to [Table 11B-1:29/a] |
| (f) | Amount in [Table 11-1A:2/a] is equal to [Table 11B-1:45/a] |
| (g) | Amount in [Table 11-1A:3/a] is equal to [Table Table 11B-1:59/a] |
| (h) | Amount in [Table 11-1A:4/a] is equal to [Table 11B-1:60/a] |
| (i) | Amount in [Table 11-1A:5/a] is equal to [Table 11B-1:61/a] |
| (j) | Amount in [Table 11-1A:6/a] is equal to [Table 11B-1:62/a] |
| (k) | Amount in [Table 11-1A:7/a] is equal to [Table 11B-1:63/a] |
| (l) | Amount in [Table 11-1A:8/a] is equal to [Table 11B-1:65/a] |
| (m) | Amount in [Table 11-1A:9/a] is equal to [Table 11B-1:66/a] |
| (n) | Amount in [Table 11-1A:10/a] is equal to [Table 11B-1:67/a] |
| (o) | Amount in [Table 11-1A:12/a] is equal to [Table 11B-1:68/a] |
| (p) | Amount in [Table 11-1A:13/a] is equal to [Table 11G-1:21/a] |
| (q) | Amount in [Table 11-1A:14/a] is equal to [Table 11G-1:22/a] |
| (r) | Amount in [Table 11-1A:15/a] is equal to [LCR Disclosure Template under Appendix 1 of MAS Notice 651:21/b] |
| (s) | Amount in [Table 11-1A:16/a] is equal to [LCR Disclosure Template under Appendix 1 of MAS Notice 651:22/b] |
| (t) | Amount in [Table 11-1A:17/a] is equal to [LCR Disclosure Template under Appendix 1 of MAS Notice 651:23/b] |
| (u) | Amount in [Table 11-1A:18/a] is equal to [NSFR Disclosure Template under Annex 1 of MAS Notice 653:14/e] |
| (v) | Amount in [Table 11-1A:19/a] is equal to [NSFR Disclosure Template under Annex 1 of MAS Notice 653:33/e] |
| (w) | Amount in [Table 11-1A:20/a] is equal to [NSFR Disclosure Template under Annex 1 of MAS Notice 653:34/e] |

[MAS Notice 637 (Amendment No. 3) 2017]

Table 11-2: Risk Management Approach

| Purpose | To provide a description of the Reporting Bank's strategy and how senior management and the Board assess and manage risks, enabling users to gain a clear understanding of the Reporting Bank's risk tolerance or risk appetite in relation to its main activities and significant risks. |
|---|---|
| Scope of application | This table is mandatory for all Reporting Banks. |
| Content | Qualitative information |
| Frequency | Annually |
| Format | Flexible |

| A Reporting Bank shall provide a description of its risk management objectives and policies, in particular, a description of - | |
|---|---|
| (a) | (i) How the business model determines and interacts with the overall risk profile (e.g. key risks related to the business model and how each of these key risks is reflected and described in the risk disclosures); and<br>(ii) How the risk profile of the Reporting Bank interacts with the risk tolerance approved by the Board. |
| (b) | Its risk governance structure:<br>(i) the responsibilities attributed throughout the Reporting Bank (e.g. oversight and delegation of authority, breakdown of responsibilities by risk type and business unit etc.); and<br>(ii) the relationships between the structures involved in risk management processes (e.g. the Board, senior management, the Board Risk Committee, risk management structure, compliance function, IA function). |
| (c) | Channels that communicate, decline and enforce the risk culture within the Reporting Bank (e.g. code of conduct; manuals containing operating limits or procedures to deal with violations or breaches of risk thresholds; procedures to raise and share risk issues between business lines and risk functions). |
| (d) | Scope and main features of risk measurement systems. |
| (e) | The process of risk information reporting provided to the Board and senior management, including the scope and main content of reporting on risk exposure. |
| (f) | Stress testing (e.g. portfolios subject to stress testing, scenarios adopted and methodologies used, and the use of stress testing in risk management). |
| (g) | (i) Strategies and processes to manage, hedge and mitigate risks that arise from its business model; and<br>(ii) Processes for monitoring the continuing effectiveness of hedges and mitigants. |

Table 11-3: Overview of RWA

| Purpose | To provide an overview of total RWA and further breakdowns of RWA. |
|---|---|
| Scope of application | This table is mandatory for all Reporting Banks. |
| Content | RWA and capital requirements under Pillar 1 |
| Frequency | Quarterly |
| Format | Fixed |
| Accompanying narrative | A Reporting Bank shall identify and explain the drivers behind differences in current and prior quarterly reporting periods, where such differences are significant. The Reporting Bank shall explain the adjustments made where minimum capital requirements in column (c) do not correspond to the RWA in column (a) multiplied by the minimum Total CAR requirement applicable to the Reporting Bank as defined in paragraph 4.1.4. If the Reporting Bank uses the IMM to calculate the credit risk-weighted exposure amount of its equity exposures, the Reporting Bank shall provide a description of the main characteristics of its internal model annually. |

| | | (a) | (b) | (c) |
|---|---|---|---|---|
| | | RWA | | Minimum capital requirements |
| | | As at end of current quarter | As at end of prior quarter | As at end of current quarter |
| 1 | Credit risk (excluding CCR) | | | |
| 2 | of which: SA(CR) and SA(EQ) | | | |
| 3 | of which: IRBA and IRBA(EQ) for equity exposures under the PD/LGD method | | | |
| 4 | CCR | | | |
| 5 | of which: SA-CCR* | | | |
| 6 | of which: CCR Internal Models Method | | | |
| 7 | IRBA(EQ) for equity exposures under the simple risk weight method or the IMM | | | |
| 8 | Equity investments in funds – look through approach | | | |
| 9 | Equity investments in funds – mandate-based approach | | | |
| 10 | Equity investments in funds – fall back approach | | | |
| 10a | Equity investment in funds –partial use of an approach | | | |

| | | | | |
|---|---|---|---|---|
| 11 | Unsettled transactions | | | |
| 12 | Securitisation exposures in the banking book | | | |
| 13 | of which: SEC-IRBA | | | |
| 14 | of which: SEC-ERBA, including IAA | | | |
| 15 | of which: SEC-SA | | | |
| 16 | Market risk | | | |
| 17 | of which: SA(MR) | | | |
| 18 | of which: IMA | | | |
| 19 | Operational risk | | | |
| 20 | of which: BIA | | | |
| 21 | of which: SA(OR) | | | |
| 22 | of which: AMA | | | |
| 23 | Amounts below the thresholds for deduction (subject to 250% risk weight) | | | |
| 24 | Floor adjustment | | | |
| **25** | **Total** | | | |

*Depending on the approach used for Pillar 1, the Reporting Bank shall choose either "SA-CCR" or "Current Exposure Method" for the heading of row 5.

[MAS Notice 637 (Amendment No. 3) 2017]

Table 11-3A: Explanatory Notes to Overview of RWA

| **Definitions** | |
|---|---|
| (a) | *Minimum capital requirements:* Pillar 1 capital requirements (based on the minimum Total CAR requirement applicable to the Reporting Bank as defined in paragraph 4.1.4) at the reporting date, after taking into account applicable capital floors and adjustments. |
| (b) | *Credit risk (excluding CCR):* This excludes capital requirements for securitisation exposures (which are reported in row 12) and for CCR (which are reported in row 4), i.e. capital requirements for pre-settlement counterparty exposures arising from OTC derivative transactions, long settlement transactions and SFTs, capital requirements for exposures to CCPs included in the calculation of CCP RWA, and capital requirements for CVA risk. |
| (c) | *Credit risk (excluding CCR) of which: IRBA and IRBA(EQ):* This includes the capital requirements for equities in the banking book calculated in accordance with the PD/LGD method. |
| (d) | *CCR:* Row 4 relates to capital requirements for CCR (including CVA RWA and CCP RWA). A Reporting Bank shall report in row 5 of this table, information corresponding to CCR exposures calculated using the SA-CCR in accordance with Annex 7O. CVA RWA and CCP RWA are excluded in rows 5 and 6. |
| (e) | *Equity investments in funds – look-through approach:* This is in accordance with paragraphs 7.5.62 to 7.5.66 and 7.5.73. |
| (f) | *Equity investments in funds – mandate-based approach:* This is in accordance with paragraphs 7.5.67 to 7.5.69 and 7.5.73. |
| (g) | *Equity investments in funds – fall-back approach:* This is in accordance with paragraphs 7.5.70. |
| (h) | *Equity investment in funds – partial use of an approach:* This is in accordance with paragraph 7.5.72. |
| (i) | *Settlement risk:* This is in accordance with paragraphs 7.3.36 to 7.3.40 and paragraphs 7.4.70 to 7.4.74. |
| (j) | *Securitisation exposures in the banking book*: The RWA amounts do not systematically correspond to the RWA reported in Tables 11-34 and 11-35, which are before application of the cap. |
| (k) | *Market risk*: This includes capital requirements for securitisation exposures booked in the trading book but excludes capital requirements for CCR. |
| (l) | *Amounts below the thresholds for deduction (subject to 250% risk weight)*: The amounts correspond to items as defined under paragraph 6.1.3(p)(iii), subject to a 250% risk weight. |
| (m) | *Floor adjustment:* This is the impact of any Pillar 1 floor adjustment on total RWA and total capital such that the total row reflects the total RWA and total capital requirements, after including such an adjustment. A Reporting Bank shall not disclose Pillar 2 adjustments in this row. The Reporting Bank shall reflect floor or adjustments at a more granular level (e.g. at risk category level) in the capital requirements reported for the risk category.<br><br>The floor adjustment on total RWA shall be calculated as |

| | |
|---|---|
| | (*total capital requirement with capital floor – total capital requirement without floor*) x the reciprocal of the *minimum Total CAR requirement applicable to the Reporting Bank*<br><br>where –<br><br>*total capital requirement with capital floor* = the floored Total Capital Resources Requirement of the Reporting Bank, calculated in accordance with Part V of this Notice;<br><br>*total capital requirement without floor* = Total Capital Resources Requirement calculated using the approaches adopted by the Reporting Bank under this Notice; and<br><br>*Total Capital Resources Requirement* is as defined in paragraph 5.1.6.<br><br>*Minimum Total CAR requirement applicable to the Reporting Bank* is as defined in paragraph 4.1.4.<br><br>For column (c), the minimum capital requirements attributed to the floor adjustment shall be calculated as the floor adjustment on total RWA multiplied by the minimum Total CAR requirement applicable to the Reporting Bank. |
| (n) | *Total*: This is the sum of rows 1, 4, 7, 8, 9, 10, 10a, 11, 12, 16, 19, 23 and 24. |
| **Linkages across tables** | |
| (o) | Amount in [Table 11-3:2/a] is equal to [Table 11-14:14/e]. |
| (p) | Amount in [Table 11-3:3/a] is equal to the sum of [Table 11-17: Total (all portfolios)/i] + [Table 11-21: Specialised lending total RWA for HVCRE and other than HVCRE]. |
| (q) | Amount in [Table 11-3:4/a] is equal to the sum of [Table 11-23:6/f + Table 11-24:4/b + Table 11-30:1/b + Table 11-30:11/b]. |
| (r) | Amount in [Table 11-3:7/a] is equal to the sum of [Table 11-21/Equities exposures: Simple risk weight method/Total RWA] + the RWA corresponding to the IMM in accordance with paragraphs 7.5.30 to 7.5.45. |
| (s) | Amount in [Table 11-3:12/c] is equal to the sum of [Table 11-34:1/n + Table 11-34:1/o + Table 11-34:1/p + Table 11-34:1/q] + [Table 11-35:1/n + Table 11-35:1/o + Table 11-35:1/p + Table 11-35:1/q]. |
| (t) | Amount in [Table 11-3:17/a] is equal to [Table 11-38:9/a]. |
| (u) | Amount in [Table 11-3:18/a] is equal to [Table 11-39:8/f]. |

Table 11-3B: Overview of RWA

| Purpose | To provide an overview of total RWA and further breakdowns of RWA. |
|---|---|
| Scope of application | This table is mandatory for all Reporting Banks. |
| Content | RWA and capital requirements under Pillar 1. |
| Frequency | Quarterly |
| Format | Fixed |
| Accompanying narrative | A Reporting Bank shall supplement the table with a narrative commentary identifying and explaining the drivers behind differences in current and prior quarterly reporting periods, where such differences are significant. The Reporting Bank shall explain in the narrative commentary the adjustments made where minimum capital requirements in column (c) do not correspond to the RWA in column (a) multiplied by the minimum Total CAR requirement applicable to the Reporting Bank as defined in paragraph 4.1.4. If the Reporting Bank uses the IMM to calculate the credit risk-weighted exposure amount of its equity exposures, the Reporting Bank shall provide a description of the main characteristics of its internal model annually in the accompanying narrative. |

| | | (a) | (b) | (c) |
|---|---|---|---|---|
| | | RWA | | Minimum capital requirements |
| | | As at end of current quarter | As at end of prior quarter | As at end of current quarter |
| 1 | Credit risk (excluding CCR) | | | |
| 2 | of which: Standardised Approach | | | |
| 3 | of which: F-IRBA | | | |
| 4 | of which: supervisory slotting approach | | | |
| 5 | of which: A-IRBA | | | |
| 6 | CCR | | | |
| 7 | of which: SA-CCR* | | | |
| 8 | of which: CCR internal models method | | | |
| 9 | of which: other CCR | | | |
| 9a | of which: CCP | | | |
| 10 | CVA | | | |
| 11 | Equity exposures under the simple risk weight method | | | |
| 11a | Equity exposures under the IMM | | | |
| 12 | Equity investments in funds – look through approach | | | |

| 13 | Equity investments in funds – mandate-based approach | | | |
|---|---|---|---|---|
| 14 | Equity investments in funds – fall back approach | | | |
| 14a | Equity investment in funds – partial use of an approach | | | |
| 15 | Unsettled transactions | | | |
| 16 | Securitisation exposures in the banking book | | | |
| 17 | of which: SEC-IRBA | | | |
| 18 | of which: SEC-ERBA, including IAA | | | |
| 19 | of which: SEC-SA | | | |
| 20 | Market risk | | | |
| 21 | of which: SA(MR) | | | |
| 22 | of which: IMA | | | |
| 23 | Operational risk | | | |
| 24 | Amounts below the thresholds for deduction (subject to 250% risk weight) | | | |
| 25 | Floor adjustment | | | |
| **26** | **Total** | | | |

* Depending on the approach used for Pillar 1, the Reporting Bank shall choose either "SA-CCR" or "Current Exposure Method" for the heading of row 7.

[MAS Notice 637 (Amendment No. 3) 2017]

Table 11-3C: Explanatory Notes to Overview of RWA

| **Definitions** | |
|---|---|
| (a) | *RWA in columns (a) and (b)*: Risk-weighted assets, including the 1.06 scaling factor under paragraph 7.1.1(b). |
| (b) | *Minimum capital requirements in column (c)*: Pillar 1 capital requirements (based on the minimum Total CAR requirement applicable to the Reporting Bank as defined in paragraph 4.1.4) at the reporting date. |
| (c) | *Credit risk (excluding CCR)*: This excludes capital requirements for –<br>(i) securitisation exposures (which are reported in row 16);<br>(ii) CVA (which is reported in row 10); and<br>(iii) CCR (which is reported in row 6), i.e. capital requirements for pre-settlement counterparty exposures arising from OTC derivative transactions, long settlement transactions and SFTs and capital requirements for exposures to CCPs included in the calculation of CCP RWA. |
| (d) | *Credit risk (excluding CCR) of which: Standardised Approach*: This comprises SA(CR) exposures and SA(EQ) exposures (excluding equity investments in funds held in the banking book, which are reported in rows 12 to 14a). |

| | |
|---|---|
| (e) | *Credit risk (excluding CCR) of which: F-IRBA*: This comprises IRBA exposures for which the Reporting Bank is using the F-IRBA to calculate credit-risk weighted exposure amounts, and IRBA(EQ) exposures for which the Reporting Bank is using the PD/LGD method under paragraphs 7.5.46 to 7.5.60 to calculate credit risk-weighted exposure amounts (excluding equity investments in funds held in the banking book, which are reported in rows 12 to 14a). |
| (f) | *Supervisory slotting approach*: This is in accordance with Sub-division 12 of Division 4 of Part VII. |
| (g) | *Credit risk (excluding CCR) of which: A-IRBA*: This comprises IRBA exposures for which the Reporting Bank is using the A-IRBA or the IRBA for the IRBA retail asset class to calculate credit risk-weighted exposure amounts. |
| (h) | *CCR*: Row 6 relates to capital requirements for CCR (excluding CVA RWA and including CCP RWA). A Reporting Bank shall report in row 7 of this table, information corresponding to CCR exposures calculated using the SA-CCR in accordance with Annex 7O. CVA RWA and CCP RWA are excluded in rows 7 and 8. |
| (i) | *CCR of which: other CCR*: Row 9 relates to capital requirements for CCR calculated using a method other than the SA-CCR or CCR internal models method and excludes CVA RWA and CCP RWA, which are reported in rows 10 and 9a respectively. |
| (j) | *CCR of which: CCP:* Row 9a relates to capital requirements for CCP exposures. |
| (k) | *CVA*: Row 10 relates to capital requirements for CVA calculated in accordance with Annex 7AI. |
| (l) | *Equity exposures under the simple risk weight method*: IRBA(EQ) exposures for which the Reporting Bank is using the simple risk weight method under paragraphs 7.5.24 to 7.5.26 to calculate credit risk-weighted exposure amounts (excluding equity investments in funds held in the banking book, which are reported in rows 12 to 14a). |
| (m) | *Equity exposures under the IMM*: IRBA(EQ) exposures for which the Reporting Bank is using the IMM under paragraphs 7.5.27 to 7.5.45 to calculate credit risk-weighted exposure amounts (excluding equity investments in funds held in the banking book, which are reported in rows 12 to 14a). |
| (n) | *Equity investments in funds – look-through approach*: This is in accordance with paragraphs 7.5.62 to 7.5.66 and 7.5.73. |
| (o) | *Equity investments in funds – mandate-based approach*: This is in accordance with paragraphs 7.5.67 to 7.5.69 and 7.5.73. |
| (p) | *Equity investments in funds – fall-back approach*: This is in accordance with paragraphs 7.5.70 and 7.5.70A. |
| (q) | *Equity investment in funds – partial use of an approach*: This is in accordance with paragraph 7.5.72. |
| (r) | *Unsettled transactions*: This is in accordance with paragraphs 7.3.36 to 7.3.40 and paragraphs 7.4.70 to 7.4.74. |
| (s) | *Securitisation exposures in the banking book*: The RWA amounts do not systematically correspond to the RWA reported in Tables 11-34 and 11-35, which are before application of the cap. |
| (t) | *Market risk*: This includes capital requirements for securitisation exposures booked in the trading book but excludes capital requirements for CCR. |

| | |
|---|---|
| (u) | *Operational risk*: This is in accordance with Part IX. |
| (v) | *Amounts below the thresholds for deduction (subject to 250% risk weight)*: The amounts correspond to items as defined under paragraph 6.1.3(p)(iii), subject to a 250% risk weight. |
| (w) | *Floor adjustment*: This is the impact of any Pillar 1 floor adjustment on total RWA and total capital such that the total row reflects the total RWA and total capital requirements, after including such an adjustment. A Reporting Bank shall not disclose Pillar 2 adjustments in this row.<br><br>The floor adjustment on total RWA shall be calculated as<br><br>(*Floored total capital resources requirement - total capital requirement without floor*) x the reciprocal of the *minimum Total CAR requirement applicable to the Reporting Bank*<br><br>where –<br><br>*Floored total capital resources requirement* = the Total Capital Resources Requirement of the Reporting Bank when the total capital floor is binding, calculated in accordance with Part V of this Notice;<br><br>*total capital requirement without floor* = Total Capital Resources Requirement calculated using the approaches adopted by the Reporting Bank under this Notice; and<br><br>*Total Capital Resources Requirement* is as defined in paragraph 5.1.6.<br><br>*Minimum Total CAR requirement applicable to the Reporting Bank* is as defined in paragraph 4.1.4.<br><br>For column (c), the minimum capital requirements attributed to the floor adjustment shall be calculated as the floor adjustment on total RWA multiplied by the minimum Total CAR requirement applicable to the Reporting Bank. |
| (x) | *Total*: This is the sum of rows 1, 6, 10, 11, 11a, 12, 13, 14, 14a, 15, 16, 20, 24, 25 and 26. |
| **Linkages across tables** | |
| (y) | Amount in [Table 11-3B:2/a] is equal to [Table 11-14:14/e]. |
| (z) | Amount in [Table 11-3B:3/a] is equal to the sum of [Table 11-17: Total (all portfolios)/i] + [Table 11-21: Specialised lending total RWA for HVCRE and other than HVCRE]. |
| (aa) | Amount in [Table 11-3B:6/a] is equal to the sum of [Table 11-23:6/f + Table 11-30:1/b + Table 11-30:11/b]. |
| (ab) | Amount in [Table 11-3B: 11/a] is equal to [Table 11-21/Equities exposures: Simple risk weight method/Total RWA]. |
| (ac) | Amount in [Table 11-3B: 16/c] is equal to the sum of [Table 11-34:1/n + Table 11-34:1/o + Table 11-34:1/p + Table 11-34:1/q] + [Table 11-35:1/n + Table 11-35:1/o + Table 11-35:1/p + Table 11-35:1/q]. |

| | |
|---|---|
| (ad) | Amount in [Table 11-3B:21/a] is equal to [Table 11-38:9/a]. |
| (ae) | Amount in [Table 11-3B:22/a] is equal to [Table 11-39:8/f]. |

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**Sub-division 3: Linkages between financial statements and regulatory exposures**

11.3.4 A Reporting Bank shall disclose all items set out in Tables 11-4, 11-5, 11-6 and 11-6A.

[MAS Notice 637 (Amendment No. 3) 2017]

11.3.5 For the purposes of Tables 11-4 to 11-33, 'carrying amounts' refer to values of items as reported in financial statements but according to the scope of regulatory consolidation, unless otherwise specified in Sub-divisions 3 to 6 in this Division.

Table 11-4: Differences between Accounting and Regulatory Scopes of Consolidation and Mapping of Financial Statement Categories with Regulatory Risk Categories

| Purpose | Columns (a) and (b) enable users to identify the differences between a Reporting Bank's accounting scope of consolidation and its regulatory scope of consolidation. Columns (c) to (g) break down the amount reported in a Reporting Bank's financial statements by regulatory risk categories. The sum of amounts in columns (c) to (g) may not be equal to the amount in column (b) as some items may be subject to regulatory capital requirements in more than one risk category. |
|---|---|
| Scope of application | This table is mandatory for all Reporting Banks. |
| Content | Carrying amounts |
| Frequency | Annually |
| Format | Flexible |
| Accompanying narrative | A Reporting Bank shall provide qualitative explanation on items that are subject to regulatory capital requirements in more than one risk category. |

| | (a) | (b) | (c) | (d) | (e) | (f) | (g) |
|---|---|---|---|---|---|---|---|
| | Carrying amounts as reported in balance sheet of published financial statements | Carrying amounts under regulatory scope of consolidation | Carrying amounts of items - | | | | |
| | | | subject to credit risk requirements | subject to CCR requirements | subject to securitisation framework | subject to market risk requirements | not subject to capital requirements or subject to deduction from regulatory capital |
| **Assets** | | | | | | | |
| Cash and balances at central banks | | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Items in the course of collection from other banks | | | | | | | |
| Trading portfolio assets | | | | | | | |
| Financial assets designated at fair value | | | | | | | |
| Derivative financial instruments | | | | | | | |
| Loans and advances to banks | | | | | | | |
| Loans and advances to customers | | | | | | | |
| Reverse repos and other similar secured lending | | | | | | | |
| Fair value through other comprehensive income financial investments | | | | | | | |
| Current and deferred tax assets | | | | | | | |
| Prepayments, accrued income and other assets | | | | | | | |
| Investments in associates and joint ventures | | | | | | | |
| Goodwill and intangible assets | | | | | | | |
| Property, plant and equipment | | | | | | | |

| Total assets | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Liabilities** | | | | | | | |
| Deposits from banks | | | | | | | |
| Items in the course of collection due to other banks | | | | | | | |
| Customer accounts | | | | | | | |
| Repos and other similar secured borrowings | | | | | | | |
| Trading portfolio liabilities | | | | | | | |
| Financial liabilities designated at fair value | | | | | | | |
| Derivative financial instruments | | | | | | | |
| Debt securities in issue | | | | | | | |
| Accruals, deferred income and other liabilities | | | | | | | |
| Current and deferred tax liabilities | | | | | | | |
| Subordinated liabilities | | | | | | | |
| Provisions | | | | | | | |
| Retirement benefit liabilities | | | | | | | |
| **Total liabilities** | | | | | | | |

Table 11-4A: Explanatory Notes to Differences between Accounting and Regulatory Scopes of Consolidation and Mapping of Financial Statement Categories with Regulatory Risk Categories

| **Instructions** | |
|---|---|
| (a) | The Reporting Bank shall strictly follow the balance sheet presentation in its financial reporting. |
| (b) | Columns (a) and (b) should be merged if a Reporting Bank's accounting scope of consolidation is the same as its regulatory scope of consolidation. |
| (c) | Column (g) includes amounts not subject to capital requirements or subject to deductions from regulatory capital. |
| (d) | Where an item is subjected to capital requirements from more than one risk category framework, the item shall be reported in all columns that it is subjected to capital requirements. Therefore, the sum of amounts reported in columns (c) to (g) may be greater than the amount reported in column (b). |

Table 11-5: Main Sources of Differences between Regulatory Exposure Amounts and Carrying Amounts in Financial Statements

| | |
|---|---|
| Purpose | To provide information on the main sources of differences, other than due to the difference in scope of consolidation, between regulatory exposure amounts and carrying amounts in financial statements. |
| Scope of application | This table is mandatory for all Reporting Banks. |
| Content | Carrying amounts for rows 1 to 3 and exposure amounts considered for regulatory purposes for row 9. |
| Frequency | Annually |
| Format | Flexible. Row headings are provided for illustrative purposes only and the rows should be adapted by the Reporting Bank to describe the most meaningful or relevant drivers for differences between regulatory exposure amounts and carrying amounts in financial statements. |
| Accompanying narrative | Set out in Table 11-6 |

| | | (a) | (b) | (c) | (d) | (e) |
|---|---|---|---|---|---|---|
| | | Total | Items subject to - | | | |
| | | | credit risk requirements | CCR requirements | securitisation framework | market risk requirements |
| **1** | **Asset carrying amount under regulatory scope of consolidation (as per Table 11-4)** | | | | | |
| 2 | Liabilities carrying amount under regulatory scope of consolidation (as per Table 11-4) | | | | | |
| 3 | Total net amount under regulatory scope of consolidation | | | | | |
| 4 | Off-balance sheet amounts | | | | | |
| 5 | Differences in valuations | | | | | |
| 6 | Differences due to different netting rules, other than those already included in row 2 | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 | Differences due to consideration of provisions | | | | | |
| 8 | Differences due to prudential filters | | | | | |
| **9** | **Exposure amounts considered for regulatory purposes** | | | | | |

Table 11-5A: Explanatory Notes to Main Sources of Differences between Regulatory Exposure Amounts and Carrying Amounts in Financial Statements

| **Instructions** | |
|---|---|
| (a) | *Off-balance sheet amounts:* This includes notional amounts of off-balance sheet items in column (a) and the amounts subject to regulatory framework, after application of the CCFs in columns (b) to (e), where relevant. |
| (b) | *Exposure amounts considered for regulatory purposes*: This refers to the aggregate amount considered as a starting point of the RWA calculation for each risk category. |
| **Linkages across tables** | |
| (c) | Amounts in rows 1 and 2 of columns (b) to (e) correspond to amounts in columns (c) to (f) of Table 11-4. |

Table 11-6: Qualitative Disclosure of Differences between Carrying Amounts in Financial Statements and Regulatory Exposure Amounts

| | |
|---|---|
| Purpose | To provide qualitative explanation on the differences between carrying amounts in financial statements and regulatory exposure amounts under each framework. |
| Scope of application | This table is mandatory for all Reporting Banks. |
| Content | Qualitative information |
| Frequency | Annually |
| Format | Flexible |

<table>
<tr><td colspan="2">A Reporting Bank shall explain the sources of the differences between accounting amounts as reported in financial statements and regulatory exposure amounts, as disclosed in Tables 11-4 and 11-5. A Reporting Bank shall provide a description of -</td></tr>
<tr><td>(a)</td><td>The sources of any significant differences between the amounts in columns (a) and (b) in Table 11-4.</td></tr>
<tr><td>(b)</td><td>The sources of differences between accounting amounts as reported in financial statements and exposure amounts considered for regulatory purposes shown in Table 11-5.</td></tr>
<tr><td>(c)</td><td>The systems and controls to ensure that the valuation adjustments are prudent and reliable, in accordance with the standards for a prudent valuation framework set out in Annex 8N. It shall include a description of -<br>(i) valuation methodologies, including a description of the extent that mark-to-market and mark-to-model methodologies are used;<br>(ii) independent price verification process; and<br>(iii) procedures for valuation adjustments or reserves, including a description of the process and the methodology for valuing trading positions by type of instrument.</td></tr>
</table>

Table 11-6A: Prudent Valuation Adjustments

| Purpose | To provide a breakdown of the constituent elements of a Reporting Bank's prudent valuation adjustments in accordance with paragraphs 1.17 to 1.21 in Annex 8N. A Reporting Bank shall take into account the guidance set out in *Supervisory Guidance for Assessing Banks' Financial Instrument Fair Value Practices* issued by the BCBS in April 2009, in particular Principle 10 in providing the breakdown. |
|---|---|
| Scope of application | This table is mandatory for all Reporting Banks. |
| Content | Prudent valuation adjustments for all assets measured at fair value (marked to market or marked to model) and for which valuation adjustments are required. Assets can be non-derivative or derivative instruments. |
| Frequency | Annual |
| Format | Fixed. The row numbers cannot be altered. Rows which are not applicable to a Reporting Bank should be filled with "0" and the reason why they are not applicable should be explained in the accompanying narrative. |
| Accompanying narrative | A Reporting Bank shall supplement the table with a narrative commentary to explain any significant changes over the reporting period and the key drivers of such changes. In particular, Reporting Banks must provide details on other prudent valuation adjustments in row 11, where significant, and define them in the narrative commentary when they are not listed in Annex 8N. Reporting Banks must also explain the types of financial instruments for which high amounts of valuation adjustments are observed. |

| | | (a) | (b) | (c) | (d) | (e) | **(f)** | (g) | (h) |
|---|---|---|---|---|---|---|---|---|---|
| | | Equity | Interest rates | FX | Credit | Commodities | **Total** | of which: in the trading book | of which: in the banking book |
| 1 | Closeout uncertainty | | | | | | | | |
| 2 | of which: Mid-market value | | | | | | | | |
| 3 | of which: Closeout cost | | | | | | | | |
| 4 | of which: Concentration | | | | | | | | |
| 5 | Early termination | | | | | | | | |
| 6 | Model risk | | | | | | | | |
| 7 | Operational risk | | | | | | | | |
| 8 | Investing and funding costs | | | | | | | | |
| 9 | Unearned credit spreads | | | | | | | | |
| 10 | Future administrative costs | | | | | | | | |
| 11 | Other | | | | | | | | |

| 12 | **Total adjustment** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 13 | of which: exceeds the valuation adjustment under financial reporting standards | | | | | | | | |

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Table 11-6B: Explanatory Notes to Prudent Valuation Adjustments

| **Definitions** | |
|---|---|
| (a) | *Closeout cost (in row 3)*: Valuation adjustments required to take account of the valuation uncertainty to adjust for the fact that the position level valuations calculated do not reflect an exit price for the position or portfolio.[800D] |
| (b) | *Concentration (in row 4)*: Valuation adjustments over and above market price and closeout costs that would be required to get to a prudent exit price for positions that are larger than the size of positions for which the valuation has been calculated i.e. cases where the aggregate position held by the institution is larger than normal traded volume or larger than the position sizes on which observable quotes or trades that are used to calibrate the price or inputs used by the core valuation model are based. |
| (c) | *Early termination (in row 5)*: Valuation adjustments to take into account the potential losses arising from contractual or non-contractual early terminations of customer trades that are not reflected in the valuation. |
| (d) | *Model risk (in row 6)*: Valuation adjustments to take into account valuation model risk which arises due to: (i) the potential existence of a range of different models or model calibrations which are used by users of Pillar 3 data; (ii) the lack of a firm exit price for the specific product being valued; (iii) the use of an incorrect valuation methodology; (iv) the risk of using unobservable and possibly incorrect calibration parameters; or (v) the fact that market or product factors are not captured by the core valuation model. |
| (e) | *Operational risk (in row 7)*: Valuation adjustments to take into account the potential losses that may be incurred as a result of operational risk related to valuation processes. |
| (f) | *Investing and funding costs (in row 8)*: Valuation adjustments to reflect the valuation uncertainty in the funding costs that other users of Pillar 3 data would factor into the exit price for a position or portfolio. It includes funding valuation adjustments on derivatives exposures. |
| (g) | *Unearned credit spreads (in row 9)*: Valuation adjustments to take account of the valuation uncertainty in the adjustment necessary to include the current value of expected losses due to counterparty default on derivative positions, including the valuation uncertainty on CVAs. |
| (h) | *Future administrative costs (in row 10)*: Valuation adjustments to take into account the administrative costs and future hedging costs over the expected life |

[800D] For example, where such valuations are calibrated to a mid-market price.

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| | |
|---|---|
| | of the exposures for which a direct exit price is not applied for the closeout costs. This valuation adjustment has to include the operational costs arising from hedging, administration and settlement of contracts in the portfolio. The future administrative costs are incurred by the portfolio or position but are not reflected in the core valuation model or the prices used to calibrate inputs to that model. |
| (i) | *Other (in row 11)*: Valuation adjustments which are required to take into account factors that will influence the exit price but which do not fall in any of the categories listed in paragraph 1.19 in Annex 8N. These should be described by Reporting Banks in the narrative commentary that supports the disclosure. |
| **Linkages across tables** | |
| (j) | [Table 11-6A:13/f] is equal to [11B-1:7/a]. |

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**Sub-division 4: Credit Risk**

11.3.6 This Sub-division includes items subject to the credit risk requirements under Part VII, excluding –

(a) capital requirements for securitisation exposures, as set out in Division 6 of Part VII; and

(b) capital requirements relating to CCR (i.e. capital requirements for pre-settlement counterparty exposures arising from OTC derivative transactions, long settlement transactions and SFTs, capital requirements for exposures to CCPs included in the calculation of CCP RWA, and capital requirements for CVA risk).

11.3.7 A Reporting Bank shall disclose all items set out in Tables 11-7 to 11-12. In the case where the Reporting Bank has adopted:

(a) the SA(CR), the Reporting Bank shall also disclose all items set out in Tables 11-13 to 11-15;

(b) the SA(EQ), the Reporting Bank shall also disclose all items set out in Tables 11-14 and 11-15; and

(c) the IRBA, the Reporting Bank shall also disclose all items set out in Tables 11-16 to 11-21.

Table 11-7: General Qualitative Disclosures on Credit Risk

| | |
|---|---|
| Purpose | To describe the main characteristics and elements of credit risk management, including its business model, credit risk profile, organisation and functions involved in credit risk management and risk management reporting. |
| Scope of application | This table is mandatory for all Reporting Banks. |
| Content | Qualitative information |
| Frequency | Annually |
| Format | Flexible |

| A Reporting Bank shall provide a description of its risk management objectives and policies for credit risk, in particular, a description of - | |
|---|---|
| (a) | How the business model translates into the components of the Reporting Bank's credit risk profile. |
| (b) | Criteria and approach used for defining credit risk management policy and the setting of credit risk limits. |
| (c) | Structure and organisation of the credit risk management and control function. |
| (d) | Relationships between the credit risk management, risk control, compliance and IA functions. |

| (e) | Scope and main content of the reporting on credit risk exposure and credit risk management function to the senior management and Board. |
|---|---|

Table 11-8: Credit Quality of Assets

| | |
|---|---|
| Purpose | To provide a comprehensive overview of the credit quality of a Reporting Bank's on- and off-balance sheet assets. |
| Scope of application | This table is mandatory for all Reporting Banks. |
| Content | Carrying amounts |
| Frequency | Semi-annually |
| Format | Fixed |
| Accompanying narrative | A Reporting Bank shall provide its definition of default. |

| | | (a) | (b) | (c) | (d) |
|---|---|---|---|---|---|
| | | Gross carrying amount of | | Impairment allowances | Net values (a + b - c) |
| | | Defaulted exposures | Non-defaulted exposures | | |
| 1 | Loans | | | | |
| 2 | Debt securities | | | | |
| 3 | Off-balance sheet exposures | | | | |
| **4** | **Total** | | | | |

Table 11-8A: Explanatory Notes of Credit Quality of Assets

| **Definitions** | |
|---|---|
| (a) | *Gross carrying amount*: The gross carrying amount is the accounting value before any impairment allowances but after write-offs. A Reporting Bank shall not take into account any CRM. The gross carrying amount of off-balance sheet exposures, which excludes revocable loan commitments for the purpose of this table, shall be measured as -<br>(a) for guarantees, the maximum amount that a Reporting Bank would have to pay if the guarantees were called, gross of any CCF or CRM; and<br>(b) for irrevocable loan commitments, the total amount that a Reporting Bank has committed to lend, gross of any CCF or CRM. |
| (b) | *Write-offs:* This refers a direct reduction of the carrying amount when a Reporting Bank has no reasonable expectations of recovery. |
| (c) | *Defaulted exposures*: This refers to exposures that the Reporting Bank has defined as defaulted for regulatory purposes. For IRBA exposures and IRBA(EQ) exposures, this refers to exposures meeting the definition of default set out in Annex 7X. |
| (d) | *Non-defaulted exposures*: This refers to any exposures that are not defaulted exposures. |
| (e) | *Impairment allowances*: This refers to the total amount of impairment, made via an allowance against impaired and non-impaired exposures in accordance with the Accounting Standards. |
| (f) | *Net values:* This is the total gross carrying amount less impairment allowances. |
| **Linkages across tables** | |
| (g) | Amount in [Table 11-8:1/d] is equal to the sum [Table 11-12:1/a + Table 11-12:1/b + Table 11-12:1/d + Table 11-12:1/f]. |
| (h) | Amount in [Table 11-8:2/d] is equal to the sum [Table 11-12:2/a + Table 11-12:2/b + Table 11-12:2/d + Table 11-12:2/f]. |
| (i) | Amount in [Table 11-8:1/a + Table 11-8:2/a] is equal to [Table 11-9:6/a]. |

Table 11-9: Changes in Stock of Defaulted Loans and Debt Securities

| | |
|---|---|
| Purpose | To identify the changes in the defaulted exposures of a Reporting Bank, the flows between non-defaulted and defaulted exposure categories and reductions in the defaulted exposures due to write-offs. |
| Scope of application | This table is mandatory for all Reporting Banks. |
| Content | Carrying amounts |
| Frequency | Semi-annually |
| Format | Fixed |
| Accompanying narrative | A Reporting Bank shall explain the drivers of any significant changes in the amount of defaulted exposures from the previous semi-annual reporting period and any significant movement between defaulted and non-defaulted loans. |

| | | (a) |
|---|---|---|
| **1** | **Defaulted loans and debt securities at end of the previous semi-annual reporting period** | |
| 2 | Loans and debt securities that have defaulted since the previous semi-annual reporting period | |
| 3 | Returned to non-defaulted status | |
| 4 | Amounts written-off | |
| 5 | Other changes | |
| **6** | **Defaulted loans and debt securities at end of the semi-annual reporting period**<br>**(1+2-3-4±5)** | |

Table 11-9A: Explanatory Notes of Changes in Stock of Defaulted Loans and Debt Securities

| **Definitions** | |
|---|---|
| (a) | *Defaulted exposures:* Such exposures shall be net of write-offs and gross of impairment allowances. |
| (b) | *Loans and debt securities that have defaulted since the previous semi-annual reporting period*: This refers to any loans or debt securities that became marked as defaulted during the semi-annual reporting period. |
| (c) | *Return to non-defaulted status*: This refers to defaulted loans or debt securities that a Reporting Bank deems as non-defaulted assets during the semi-annual reporting period. |
| (d) | *Amounts written-off:* This refers to both total and partial write offs. |
| (e) | *Other changes*: These are the balancing items that are necessary to enable reconciliation. |

Table 11-10: Additional Disclosures related to the Credit Quality of Assets

| Purpose | To provide information on the credit quality of a Reporting Bank's assets. |
|---|---|
| Scope of application | This table is mandatory for all Reporting Banks. |
| Content | Qualitative and quantitative (carrying amounts) information |
| Frequency | Annually |
| Format | Flexible |

| **Qualitative Disclosures** | |
|---|---|
| A Reporting Bank shall provide a description of - | |
| (a) | Scope and definitions of past due and impaired exposures in accordance with the Accounting Standards and the differences, if any, between the definition of past due and default for accounting and regulatory purposes. |
| (b) | Extent of exposures that are past due for more than 90 days which are not considered to be impaired and its justifications. |
| (c) | Methods used for determining if an exposure is impaired. |
| (d) | Definition of a restructured exposure. |
| **Quantitative Disclosures** | |
| (e) | Breakdown of credit risk exposures by geographical areas, industry and residual maturity. |
| (f) | Amounts of impaired exposures (using the definition of impairment in accordance with the Accounting Standards) and related allowances and write-offs, broken down by geographical areas and industry. |
| (g) | Ageing analysis of past due exposures in accordance with the Accounting Standards. |
| (h) | Breakdown of restructured exposures, by impaired and non-impaired exposures. |

Table 11-11: Qualitative Disclosures related to CRM Techniques

| Purpose | To provide qualitative information on the mitigation of credit risk. |
|---|---|
| Scope of application | This table is mandatory for all Reporting Banks. |
| Content | Qualitative |
| Frequency | Annually |
| Format | Flexible |

| A Reporting Bank shall provide a description of - | |
|---|---|
| (a) | (i) Core features of policies and processes for off-balance sheet netting; and<br>(ii) Extent to which a Reporting Bank makes use of off-balance sheet netting. |
| (b) | Core features of policies and processes for collateral evaluation and management. |
| (c) | Market or credit risk concentrations under the CRM instruments used (i.e. by guarantor type, collateral and credit derivative providers). |

Table 11-12: Overview of CRM Techniques

| Purpose | To provide information on the extent of usage of CRM techniques. |
|---|---|
| Scope of application | This table is mandatory for all Reporting Banks. |
| Content | Carrying amounts. A Reporting Bank shall include all CRM techniques used to reduce capital requirements and shall disclose all secured exposures, irrespective of whether the SA(CR) or IRBA is used for RWA calculation. |
| Frequency | Semi-annually |
| Format | Fixed. In the event that a Reporting Bank is unable to categorise exposures secured by collateral, financial guarantees and credit derivatives into loans and debt securities, the Reporting Bank may merge row 1 and row 2 or divide the amount by the pro-rata weight of gross carrying amounts. The Reporting Bank shall explain which method it adopted. |
| Accompanying narrative | A Reporting Bank shall explain any significant changes over the semi-annual reporting period and key drivers of such changes. |

| | | (a) | (b) | (c) | (d) | (e) | (f) | (g) |
|---|---|---|---|---|---|---|---|---|
| | | Carrying amount of unsecured exposures | Exposures secured by collateral | Exposures secured by collateral, of which: secured amount | Exposures secured by financial guarantees | Exposures secured by financial guarantees, of which: secured amount | Exposures secured by credit derivatives | Exposures secured by credit derivatives, of which: secured amount |
| 1 | Loans | | | | | | | |
| 2 | Debt securities | | | | | | | |
| **3** | **Total** | | | | | | | |
| 4 | Of which: defaulted | | | | | | | |

Table 11-12A: Explanatory Notes of Overview of CRM Techniques

| **Instructions** | |
|---|---|
| (a) | *Carrying amount of unsecured exposures:* This refers to the carrying amount of exposures (net of impairment allowances) that do not benefit from a CRM technique. |
| (b) | *Exposures secured by collateral:* This refers to the carrying amount of exposures (net of impairment allowances) partly or totally secured by collateral, regardless of what portion of the original exposure is secured. |
| (c) | *Exposures secured by collateral, of which secured amount*: This refers to the amount of the exposure portions, which are secured by collateral. Where the value of the collateral (i.e. the amount that the collateral can be settled for) exceeds the amount of the exposure, the Reporting Bank shall report the exposure amount (i.e. the Reporting Bank shall not report the over-collateralisation). |
| (d) | *Exposures secured by financial guarantees*: This refers to the carrying amount of exposures (net of impairment allowances) partly or totally secured by financial guarantees, regardless of what portion of the original exposure is guaranteed. |
| (e) | *Exposures secured by financial guarantees, of which secured amount*: This refers to the amount of the exposure portions, which are covered by the financial guarantee. Where the value of the guarantee (i.e. the amount that can be obtained if the guarantee is called) is above the amount of the exposure, the Reporting Bank shall report the exposure amount (i.e. the Reporting Bank shall not report the excess value). |
| (f) | *Exposures secured by credit derivatives*: This refers to the carrying amount of exposures (net of impairment allowances) partly or totally secured by credit derivatives, regardless of what portion of the original exposure is secured. |
| (g) | *Exposures secured by credit derivatives, of which secured amount*: This refers to the amount of the exposure portions, which are secured by the credit derivatives. Where the value of the credit derivative (i.e. amount that the credit derivative can be settled for) is above the amount of the exposure, the Reporting Bank shall report the exposure amount (i.e. the Reporting Bank shall not report the excess value). |

Table 11-13: Qualitative Disclosures on the use of external credit ratings under the SA(CR)

| Purpose | To supplement the information on a Reporting Bank's use of SA(CR) with qualitative information on the use of external ratings. |
|---|---|
| Scope of application | This table is mandatory for Reporting Banks using the SA(CR) for its RWA calculation. The Reporting Bank may omit disclosures pertaining to certain SA(CR) asset classes if the exposures and RWA amounts are negligible. The Reporting Bank shall explain clearly why it considers the omitted information not to be meaningful or relevant to users, including a description of the portfolios concerned and the aggregate total RWA these asset classes represent. |
| Content | Qualitative |
| Frequency | Annually |
| Format | Flexible |

| For portfolios under the SA(CR), a Reporting Bank shall disclose information on - | |
|---|---|
| (a) | The names of the ECAIs used by the Reporting Bank, and the reasons for any changes over the annual reporting period. |
| (b) | The asset classes for which each ECAI is used. |
| (c) | The process used to transfer the issuer to issue credit ratings onto comparable assets in the banking book, as set out in paragraphs 7.3.5, 7.3.6 and 7.3.8. |

Table 11-14: SA(CR) and SA(EQ) - Credit Risk Exposure and CRM Effects

| | |
|---|---|
| Purpose | To illustrate the effects of CRM on the calculation of capital requirements for SA(CR) and SA(EQ). The RWA density provides a synthetic metric on the riskiness of each portfolio. |
| Scope of application | This table is mandatory for Reporting Banks using the SA(CR) and SA(EQ). The Reporting Bank may omit disclosures pertaining to certain portfolios in this table if the exposures and RWA amounts are negligible. The Reporting Bank shall state clearly why it considers the omitted information not to be meaningful or relevant to users, including a description of the portfolios concerned and the aggregate total RWA these portfolios represent. |
| Content | Regulatory exposure amounts |
| Frequency | Semi-annually |
| Format | Fixed. Columns are fixed and the rows reflect the asset classes under SA(CR) and SA(EQ) under Part VII of MAS Notice 637. |
| Accompanying narrative | A Reporting Bank shall explain any significant changes over the semi-annual reporting period and the key drivers of such changes. |

| | | (a) | (b) | (c) | (d) | (e) | (f) |
|---|---|---|---|---|---|---|---|
| | | **Exposures before CCF and CRM** | | **Exposures post-CCF and post-CRM** | | **RWA and RWA density** | |
| | Asset classes and others | On-balance sheet amount | Off-balance sheet amount | On-balance sheet amount | Off-balance sheet amount | RWA | RWA density |
| 1 | Cash items | | | | | | |
| 2 | Central government and central bank | | | | | | |
| 3 | PSE | | | | | | |
| 4 | MDB | | | | | | |
| 5 | Bank | | | | | | |
| 6 | Corporate | | | | | | |
| 7 | Regulatory retail | | | | | | |
| 8 | Residential mortgage | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9 | CRE | | | | | | |
| 10 | Equity - SA(EQ) | | | | | | |
| 11 | Past due exposures | | | | | | |
| 12 | Higher-risk categories | | | | | | |
| 13 | Other exposures | | | | | | |
| **14** | **Total** | | | | | | |

Table 11-14A: Explanatory Notes of SA(CR) and SA(EQ) - Credit Risk Exposure and CRM Effects

| **Instructions** | |
|---|---|
| (a) | *Higher-risk categories*: A Reporting Bank shall include the exposures that are risk-weighted at 150% or higher in row 12 and that are not already included in the other rows. Equity investments in funds shall not be reported in this table but only in Table 11-3. |
| (b) | *Other exposures asset class*: This refers to SA(CR) exposures in the other exposures asset class as set out in paragraph 7.3.1(j). |
| (c) | *Exposures before CCF and CRM, on-balance sheet amount:* A Reporting Bank shall disclose the regulatory exposure amount (net of impairment allowances and write-offs) under the regulatory scope of consolidation gross of any CRM. |
| (d) | *Exposures before CCF and CRM, off-balance sheet amount:* A Reporting Bank shall disclose the off-balance sheet exposures, gross of CCF and any CRM under the regulatory scope of consolidation. |
| (e) | *Exposures post-CCF and post-CRM*: This is the amount to which the capital requirements are applied (i.e. before the application of the relevant risk weights). It is a net credit equivalent amount, after having applied CRM and CCF. |
| (f) | *RWA density*: Total RWA divided by the exposures post-CCF and post-CRM, expressed as a percentage. |
| **Linkages across tables** | |
| (g) | The amount in [Table 11-14:14/c + Table 11-14:14/d] is equal to the amount in [Table 11-15:14/j]. |

Table 11-15: SA(CR) and SA(EQ) – Exposures by Asset Classes and Risk Weights

| | |
|---|---|
| Purpose | To present the breakdown of credit risk exposures under the SA(CR) and SA(EQ) by asset class and risk weight, corresponding to the level of risk attributed to the exposures. |
| Scope of application | This table is mandatory for Reporting Banks using the SA(CR) and SA(EQ). The Reporting Bank may omit disclosures pertaining to certain portfolios in this table if the exposures and RWA amounts are negligible. The Reporting Bank shall state clearly why it considers the omitted information not to be meaningful or relevant to users, including a description of the portfolios concerned and the aggregate total RWA these portfolios represent. |
| Content | Regulatory exposure amounts |
| Frequency | Semi-annually |
| Format | Fixed. The rows reflect the asset classes under SA(CR) and SA(EQ) under Part VII. |
| Accompanying narrative | A Reporting Bank shall explain any significant changes over the semi-annual reporting period and the key drivers of such changes. |

| | | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Risk weight / Asset classes and others | 0% | 10% | 20% | 35% | 50% | 75% | 100% | 150% | Others | Total credit exposure amount (post-CCF and post-CRM) |
| 1 | Cash items | | | | | | | | | | |
| 2 | Central government and central bank | | | | | | | | | | |
| 3 | PSE | | | | | | | | | | |
| 4 | MDB | | | | | | | | | | |
| 5 | Bank | | | | | | | | | | |
| 6 | Corporate | | | | | | | | | | |
| 7 | Regulatory retail | | | | | | | | | | |
| 8 | Residential mortgage | | | | | | | | | | |
| 9 | CRE | | | | | | | | | | |
| 10 | Equity - SA(EQ) | | | | | | | | | | |

| 11 | Past due exposures | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | Higher-risk categories | | | | | | | | | | |
| 13 | Other exposures | | | | | | | | | | |
| **14** | **Total** | | | | | | | | | | |

Table 11-15A: Explanatory Notes of SA(CR) and SA(EQ) - Exposures by Asset Classes and Risk Weights

| **Instructions** | |
|---|---|
| (a) | *Total credit exposure amount (post-CCF and post-CRM):* This refers to the amount used for computing capital requirements (both for on- and off-balance sheet amounts), net of impairment allowances and write-offs and after applying CRM and CCF but before the application of the relevant risk weights. |
| (b) | *Past due exposures:* This corresponds to the unsecured portion of any exposures that is past due for more than 90 days, as set out in paragraph 7.3.31. |
| (c) | *Higher-risk categories*: A Reporting Bank shall include the exposures that are risk-weighted at 150% or higher in row 12 and that are not already included in the other rows. Equity investments in funds shall not be reported in this table but only in Table 11-3. |
| (d) | *Other exposures asset class*: This refers to SA(CR) exposures in the other exposures asset class as set out in paragraph 7.3.1(j). |

Table 11-16: Qualitative Disclosures for IRBA Models

| Purpose | To provide additional information on models used to compute RWA under IRBA models. |
|---|---|
| Scope of application | This table is mandatory for Reporting Banks using the A-IRBA, F-IRBA, IRBA for the IRBA retail asset class or IRBA(EQ) – PD/LGD method for some or all of their exposures. To provide meaningful or relevant information to users, the Reporting Bank shall describe the main characteristics of the models used, in accordance with the regulatory scope of consolidation, and explain how the scope of the described models was determined. The commentary shall include the percentage of RWA covered by the models of each of the regulatory portfolios. |
| Content | Qualitative information |
| Frequency | Annually |
| Format | Flexible |

| A Reporting Bank shall provide a description of - | |
|---|---|
| (a) | Internal model development, controls and changes, in particular, the role of the functions involved in the development, approval and subsequent changes of the credit risk models. |
| (b) | (i) Relationships between risk management function and IA function; and<br>(ii) Procedure to ensure the independence of the function in charge of the review of the models from the function in charge of the development of the models. |
| (c) | Scope and main content of the reporting related to credit risk models. |
| (d) | Scope of approval by the Authority. |
| (e) | For each of the portfolios, the Reporting Bank shall indicate the portion of E or EAD, whichever is applicable, within the Group (expressed as a percentage of total credit risk exposure) covered by SA(CR), SA(EQ), F-IRBA, A-IRBA, IRBA for the IRBA retail asset class and IRBA(EQ) – PD/LGD method and the portion of portfolios that are involved in a rollout plan. |
| (f) | Number of key models used with respect to each portfolio, with a brief description of the main differences among the models within the same portfolios. |
| (g) | Main characteristics of the approved models:<br>(i) Definitions, methods and data for estimation and validation of PD (e.g. how PDs are estimated for low default portfolios, if there are regulatory floors, the drivers for differences observed between PD and actual default rates at least for the last three annual reporting periods);<br>(ii) LGD (e.g. methods to calculate downturn LGD, how LGDs are estimated for low default portfolio; the time lapse between the default event and the closure of the exposure), where applicable; and<br>(iii) CCFs, including assumptions employed in the derivation of these variables, where applicable. |

Table 11-17: IRBA - Credit Risk Exposures by Portfolio and PD Range

| | |
|---|---|
| Purpose | To provide main parameters used for the calculation of capital requirements for IRBA models, so as to enhance the transparency of RWA calculations and the reliability of regulatory measures. |
| Scope of application | This table is mandatory for Reporting Banks using the A-IRBA, F-IRBA, IRBA for the IRBA retail asset class or IRBA(EQ) – PD/LGD method for some or all of their credit risk exposures. |
| Content | All columns are based on the regulatory scope of consolidation. |
| Frequency | Semi-annually |
| Format | Fixed. The columns and PD range in the rows are fixed. A Reporting Bank shall disclose one table for portfolios using F-IRBA, and one table for portfolios using A-IRBA and IRBA for the IRBA retail asset class. |
| Accompanying narrative | A Reporting Bank shall explain the effect of credit derivatives on RWA. |

| | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PD range | Original on-balance sheet gross exposures | Off-balance sheet exposures pre-CCF | Average CCF | EAD post-CRM and post-CCF | Average PD | Number of obligors | Average LGD | Average maturity | RWA | RWA density | EL | TEP |
| Portfolio X | | | | | | | | | | | | |
| 0.00 to < 0.15 | | | | | | | | | | | | |
| 0.15 to <0.25 | | | | | | | | | | | | |
| 0.25 to <0.50 | | | | | | | | | | | | |
| 0.50 to <0.75 | | | | | | | | | | | | |
| 0.75 to < 2.50 | | | | | | | | | | | | |
| 2.50 to < 10.00 | | | | | | | | | | | | |
| 10.00 to <100.00 | | | | | | | | | | | | |
| 100.00 (Default) | | | | | | | | | | | | |
| Sub-total | | | | | | | | | | | | |
| Total (all portfolios) | | | | | | | | | | | | |

Table 11-17A: Explanatory Notes to IRBA - Credit Risk Exposures by Portfolio and PD Range

| **Definitions** | |
|---|---|
| (a) | *Portfolio X* includes the following regulatory portfolios under the F-IRBA: (i) Sovereign; (ii) Banks; (iii) Corporate; (iv) Corporate small business; (v) Specialised Lending; (vi) High Volatility Commercial Real Estate; (vii) Equity (PD/LGD methods described in paragraphs 7.5.46 to 7.5.60); (viii) Purchased receivables, as defined in Part VII.<br><br>*Portfolio X also* includes the following regulatory portfolios under the A-IRBA and IRBA for the IRBA retail asset class: (i) Sovereign; (ii) Banks; (iii) Corporate; (iv) Corporate small business; (v) Specialised Lending; (vi) High Volatility Commercial Real Estate; (vii) Equity (PD/LGD method as described in paragraphs 7.5.46 to 7.5.60); (viii) Retail - QRRE; (ix) Retail - Residential mortgage; (x) Retail – small business as set out under paragraph 7.4.16(c)(ii); (xi) Other retail exposures; (xii) Purchased receivables, as defined in Part VII. |
| (b) | *Original on-balance sheet gross exposure*: This refers to the amount of the on-balance sheet exposure gross of impairment allowances (before taking into account the effect of CRM). |
| (c) | *Off-balance sheet exposure pre-CCF*: This refers to the exposure value without taking into account valuation adjustments and impairment allowances, CCFs and the effect of CRM. |
| (d) | *Average CCF*: This refers to EAD post-CCF for off-balance sheet exposure to total off-balance sheet exposure pre-CCF. |
| (e) | *EAD post-CRM and post-CCF*: This refers to the amount relevant for the capital requirements calculation. |
| (f) | *Number of obligors:* This corresponds to the number of obligors in each PD range. Approximation to the nearest rounded number is acceptable. |
| (g) | *Average PD*: This refers to the PD associated with each obligor grade, weighted by EAD post-CRM and post-CCF. |
| (h) | *Average LGD*: This refers to the LGD associated with each obligor grade, weighted by EAD post-CRM and post-CCF. The LGD shall be net of any CRM. |
| (i) | *Average maturity*: This refers to the obligor maturity in years weighted by EAD post-CRM and post-CCF. This parameter needs to be filled in only when it is used for the RWA calculation. |
| (j) | *RWA density*: This corresponds to total RWA to EAD post-CRM and post-CCF. |
| (k) | *EL*: This is calculated according to Sub-division 14 of Division 4 of Part VII. |

Table 11-18: IRBA – Effect on RWA of Credit Derivatives used as CRM

| | |
|---|---|
| Purpose | To illustrate the effect of credit derivatives on the calculation of IRBA capital requirements. Pre-credit derivatives RWA assess the impact of credit derivatives on RWA, irrespective of the effects of CRM. |
| Scope of application | This table is mandatory for Reporting Banks using the A-IRBA, F-IRBA, IRBA for the IRBA retail asset class or IRBA(EQ) – PD/LGD method for some or all of their credit risk exposures. |
| Content | RWA that are subject to credit risk approach |
| Frequency | Semi-annually |
| Format | Fixed |
| Accompanying narrative | A Reporting Bank could explain the effect of credit derivatives on its RWA. |

| | | (a) | (b) |
|---|---|---|---|
| | | Pre-credit derivatives RWA | Actual RWA |
| 1 | Sovereign – F-IRBA | | |
| 2 | Sovereign – A-IRBA | | |
| 3 | Banks – F-IRBA | | |
| 4 | Banks – A-IRBA | | |
| 5 | Corporate – F-IRBA | | |
| 6 | Corporate – A-IRBA | | |
| 7 | Corporate small business – F-IRBA | | |
| 8 | Corporate small business – A-IRBA | | |
| 9 | Specialised lending- F-IRBA | | |
| 10 | Specialised lending- A-IRBA | | |
| 11 | High Volatility Commercial Real Estate – F-IRBA | | |
| 12 | High Volatility Commercial Real Estate – A-IRBA | | |
| 13 | Retail – QRRE | | |
| 14 | Retail – residential mortgage | | |
| 15 | Retail –small business | | |
| 16 | Other retail exposures | | |
| 17 | Equity – F-IRBA | | |
| 18 | Equity – A-IRBA | | |
| 19 | Purchased receivables – F-IRBA | | |
| 20 | Purchased receivables – A-IRBA | | |

| 21 | **Total** | | |
|---|---|---|---|

Table 11-18A: Explanatory Notes of IRBA – Effect on RWA of Credit Derivatives used as CRM

| **Definitions** | |
|---|---|
| (a) | *Pre-credit derivatives RWA*: This refers to the hypothetical RWA calculated assuming the absence of recognition of the credit derivative as a CRM technique. |
| (b) | *Actual RWA*: This refers to the RWA taking into account the effects of CRM through the use of the credit derivative. |

Table 11-19: IRBA – RWA Flow Statement for Credit Risk Exposures

| | |
|---|---|
| Purpose | To present a flow statement explaining variations in the credit RWA determined under the IRBA. |
| Scope of application | This table is mandatory for Reporting Banks using the A-IRBA, F-IRBA, IRBA for the IRBA retail asset class or IRBA(EQ) – PD/LGD method for some or all of their credit risk exposures. |
| Content | RWA corresponding to credit risk only, excluding CCR. Changes in RWA amounts over the quarterly reporting period for each of the key drivers should be based on a Reporting Bank's reasonable estimation of the figure. |
| Frequency | Quarterly |
| Format | Fixed. The column and rows 1 and 9 are fixed. A Reporting Bank may add additional rows between rows 7 and 8 to disclose other material drivers of RWA movements over the quarterly reporting period. |
| Accompanying narrative | A Reporting Bank shall explain any significant change over the quarterly reporting period and the key drivers of such changes. |

| | | (a) |
|---|---|---|
| | | **RWA amounts** |
| **1** | **RWA as at end of previous quarter** | |
| 2 | Asset size | |
| 3 | Asset quality | |
| 4 | Model updates | |
| 5 | Methodology and policy | |
| 6 | Acquisitions and disposals | |
| 7 | Foreign exchange movements | |
| 8 | Other | |
| **9** | **RWA as at end of quarter** | |

Table 11-19A: Explanatory Notes of IRBA – RWA Flow Statement for Credit Risk Exposures

| **Definitions** | |
|---|---|
| (a) | *Asset size:* This refers to organic changes in book size and composition (including origination of new businesses and maturing loans) but excludes changes in book size due to acquisitions and disposal of entities. |
| (b) | *Asset quality*: This refers to changes in the assessed quality of the Reporting Bank's assets due to changes in borrower risk, such as rating grade migration or similar effects. |
| (c) | *Model updates*: This refers to changes due to model implementation, changes in model scope, or any changes intended to address model weaknesses. |
| (d) | *Methodology and policy*: This refers to changes due to methodological changes in calculations driven by regulatory policy changes, including both revisions to existing regulations and new regulations. |
| (e) | *Acquisitions and disposals*: This refers to changes in book sizes due to acquisitions and disposal of entities. |
| (f) | *Foreign exchange movements*: This refers to changes driven by market movements such as foreign exchange movements. |
| (g) | *Other*: This category captures changes that cannot be attributed to any other category. |

Table 11-20: IRBA – Backtesting of PD per Portfolio

| | |
|---|---|
| Purpose | To provide backtesting data to validate the reliability of PD calculations. This table compares the PD used in IRBA capital calculations with the effective default rates of bank obligors. A Reporting Bank shall use, at a minimum, a five-year average annual default rate to compare the PD with a more stable default rate. The Reporting Bank may use a longer historical period that is consistent with its actual risk management practices. |
| Scope of application | This table is mandatory for Reporting Banks using the A-IRBA, F-IRBA, IRBA for the IRBA retail asset class or IRBA(EQ) – PD/LGD method for some or all of their credit risk exposures. To provide meaningful or relevant information to users on the backtesting of its internal models, the Reporting Bank shall include the key models used, in accordance with the regulatory scope of consolidation and explain how the scope of the described models was determined. The commentary shall include the percentage of RWA covered by the models for which backtesting results are shown for each of the Reporting Bank's regulatory portfolios. |
| Content | Modelling parameters used in IRBA calculation |
| Frequency | Annually |
| Format | Flexible. A Reporting Bank shall disclose one table for portfolios using F-IRBA, and one table for portfolios using A-IRBA and IRBA for the IRBA retail asset class. |
| Accompanying narrative | A Reporting Bank shall explain any significant change over the annual reporting period and the key drivers of such changes. The Reporting Bank could disclose the amount of exposure and number of obligors whose defaulted exposures have been cured in the annual reporting period. |

| (a) | (b) | (c) | | | (d) | (e) | (f) | | (g) | (h) | (i) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Number of obligors | | | | |
| Portfolio X | PD Range | S&P | Fitch's Rating | Moody's Rating | Weighted average PD | Arithmetic average PD by obligors | End of previous annual reporting period | End of the annual reporting period | Defaulted obligors in the annual reporting period | of which: new defaulted obligors in the annual reporting period | Average historical annual default rate |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

Table 11-20A: Explanatory Notes of IRBA – Backtesting of PD per Portfolio

| **Definitions** | |
|---|---|
| (a) | *Portfolio X* includes the following regulatory portfolios under the F-IRBA: (i) Sovereign; (ii) Banks; (iii) Corporate; (iv) Corporate small business; (v) Specialised lending; (vi) High Volatility Commercial Real Estate; (vii) Equity (PD/LGD methods described in paragraphs 7.5.46 to 7.5.60); (viii) Purchased receivables, as defined in Part VII.<br><br>*Portfolio X* also includes the following regulatory portfolios under the A-IRBA and IRBA for the IRBA retail asset class: (i) Sovereign; (ii) Banks; (iii) Corporate; (iv) Corporate small business; (v) Specialised Lending; (vi) High Volatility Commercial Real Estate; (vii) Equity (PD/LGD method as described in paragraphs 7.5.46 to 7.5.60); (viii) Retail - QRRE; (ix) Retail - Residential mortgage; (x) Retail – small business as set out under paragraph 7.4.16(c)(ii); (xi) Other retail exposures; (xii) Purchased receivables, as defined in Part VII. |
| (b) | *Weighted average PD*: This refers to the PD associated with each obligor grade, weighted by EAD post-CCF and post-CRM. |
| (c) | *Arithmetic average PD by obligors:* This refers to the arithmetic mean of PDs of the number of obligors within the PD range. |
| (d) | *Number of obligors*: This includes the number of obligors at both (i) the end of the previous annual reporting period; and (ii) the end of the annual reporting period. |
| (e) | *Defaulted obligors in the annual reporting period*: This refers to the number of defaulted obligors during the annual reporting period. |
| (f) | *Defaulted obligors in the annual reporting period, of which: new defaulted obligors in the annual reporting period*: This refers to the number of obligors that defaulted during the last 12-month period that were not funded at the end of the previous financial annual reporting period. |
| (g) | *Average historical annual default rate:* The five-year average of the annual default rate (number of obligors at the beginning of each year that have defaulted during that year divided by the total number of obligors at the beginning of the year) is a minimum. A Reporting Bank should use a longer historical period that is consistent with the Reporting Bank's risk management practices. |

Table 11-21: IRBA - Specialised Lending and Equities under the Simple Risk Weight Method

| Purpose | To provide quantitative disclosures of a Reporting Bank's specialised lending and equity exposures using the simple risk weight method. |
|---|---|
| Scope of application | This table is mandatory for Reporting Banks using the supervisory slotting criteria for IRBA exposures belonging to the SL asset sub-class or HVCRE asset sub-classes and the IRBA(EQ) – simple risk weight method. |
| Content | Exposure amounts and RWA |
| Frequency | Semi-annually |
| Format | Flexible |
| Accompanying narrative | A Reporting Bank shall explain any significant change over the semi-annual reporting period and the key drivers of such changes. |

| **Specialised lending** | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Other than HVCRE** | | | | | | | | | | | | |
| Regulatory categories | Remaining maturity | On-balance sheet amount | Off-balance sheet amount | Risk weight | Exposure amount | | | | | RWA | Expected losses |
| | | | | | PF | OF | CF | IPRE | Total | | |
| Strong | Less than 2.5 years | | | 50% | | | | | | | |
| | Equal to or more than 2.5 years | | | 70% | | | | | | | |
| Good | Less than 2.5 years | | | 70% | | | | | | | |
| | Equal to or more than 2.5 years | | | 90% | | | | | | | |
| Satisfactory | | | | 115% | | | | | | | |
| Weak | | | | 250% | | | | | | | |
| Default | | | | - | | | | | | | |
| Total | | | | | | | | | | | |
| **HVCRE** | | | | | | | | | | | |

| Regulatory categories | Remaining maturity | On-balance sheet amount | Off-balance sheet amount | Risk weight | Exposure amount | RWA | Expected losses |
|---|---|---|---|---|---|---|---|
| Strong | Less than 2.5 years | | | 70% | | | |
| | Equal to or more than 2.5 years | | | 95% | | | |
| Good | Less than 2.5 years | | | 95% | | | |
| | Equal to or more than 2.5 years | | | 120% | | | |
| Satisfactory | | | | 140% | | | |
| Weak | | | | 250% | | | |
| Default | | | | - | | | |
| Total | | | | | | | |
| **Equity exposures under the simple risk weight method** | | | | | | | |
| Categories | | On-Balance sheet amount | Off-balance sheet amount | RW | Exposure amount | RWA | |
| Exchange-traded equity exposures | | | | 300% | | | |
| Other equity exposures | | | | 400% | | | |
| Total | | | | | | | |

Table 11-21A: Explanatory Notes of IRBA - Specialised Lending and Equities under the Simple Risk Weight Method

| **Definitions** | |
|---|---|
| (a) | *On-balance sheet amount*: This is the EAD post-CRM (net of impairment allowances and write-offs) under the regulatory scope of consolidation. |
| (b) | *Off-balance sheet amount*: This is the EAD before CCF and CRM. |
| (c) | *Exposure amount*: This is the amount for the capital requirement computation, post-CCF and post-CRM. |
| (d) | *Expected losses*: This is the EL calculated in accordance with Sub-division 14 of Division 4 of Part VII. |

**Sub-division 5: Counterparty credit risk**

11.3.8 The counterparty credit risk section includes all exposures in the banking book and trading book that are subject to capital requirements for CCR, i.e. capital requirements for pre-settlement counterparty exposures arising from OTC derivative transactions, long settlement transactions and SFTs, capital requirements for exposures to CCPs included in the calculation of CCP RWA, and capital requirements for CVA risk.

11.3.9 A Reporting Bank shall disclose all items set out in Tables 11-22 to 11-24, 11-27, 11-28 and 11-30. In the case where the Reporting Bank has adopted:

(a) the SA(CR) to compute RWA for CCR exposures, the Reporting Bank shall also disclose all items set out in Table 11-25;

(b) the A-IRBA and F-IRBA to compute RWA for CCR exposures, the Reporting Bank also shall disclose all items set out in Table 11-26; and

(c) the CCR internal models method, the Reporting Bank shall also disclose all items set out in Table 11-29.

Table 11-22: Qualitative Disclosures related to CCR

| | |
|---|---|
| Purpose | To describe the main characteristics of CCR management (e.g. operating limits, use of guarantees and other CRM techniques, impacts of own credit downgrading). |
| Scope of application | This table is mandatory for all Reporting Banks. |
| Content | Qualitative information |
| Frequency | Annually |
| Format | Flexible |

| A Reporting Bank shall provide a description of - | |
|---|---|
| (a) | Risk management objectives and policies related to CCR. |
| (b) | Methodologies used to assign economic capital and credit limits for counterparty credit exposures and for CCP exposures. |
| (c) | Policies relating to guarantees and assessments concerning CCR, including exposures towards CCPs. |
| (d) | Policies relating to general or specific wrong-way risk. |
| (e) | Impact of the amount of collateral that the Reporting Bank would have to provide given a credit rating downgrade. |

Table 11-23: Analysis of CCR Exposure by Approach

| Purpose | To provide a comprehensive view of the methods used to calculate CCR regulatory requirements and the main parameters used within each method. |
|---|---|
| Scope of application | This table is mandatory for all Reporting Banks. |
| Content | Regulatory exposures, RWA and parameters used for RWA calculations for all exposures subject to capital requirements for CCR (excluding capital requirements for exposures to CCPs included in the calculation of CCP RWA, and capital requirements for CVA risk). |
| Frequency | Semi-annually |
| Format | Fixed |
| Accompanying narrative | A Reporting Bank shall explain any significant changes over the semi-annual reporting period and the key drivers of such changes. |

| | | (a) | (b) | (c) | (d) | (d.1) | (e) | (f) |
|---|---|---|---|---|---|---|---|---|
| | | Replacement cost | Potential future exposure | Effective EPE | Fixed beta factor, β used for computing regulatory EAD | α used for computing regulatory EAD | EAD (post-CRM) | RWA |
| 1 | SA-CCR* (for derivatives) | | | | 1.4 | | | |
| 2 | CCR internal models method (for derivatives and SFTs) | | | | | | | |
| 3 | FC(SA) (for SFTs) | | | | | | | |
| 4 | FC(CA) (for SFTs) | | | | | | | |
| 5 | VaR for SFTs | | | | | | | |
| **6** | **Total** | | | | | | | |

*Depending on the approach used for Pillar 1, the Reporting Bank shall choose either “SA-CCR” or “Current Exposure Method” for the heading of row 1. For “Current Exposure Method”, column (d) shall be omitted and column “d.1” shall be renamed as column “d”.

Table 11-23A: Explanatory Notes to Analysis of CCR Exposure by Approach

| **Definitions** | |
|---|---|
| (a) | *Replacement cost*: The replacement cost under the SA-CCR calculated in accordance with Annex 7O. |
| (b) | *Potential future exposure*: The potential future exposure under the SA-CCR calculated in accordance with Annex 7O. |
| (c) | *Effective EPE*: Effective EPE is computed in accordance with Section 3 of Annex 7Q. |
| (d) | *EAD (post-CRM)*: This refers to the amount relevant for the capital requirements calculation after applying CRM, computed in accordance with paragraphs 7.2.20A, 7.2.23 and 7.2.32A. |
| **Instructions** | |
| (e) | A Reporting Bank shall report in row 1 of this table, information corresponding to CCR exposures using the SA-CCR calculated in accordance with Annex 7O. |

Table 11-24: CVA Risk Capital Requirements

| | |
|---|---|
| Purpose | To provide the calculations for CVA risk capital requirements, with a breakdown by standardised and advanced methods. |
| Scope of application | This table is mandatory for all Reporting Banks with exposures subject to CVA risk capital requirements. |
| Content | RWA and corresponding EADs. |
| Frequency | Semi-annually |
| Format | Fixed |
| Accompanying narrative | A Reporting Bank shall explain any significant changes over the semi-annual reporting period and the key drivers of such changes. |

| | | (a) | (b) |
|---|---|---|---|
| | | EAD (post-CRM) | RWA |
| | Total portfolios subject to the Advanced CVA capital requirement | | |
| 1 | (i) VaR component (including the three-times multiplier) | | |
| 2 | (ii) Stressed VaR component (including the three-times multiplier) | | |
| 3 | All portfolios subject to the Standardised CVA capital requirement | | |
| 4 | Total portfolios subject to the CVA risk capital requirement | | |

Table 11-24A: Explanatory Notes to CVA Risk Capital Requirements

| **Definitions** | |
|---|---|
| (a) | *Advanced CVA capital requirement*: This refers to the capital requirements calculated in accordance with the CVA advanced method as specified in Section 3 of Annex 7AI. |
| (b) | *Standardised CVA capital requirement*: This refers to the capital requirements calculated in accordance with the CVA standardised method as specified in Section 2 of Annex 7AI. |
| (c) | *EAD (post-CRM)*: This refers to the amount relevant for the capital requirements calculation, after applying CRM, calculated in accordance with paragraphs 2.1(c) and 3.1(e) of Annex 7AI. |

Table 11-25: Standardised Approach - CCR Exposures by Portfolio and Risk Weights

| | |
|---|---|
| Purpose | To provide a breakdown of CCR exposures calculated in accordance with the SA(CR), by regulatory portfolio and risk weight. |
| Scope of application | This table is mandatory for all Reporting Banks using the SA(CR) to compute RWA for CCR, regardless of the CCR approach used to determine E or EAD.<br><br>A Reporting Bank may omit disclosures pertaining to a certain portfolio in this table if the exposures and RWA amounts are negligible. The Reporting Bank, which omits disclosures in this table, shall state clearly why it considers the information not to be meaningful or relevant to users, including a description of the exposures in the portfolios concerned, and the aggregate total of RWA from such exposures. |
| Content | Credit exposure amounts |
| Frequency | Semi-annually |
| Format | Fixed |
| Accompanying narrative | A Reporting Bank shall explain any significant changes over the semi-annual reporting period and the key drivers of such changes. |

| | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) |
|---|---|---|---|---|---|---|---|---|---|
| Risk Weight / Asset classes | 0% | 10% | 20% | 50% | 75% | 100% | 150% | Others | Total Credit Exposure |
| Central government and central bank | | | | | | | | | |
| PSE | | | | | | | | | |
| MDB | | | | | | | | | |
| Bank | | | | | | | | | |
| Corporate | | | | | | | | | |
| Regulatory retail | | | | | | | | | |
| Other exposures | | | | | | | | | |
| **Total** | | | | | | | | | |

Table 11-25A: Explanatory notes to Standardised Approach - CCR Exposures by Portfolio and Risk Weights

| **Definitions** | |
|---|---|
| (a) | *Total credit exposure*: This refers to the post-CRM amount relevant for the capital requirements calculation. |
| (b) | *Other exposures*: This amount excludes exposures to CCPs, which are reported in Table 11-30. |

Table 11-26: IRBA - CCR Exposures by Portfolio and PD Range

| Purpose | To provide all relevant parameters used for the calculation of CCR capital requirements for IRBA models. |
|---|---|
| Scope of application | This table is mandatory for all Reporting Banks using the A-IRBA and F-IRBA to compute RWA for CCR exposures, regardless of the CCR approach used to determine E or EAD.<br><br>A Reporting Bank shall include in this table the key models used at the group-wide level (according to the scope of regulatory consolidation) and explain how the scope of models described in this table was determined. The Reporting Bank shall also disclose the percentage of RWA covered by the models shown in this table for each of the Reporting Bank's regulatory portfolios. |
| Content | RWA and parameters used for RWA calculations for all exposures subject to the capital requirements for CCR (excluding capital requirements for exposures to CCPs included in the calculation of CCP RWA, and capital requirements for CVA risk). |
| Frequency | Semi-annually |
| Format | Fixed. The columns and PD range are fixed. A Reporting Bank shall disclose one table for portfolios using F-IRBA, and one table for portfolios using A-IRBA. |
| Accompanying narrative | A Reporting Bank shall explain any significant changes over the semi-annual reporting period and the key drivers of such changes. |

| | | (a) | (b) | (c) | (d) | (e) | (f) | (g) |
|---|---|---|---|---|---|---|---|---|
| | PD range | EAD post- CRM | Average PD | Number of obligors | Average LGD | Average maturity | RWA | RWA density |
| Portfolio X | | | | | | | | |
| | 0.00 to < 0.15 | | | | | | | |
| | 0.15 to <0.25 | | | | | | | |
| | 0.25 to <0.50 | | | | | | | |
| | 0.50 to <0.75 | | | | | | | |
| | 0.75 to < 2.50 | | | | | | | |
| | 2.50 to < 10.00 | | | | | | | |
| | 10.00 to <100.00 | | | | | | | |
| | 100.00(Default) | | | | | | | |

| | Sub-total | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Total (sum of portfolios)** | | | | | | | | |

Table 11-26A: Explanatory Notes to CCR Exposures by Portfolio and PD Range

| **Definitions** | |
|---|---|
| (a) | *Portfolio X* includes the following regulatory portfolios under the F-IRBA: (i) Sovereign; (ii) Banks; (iii) Corporate, (iv) Corporate small business, as defined in Part VII.<br><br>*Portfolio X* also includes the following regulatory portfolios under the A-IRBA: (i) Sovereign; (ii) Banks; (iii) Corporate, (iv) Corporate small business, as defined in Part VII. |
| (b) | *EAD post-CRM*: This refers to the amount relevant for the capital requirements calculation, having applied the CCR approach and CRM, but gross of any impairment allowance as determined in accordance with the Accounting Standards. |
| (c) | *Number of obligors*: This corresponds to the number of individual PDs in this band. Approximation to the nearest rounded number is acceptable. |
| (d) | *Average PD*: This refers to the PD associated with each obligor grade, weighted by EAD post-CRM. |
| (e) | *Average LGD*: This refers to the LGD associated with each obligor grade, weighted by EAD post-CRM. The LGD shall be net of any CRM. |
| (f) | *Average maturity*: This refers to the obligor maturity weighted by EAD post-CRM. |
| (g) | *RWA density*: This corresponds to total RWA to EAD post-CRM. |

Table 11-27: Composition of Collateral for CCR Exposure

| | |
|---|---|
| Purpose | To provide a breakdown of all types of collateral posted or received by a Reporting Bank to support or reduce the CCR exposures related to derivative transactions or to SFTs, including transactions cleared through a CCP. |
| Scope of application | This table is mandatory for all Reporting Banks. |
| Content | Carrying amounts of collateral used in derivative transactions or SFTs, regardless of whether the transactions are cleared through a CCP, or whether the collateral is posted to a CCP. |
| Frequency | Semi-annually |
| Format | Flexible. The columns are fixed, but the rows are flexible. |
| Accompanying narrative | A Reporting Bank shall explain any significant changes over the semi-annual reporting period and the key drivers of such changes. |

| | (a) | (b) | (c) | (d) | (e) | (f) |
|---|---|---|---|---|---|---|
| | Collateral used in derivative transactions | | | | Collateral used in SFTs | |
| | Fair value of collateral received | | Fair value of collateral posted | | Fair value of collateral received | Fair value of collateral posted |
| | Segregated | Unsegregated | Segregated | Unsegregated | | |
| Cash - domestic currency | | | | | | |
| Cash - other currencies | | | | | | |
| Domestic sovereign debt | | | | | | |
| Other sovereign debt | | | | | | |
| Government agency debt | | | | | | |
| Corporate bonds | | | | | | |
| Equity securities | | | | | | |
| Other collateral | | | | | | |
| **Total** | | | | | | |

Table 11-27A: Explanatory notes to Composition of Collateral for CCR Exposure

| **Definitions** | |
|---|---|
| (a) | *Segregated*: This refers to collateral which is held in a bankruptcy-remote manner. In the case where collateral is posted for centrally cleared trades, this refers to collateral that is posted by a clearing member or a client of a clearing member, is held by a custodian and is bankruptcy remote from the CCP, the clearing member, and other clients as set out in paragraphs 2.8 and 2.10 of Annex 7AJ. |
| (b) | *Unsegregated*: This refers to collateral that is not held in bankruptcy-remote manner. |

Table 11-28: Credit Derivative Exposures

| | |
|---|---|
| Purpose | To illustrate the extent of a Reporting Bank's exposure to credit derivative transactions broken down between credit derivatives bought or sold. |
| Scope of application | This table is mandatory for all Reporting Banks. |
| Content | Notional derivative amounts, before any netting, and fair values. |
| Frequency | Semi-annually |
| Format | Flexible. The columns are fixed, but the rows are flexible. |
| Accompanying narrative | A Reporting Bank shall explain any significant changes over the semi-annual reporting period and the key drivers of such changes. |

| | | (a) | (b) |
|---|---|---|---|
| | | Protection bought | Protection sold |
| | **Notionals** | | |
| 1 | Single-name credit default swaps | | |
| 2 | Index credit default swaps | | |
| 3 | Total return swaps | | |
| 4 | Credit options | | |
| 5 | Other credit derivatives | | |
| **6** | **Total notionals** | | |
| | **Fair values** | | |
| 7 | Positive fair value (asset) | | |
| 8 | Negative fair value (liability) | | |

Table 11-29: RWA Flow Statements under the CCR Internal Models Method

| | |
|---|---|
| Purpose | To present a flow statement explaining changes in CCR RWA determined under the CCR internal models method (derivatives and SFTs). |
| Scope of application | This table is mandatory for all Reporting Banks using the CCR internal models method, irrespective of the credit risk approach used to compute RWA. |
| Content | RWA corresponding to CCR. Credit risk shown in Table 11-19 is excluded. Changes in RWA amounts over the quarterly reporting period for each of the key drivers should be based on a Reporting Bank's reasonable estimation of the figure. |
| Frequency | Quarterly |
| Format | Fixed. The column and rows 1 and 9 are fixed. A Reporting Bank may add additional rows between rows 7 and 8 to disclose other material drivers of RWA movements over the quarterly reporting period. |
| Accompanying narrative | A Reporting Bank shall explain any significant changes over the quarterly reporting period and the key drivers of such changes. |

| | | (a) |
|---|---|---|
| | | Amounts |
| **1** | **RWA as at end of previous quarter** | |
| 2 | Asset size | |
| 3 | Credit quality of counterparties | |
| 4 | Model updates (CCR internal models method only) | |
| 5 | Methodology and policy (CCR internal models method only) | |
| 6 | Acquisitions and disposals | |
| 7 | Foreign exchange movements | |
| 8 | Other | |
| **9** | **RWA as at end of current quarter** | |

Table 11-29A: Explanatory Notes to RWA Flow Statements under CCR Internal Models Method

| **Definitions** | |
|---|---|
| (a) | *Asset size*: This refers to organic changes in book size and composition (including origination of new businesses and maturing exposures) but excludes changes in book size due to acquisitions and disposal of entities. |
| (b) | *Credit quality of counterparties*: This refers to changes in the assessed quality of the Reporting Bank's counterparties as measured under the credit risk framework, regardless of the approach the Reporting Bank uses. This row includes potential changes due to IRBA models when the Reporting Bank uses IRBA. |
| (c) | *Model updates*: This refers to changes due to model implementation, changes in model scope, or any changes intended to address model weaknesses. This row addresses only changes in the CCR internal models method. |

| | |
|---|---|
| (d) | *Methodology and policy*: This refers to methodology changes in calculations driven by regulatory policy changes, such as new regulations (only in the CCR internal models method). |
| (e) | *Acquisitions and disposals*: This refers to changes in book sizes due to acquisitions and disposal of entities. |
| (f) | *Foreign exchange movements*: This refers to changes driven by foreign exchange rates. |
| (g) | *Other*: This category captures changes that cannot be attributed to the above categories. |

Table 11-30: Exposures to Central Counterparties

| | |
|---|---|
| Purpose | To provide a comprehensive picture of a Reporting Bank's exposures to CCPs, including all types of exposures (due to operations, margins, contributions to default funds) and related capital requirements. |
| Scope of application | This table is mandatory for all Reporting Banks from 1 January 2018. |
| Content | Exposures at default and RWA corresponding to exposures to CCPs. |
| Frequency | Semi-annually |
| Format | Fixed |
| Accompanying narrative | A Reporting Bank shall also supplement this table with a narrative commentary to explain any significant changes over the semi-annual reporting period and the key drivers of such changes. |

| | | (a) | (b) |
|---|---|---|---|
| | | EAD (post-CRM) | RWA |
| **1** | **Total exposures to qualifying CCPs** | | |
| 2 | Exposures to qualifying CCPs (excluding collateral and default fund contributions) | | |
| 3 | arising from: OTC derivative transactions; | | |
| 4 | arising from: Exchange-traded derivative transactions; | | |
| 5 | arising from: SFTs; and | | |
| 6 | arising from: Netting sets where cross-product netting has been approved | | |
| 7 | Segregated collateral | | |
| 8 | Non-segregated collateral | | |
| 9 | Pre-funded default fund contributions | | |
| 10 | Unfunded default fund contributions | | |
| **11** | **Total exposures to non-qualifying CCPs** | | |
| 12 | Exposures to non-qualifying CCPs (excluding collateral and default fund contributions) | | |
| 13 | arising from: OTC derivative transactions; | | |
| 14 | arising from: Exchange-traded derivative transactions; | | |
| 15 | arising from: SFTs; and | | |
| 16 | arising from: Netting sets where cross-product netting has been approved | | |
| 17 | Segregated collateral | | |
| 18 | Non-segregated collateral | | |
| 19 | Pre-funded default fund contributions | | |

| 20 | Unfunded default fund contributions | | |
|---|---|---|---|

Table 11-30A: Explanatory Notes to Exposures to Central Counterparties

| **Definitions** | |
|---|---|
| (a) | *Exposures to central counterparties (in rows 2 to 6 and rows 12 to 16)*: This refers to CCP trade exposures are described in paragraphs 2.1 to 2.13 of Annex 7AJ. |
| (b) | *EAD (post-CRM)*: This refers to the amount relevant for the capital requirements calculation after applying CRM, computed in accordance with paragraph 2.2 of Annex 7AJ. |
| (c) | *Qualifying CCP*: A qualifying CCP is as defined in paragraph 1.2 of Annex 7AJ. |
| (d) | *Prefunded default fund contributions*: This refers to prefunded clearing member contributions towards, or underwriting of, a CCP's mutualised loss-sharing arrangements. |
| (e) | *Unfunded default fund contributions*: This refers to unfunded clearing member contributions towards, or underwriting of, a CCP's mutualised loss-sharing arrangements. |
| (f) | *Segregated collateral*: This refers to collateral which is held in a bankruptcy-remote manner in accordance with paragraphs 2.8 and 2.10 of Annex 7AJ. |
| (g) | *Unsegregated collateral*: This refers to collateral that is not held in bankruptcy-remote manner. |

**Sub-division 6: Securitisation**

11.3.10 A Reporting Bank shall disclose, in Tables 11-34 and 11-35, only securitisation exposures that meet the requirements for the recognition of risk transference as set out in Sub-division 2 of Division 6 of Part VII. A Reporting Bank shall disclose all securitisation exposures, including those that do not meet the requirements for the recognition of risk transference, in Tables 11-32 and 11-33. As a result, Tables 11-32 and 11-33 may include exposures that are subject to credit risk and market risk capital requirements and that are also included in other parts of the standalone Pillar 3 report. The purpose is to provide a comprehensive view of a Reporting Bank's securitisation activities. There is no double-counting of capital requirements as Tables 11-34 and 11-35 are limited to securitisation exposures subject to capital requirements set out in Division 6 of Part VII.

11.3.11 A Reporting Bank shall disclose all items set out in Tables 11-31 to 11-35.

Table 11-31: Qualitative Disclosures related to Securitisation Exposures

| Purpose | To provide qualitative information on a Reporting Bank's strategy and risk management with respect to its securitisation activities. |
|---|---|
| Scope of application | This table is mandatory for all Reporting Banks with securitisation exposures. |
| Content | Qualitative information |
| Frequency | Annually |
| Format | Flexible |

| A Reporting Bank shall provide a description of - | |
|---|---|
| (a) | its risk management objectives and policies for securitisation activities and main features of these activities based on the rows (c) to (g) of this table. If the Reporting Bank holds securitisation exposures in both the banking book and the trading book, the Reporting Bank shall describe each of the points set out in rows (c) to (g) of this table by distinguishing the activities in each of the books. |
| (b) | The Reporting Bank's objectives in relation to its securitisation and re-securitisation activity, including the extent to which these activities transfer credit risk of the underlying securitised exposures away from the Reporting Bank to other entities, including the type of risks assumed and retained. |
| (c) | A list of -<br>(i) SPEs where it acts as sponsor[801] (but not as an originator such as an ABCP conduit), indicating whether the Reporting Bank consolidates the SPEs into its scope of regulatory consolidation;<br>(ii) affiliates that the Reporting Bank manages or advises; and that invest either in the securitisation exposures that the Reporting Bank has securitised or in SPEs that the Reporting Bank sponsors; and<br>(iii) entities to which the Reporting Bank provides implicit support and the associated capital impact for each of them. |
| (d) | Summary of a Reporting Bank's accounting policies for securitisation activities[802]. |
| (e) | The names of ECAIs used for securitisations and the types of securitisation exposure for which each agency is used, if applicable. |
| (f) | The IAA process, including -<br>(i) structure of the internal assessment process and the relation between internal assessment and external ratings, including information on ECAIs as referenced in row (e) of this table;<br>(ii) control mechanisms for the internal assessment process including discussion of independence, accountability, and internal assessment process review;<br>(iii) the exposure type to which the internal assessment process is applied; and<br>(iv) stress factors used for determining credit enhancement levels, by exposure type[803]. |

801 A Reporting Bank would generally be considered "a sponsor" if it, in fact or in substance, manages or advises the programme, places securities into the market, or provides liquidity and/or credit enhancements. The programme may include, for example, the ABCP conduit programme and structured investment vehicles.

802 Where meaningful or relevant, the Reporting Bank should differentiate between accounting policies applied for securitisation exposures and resecuritisation exposures.

803 For example, credit cards, home equity, auto, and securitisation exposures detailed by underlying exposure type and security type (e.g. residential mortgage-backed securities, commercial mortgage-backed securities, asset-backed securities, collateralised debt obligations) etc.

| (g) | The use of internal assessment other than for IAA capital purposes. |
|---|---|

Table 11-32: Securitisation Exposures in the Banking Book

| | |
|---|---|
| Purpose | To present a Reporting Bank's securitisation exposures in its banking book. |
| Scope of application | This table is mandatory for all Reporting Banks with securitisation exposures in the banking book. |
| Content | Carrying amounts. In this table, securitisation exposures include securitisation exposures even where criteria for recognition of risk transference are not met. |
| Frequency | Semi-annually |
| Format | Flexible. A Reporting Bank may modify the breakdown and order of proposed rows if another breakdown (e.g. whether or not criteria for recognition of risk transference are met) would be more appropriate to reflect their activities. Where the Reporting Bank acts both as originator and sponsor, the Reporting Bank can merge the two columns of 'a Reporting Bank acts as originator' and 'a Reporting Bank acts as sponsor' and use 'a Reporting Bank acts as originator/sponsor' column. |
| Accompanying narrative | A Reporting Bank shall explain any significant changes over the semi-annual reporting period and the key drivers of such changes. |

| | | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | A Reporting Bank act as originator | | | A Reporting Bank acts as sponsor | | | A Reporting Bank acts as investor | | |
| | | Traditional | Synthetic | Sub-total | Traditional | Synthetic | Sub-total | Traditional | Synthetic | Sub-total |
| 1 | Total retail | | | | | | | | | |
| 2 | of which: residential mortgage | | | | | | | | | |
| 3 | of which: credit card | | | | | | | | | |
| 4 | of which: other retail exposures | | | | | | | | | |
| 5 | of which: resecuritisation | | | | | | | | | |
| 6 | Total wholesale | | | | | | | | | |
| 7 | of which: loans to corporates | | | | | | | | | |
| 8 | of which: commercial mortgage | | | | | | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 9 | of which: lease and receivables | | | | | | | | | |
| 10 | of which: other wholesale | | | | | | | | | |
| 11 | of which: resecuritisation | | | | | | | | | |

Table 11-32A: Explanatory Notes to Securitisation Exposures in the Banking Book

| **Definitions** | |
|---|---|
| (a) | When 'a *Reporting Bank acts as originator*', the securitisation exposures are retained positions, even where not eligible for the securitisation framework due to the absence of significant and effective risk transfer. |
| (b) | When 'a *Reporting Bank acts as sponsor*', the securitisation exposures include exposures to commercial paper conduits to which the Reporting Bank provides programme-wide enhancements, liquidity and other facilities. Where the Reporting Bank acts both as originator and sponsor, it must avoid double-counting. |
| (c) | When 'a *Reporting Bank acts as investor*', the securitisation exposures are investment positions purchased in third-party deals. |
| (d) | *Synthetic transactions*: If the Reporting Bank has purchased protection, it shall report the unsecured net exposure amounts to which it is exposed under columns 'a Reporting Bank acts as originator' or 'a Reporting Bank acts as sponsor'. If the Reporting Bank has sold protection, the exposure amount of the credit protection shall be reported in the 'Reporting Bank acts as investor' column. |
| (e) | *Resecuritisation*: All securitisation exposures related to resecuritisation shall be completed in rows 5 and 11 of this table, and not in the other rows of this table which contain only securitisation exposures other than resecuritisation. |

Table 11-33: Securitisation Exposures in the Trading Book

| | |
|---|---|
| Purpose | To present a Reporting Bank's securitisation exposures in its trading book. |
| Scope of application | This table is mandatory for all Reporting Banks with securitisation exposures in the trading book. |
| Content | Carrying amounts |
| Frequency | Semi-annually |
| Format | Flexible. A Reporting Bank may modify the breakdown and order of proposed rows if another breakdown (e.g. whether or not criteria for recognition of risk transference are met) would be more appropriate to reflect their activities. Where the Reporting Bank acts both as originator and sponsor, the Reporting Bank can merge the two columns of 'a Reporting Bank acts as originator' and 'a Reporting Bank acts as sponsor' and use 'a Reporting Bank acts as originator/sponsor' column. |
| Accompanying narrative | A Reporting Bank shall explain any significant changes over the semi-annual reporting period and the key drivers of such changes. |

| | | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | A Reporting Bank act as originator | | | A Reporting Bank acts as sponsor | | | A Reporting Bank acts as investor | | |
| | | Traditional | Synthetic | Sub-total | Traditional | Synthetic | Sub-total | Traditional | Synthetic | Sub-total |
| 1 | Total retail | | | | | | | | | |
| 2 | of which: residential mortgage | | | | | | | | | |
| 3 | of which: credit card | | | | | | | | | |
| 4 | of which: other retail exposures | | | | | | | | | |
| 5 | of which: resecuritisation | | | | | | | | | |
| 6 | Total wholesale | | | | | | | | | |
| 7 | of which: loans to corporates | | | | | | | | | |
| 8 | of which: commercial mortgage | | | | | | | | | |

| 9 | of which: lease and receivables | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 10 | of which: other wholesale | | | | | | | | | |
| 11 | of which: resecuritisation | | | | | | | | | |

Table 11-33A: Explanatory Notes to Securitisation Exposures in the Trading Book

| **Definitions** | |
|---|---|
| (a) | When 'a *Reporting Bank acts as originator*', the securitisation exposures are retained positions, even where not eligible for the securitisation framework due to the absence of significant and effective risk transfer. |
| (b) | When 'a *Reporting Bank acts as sponsor*', the securitisation exposures include exposures to commercial paper conduits to which the Reporting Bank provides programme-wide enhancements, liquidity and other facilities. Where the Reporting Bank acts both as originator and sponsor, it shall avoid double-counting. |
| (c) | When 'a *Reporting Bank acts as investor*', the securitisation exposures are investment positions purchased in third-party deals. |
| (d) | *Synthetic transactions*: If a Reporting Bank has purchased protection, it shall report the unsecured net exposure amounts to which it is exposed under columns 'a Reporting Bank acts as originator' or 'a Reporting Bank acts as sponsor'. If the Reporting Bank has sold protection, the exposure amount of the credit protection shall be reported in 'a Reporting Bank acts as investor' column. |
| (e) | *Resecuritisation*: All securitisation exposures related to resecuritisation shall be completed in rows 5 and 11 of this table, and not in the other rows of this table which contain only securitisation exposures other than resecuritisation. |

Table 11-34: Securitisation Exposures in the Banking Book and associated Regulatory Capital Requirements – A Reporting Bank acting as Originator or as Sponsor

| | |
|---|---|
| Purpose | To present a Reporting Bank's securitisation exposures in the banking book when the Reporting Bank acts as originator or sponsor, and the associated capital requirements. |
| Scope of application | This table is mandatory for all Reporting Banks with securitisation exposures as sponsor or originator. |
| Content | Exposure values, RWA and capital requirements. Only securitisation exposures where the risk transference recognition criteria are met shall be disclosed here. |
| Frequency | Semi-annually |
| Format | Fixed |
| Accompanying narrative | A Reporting Bank shall explain any significant changes over the semi-annual reporting period and the key drivers of such changes. |

| | | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | (m) | (n) | (o) | (p) | (q) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Exposure values (by risk weight bands) | | | | | Exposure values (by regulatory approach) | | | | RWA (by regulatory approach) | | | | Capital charge after cap | | | |
| | | ≤20% RW | >20% to 50% RW | >50% to 100% RW | >100% to <1250% RW | 1250% RW | SEC-IRBA | SEC-ERBA | SEC-SA | 1250% | SEC-IRBA | SEC-ERBA | SEC-SA | 1250% | SEC-IRBA | SEC-ERBA | SEC-SA | 1250% |
| **1** | **Total exposures** | | | | | | | | | | | | | | | | | |
| 2 | Traditional securitisation | | | | | | | | | | | | | | | | | |
| 3 | of which: securitisation | | | | | | | | | | | | | | | | | |
| 4 | of which: retail underlying | | | | | | | | | | | | | | | | | |
| 5 | of which: wholesale | | | | | | | | | | | | | | | | | |
| 6 | of which: resecuritisation | | | | | | | | | | | | | | | | | |
| 7 | of which: senior | | | | | | | | | | | | | | | | | |
| 8 | of which: non-senior | | | | | | | | | | | | | | | | | |
| 9 | Synthetic securitisation | | | | | | | | | | | | | | | | | |
| 10 | of which: securitisation | | | | | | | | | | | | | | | | | |

| 11 | of which: retail underlying | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | of which: wholesale | | | | | | | | | | | | | | | | | |
| 13 | of which resecuritisation | | | | | | | | | | | | | | | | | |
| 14 | of which: senior | | | | | | | | | | | | | | | | | |
| 15 | of which: non-senior | | | | | | | | | | | | | | | | | |

[MAS Notice 637 (Amendment No. 2) 2017]

Table 11-34A: Explanatory Notes to Securitisation Exposures in the Banking Book and associated Regulatory Capital Requirements – A Reporting Bank acting as Originator or as Sponsor

| **Definitions** | |
|---|---|
| (a) | Columns (i), (m) and (q) refer to securitisation exposures subject to a 1250% risk weight as the SEC-IRBA, SEC-ERBA and SEC-SA cannot be applied, and exclude securitisation exposures capitalised under the SEC-IRBA, SEC-ERBA, or SEC-SA which are subject to a 1250% risk weight. |
| (b) | *Capital requirement after cap*: This refers to the capital requirement after application of any caps as specified in paragraphs 7.1.9 to 7.1.17. |

[MAS Notice 637 (Amendment No. 2) 2017]

Table 11-35: Securitisation Exposures in the Banking Book and associated Regulatory Capital Requirements – A Reporting Bank acting as Investor

| | |
|---|---|
| Purpose | To present a Reporting Bank's securitisation exposures in the banking book when the Reporting Bank acts as investor and the associated capital requirements. |
| Scope of application | This table is mandatory for all Reporting Banks with securitisation exposures as investor. |
| Content | Exposure values, RWA and capital requirements. Only securitisation exposures where the risk transference recognition criteria are met shall be disclosed here. |
| Frequency | Semi-annually |
| Format | Fixed |
| Accompanying narrative | A Reporting Bank shall explain any significant changes over the semi-annual reporting period and the key drivers of such changes. |

| | | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | (m) | (n) | (o) | (p) | (q) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Exposure values (by risk weight bands) | | | | | Exposure values (by regulatory approach) | | | | RWA (by regulatory approach) | | | | Capital charge after cap | | | |
| | | ≤20% RW | >20% to 50% RW | >50% to 100% RW | >100% to <1250% RW | 1250% RW | SEC-IRBA | SEC-ERBA | SEC-SA | 1250% | SEC-IRBA | SEC-ERBA | SEC-SA | 1250% | SEC-IRBA | SEC-ERBA | SEC-SA | 1250% |
| **1** | **Total exposures** | | | | | | | | | | | | | | | | | |
| 2 | Traditional securitisation | | | | | | | | | | | | | | | | | |
| 3 | of which: securitisation | | | | | | | | | | | | | | | | | |
| 4 | of which: retail underlying | | | | | | | | | | | | | | | | | |
| 5 | of which: wholesale | | | | | | | | | | | | | | | | | |
| 6 | of which: resecuritisation | | | | | | | | | | | | | | | | | |
| 7 | of which: senior | | | | | | | | | | | | | | | | | |
| 8 | of which: non-senior | | | | | | | | | | | | | | | | | |
| 9 | Synthetic securitisation | | | | | | | | | | | | | | | | | |
| 10 | of which: securitisation | | | | | | | | | | | | | | | | | |

| 11 | of which: retail underlying | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | of which: wholesale | | | | | | | | | | | | | | | | | |
| 13 | of which resecuritisation | | | | | | | | | | | | | | | | | |
| 14 | of which: senior | | | | | | | | | | | | | | | | | |
| 15 | of which: non-senior | | | | | | | | | | | | | | | | | |

[MAS Notice 637 (Amendment No. 2) 2017]

Table 11-35A: Explanatory Notes to Securitisation Exposures in the Banking Book and associated Regulatory Capital Requirements – A Reporting Bank acting as Investor

| **Definitions** | |
|---|---|
| (a) | Columns (i), (m) and (q) refer to securitisation exposures subject to a 1250% risk weight as the SEC-IRBA, SEC-ERBA and SEC-SA cannot be applied, and exclude securitisation exposures capitalised under the SEC-IRBA, SEC-ERBA, or SEC-SA which are subject to a 1250% risk weight. |
| (b) | *Capital requirement after cap*: This refers to the capital requirement after application of any caps as specified in paragraphs 7.1.9 to 7.1.17. |

[MAS Notice 637 (Amendment No. 2) 2017]

**Sub-division 7: Market risk**

11.3.12 The market risk section includes the market risk capital requirements calculated for trading book and banking book exposures that are subject to a market risk charge. It also includes capital requirements for securitisation exposures held in the trading book. However, it excludes the CCR capital requirements that apply to the same exposures, which are disclosed in Sub-division 5 of this Division.

11.3.13 The Reporting Bank shall disclose all items set out in Table 11-36. In the case where the Reporting Bank has adopted:

(a) the SA(MR), the Reporting Bank shall also disclose all items set out in Table 11-38; and

(b) the IMA, the Reporting Bank shall also disclose all items set out in Tables 11-37, 11-39, 11-40 and 11-41.

Table 11-36: Qualitative Disclosures related to Market Risk

| | |
|---|---|
| Purpose | To provide a description of the risk management objectives and policies concerning market risk as defined in paragraph 8.1.1. |
| Scope of application | This table is mandatory for all Reporting Banks that are subject to a market risk capital requirement for their trading activities. |
| Content | Qualitative information |
| Frequency | Annually |
| Format | Flexible |

| The Reporting Bank shall provide a description of - | |
|---|---|
| (a) | The strategies and processes of a Reporting Bank, including -<br>(i) an explanation of management's strategic objectives in undertaking trading activities;<br>(ii) processes implemented to identify, measure, monitor and control the Reporting Bank's market risks;<br>(iii) policies for hedging risk; and<br>(iv) strategies or processes for monitoring the continuing effectiveness of hedges. |
| (b) | The structure and organisation of the market risk management function, including -<br>(i) a description of the market risk governance structure established to implement the strategies and processes of the Reporting Bank described in row (a) of this table; and<br>(ii) a description of the relationships and the communication mechanisms between the different parties involved in market risk management. |
| (c) | The scope and nature of risk reporting and/or measurement systems. |

Table 11-37: Qualitative Disclosures related to IMA

| Purpose | To provide the scope, main characteristics and the key modelling choices of the different models (VaR, stressed VaR, IRC, comprehensive risk measure) used for regulatory calculation of market risks. |
|---|---|
| Scope of application | This table is mandatory for all Reporting Banks using an internal model to calculate its market risk capital requirements.<br><br>A Reporting Bank shall include in this table a description of the main characteristics of the internal models used at the group-wide level (according to the scope of regulatory consolidation) and explain the extent to which they represent all the models used at the group-wide level. The Reporting Bank shall also disclose the percentage of capital requirements covered by the models described in this table for each of the Reporting Bank's regulatory models (Var, stressed VaR, IRC, comprehensive risk measure). |
| Content | Qualitative information |
| Frequency | Annually |
| Format | Flexible |

| A Reporting Bank shall disclose the following information - | |
|---|---|
| (a) | For VaR models and stressed VaR model:<br>(i) A description of the activities and risks covered by the VaR models and stressed VaR models. The Reporting Bank shall also describe the main activities and risks not included in VaR or stressed VaR regulatory calculations (due to lack of historical data or model constraints) and treated under other model risk measures (such as specific treatments allowed by the Authority), where applicable.<br>(ii) A list of legal entities (or trading portfolios) in the banking group which uses the models or if a single model (VaR or stressed VaR) is used for all legal entities (or trading portfolios) with market risk exposure.<br>(iii) A general description of the models (VaR or stressed VaR) used.<br>(iv) A discussion of the main differences, if any, between the model used for management purposes and the model used for regulatory purposes as specified in paragraph 8.3.70, for VaR and stressed VaR models.<br>(v) For VaR models, the Reporting Bank shall specify -<br>a. the frequency in which it updates the data sets ;<br>b. the historical observation period that is used to calibrate the model. A description of the weighting scheme that is used, if any;<br>c. the determination of the 10-day holding period, e.g. for a Reporting Bank which calculates a VaR measure according to a holding period of less than ten trading days, a description of the approach it uses to scale up to ten days by, or does the Reporting Bank directly model the 10-day VaR;<br>d. the method of aggregating specific and general risk (e.g. if a Reporting Bank has calculated the specific and general risk separately or based on a single model); |

| | |
|---|---|
| | e. the valuation approach (full revaluation or use of approximations); and<br>f. A description of whether absolute or relative returns (or a mixed approach) is used (i.e. proportional change in prices or rates or absolute change in prices or rates) when simulating potential movements in risk factors.<br>(vi) For stressed VaR models, the Reporting Bank shall specify -<br>a. the determination of the 10-day holding period, e.g. for a Reporting Bank which calculates a VaR measure according to a holding period of less than ten trading days, a description of the approach it uses to scale up to ten days by, or does the Reporting Bank directly model the 10-day VaR. The Reporting Bank may indicate if the approach is the same as that described in row (a)(v)(c) of this table;<br>b. The stress period chosen by the Reporting Bank and the rationale for this choice;<br>c. The valuation approach (full revaluation or use of approximations).; and<br>d. A description of whether absolute or relative returns (or a mixed approach) is used (i.e. proportional change in prices or rates or absolute change in prices or rates) when simulating potential movements in risk factors.<br>(vii) A description of stress testing applied to the modelling parameters.<br>(viii) A description of the approach used for backtesting or validating the accuracy and consistency of the data and parameters used for the internal models and modelling process. |
| (b) | For a Reporting Bank using internal models to measure the risk for the IRC charge:<br>(i) A description of the methodology used, including -<br>a. Information about the overall modelling approach (the use of spread-based models or transition matrix-based models);<br>b. Information on the calibration of the transition matrix; and<br>c. Information about correlation assumptions.<br>(ii) The approach used to determine liquidity horizons.<br>(iii) A description of the methodologies used to achieve a capital assessment that is consistent with the required soundness standard.<br>(iv) The approach used in the validation of the models. |
| (c) | For a Reporting Bank using internal models to measure the risk for the comprehensive risk capital charge:<br>(i) A description of the methodology used, including -<br>a. Information about the overall modelling approach (choice of model correlation between default or migrations and spread: (i) separate but correlated stochastic processes driving migration or default and spread movement; (ii) spread changes driving migration or default; or (iii) default or migrations driving spread changes); |

| | |
|---|---|
| | b. Information used to calibrate the parameters of the base correlation, e.g. LGD pricing of the tranches (constant or stochastic); and<br>c. Information on the choice whether to age positions (profits and losses based on the simulated market movement in the model calculated based on the time to expiry of each position at the end of the one-year capital horizon or using their time to expiry at the calculation date).<br>(ii) The approach used to determine liquidity horizons.<br>(iii) A description of the methodologies used to achieve a capital assessment that is consistent with the required soundness standard.<br>(iv) The approach used in the validation of the models. |

Table 11-38: Market Risk under Standardised Approach

| Purpose | To display the components of the capital requirement under the standardised approach for market risk. |
|---|---|
| Scope of application | This table is mandatory for all Reporting Banks using the standardised approach for market risk.<br><br>A Reporting Bank may omit disclosures in this table, if the Reporting Bank uses approaches other than the standardised approach for most of their market risk exposures, such that exposures and RWA amounts under the standardised approach may be negligible. The Reporting Bank, which omits disclosures in this table, shall state clearly why it considers the information not to be meaningful or relevant to users, including a description of the exposures in the respective portfolios, and the aggregate total of RWA from such exposures. |
| Content | RWA |
| Frequency | Semi-annually |
| Format | Fixed |
| Accompanying narrative | A Reporting Bank shall explain any significant changes over the semi-annual reporting period and the key drivers of such changes. |

| | | (a) |
|---|---|---|
| | | RWA[804] |
| | **Products excluding options** | |
| 1 | Interest rate risk (general and specific) | |
| 2 | Equity risk (general and specific) | |
| 3 | Foreign exchange risk | |
| 4 | Commodity risk | |
| | **Options** | |
| 5 | Simplified approach | |
| 6 | Delta-plus method | |
| 7 | Scenario approach | |
| **8** | **Securitisation** | |
| **9** | **Total** | |

[804] The RWA is derived by multiplying the capital requirements by 12.5.

Table 11-39: RWA Flow Statements of Market Risk Exposures under IMA

| | |
|---|---|
| Purpose | To present a flow statement explaining variations in the market RWA determined under IMA. |
| Scope of application | This table is mandatory for all Reporting Banks using IMA for their market risk exposures. |
| Content | RWA corresponding to market risk. Changes in RWA over the quarterly reporting period for each of the key drivers should be based on a Reporting Bank's reasonable estimation of the figure. |
| Frequency | Quarterly |
| Format | Fixed. The columns and rows 1 and 8 are fixed. A Reporting Bank may add additional rows between rows 7 and 8 to disclose additional elements that contribute to RWA variations. |
| Accompanying narrative | A Reporting Bank shall explain any significant changes over the quarterly reporting period and the key drivers of such changes. |

| | | (a) | (b) | (c) | (d) | (e) | (f) |
|---|---|---|---|---|---|---|---|
| | | VaR | Stressed VaR | IRC | Comprehensive Risk Measure | Other | Total RWA |
| 1 | RWA as at end of previous quarter | | | | | | |
| 2 | Movement in risk levels | | | | | | |
| 3 | Model updates or changes | | | | | | |
| 4 | Methodology and policy | | | | | | |
| 5 | Acquisitions and disposals | | | | | | |
| 6 | Foreign exchange movements | | | | | | |
| 7 | Other | | | | | | |
| 8 | RWA at end of current quarter | | | | | | |

Table 11-39A: Explanatory Notes to RWA Flow Statements of Market Risk Exposures under IMA

| **Definitions** | |
|---|---|
| (a) | *Movement in risk levels*: This refers to changes due to position changes. |
| (b) | *Model changes*: This refers to significant updates to the model to reflect recent experience (e.g. recalibration), as well as significant changes in model scope. Additional rows should be added if there was more than one model update. |
| (c) | *Methodology and policy*: This refers to methodology changes in calculations driven by regulatory policy changes. |
| (d) | *Acquisitions and disposals*: This refers to modifications due to acquisition or disposal of business, product lines or entities. |
| (e) | *Foreign exchange movements*: This refers to changes driven by foreign exchange movements. |
| (f) | *Other*: This category captures changes that cannot be attributed to any other category. |
| (g) | *Var column on RWA at end of current quarter*: This refers to the derived RWA which is calculated by multiplying VaR (calculated using a 99th percentile, one-tailed confidence interval and an instantaneous price shock equivalent to a 10-day movement in price), as well as any additional capital charge in relation to the VaR model required to be maintained by the Authority, with 12.5. |
| (h) | *Stressed VaR column on RWA at end of current quarter*: This refers to the derived RWA which is calculated by multiplying stressed VaR (based on 10-day, 99$^{th}$ percentile, one-tailed confidence interval VaR measure), as well as any additional capital in relation to the stressed VaR model required to be maintained by the Authority, with 12.5. |
| (i) | *IRC column on RWA at end of current quarter*: This refers to the derived RWA which is calculated by multiplying IRC, as well as any additional capital in relation to the IRC model required to be maintained by the Authority, with 12.5. |
| (j) | *Comprehensive-risk model column on RWA at end of current quarter*: This refers to the derived RWA which is calculated by multiplying the comprehensive risk capital charge, as well as any additional capital in relation to the comprehensive risk model required to be maintained by the Authority, with 12.5. |
| (k) | *Other column on RWA at end of current quarter*: This refers to the derived RWA corresponding to the specific capital charges on the basis of model approaches not reported in VaR, stressed VaR, IRC or the comprehensive risk measure. Additional rows should be added where there is more than one specific capital charge. |
| (l) | *Total RWA at the end of current quarter*: This refers to the derived RWA which is calculated by multiplying the total risk capital requirement under IMA, with 12.5. This should be consistent with row 18 of Table 11-3. |

Table 11-40: IMA Values for Trading Portfolios

| | |
|---|---|
| Purpose | To disclose the values (maximum, minimum, average and period end) resulting from the different types of models used for computing the regulatory capital charge at the Group level, before any additional capital charge is applied by the Authority. |
| Scope of application | This table is mandatory for all Reporting Banks using IMA for their market risk exposures. |
| Content | Outputs of internal models for regulatory capital purposes at the group-wide level (according to the scope of regulatory consolidation). |
| Frequency | Semi-annually |
| Format | Fixed |
| Accompanying narrative | A Reporting Bank shall explain any significant changes over the semi-annual reporting period and the key drivers of such changes. |

| | | (a) |
|---|---|---|
| **VaR (calculated using a 99$^{th}$ percentile, one-tailed confidence interval and an instantaneous price shock equivalent to a 10-day movement in price)** | | |
| 1 | Maximum value | |
| 2 | Average value | |
| 3 | Minimum value | |
| 4 | Semi-annual period end | |
| **Stressed VaR (based on 10-day, 99$^{th}$ percentile, one-tailed confidence interval VaR measure)** | | |
| 5 | Maximum value | |
| 6 | Average value | |
| 7 | Minimum value | |
| 8 | Semi-annual period end | |
| **IRC charge (measured at 99.9 percent confidence interval over a capital horizon of one year)** | | |
| 9 | Maximum value | |
| 10 | Average value | |
| 11 | Minimum value | |
| 12 | Semi-annual period end | |
| **Comprehensive risk capital charge (measured at 99.9 percent confidence interval over a capital horizon of one year based on an internally developed approach that adequately captures not only incremental default and migration risks, but all price risks)** | | |
| 13 | Maximum value | |
| 14 | Average value | |
| 15 | Minimum value | |

| 16 | Semi-annual period end | |
|---|---|---|
| 17 | Floor | |

Table 11-40A: Explanatory Notes on IMA Values for Trading Portfolios

| **Definitions** | |
|---|---|
| (a) | *VaR*: This refers to the regulatory VaR used to compute capital charge, and shall not include additional capital required to be maintained by the Authority. |
| (b) | *Stressed VaR*: This refers to the regulatory stressed VaR used to compute capital charge, and shall not include additional capital required to be maintained by the Authority. |
| (c) | *IRC*: This refers to the IRC used for computing the capital charge. The amounts reported shall not include additional capital required to be maintained by the Authority. |
| (d) | *Floor*: 8% of the capital charge for specific risk according to the standardised approach, as described in paragraph 8.3.82B. |
| **Instructions** | |
| (e) | Values disclosed in rows 13, 14, 15 and 16 of this table are figures before application of the capital floor; the floor calculation is reflected for end of the semi-annual reporting period in row 17 of this table . |

Table 11-41: Comparison of VaR Estimates with Gains or Losses

| | |
|---|---|
| Purpose | To present a comparison of the results of estimates from the regulatory VaR model with both hypothetical and actual trading outcomes, to highlight the frequency and the extent of backtesting exceptions, and to give an analysis of the main outliers in backtested results, as per paragraphs 8.3.117 to 8.3.123. |
| Scope of application | This table is mandatory for all Reporting Banks using an internal model for their market risk exposures. |
| Content | VaR model outcomes |
| Frequency | Semi-annually |
| Format | Flexible |
| Accompanying narrative | A Reporting Bank shall include in this table a description of the key models used at the group-wide level (according to the regulatory scope of consolidation) and explain the extent to which they represent the models used at the group-wide level. The Reporting Bank shall also disclose the percentage of capital requirements covered by the models for which backtesting results are shown in this table.<br><br>A Reporting Bank shall also present an analysis of outliers in backtesting results, specifying the dates and the corresponding excess (VaR – profit and loss). At the minimum, the analysis should specify the key drivers of the backtesting exceptions.<br><br>The Reporting Bank shall disclose a comparison of hypothetical changes based on static positions with realised measures as described in paragraphs 8.3.117 (a), 8.3.117(b) and 8.3.119.<br><br>The Reporting Bank shall also provide information about actual gains or losses, including whether the Reporting Bank includes reserves, and if not, how reserves are integrated into the backtesting process. The Reporting Bank shall clarify if actual profit and loss includes commissions and fees. |

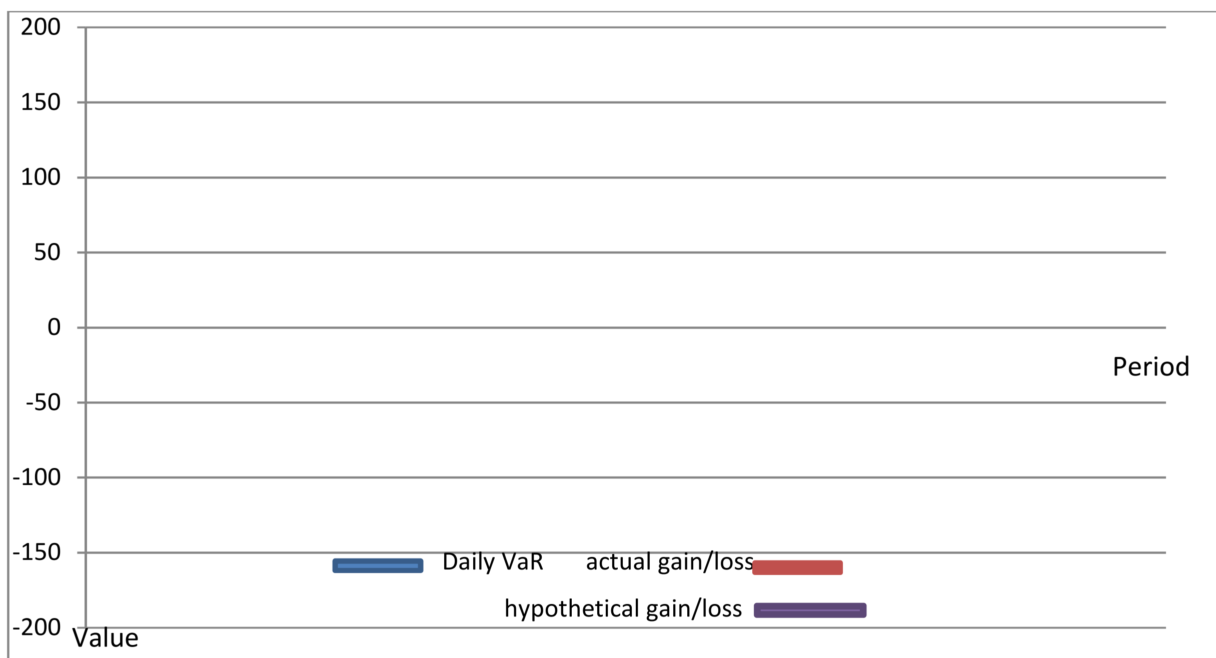


Table 11-41A: Explanatory Notes to Comparison of VaR Estimates with Gains or Losses

| **Definitions** | |
|---|---|
| (a) | *Daily VaR* should reflect the observed percentage of outcomes covered by risk measures which is consistent with a 99th percentile, one-tailed confidence interval calibrated to a one-day holding period. |
| (b) | *Hypothetical gain or loss* shall be based on hypothetical changes in portfolio values which would occur if end-of-day positions were to remain unchanged over the one-day holding period. |

**Sub-division 8: Operational Risk**

11.3.14 A Reporting Bank shall disclose all items set out in Table 11-42.

Table 11-42: Operational risk

| | | |
|---|---|---|
| Qualitative Disclosures | (a) | A description of risk management objectives and policies, including:<br>(i) the strategies and processes;<br>(ii) the structure and organisation of the risk management function;<br>(iii) the scope and nature of risk reporting and measurement systems;<br>(iv) the policies for mitigating risk, and processes for monitoring the continuing effectiveness of such policies; and<br>(v) the regulatory approach or approaches used for the calculation of operational risk capital requirements. |

| | | |
|---|---|---|
| | (b) | A description of the AMA, if used by the Reporting Bank, including a discussion of relevant internal and external factors considered in the measurement approach of the Reporting Bank, and in the case of partial use, the scope and coverage of the different approaches used. |
| | (c)* | For a Reporting Bank that uses the AMA for calculating operational risk capital requirements, a description of any use of insurance for the purpose of mitigating operational risk. |

**Sub-division 9: Interest Rate Risk in the Banking Book**

11.3.15 A Reporting Bank shall disclose all items set out in Table 11-43.

Table 11-43: Interest rate risk in the banking book

| | | |
|---|---|---|
| Qualitative Disclosures | (a) | A description of risk management objectives and policies, including:<br>(i) the strategies and processes;<br>(ii) the structure and organisation of the risk management function;<br>(iii) the scope and nature of risk reporting and measurement systems; and<br>(iv) the policies for hedging and mitigating risk, and processes for monitoring the continuing effectiveness of such policies. |
| | (b) | A description of the nature of interest rate risk in the banking book and key assumptions made by the Reporting Bank, including assumptions regarding loan prepayments and behaviour of non-maturity deposits, and frequency with which interest rate risk in the banking book is measured. |
| Quantitative Disclosures | (c) | The changes in earnings or economic value (or relevant measure used by the Reporting Bank) for upward and downward rate shocks according to the internal method of the Reporting Bank for measuring interest rate risk in the banking book, broken down by currency, where applicable. |

**Sub-division 10: Remuneration**

11.3.16 A Reporting Bank shall disclose all items set out in Tables 11-44, 11-44A, 11-44C and 11-44E.

[MAS Notice 637 (Amendment No. 3) 2017]

11.3.17 [Deleted by MAS Notice 637 (Amendment No. 3) 2017]

Table 11-44: Remuneration Policy

| | |
|---|---|
| Purpose | Describe a Reporting Bank's remuneration policy as well as key features of the remuneration system to allow meaningful assessments by users of Pillar 3 data of banks' compensation practices. |
| Scope of application | The template is mandatory for all Reporting Banks. |
| Content | Qualitative information |
| Frequency | Annual. If it is not possible to disclose the table together with annual financial statements, it should be disclosed as soon as possible thereafter and no later than 4 months after the end of each financial year. |
| Format | Flexible |

| Reporting Banks must describe the main elements of their remuneration system and how they develop this system. In particular, the following elements, where relevant, must be described: | |
|---|---|
| (a) | Information relating to the bodies that oversee remuneration. Disclosures must include:<br>(i) the name, composition and mandate of the main body overseeing remuneration;<br>(ii) the external consultants whose advice have been sought, the body by which they were commissioned, and in what areas of the remuneration process;<br>(iii) a description of the scope of the bank's remuneration policy[806A], including the extent to which it is applicable to foreign subsidiaries and branches; and<br>(iv) a description of the types of employees considered as material risk-takers and as senior managers. |
| (b) | Information relating to the design and structure of remuneration processes. Disclosures must include:<br>(i) the key features and objectives of remuneration policy;<br>(ii) whether the remuneration committee reviewed the firm's remuneration policy during the past year, and if so, an overview of any changes that were made, the reasons for those changes and their impact on remuneration; and |

[805] [Deleted by MAS Notice 637 (Amendment No. 3) 2017]
[806] [Deleted by MAS Notice 637 (Amendment No. 3) 2017]
[806A] For example, by regions or business lines.

[MAS Notice 637 (Amendment No. 3) 2017]

| | |
|---|---|
| | (iii) a description of how the bank ensures that risk and compliance employees are remunerated independently of the businesses they oversee. |
| (c) | Description of the ways in which current and future risks are taken into account in the remuneration processes. Disclosures must include a description of the key risks, their measurement and how these measures affect remuneration. |
| (d) | Description of the ways in which the bank seeks to link performance during a performance measurement period with levels of remuneration. Disclosures should include:<br>(i) a description of main performance metrics for bank, top-level business lines and individuals;<br>(ii) a description of how amounts of individual remuneration are linked to bank-wide and individual performance; and<br>(iii) a description of the measures the bank will implement to adjust remuneration in the event that performance metrics are weak, including the bank's criteria for determining "weak" performance metrics. |
| (e) | Description of the ways in which the bank seeks to adjust remuneration to take account of longer-term performance. Disclosures should include:<br>(i) a description of the bank's policy on deferral and vesting of variable remuneration and, if the fraction of variable remuneration that is deferred differs across employees or groups of employees, a description of the factors that determine the fraction and their relative importance; and<br>(ii) a description of the bank's policy and criteria for adjusting deferred remuneration before vesting and after vesting through clawback arrangements. |
| (f) | Description of the different forms of variable remuneration that the bank utilises and the rationale for using these different forms. Disclosures should include:<br>(i) a description of the forms of variable remuneration offered (i.e. cash, shares and share-linked instruments and other forms); and<br>(ii) a description of the use of the different forms of variable remuneration and, if the mix of different forms of variable remuneration differs across employees or groups of employees), a description of the factors that determine the mix and their relative importance. |

[MAS Notice 637 (Amendment No. 3) 2017]

Table 11-44A: Remuneration Awarded during the Financial Year

| | |
|---|---|
| Purpose | Provide quantitative information on remuneration for the financial year. |
| Scope of application | The template is mandatory for all Reporting Banks. |
| Content | Quantitative information |
| Frequency | Annual. If it is not possible to disclose the template together with the annual financial statements, it should be disclosed as soon as possible thereafter and no later than 4 months after the end of each financial year. |
| Format | Flexible |
| Accompanying narrative | Reporting Banks may wish to supplement the template with a narrative commentary to explain any significant movements over the reporting period and the key drivers of such movements. |

| | | | (a) | (b) |
|---|---|---|---|---|
| | | | Senior management | Other material risk-takers |
| 1 | Fixed remuneration | Number of employees | | |
| 2 | | Total fixed remuneration (row 3 + row 5 + row 7) | | |
| 3 | | of which: cash-based | | |
| 4 | | of which: deferred | | |
| 5 | | of which: shares and other share-linked instruments | | |
| 6 | | of which: deferred | | |
| 7 | | of which: other forms of remuneration | | |
| 8 | | of which: deferred | | |
| 9 | Variable remuneration | Number of employees | | |
| 10 | | Total variable remuneration (row 11 + row 13 + row 15) | | |
| 11 | | of which: cash-based | | |
| 12 | | of which: deferred | | |
| 13 | | of which: shares and other share-linked instruments | | |
| 14 | | of which: deferred | | |
| 15 | | of which: other forms of remuneration | | |
| 16 | | of which: deferred | | |
| 17 | Total remuneration (row 2 + row 10) | | | |

[MAS Notice 637 (Amendment No. 3) 2017]

Table 11-44B: Explanatory Notes to Remuneration Awarded during the Financial Year

| **Explanatory notes** | |
|---|---|
| (a) | Senior management and other material risk-takers categories in columns (a) and (b) must correspond to the type of employees described in Table 11-44. |
| (b) | Other forms of remuneration in rows 7 and 15 must be described in Table 11-44 and, if needed, in the accompanying narrative to Table 11-44A. |

[MAS Notice 637 (Amendment No. 3) 2017]

Table 11-44C: Special Payments

| Purpose | Provide quantitative information on special payments for the financial year. |
|---|---|
| Scope of application | The template is mandatory for all Reporting Banks. |
| Content | Quantitative information |
| Frequency | Annual. If it is not possible to disclose the template together with the annual financial statements, it should be disclosed as soon as possible thereafter and no later than 4 months after the end of each financial year. |
| Format | Flexible |
| Accompanying narrative | Reporting Banks may wish to supplement the template with a narrative commentary to explain any significant movements over the reporting period and the key drivers of such movements. |

| | | Guaranteed bonuses | | Sign-on awards | | Severance payments | |
|---|---|---|---|---|---|---|---|
| | | Number of employees | Total amount | Number of employees | Total amount | Number of employees | Total amount |
| 1 | Senior management* | | | | | | |
| 2 | Other material risk-takers | | | | | | |

* Where the disclosure of the total amount of certain special payments will reveal information relating to the remuneration of specific employees, the Reporting Bank may omit the disclosure. Nonetheless, the Reporting Bank should provide the reason for the omission in the narrative commentary and disclose the omitted information to the Authority to assist the Authority in its assessment of the Reporting Bank's remuneration practices.

[MAS Notice 637 (Amendment No. 3) 2017]

Table 11-44D: Explanatory Notes to Special Payments

| **Explanatory notes** | |
|---|---|
| (a) | Senior management and other material risk-takers categories in columns (a) and (b) must correspond to the type of employees described in Table 11-44. |
| (b) | Guaranteed bonuses are payments of guaranteed bonuses during the financial year. |
| (c) | Sign-on awards are payments allocated to employees upon recruitment during the financial year. |
| (d) | Severance payments are payments allocated to employees dismissed during the financial year. |

[MAS Notice 637 (Amendment No. 3) 2017]

Table 11-44E: Deferred Remuneration

| Purpose | Provide quantitative information on deferred and retained remuneration. |
|---|---|
| Scope of application | The template is mandatory for all Reporting Banks. |
| Content | Quantitative information |
| Frequency | Annual. If it is not possible to disclose the template together with the annual financial statements, it should be disclosed as soon as possible thereafter and no later than 4 months after the end of each financial year. |
| Format | Flexible |
| Accompanying narrative | Reporting Banks may wish to supplement the template with a narrative commentary to explain any significant movements over the reporting period and the key drivers of such movements. |

| | | (a) | (b) | (c) | (d) | (e) |
|---|---|---|---|---|---|---|
| | Deferred and retained remuneration | Total outstanding deferred remuneration | of which: total outstanding deferred and retained remuneration exposed to ex post explicit and/or implicit adjustments | Total amendments during the year due to ex post explicit adjustments | Total amendments during the year due to ex post implicit adjustments | Total deferred remuneration paid out in the financial year |
| 1 | Senior management | | | | | |
| 2 | Cash | | | | | |
| 3 | Shares | | | | | |
| 4 | Share-linked instruments | | | | | |
| 5 | Other | | | | | |
| 6 | Other material risk-takers | | | | | |
| 7 | Cash | | | | | |
| 8 | Shares | | | | | |
| 9 | Share-linked instruments | | | | | |
| 10 | Other | | | | | |

[MAS Notice 637 (Amendment No. 3) 2017]

Table 11-44F: Explanatory Notes to Deferred Remuneration

| Explanatory notes | |
|---|---|
| (a) | *Outstanding exposed to ex post explicit adjustment*: part of the deferred and retained remuneration that is subject to direct adjustment clauses.[806B] |
| (b) | *Outstanding exposed to ex post implicit adjustment*: part of the deferred and retained remuneration that is subject to adjustment clauses that could change the remuneration, due to the fact that they are linked to the performance of other indicators.[806C] |
| (c) | In columns (a) and (b), Reporting Banks must disclose the figures as at reporting date (cumulated over the last years). In columns (c)–(e), Reporting Banks must disclose the movements during the financial year. While columns (c) and (d) must show the movements specifically related to column (b), column (e) must show payments that have affected column (a). |

[MAS Notice 637 (Amendment No. 3) 2017]

[806B] For example, subject to malus, clawbacks or similar reversal or downward revaluations of awards.
[MAS Notice 637 (Amendment No. 3) 2017]

[806C] For example, fluctuation in the value of shares performance or performance units.
[MAS Notice 637 (Amendment No. 3) 2017]

**Sub-division 11: Composition of Capital**

11.3.18 To enable users to compare the capital adequacy of banks across jurisdictions, a Reporting Bank shall disclose the information set out in this Sub-division in its published financial statements, or provide a URL in its published financial statements to such disclosure which is made on its website or publicly available regulatory reports. Regardless of the location of the disclosure, all disclosures shall be in the format set out in this Sub-division.

[MAS Notice 637 (Amendment No. 3) 2017]

11.3.19 A Reporting Bank shall disclose all items set out in Table 11-45 on a quarterly basis.

[MAS Notice 637 (Amendment No. 3) 2017]

Table 11-45: Key Capital Figures

| | | |
|---|---|---|
| Quantitative Disclosures | (a) | Total RWA and minimum capital requirements at the Group level. These shall be based on the floor-adjusted total RWA which incorporates the floor adjustment on total RWA set out in Table 11-3A(m). |
| | (b) | CET1 Capital, Tier 1 Capital, Eligible Total Capital, CET1 CAR, Tier 1 CAR and Total CAR at the Group level. The CAR figures shall be based on the floor-adjusted total RWA which incorporates the floor adjustment on total RWA set out in Table 11-3A(m). |
| | (c) | Total RWA, CET1 CAR, Tier 1 CAR and Total CAR for each significant[807] banking subsidiary[808]. In the case of a significant local subsidiary, the required disclosures shall be based on the floor-adjusted total RWA which incorporates the floor adjustment on total RWA set out in Table 11-3A(m). In the case of a significant overseas subsidiary, the required disclosures shall incorporate any Pillar 1 floor adjustments in accordance with the capital adequacy rules that are applied to the subsidiary in the overseas jurisdiction. |

[MAS Notice 637 (Amendment No. 3) 2017]

807 A significant banking subsidiary may be determined in several ways, for example, in terms of revenue contribution to the banking group.

808 A Reporting Bank shall provide disclosures in relation to a significant subsidiary on a Solo basis, but may choose to disclose such information on a sub-consolidated basis providing that capital adequacy requirements are imposed on this basis and that an explanatory note to this effect is provided by the Reporting Bank. In the case of a significant overseas subsidiary, the required disclosures may be made on the basis of the capital adequacy rules that are applied to the subsidiary in the overseas jurisdiction, provided that this is disclosed in an explanatory note that includes a description of the basis of the calculation and the approaches applied to each major risk type in the overseas jurisdiction. Such disclosures are appropriate in order to recognise the limitations of transfer of funds or capital within the Group.

Composition of capital template

[MAS Notice 637 (Amendment No. 3) 2017]

11.3.20 To improve consistency and ease of use of disclosures relating to the composition of regulatory capital, and to mitigate the risk of inconsistent formats undermining the objective of enhanced disclosure, a Reporting Bank shall provide a breakdown of its regulatory capital and regulatory adjustments in the format as set out in the template in Annex 11B of this Part with effect from 1 January 2018. This template shall be used to capture the capital position of the Reporting Bank from 1 January 2018 onwards, and after the end of the transition period for the phasing-in of regulatory adjustments set out in paragraphs 6.1.3, 6.2.3 and 6.3.3.

11.3.21 To prevent a divergence of templates that could undermine the objectives of consistency and comparability, a Reporting Bank shall not add, delete or change the definitions of any rows from the template set out in Annex 11B of this Part.

11.3.22 In cases where a more conservative definition of an element is required under this Notice relative to those set out under the Basel III capital standards, a Reporting Bank shall clearly label them as being different from the Basel III definition, and separately disclose the impact of each of these differences in the notes to the template.

Reconciliation requirements[809]

11.3.23 A Reporting Bank shall, for the purpose of the reconciliation, publish its financial statements in accordance with the Accounting Standards, as at each reporting date for which the Reporting Bank provides its reconciliation disclosures, on its website. To show a full reconciliation between the balance sheet in its published financial statements and the regulatory capital elements reported using the template in Annex 11B, a Reporting Bank shall perform the three following steps using the template in Annex 11C of this Part –

(a) Step 1: Disclose the reported balance sheet under the regulatory scope of consolidation:

(i) The difference in scope of consolidation for accounting purposes and for regulatory purposes often explains much of the difference between the numbers used in the calculation of regulatory capital and the numbers used in a Reporting Bank's published financial statements. As such, a key element of the reconciliation requirements involves disclosing how the balance sheet in its published financial statements changes when the regulatory scope of consolidation is applied.

[MAS Notice 637 (Amendment No. 3) 2017]

809 Prior to 1 January 2018 (i.e. during the transitional period), the reconciliation requirements shall apply to the modified template used set out in Annex 11E (instead of the post-1 January 2018 template) of this Part.

(ii) In addition to sub-paragraph (i) above, the Reporting Bank shall disclose the list of legal entities that are included within its accounting scope of consolidation but excluded from its regulatory scope of consolidation, and vice versa[810]. For entities that are included in both the regulatory and accounting scopes of consolidation, but the method of consolidation differs between these two scopes, the Reporting Bank shall list these legal entities separately and explain the differences in the consolidation methods. For each legal entity that is required to be disclosed by this sub-paragraph, the Reporting Bank shall disclose the entity's total balance sheet assets, total balance sheet equity (as stated on the accounting balance sheet of the legal entity) and a description of the principal activities of the entity.

(iii) Where its regulatory scope of consolidation is identical to its accounting scope of consolidation, the Reporting Bank shall state that there is no difference between the regulatory and accounting scopes of consolidation and proceed to Step 2 below.

(b) Step 2: Expand the lines of the balance sheet under the regulatory scope of consolidation to identify all components of regulatory capital reported using the template set out in Annex 11B[811].

(i) As many elements used in the calculation of regulatory capital cannot be readily identified from the face of the balance sheet, a Reporting Bank should expand the rows of the regulatory-scope balance sheet such that all components of regulatory capital reported using the template set out in Annex 11B are disclosed separately.

(ii) In addition, each element of the expanded balance sheet shall be given a reference number or letter for the purposes of Step 3 below.

[MAS Notice 637 (Amendment No. 3) 2017]

(c) Step 3: Map each element disclosed under Step 2 to the composition of capital disclosure template set out in Annex 11B.

(i) The Reporting Bank shall use the reference numbers or letters from Step 2 to show the source of every input to each component of regulatory capital reported using the template set out in Annex 11B.

[MAS Notice 637 (Amendment No. 3) 2017]

[810] This refers to legal entities that are included in the regulatory scope of consolidation, but excluded from the accounting scope of consolidation.

[811] A Reporting Bank would only need to expand the lines of the balance sheet to the extent necessary to reach the components of capital disclosed in the capital disclosure template set out in Annex 11B.

11.3.24 The three-step approach described above offers the following benefits:

(a) the level of disclosure is proportionate, varying with the complexity of the balance sheet and capital structure of the Reporting Bank. Where no further information is added by a step, the Reporting Bank can skip the step;

(b) users can trace the origin of the elements of the regulatory capital back to their exact location on a Reporting Bank's balance sheet under the regulatory scope of consolidation; and

(c) the approach is flexible enough to be used under any accounting standard. A Reporting Bank is required to map all regulatory capital components reported in the disclosure template back to its balance sheet under the regulatory scope of consolidation regardless of whether the accounting standards require the source to be reported on the balance sheet.

Main features template

11.3.25 To ensure that the main features of the regulatory capital instruments of a Reporting Bank are disclosed in a consistent and comparable way, the Reporting Bank shall complete, for each regulatory capital instrument issued, the main features template set out in Annex 11D of this Part.

11.3.26 This template represents the minimum level of summary disclosure that a Reporting Bank is required to report in respect of each regulatory capital instrument issued. In this regard, the Reporting Bank shall -

(a) disclose within the template, information relating to its capital instruments that are subject to the transitional arrangements;

(b) report each regulatory capital instrument issued, including ordinary shares, in a separate column of the template, such that the completed template provides a 'main features report' that summarises all of the regulatory capital instruments of the Reporting Bank's banking group;

(c) disclose the list of features set out in Annex 11D and any other features of its regulatory capital instruments that it deems to be important;

(d) keep the main features report up to date, such that the disclosure is updated and made publicly available whenever the Reporting Bank issues or repays a capital instrument and whenever there is a redemption, conversion/write-down or other material change in the nature of an existing capital instrument; and

(e) ensure that the main features report is included in the Reporting Bank's published financial statements or, at a minimum, that these financial

statements provide a URL to where the main features report can be found on the Reporting Bank’s website or publicly available regulatory reports.

Other disclosure requirements

11.3.27 A Reporting Bank which discloses non-regulatory ratios[812] involving components of regulatory capital, shall accompany such disclosures with a comprehensive explanation of how these ratios are calculated.

11.3.28 A Reporting Bank shall make available on its website, the full terms and conditions of all capital instruments included in its regulatory capital. This will allow users to investigate the specific features of individual capital instruments. Such disclosures shall be updated whenever the Reporting Bank issues or repays a capital instrument and whenever there is a redemption, conversion/write-down or other material change in the nature of an existing capital instrument.

11.3.29 A Reporting Bank shall also maintain a section on its website, where all the information relating to disclosure of regulatory capital is made available to users (“regulatory disclosures section”). In cases where the disclosure requirements set out in this Sub-division are met via publication through publicly available regulatory reports, the regulatory disclosures section of the Reporting Bank’s website should provide URLs to the relevant regulatory reports that relate to the Reporting Bank.

11.3.30 A Reporting Bank is encouraged to include the information disclosed in the regulatory disclosures section of the website in its published financial statements. At a minimum, the Reporting Bank shall ensure that the published financial statements direct users to the relevant section of its website, where the full set of required regulatory disclosure is provided.

Template during the transitional period

11.3.31 During the transitional period, a Reporting Bank shall disclose the specific components of capital, including capital instruments and regulatory adjustments that are benefitting from the transitional provisions. To ensure that disclosure during the transitional period is consistent and comparable across banks in different jurisdictions, the Reporting Bank shall use the modified version of the template set out in Annex 11B, and this modified version, as well as an illustration of how the template will work in practice, is set out in Annex 11E of this Part.

[812] For example, “Equity Tier 1”, “Core Tier 1” or “Tangible Common Equity” ratios.

**Sub-division 12: Leverage Ratio**

11.3.32 [Deleted by MAS Notice 637 (Amendment No. 3) 2017]

11.3.33 A Reporting Bank shall disclose the information set out in this Sub-division in its published financial statements, or provide a URL in its published financial statements to such disclosure which is made on its website or publicly available regulatory reports.

11.3.34 Regardless of the location of the disclosure, a Reporting Bank shall make all disclosures in the format set out in this Sub-division. To prevent a divergence of formats that could undermine the objectives of consistency and comparability, the Reporting Bank shall not add, delete or change the definitions of any rows from the templates set out in this Sub-division.

11.3.35 [Deleted by MAS Notice 637 (Amendment No. 3) 2017]

Summary comparison table

11.3.36 A Reporting Bank shall, for the purpose of the reconciliation, publish its financial statements in accordance with the Accounting Standards, as at each reporting date for which the Reporting Bank provides its reconciliation disclosures, on its website. A Reporting Bank shall disclose a reconciliation of its balance sheet assets in its published financial statements with the leverage ratio exposure measure in the format as set out in Annex 11F.

[MAS Notice 637 (Amendment No. 3) 2017]

Common disclosure template

11.3.37 A Reporting Bank shall disclose a breakdown of the main leverage ratio regulatory elements in the format as set out in Annex 11G.

[MAS Notice 637 (Amendment No. 3) 2017]

11.3.38 [Deleted by MAS Notice 637 (Amendment No. 3) 2017]

11.3.39 [Deleted by MAS Notice 637 (Amendment No. 3) 2017]

**Sub-division 13: Macroprudential Supervisory Measures**

[MAS Notice 637 (Amendment No. 3) 2017 (Insertion of this Sub-division)]

11.3.40 A Reporting Bank shall disclose all items set out in Table 11-46.

Table 11-46: Geographical Distribution of Credit Exposures Used in the Countercyclical Capital Buffer

| | |
|---|---|
| Purpose | To provide an overview of the geographical distribution of private sector credit exposures relevant for the calculation of the countercyclical buffer. |
| Scope of application | The template is mandatory for all Reporting Banks subject to a countercyclical buffer requirement based on the jurisdictions in which they have private sector credit exposures subject to a countercyclical buffer requirement compliant with the Basel standards. Only banks with exposures to jurisdictions in which the countercyclical buffer rate is higher than zero must disclose this template set out in Table 11-46. |
| Content | Private sector credit exposures and other relevant inputs necessary for the computation of the bank-specific countercyclical buffer requirement. |
| Frequency | Semi-annual |
| Format | Flexible |
| Accompanying narrative | For the purposes of the countercyclical buffer, Reporting Banks should use, where possible, exposures on an "ultimate risk" basis. They should disclose the methodology of geographical allocation used, and explain the jurisdictions or types of exposures for which the ultimate risk method is not used as a basis for allocation. The allocation of exposures to jurisdictions should be made taking into consideration the *Frequently asked questions on the Basel III countercyclical capital buffer, October 2015*[812A] and any other clarifications provided by BCBS. Information about the drivers for changes in the exposure amounts and the applicable jurisdiction-specific rates must be summarised. |

| | (a) | (b) | (c) | (d) |
|---|---|---|---|---|
| Geographical breakdown | Country-specific countercyclical buffer requirement | RWA for private sector credit exposures used in the computation of the countercyclical buffer | Bank-specific countercyclical buffer requirement | Countercyclical buffer amount |
| (Home) Country 1 | | | | |
| Country 2 | | | | |
| Country 3 | | | | |
| … | | | | |

[812A] www.bis.org/bcbs/publ/d339.pdf

[MAS Notice 637 (Amendment No. 3) 2017]

| Country N | | | | |
|---|---|---|---|---|
| Sum | | | | |
| Total | | | | |

Table 11-47: Explanatory Notes to Geographical Distribution of Credit Exposures Used in the Countercyclical Capital Buffer

| **Definitions** | |
|---|---|
| (a) | *RWA for private sector credit exposures*: This is in accordance with paragraph 4.1.16(b). |
| (b) | *Country*: Country in which the Reporting Bank has relevant private sector credit exposures, and which has set a countercyclical capital buffer rate greater than zero that was applicable during the reporting period covered by the template set out in Table 11-46. |
| (c) | *Sum*: Sum of RWA for private sector credit exposures, in jurisdictions with a non-zero countercyclical buffer rate. |
| (d) | *Country-specific Countercyclical buffer requirement*: This is the requirement that is applicable at the reporting date, calculated in accordance with paragraph 4.1.16(a). |
| (e) | *Bank-specific countercyclical buffer requirement*: This is in accordance with paragraph 4.1.15. |
| (f) | *Total*: Total of RWA for private sector credit exposures, across all jurisdictions to which the bank is exposed, including jurisdictions with no countercyclical buffer rate or with a countercyclical buffer rate set at zero, and value of the bank specific countercyclical capital buffer rate and resulting countercyclical buffer amount. |
| (g) | *Countercyclical capital buffer amount*: amount of CET1 Capital held to meet the countercyclical capital buffer requirement determined in accordance with paragraphs 4.1.14 to 4.1.20. |
| **Linkages across tables** | |
| (h) | Amount in [Table 11-46:Total/d] is equal to [Table 11-1A:9/a] for the semi-annual disclosure of Table 11-1A, and to [Table 11-1A:9/b] in the quarterly disclosure of Table 11-1A. |
| (i) | Amount in [Table 11-46:Total/d] is equal to [11B-2:66/a]. |

**Annex 11A**

[Deleted by MAS Notice 637 (Amendment No. 3) 2017]

[813] [Deleted by MAS Notice 637 (Amendment No. 3) 2017]

**Annex 11B**

**COMPOSITION OF CAPITAL**

[MAS Notice 637 (Amendment No. 3) 2017]

A Reporting Bank shall disclose its capital position using the template set out in Table 11B-1 after the transition period for the phasing-in of regulatory adjustments set out in paragraphs 6.1.3, 6.2.3 and 6.3.3 ends on 1 January 2018.[814] A Reporting Bank shall exclude the rows in italics from the disclosure template after all ineligible capital instruments have been fully phased out in accordance with paragraph 6.5.3 of the Notice.

[MAS Notice 637 (Amendment No. 3) 2017]

A Reporting Bank is required to complete column (b) to show the source of every major input, which is to be cross-referenced to the corresponding rows in Table 11C. This is Step 3 as required under the three-step approach to reconciliation as explained and illustrated in paragraph 11.3.23(c) and Annex 11C. Table 11B-2 sets out the explanation of each row of Table 11B-1.

[MAS Notice 637 (Amendment No. 3) 2017]

Table 11B-1: Composition of Regulatory Capital

| Purpose | To provide a breakdown of the constituent elements of a Reporting Bank's capital. |
|---|---|
| Scope of application | The table is mandatory for all Reporting Banks at the consolidated level. |
| Content | Breakdown of regulatory capital according to the scope of regulatory consolidation. |
| Frequency | Semi-annually |
| Format | Fixed |
| Accompanying narrative | A Reporting Bank shall explain any significant changes over the semi-annual reporting period and the key drivers of such changes. |

| | | (a) | (b) |
|---|---|---|---|
| | | Amount | Source based on reference numbers/letters of the balance sheet under the regulatory scope of consolidation |
| **Common Equity Tier 1 capital: instruments and reserves** | | | |

[814] A Reporting Bank shall report deductions from capital as positive numbers, and additions to capital as negative numbers.

| | | | |
|---|---|---|---|
| 1 | Paid-up ordinary shares and share premium (if applicable) | | (g) |
| 2 | Retained earnings | | |
| 3# | Accumulated other comprehensive income and other disclosed reserves | | |
| 4 | *Directly issued capital subject to phase out from CET1 (only applicable to non-joint stock companies)* | | |
| 5 | Minority interest that meets criteria for inclusion | | |
| 6 | **Common Equity Tier 1 capital before regulatory adjustments** | | |
| **Common Equity Tier 1 capital: regulatory adjustments** | | | |
| 7 | Valuation adjustment pursuant to Part VIII of MAS Notice 637 | | |
| 8 | Goodwill, net of associated deferred tax liability | | (a) minus (d) |
| 9# | Intangible assets, net of associated deferred tax liability | | (b) minus (e) |
| 10# | Deferred tax assets that rely on future profitability | | |
| 11 | Cash flow hedge reserve | | |
| 12 | Shortfall of TEP relative to EL under IRBA | | |
| 13 | Increase in equity capital resulting from securitisation transactions | | |
| 14 | Unrealised fair value gains/losses on financial liabilities and derivative liabilities arising from changes in own credit risk | | |
| 15 | Defined benefit pension fund assets, net of associated deferred tax liability | | |
| 16 | Investments in own shares | | |
| 17 | Reciprocal cross-holdings in ordinary shares of financial institutions | | |
| 18 | Investments in ordinary shares of unconsolidated financial institutions in which the Reporting Bank does not hold a major stake | | |
| 19 | Investments in ordinary shares of unconsolidated financial institutions in which the Reporting Bank holds a major stake (including insurance | | |

| | | | |
|---|---|---|---|
| | subsidiaries) (amount above 10% threshold) | | |
| 20# | Mortgage servicing rights (amount above 10% threshold) | | (c) minus (f) minus 10% threshold |
| 21# | Deferred tax assets arising from temporary differences (amount above 10% threshold, net of associated deferred tax liability) | | |
| 22 | Amount exceeding the 15% threshold | | |
| 23 | of which: investments in ordinary shares of unconsolidated financial institutions in which the Reporting Bank holds a major stake (including insurance subsidiaries) | | |
| 24# | of which: mortgage servicing rights | | |
| 25# | of which: deferred tax assets arising from temporary differences | | |
| 26 | National specific regulatory adjustments | | |
| 26A | PE/VC investments held beyond the relevant holding periods set out in MAS Notice 630 | | |
| 26B | Capital deficits in subsidiaries and associates that are regulated financial institutions | | |
| 26C | Any other items which the Authority may specify | | |
| 27 | Regulatory adjustments applied in calculation of CET1 Capital due to insufficient AT1 Capital to satisfy required deductions | | |
| 28 | **Total regulatory adjustments to CET1 Capital** | | |
| 29 | **Common Equity Tier 1 capital (CET1)** | | |
| **Additional Tier 1 capital: instruments** | | | |
| 30 | AT1 capital instruments and share premium (if applicable) | | (h) |
| 31 | of which: classified as equity under the Accounting Standards | | |
| 32 | of which: classified as liabilities under the Accounting Standards | | |
| 33 | *Transitional: Ineligible capital instruments (pursuant to paragraphs 6.5.3 and 6.5.4)* | | |

| 34 | AT1 capital instruments issued by fully-consolidated subsidiaries that meet criteria for inclusion | | |
|---|---|---|---|
| 35 | *of which: instruments issued by subsidiaries subject to phase out* | | |
| 36 | **Additional Tier 1 capital before regulatory adjustments** | | |
| **Additional Tier 1 capital: regulatory adjustments** | | | |
| 37 | Investments in own AT1 capital instruments | | |
| 38 | Reciprocal cross-holdings in AT1 capital instruments of financial institutions | | |
| 39 | Investments in AT1 capital instruments of unconsolidated financial institutions in which the Reporting Bank does not hold a major stake | | |
| 40 | Investments in AT1 capital instruments of unconsolidated financial institutions in which the Reporting Bank holds a major stake (including insurance subsidiaries) | | |
| 41 | National specific regulatory adjustments which the Authority may specify | | |
| 42 | Regulatory adjustments applied in calculation of AT1 Capital due to insufficient Tier 2 Capital to satisfy required deductions | | |
| 43 | **Total regulatory adjustments to Additional Tier 1 capital** | | |
| 44 | **Additional Tier 1 capital (AT1)** | | |
| 45 | **Tier 1 capital (T1 = CET1 + AT1)** | | |
| **Tier 2 capital: instruments and provisions** | | | |
| 46 | Tier 2 capital instruments and share premium (if applicable) | | |
| 47 | *Transitional: Ineligible capital instruments (pursuant to paragraphs 6.5.3 and 6.5.4)* | | |
| 48 | Tier 2 capital instruments issued by fully-consolidated subsidiaries that meet criteria for inclusion | | |
| 49 | *of which: instruments issued by subsidiaries subject to phase out* | | |
| 50 | Provisions | | |

| | | | |
|---|---|---|---|
| 51 | **Tier 2 capital before regulatory adjustments** | | |
| **Tier 2 capital: regulatory adjustments** | | | |
| 52 | Investments in own Tier 2 instruments | | |
| 53 | Reciprocal cross-holdings in Tier 2 capital instruments of financial institutions | | |
| 54 | Investments in Tier 2 capital instruments of unconsolidated financial institutions in which the Reporting Bank does not hold a major stake | | |
| 55 | Investments in Tier 2 capital instruments of unconsolidated financial institutions in which the Reporting Bank holds a major stake (including insurance subsidiaries) | | |
| 56 | National specific regulatory adjustments which the Authority may specify | | |
| 57 | **Total regulatory adjustments to Tier 2 capital** | | |
| 58 | **Tier 2 capital (T2)** | | |
| 59 | **Total capital (TC = T1 + T2)** | | |
| 60 | **Floor-adjusted total risk weighted assets** | | |
| **Capital ratios (as a percentage of floor-adjusted risk weighted assets)** | | | |
| 61 | **Common Equity Tier 1 CAR** | | |
| 62 | **Tier 1 CAR** | | |
| 63 | **Total CAR** | | |
| 64 | Bank-specific buffer requirement | | |
| 65 | of which: capital conservation buffer requirement | | |
| 66 | of which: bank specific countercyclical buffer requirement | | |
| 67 | of which: G-SIB and/or D-SIB buffer requirement (if applicable) | | |
| 68 | Common Equity Tier 1 available after meeting the Reporting Bank's minimum capital requirements | | |
| **National minima** | | | |
| 69 | Minimum CET1 CAR | | |
| 70 | Minimum Tier 1 CAR | | |
| 71 | Minimum Total CAR | | |
| **Amounts below the thresholds for deduction (before risk weighting)** | | | |

| | | | |
|---|---|---|---|
| 72 | Investments in ordinary shares, AT1 capital and Tier 2 capital of unconsolidated financial institutions in which the Reporting Bank does not hold a major stake | | |
| 73 | Investments in ordinary shares of unconsolidated financial institutions in which the Reporting Bank holds a major stake (including insurance subsidiaries) | | |
| 74 | Mortgage servicing rights (net of associated deferred tax liability) | | |
| 75 | Deferred tax assets arising from temporary differences (net of associated deferred tax liability) | | |
| **Applicable caps on the inclusion of provisions in Tier 2** | | | |
| 76 | Provisions eligible for inclusion in Tier 2 in respect of exposures subject to standardised approach (prior to application of cap) | | |
| 77 | Cap on inclusion of provisions in Tier 2 under standardised approach | | |
| 78 | Provisions eligible for inclusion in Tier 2 in respect of exposures subject to internal ratings-based approach (prior to application of cap) | | |
| 79 | Cap for inclusion of provisions in Tier 2 under internal ratings-based approach | | |
| ***Capital instruments subject to phase-out arrangements (only applicable between 1 Jan 2013 and 1 Jan 2022)*** | | | |
| 80 | *Current cap on CET1 instruments subject to phase out arrangements* | | |
| 81 | *Amount excluded from CET1 due to cap (excess over cap after redemptions and maturities)* | | |
| 82 | *Current cap on AT1 instruments subject to phase out arrangements* | | |
| 83 | *Amount excluded from AT1 due to cap (excess over cap after redemptions and maturities)* | | |
| 84 | *Current cap on T2 instruments subject to phase out arrangements* | | |
| 85 | *Amount excluded from T2 due to cap (excess over cap after redemptions and maturities)* | | |

Items marked with a hash [#] are elements where a more conservative definition has been applied relative to those set out under the Basel III capital standards.

[MAS Notice 637 (Amendment No. 3) 2017]

Table 11B-2: Explanatory Notes to Composition of Regulatory Capital

| **Explanatory Notes** | |
|---|---|
| 1 | This is the sum of components calculated in accordance with paragraph 6.1.1(a) and 6.1.1(b) of the Notice. |
| 2 | This is as defined under paragraph 6.1.1(c) of the Notice. |
| 3 | This is the sum of components calculated in accordance with paragraph 6.1.1(d) and 6.1.1(e) of the Notice. |
| 4 | This is only applicable to non-joint stock companies. |
| 5 | This is as defined under paragraph 6.1.1(f) of the Notice. |
| 6 | This is the sum of rows 1 to 5. |
| 7 | This is as defined under paragraph 6.1.3(n) of the Notice. |
| 8 | This is as defined under paragraph 6.1.3(a) of the Notice. |
| 9 | This is as defined under paragraph 6.1.3(b) of the Notice. |
| 10 | This is as defined under paragraph 6.1.3(c) of the Notice. |
| 11 | This is as defined under paragraph 6.1.3(d) of the Notice. |
| 12 | This is as defined under paragraph 6.1.3(e) of the Notice. |
| 13 | This is as defined under paragraph 6.1.3(f) of the Notice. |
| 14 | This is as defined under paragraph 6.1.3(g) of the Notice. |
| 15 | This is as defined under paragraph 6.1.3(h) of the Notice. |
| 16 | This is as defined under paragraph 6.1.3(i) of the Notice. |
| 17 | This is as defined under paragraph 6.1.3(j) of the Notice. |
| 18 | This is as defined under paragraph 6.1.3(o) of the Notice. |
| 19 | This is as defined under paragraph 6.1.3(p) of the Notice. |
| 20 | Not applicable. This is the amount of mortgage servicing rights which is subject to threshold deduction in accordance with paragraphs 87 to 88 of Basel III. Mortgage servicing rights are required to be fully deducted. |
| 21 | Not applicable. This is the amount of deferred tax assets arising from temporary differences which is subject to threshold deduction in accordance with paragraphs 87 to 88 of Basel III. Deferred tax assets arising from temporary differences are required to be fully deducted. |
| 22 | This is the total amount by which the three threshold items exceed the 15% threshold, excluding amounts reported in rows 19 to 21, calculated in accordance with paragraph 6.1.3(p)(i)(B) of the Notice. |
| 23 | The amount reported in row 22 that relates to investments in the ordinary shares of unconsolidated financial institutions in which the Reporting Bank holds a major stake (including insurance subsidiaries at the Solo and Group levels). |
| 24 | Not applicable. This is the amount reported in row 22 that relates to mortgage servicing rights. Mortgage servicing rights are required to be fully deducted. |
| 25 | Not applicable. This is the amount reported in row 22 that relates to deferred tax assets arising from temporary differences. Deferred tax assets arising from temporary differences are required to be fully deducted. |

| Explanatory Notes | |
|---|---|
| 26 | This is the sum of rows 26A to 26C. |
| 26A | This is as defined under paragraph 6.1.3(l) of the Notice. |
| 26B | This is as defined under paragraph 6.1.3(m) of the Notice. |
| 26C | This is as defined under paragraph 6.1.3(q) of the Notice. |
| 27 | This is as defined under paragraph 6.1.3(r) of the Notice. |
| 28 | This is the total regulatory adjustments to CET1 Capital, to be calculated as the sum of rows 7 to 22 plus rows 26 and 27. |
| 29 | This is CET1 Capital, to be calculated as row 6 minus row 28. |
| 30 | This is the sum of components calculated in accordance with paragraphs 6.2.1(a) and 6.2.1(b) of the Notice. |
| 31 | The amount in row 30 classified as equity under the Accounting Standards. |
| 32 | The amount in row 30 classified as liabilities under the Accounting Standards. |
| 33 | This is the sum of capital instruments directly issued by the Reporting Bank that no longer qualify as AT1 Capital calculated in accordance with paragraphs 6.5.3 and 6.5.4 of the Notice. |
| 34 | This is as defined under paragraph 6.2.1(c) of the Notice. |
| 35 | The amount reported in row 34 that relates to instruments subject to phase out from AT1 Capital in accordance with the requirements of paragraphs 6.5.3 and 6.5.4 of the Notice. |
| 36 | This is the sum of rows 30, 33 and 34. |
| 37 | This is as defined under paragraph 6.2.3(a) of the Notice. |
| 38 | This is as defined under paragraph 6.2.3(b) of the Notice. |
| 39 | This is as defined under paragraph 6.2.3(d) of the Notice. |
| 40 | This is as defined under paragraph 6.2.3(e) of the Notice. |
| 41 | This is as defined under paragraph 6.2.3(f) of the Notice. |
| 42 | This is as defined under paragraph 6.2.3(g) of the Notice. |
| 43 | This is the sum of rows 37 to 42. |
| 44 | This is Additional Tier 1 Capital, to be calculated as row 36 minus row 43. |
| 45 | This is Tier 1 Capital, to be calculated as row 29 plus row 44. |
| 46 | This is the sum of components calculated in accordance with paragraph 6.3.1(a) and 6.3.1(b) of the Notice. |
| 47 | This is the sum of capital instruments directly issued by the Reporting Bank that no longer qualify as Tier 2 Capital calculated under paragraph 6.5.3 and 6.5.4 of the Notice. |
| 48 | This is as defined under paragraph 6.3.1(c) of the Notice. |
| 49 | The amount reported in row 48 that relates to instruments subject to phase out from Tier 2 Capital in accordance with the requirements of paragraphs 6.5.3 and 6.5.4 of the Notice. |
| 50 | This is the sum of components calculated in accordance with paragraphs 6.3.1(d) and 6.3.1(e) of the Notice. |
| 51 | This is the sum of rows 46 to 48 and row 50. |
| 52 | This is as defined under paragraph 6.3.3(a) of the Notice. |
| 53 | This is as defined under paragraph 6.3.3(b) of the Notice. |
| 54 | This is as defined under paragraph 6.3.3(d) of the Notice. |
| 55 | This is as defined under paragraph 6.3.3(e) of the Notice. |

| Explanatory Notes | |
|---|---|
| 56 | This is as defined under paragraph 6.3.3(f) of the Notice. |
| 57 | This is the sum of rows 52 to 56. |
| 58 | This is Tier 2 Capital, to be calculated as row 51 minus row 57. |
| 59 | This is Total capital, to be calculated as row 45 plus row 58. |
| 60 | This is the floor-adjusted total risk weighted assets of the Reporting Bank, after incorporating the floor adjustment set out in Table 11-3A(m). |
| 61 | This is CET1 CAR, to be calculated as row 29 divided by row 60 (expressed as a percentage). |
| 62 | This is Tier 1 CAR, to be calculated as row 45 divided by row 60 (expressed as a percentage). |
| 63 | This is Total CAR, to be calculated as row 59 divided by row 60 (expressed as a percentage). |
| 64 | This is the bank-specific buffer requirement (minimum CET1 requirement plus capital conservation buffer requirement plus countercyclical buffer requirement plus G-SIB and/or D-SIB buffer requirement, expressed as a percentage of risk weighted assets). This is to be calculated as the sum of (i) the minimum CET1 requirement calculated in accordance with paragraph 4.1.4; (ii) the capital conservation buffer requirement calculated in accordance with paragraphs 4.1.5 to 4.1.13; (iii) the bank-specific countercyclical buffer requirement calculated in accordance with paragraphs 4.1.14 to 4.1.25; and (iv) the buffer requirement for G-SIBs and/or D-SIBs (if applicable)[815]. This row will show the CET1 CAR below which the Reporting Bank will become subject to constraints on distributions. |
| 65 | The amount in row 64 (expressed as a percentage of risk weighted assets) that relates to the capital conservation buffer). |
| 66 | The amount in row 64 (expressed as a percentage of risk weighted assets) that relates to the bank-specific countercyclical buffer requirement. |
| 67 | The amount in row 64 (expressed as a percentage of risk weighted assets) that relates to the Reporting Bank’s G-SIB and/or D-SIB requirement, where relevant. |
| 68 | This is to be calculated as the CET1 of the Reporting Bank (as a percentage of floor-adjusted risk weighted assets), less any CET1 capital used to meet the Reporting Bank’s CET1, Tier 1 and Total capital requirements. |
| 69 | A Reporting Bank shall report the minimum CET1 CAR requirement applicable at that reporting date [pursuant to paragraph 4.1.4 of the Notice.] |
| 70 | A Reporting Bank shall report the minimum Tier 1 CAR requirement applicable at that reporting date [pursuant to paragraph 4.1.4 of the Notice.] |
| 71 | A Reporting Bank shall report the minimum Total CAR requirement applicable at that reporting date [pursuant to paragraph 4.1.4 of the Notice.] |
| 72 | This is the Reporting Bank's investments in the ordinary shares, AT1 Capital and Tier 2 Capital of unconsolidated financial institutions in which the Reporting Bank does not hold a major stake, the total amount of such holdings that are not reported in row 18, row 39 and row 54. |
| 73 | This is the Reporting Bank's investments in the ordinary shares of unconsolidated financial institutions in which the Reporting Bank holds a major stake (including |

[815] This is set out in the BCBS’ publication on “Global systemically important banks: updated assessment methodology and the higher loss absorbency requirement” (revised July 2013).

| Explanatory Notes | |
|---|---|
| | insurance subsidiaries at the Solo and Group levels), the total amount of such holdings that are not reported in row 19 and row 23. |
| 74 | Not applicable. This is the amount of mortgage servicing rights not reported in row 20 and row 24. |
| 75 | Not applicable. This is the amount of deferred tax assets arising from temporary differences not reported in row 21 and row 25. |
| 76 | This is the provisions eligible for inclusion in Tier 2 Capital in respect of exposures subject to SA(CR), calculated in accordance paragraph 6.3.1(d) of the Notice, prior to the application of the cap. |
| 77 | This is the cap on inclusion of provisions in Tier 2 Capital in respect of exposures subject to SA(CR), calculated in accordance paragraph 6.3.1(d) of the Notice. |
| 78 | This is the provisions eligible for inclusion in Tier 2 Capital in respect of exposures subject to IRBA, calculated in accordance paragraph 6.3.1(e) of the Notice, prior to the application of the cap. |
| 79 | This is the cap for inclusion of provisions in Tier 2 Capital in respect of exposures subject to IRBA, calculated in accordance paragraph 6.3.1(e) of the Notice. |
| 80 | This is only applicable to non-joint stock companies. This is the current cap on CET1 capital instruments subject to transitional arrangements. |
| 81 | This is only applicable to non-joint stock companies. This is the amount excluded from CET1 Capital due to cap (excess over cap after redemptions and maturities). |
| 82 | This is the cap on ineligible AT1 capital instruments subject to transitional arrangements, see paragraph 6.5.3 of the Notice. |
| 83 | This is the amount excluded from AT1 Capital due to cap (excess over cap after redemptions and maturities), see paragraph 6.5.3 of the Notice. |
| 84 | This is the current cap on ineligible Tier 2 capital instruments subject to transitional arrangements, see paragraph 6.5.3 of the Notice. |
| 85 | This is the amount excluded from Tier 2 Capital due to cap (excess over cap after redemptions and maturities), see paragraph 6.5.3 of the Notice. |

[MAS Notice 637 (Amendment No. 3) 2017]

**Annex 11C**

## RECONCILIATION OF REGULATORY CAPITAL TO BALANCE SHEET

[MAS Notice 637 (Amendment No. 3) 2017 (Replacement of this Annex in its entirety)]

Table 11C-1: Reconciliation of Regulatory Capital to Balance Sheet

| | |
|---|---|
| Purpose | To enable users to identify the differences between the scope of accounting consolidation and the scope of regulatory consolidation, and to show the link between a Reporting Bank's balance sheet in its published financial statements and the numbers that are used in the composition of capital disclosure template set out in Table 11B-1. |
| Scope of application | The table is mandatory for all Reporting Banks. |
| Content | Carrying values (corresponding to the values reported in financial statements. |
| Frequency | Semi-annually[816] |
| Format | Flexible (but the rows must align with the presentation of the Reporting Bank's financial report). |
| Accompanying narrative | A Reporting Bank shall explain any significant changes in the expanded balance sheet items over the semi-annual reporting period and the key drivers of such changes. A Reporting Bank may explain significant changes in other balance sheet items in the narrative commentary of Table 11-6. |

| | **(a)** | **(b)** | **(c)** |
|---|---|---|---|
| | **Balance sheet as per published financial statements** | **Under regulatory scope of consolidation** | **Reference** |
| | **As at reporting period end** | **As at reporting period end** | |
| **Assets** | | | |
| Cash and balances at central banks | | | |
| Items in the course of collection from other banks | | | |
| Trading portfolio assets | | | |
| Financial assets designated at fair value | | | |
| Derivative financial instruments | | | |
| Loans and advances to banks | | | |
| Loans and advances to customers | | | |

816 With the prior approval of the Authority, the required disclosures from a Reporting Bank may be made with at least the same frequency as the publication of the Reporting Bank's financial statements.
[MAS Notice 637 (Amendment No. 3) 2017]

| | | | |
|---|---|---|---|
| Reverse repos and other similar secured lending | | | |
| Fair value through other comprehensive income financial investments | | | |
| Current and deferred tax assets | | | |
| Prepayments, accrued income and other assets | | | |
| Investments in associates and joint ventures | | | |
| Goodwill and intangible assets | | | |
| of which: goodwill | | | (a) |
| of which: other intangibles (excluding MSRs) | | | (b) |
| #of which: MSRs | | | (c) |
| Property, plant and equipment | | | |
| **Total assets** | | | |
| **Liabilities** | | | |
| Deposits from banks | | | |
| Items in the course of collection due to other banks | | | |
| Customer accounts | | | |
| Repos and other similar secured borrowing | | | |
| Trading portfolio liabilities | | | |
| Financial liabilities designated at fair value | | | |
| Derivative financial instruments | | | |
| Debt securities in issue | | | |
| Accruals, deferred income and other liabilities | | | |
| Current and deferred tax liabilities | | | |
| of which: DTLs related to goodwill | | | (d) |
| of which: DTLs related to intangible assets (excluding MSRs) | | | (e) |
| #of which: DTLs related to MSRs | | | (f) |
| Subordinated liabilities | | | |
| Provisions | | | |
| Retirement benefit liabilities | | | |
| **Total liabilities** | | | |
| **Shareholders' Equity** | | | |
| Paid-in share capital | | | |
| of which: amount eligible for CET1 | | | (g) |
| of which: amount eligible for AT1 | | | (h) |
| Retained earnings | | | |

| Accumulated other comprehensive income | | | |
|---|---|---|---|
| **Total shareholders' equity** | | | |

Items marked with a hash [#] are elements where a more conservative definition has been applied relative to those set out under the Basel III capital standards

A Reporting Bank shall take its published financial statements (numbers reported in column (a) above) and report the numbers when the regulatory scope of consolidation is applied (numbers reported in column (b) above). This is referred to as Step 1 under the three-step approach to reconciliation, as explained and illustrated in paragraph 11.3.23(a).

If there are rows in the balance sheet under the regulatory scope of consolidation that are not present in the published financial statements, a Reporting Bank is required to add these and give a value of zero in column (a).

If a Reporting Bank's scope of accounting consolidation and its scope of regulatory consolidation are exactly the same, columns (a) and (b) must be merged and this fact must be clearly disclosed in the accompanying narrative.

As in the case of Table 11-4, the rows in the above template set out in Table 11C must follow the balance sheet presentation used by the Reporting Bank in its financial statements, on which basis the Reporting Bank is required to expand the balance sheet to identify all the items that are disclosed in Table 11B-1 (referred to as Step 2 under the three-step approach to reconciliation, as explained and illustrated in paragraph 11.3.23(b)).[817,818] A Reporting Bank must make disclosure which is proportionate to the complexity of the Reporting Bank's balance sheet. A Reporting Bank must give each item a reference number/letter in column (c) that is used as cross-reference to column (b) of Table 11B-1.

Linkages across templates

(a) The amounts in columns (a) and (b) in Table 11C-1 before balance sheet expansion (ie before Step 2) must be identical to columns (a) and (b) in Table 11-4; and

[817] For example, paid-in share capital may be reported as one line on the balance sheet. However, some elements of this may meet the requirements for inclusion in CET1 and other elements may only meet the requirements for AT1 or Tier 2, or may not meet the requirements for inclusion in regulatory capital at all. Therefore, if the Reporting Bank has some paid-in capital that feeds into the calculation of CET1 and some that feeds into the calculation of AT1, it must expand the "paid-in capital" line of the balance sheet in the manner illustrated in Table 11C-1. As another example, one of the regulatory adjustments is the deduction of goodwill net of any associated deferred tax liability that would be extinguished if the goodwill becomes impaired or derecognised under the Accounting Standards. The Reporting Bank shall expand elements of the balance sheet in the manner illustrated in Table 11C-1 to separately identify the components of goodwill and the associated deferred tax liability.

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[818] Items (a) to (h) in Table 11C-1 are examples of items that may need to be expanded for a particular banking group.

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(b) Each expanded item must be cross-referenced to the corresponding items in Table 11B-1.

**Annex 11D**

## MAIN FEATURES OF REGULATORY CAPITAL INSTRUMENTS

A Reporting Bank is required to complete Table 11D-1 for each outstanding regulatory capital instrument (Reporting Banks must insert "NA" if the question is not applicable).

A Reporting Bank is required to report each instrument, including common shares, in a separate column of Table 11D-1, such that the completed Table 11D-1 will provide a "main features report" that summarises all of the regulatory capital instruments of the banking group.

Using the reference numbers in the left-hand column of Table 11D-1, Table 11D-2 provides a more detailed explanation of what a Reporting Bank is required to report in each of the cells. Table 11D-2 sets out the explanation of each row of Table 11D-1.

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Table 11D-1: Main Features of Regulatory Capital Instruments

| | |
|---|---|
| Purpose | To provide a description of the main features of a Reporting Bank's regulatory capital instruments that are recognised as part of its capital base under Part VI of this Notice. |
| Scope of application | The table is mandatory for all Reporting Banks. |
| Content | Quantitative and qualitative information as required. |
| Frequency | Table 11D-1 must be posted on a Reporting Bank's website. It must be updated whenever a Reporting Bank issues or repays a capital instrument, and whenever there is a redemption, conversion/writedown or other material change in the nature of an existing instrument. A Reporting Bank must, at a minimum, update Table 11D-1 semi-annually. A Reporting Bank shall include the web link in each Pillar 3 report to the issuances made over the previous period. |
| Format | Flexible |
| Accompanying narrative | A Reporting Bank is required to make available on its website the full terms and conditions of all instruments included in regulatory capital. |

| | | |
|---|---|---|
| 1 | Issuer | |
| 2 | Unique identifier (eg CUSIP, ISIN or Bloomberg identifier for private placement) | |
| 3 | Governing law(s) of the instrument | |
| 4 | Transitional Basel III rules | |
| 5 | Post-transitional Basel III rules | |
| 6 | Eligible at solo/group/group&solo | |

| 7 | Instrument type (types to be specified by each jurisdiction) | |
|---|---|---|
| 8 | Amount recognised in regulatory capital (Currency in millions, as of most recent reporting date) | |
| 9 | Par value of instrument | |
| 10 | Accounting classification | |
| 11 | Original date of issuance | |
| 12 | Perpetual or dated | |
| 13 | Original maturity date | |
| 14 | Issuer call subject to prior supervisory approval | |
| 15 | Optional call date, contingent call dates and redemption amount | |
| 16 | Subsequent call dates, if applicable | |
| | Coupons / dividends | |
| 17 | Fixed or floating dividend/coupon | |
| 18 | Coupon rate and any related index | |
| 19 | Existence of a dividend stopper | |
| 20 | Fully discretionary, partially discretionary or mandatory | |
| 21 | Existence of step up or other incentive to redeem | |
| 22 | Noncumulative or cumulative | |
| 23 | Convertible or non-convertible | |
| 24 | If convertible, conversion trigger (s) | |
| 25 | If convertible, fully or partially | |
| 26 | If convertible, conversion rate | |
| 27 | If convertible, mandatory or optional conversion | |
| 28 | If convertible, specify instrument type convertible into | |
| 29 | If convertible, specify issuer of instrument it converts into | |
| 30 | Write-down feature | |
| 31 | If write-down, write-down trigger(s) | |
| 32 | If write-down, full or partial | |
| 33 | If write-down, permanent or temporary | |
| 34 | If temporary write-down, description of write-up mechanism | |
| 35 | Position in subordination hierarchy in liquidation (specify instrument type immediately senior to instrument in the insolvency creditor hierarchy of the legal entity concerned) | |
| 36 | Non-compliant transitioned features | |
| 37 | If yes, specify non-compliant features | |

[MAS Notice 637 (Amendment No. 3) 2017]

Table 11D-2: Explanatory Notes to Main Features of Regulatory Capital Instruments

| **Explanatory Notes** | |
|---|---|
| 1 | Identifies issuer legal entity.<br>*Free text* |
| 2 | Unique identifier (e.g. CUSIP, ISIN or Bloomberg identifier for private placement)<br>*Free text* |

| | |
|---|---|
| 3 | Specifies the governing law(s) of the instrument<br>*Free text* |
| 4 | Specifies the regulatory capital treatment during the Basel III transitional Basel III phase (i.e. the component of capital that the instrument is being phased-out from).<br>*Select from menu: [Common Equity Tier 1] [Additional Tier 1] [Tier 2]* |
| 5 | Specifies regulatory capital treatment under Basel III rules not taking into account transitional treatment.<br>*Select from menu: [Common Equity Tier 1] [Additional Tier 1] [Tier 2] [Ineligible]* |
| 6 | Specifies the level(s) within the group at which the instrument is included in capital.<br>*Select from menu: [Solo] [Group] [Solo and Group]* |
| 7 | Specifies instrument type, varying by jurisdiction. Helps provide more granular understanding of features, particularly during transition.<br>*Select from menu: menu options to be provided to banks by each jurisdiction* |
| 8 | Specifies amount recognised in regulatory capital.<br>*Free text* |
| 9 | Par value of instrument<br>*Free text* |
| 10 | Specifies accounting classification. Helps to assess loss absorbency.<br>*Select from menu: [Shareholders' equity] [Liability – amortised cost] [Liability – fair value option] [Non-controlling interest in consolidated subsidiary]* |
| 11 | Specifies date of issuance.<br>*Free text* |
| 12 | Specifies whether dated or perpetual.<br>*Select from menu: [Perpetual] [Dated]* |
| 13 | For dated instrument, specifies original maturity date (day, month and year). For perpetual instrument put "no maturity".<br>*Free text* |
| 14 | Specifies whether there is an issuer call option.<br>*Select from menu: [Yes] [No]* |
| 15 | For instrument with issuer call option, specifies (i) first date of call if the instrument has a call option on a specific date (day, month and year); (ii) if the instrument has a tax and/or regulatory event call; and (iii) the redemption price.<br>*Free text* |
| 16 | Specifies the existence and frequency of subsequent call dates, if applicable.<br>*Free text* |
| 17 | Specifies whether the coupon/dividend is fixed over the life of the instrument, floating over the life of the instrument, currently fixed but will move to a floating rate in the future, currently floating but will move to a fixed rate in the future.<br>*Select from menu: [Fixed], [Floating] [Fixed to floating], [Floating to fixed]* |
| 18 | Specifies the coupon rate of the instrument and any related index that the coupon/dividend rate references.<br>*Free text* |

| | |
|---|---|
| 19 | Specifies whether the non payment of a coupon or dividend on the instrument prohibits the payment of dividends on common shares (ie whether there is a dividend stopper).<br>*Select from menu: [yes], [no]* |
| 20 | Specifies whether the issuer has full discretion, partial discretion or no discretion over whether a coupon/dividend is paid. If the bank has full discretion to cancel coupon/dividend payments under all circumstances it must select "fully discretionary" (including when there is a dividend stopper that does not have the effect of preventing the bank from cancelling payments on the instrument). If there are conditions that must be met before payment can be cancelled (e.g. capital below a certain threshold), the bank must select "partially discretionary". If the bank is unable to cancel the payment outside of insolvency the bank must select "mandatory".<br>*Select from menu: [Fully discretionary] [Partially discretionary] [Mandatory]* |
| 21 | Specifies whether there is a step-up or other incentive to redeem.<br>*Select from menu: [Yes] [No]* |
| 22 | Specifies whether dividends / coupons are cumulative or noncumulative.<br>*Select from menu: [Noncumulative] [Cumulative]* |
| 23 | Specifies whether instrument is convertible or not.<br>*Select from menu: [Convertible] [Nonconvertible]* |
| 24 | Specifies the conditions under which the instrument will convert, including point of non-viability. Where one or more authorities have the ability to trigger conversion, the authorities should be listed. For each of the authorities it should be stated whether the legal basis for the authority to trigger conversion is provided by the terms of the contract of the instrument (a contractual approach) or statutory means (a statutory approach).<br>*Free text* |
| 25 | For conversion trigger separately, specifies whether the instrument will: (i) always convert fully; (ii) may convert fully or partially; or (iii) will always convert partially<br>*Free text referencing one of the options above* |
| 26 | Specifies rate of conversion into the more loss absorbent instrument.<br>*Free text* |
| 27 | For convertible instruments, specifies whether conversion is mandatory or optional.<br>*Select from menu: [Mandatory] [Optional] [NA]* |
| 28 | For convertible instruments, specifies instrument type convertible into.<br>*Select from menu: [Common Equity Tier 1] [Additional Tier 1] [Tier 2] [Other]* |
| 29 | If convertible, specify issuer of instrument into which it converts.<br>*Free text* |
| 30 | Specifies whether there is a write down feature.<br>*Select from menu: [Yes] [No]* |
| 31 | Specifies the trigger at which write-down occurs, including point of non-viability. Where one or more authorities have the ability to trigger write-down, the authorities should be listed. For each of the authorities it should be stated whether the legal basis for the authority to trigger write-down is provided by the |

| | |
|---|---|
| | terms of the contract of the instrument (a contractual approach) or statutory means (a statutory approach).<br>*Free text* |
| 32 | For each write-down trigger separately, specifies whether the instrument will: (i) always be written down fully: (ii) may be written down partially; or (iii) will always be written down partially.<br>*Free text referencing one of the options above* |
| 33 | For write down instrument, specifies whether write down is permanent or temporary.<br>*Select from menu: [Permanent] [Temporary] [NA]* |
| 34 | For instrument that has a temporary write-down, description of write-up mechanism.<br>*Free text* |
| 35 | Specifies instrument to which it is most immediately subordinate. Where applicable, banks should specify the column numbers of the instruments in the completed Table 11D-1 to which the instrument is most immediately subordinate. In the case of structural subordination, "NA" should be entered.<br>*Free text* |
| 36 | Specifies whether there are non-compliant features.<br>*Select from menu: [Yes] [No]* |
| 37 | If there are non-compliant features, asks bank/institution to specify which ones.<br>*Free text* |

[MAS Notice 637 (Amendment No. 3) 2017]

**Annex 11E**

## DISCLOSURE TEMPLATE DURING THE TRANSITION PERIOD

A Reporting Bank shall disclose its capital position using the template set out in Table 11E during the transition period for the phasing-in of regulatory adjustments set out in paragraphs 6.1.3, 6.2.3 and 6.3.3. The Reporting Bank shall report the amount of each regulatory adjustment that is subject to the treatment provided for in the cancelled MAS Notice 637 dated 14 December 2007 under the column "Amount subject to Pre-Basel III Treatment". The Reporting Bank shall also report such amounts as regulatory adjustments in rows 41C and 56C, as the case may be. For example, Reporting Banks are required to make 20% of the regulatory adjustments set out in paragraphs 6.1.3, 6.2.3 and 6.3.3 in 2014. Where a Reporting Bank has to report "Goodwill, net of associated deferred tax liability" of $100 million, the Reporting Bank shall report $20 million under the column "Amount" and report $80 million under the column "Amount subject to Pre-Basel III Treatment" in row 8. The Reporting Bank shall also report $80 million in row 41C.

Table 11E: Disclosure Template to be used during the transition period

| | | Amount | Amount subject to Pre-Basel III Treatment |
|---|---|---|---|
| | **Common Equity Tier 1 capital: instruments and reserves** | | |
| 1 | Paid-up ordinary shares and share premium (if applicable) | | |
| 2 | Retained earnings | | |
| 3# | Accumulated other comprehensive income and other disclosed reserves | | |
| 4 | Directly issued capital subject to phase out from CET1 (only applicable to non-joint stock companies) | | |
| 5 | Minority interest that meets criteria for inclusion | | |
| 6 | **Common Equity Tier 1 capital before regulatory adjustments** | | |
| | **Common Equity Tier 1 capital: regulatory adjustments** | | |
| 7 | Valuation adjustment pursuant to Part VIII of MAS Notice 637 | | |
| 8 | Goodwill, net of associated deferred tax liability | $20 million | $80 million |
| 9# | Intangible assets, net of associated deferred tax liability | | |
| 10# | Deferred tax assets that rely on future profitability | | |
| 11 | Cash flow hedge reserve | | |
| 12 | Shortfall of TEP relative to EL under IRBA | | |
| 13 | Increase in equity capital resulting from securitisation transactions | | |

| 14 | Unrealised fair value gains/losses on financial liabilities and derivative liabilities arising from changes in own credit risk | | |
|---|---|---|---|
| 15 | Defined benefit pension fund assets, net of associated deferred tax liability | | |
| 16 | Investments in own shares | | |
| 17 | Reciprocal cross-holdings in ordinary shares of financial institutions | | |
| 18 | Investments in ordinary shares of unconsolidated financial institutions in which the Reporting Bank does not hold a major stake | | |
| 19 | Investments in ordinary shares of unconsolidated financial institutions in which the Reporting Bank holds a major stake (including insurance subsidiaries) (amount above 10% threshold) | | |
| 20# | Mortgage servicing rights (amount above 10% threshold) | | |
| 21# | Deferred tax assets arising from temporary differences (amount above 10% threshold, net of related tax liability) | | |
| 22 | Amount exceeding the 15% threshold | | |
| 23 | of which: investments in ordinary shares of unconsolidated financial institutions in which the Reporting Bank holds a major stake (including insurance subsidiaries) | | |
| 24# | of which: mortgage servicing rights | | |
| 25# | of which: deferred tax assets arising from temporary differences | | |
| 26 | National specific regulatory adjustments | | |
| 26A | PE/VC investments held beyond the relevant holding periods set out in MAS Notice 630 | | |
| 26B | Capital deficits in subsidiaries and associates that are regulated financial institutions | | |
| 26C | Any other items which the Authority may specify | | |
| 27 | Regulatory adjustments applied in calculation of CET1 Capital due to insufficient AT1 Capital to satisfy required deductions | | |
| 28 | **Total regulatory adjustments to CET1 Capital** | | |
| 29 | **Common Equity Tier 1 capital (CET1)** | | |
| | **Additional Tier 1 capital: instruments** | | |
| 30 | AT1 capital instruments and share premium (if applicable) | | |
| 31 | of which: classified as equity under the Accounting Standards | | |
| 32 | of which: classified as liabilities under the Accounting Standards | | |

| | | | |
|---|---|---|---|
| 33 | Transitional: Ineligible capital instruments (pursuant to paragraphs 6.5.3 and 6.5.4) | | |
| 34 | AT1 capital instruments issued by fully-consolidated subsidiaries that meet criteria for inclusion | | |
| 35 | of which: instruments issued by subsidiaries subject to phase out | | |
| 36 | **Additional Tier 1 capital before regulatory adjustments** | | |
| | **Additional Tier 1 capital: regulatory adjustments** | | |
| 37 | Investments in own AT1 capital instruments | | |
| 38 | Reciprocal cross-holdings in AT1 capital instruments of financial institutions | | |
| 39 | Investments in AT1 capital instruments of unconsolidated financial institutions in which the Reporting Bank does not hold a major stake | | |
| 40 | Investments in AT1 capital instruments of unconsolidated financial institutions in which the Reporting Bank holds a major stake (including insurance subsidiaries) | | |
| 41 | National specific regulatory adjustments | | |
| 41A | Regulatory adjustments applied to AT1 Capital in respect of amounts subject to pre-Basel III treatment | | |
| | of which: Goodwill, net of associated deferred tax liability | $80 million | |
| | of which: Intangible assets, net of associated deferred tax liability | | |
| | of which: Deferred tax assets that rely on future profitability | | |
| | of which: Cash flow hedge reserve | | |
| | of which: Increase in equity capital resulting from securitisation transactions | | |
| | of which: Unrealised fair value gains/losses on financial liabilities and derivative liabilities arising from changes in own credit risk | | |
| | of which: Shortfall of TEP relative to EL under IRBA | | |
| | of which: PE/VC investments held beyond the relevant holding periods set out in MAS Notice 630 | | |
| | of which: Capital deficits in subsidiaries and associates that are regulated financial institutions | | |
| | of which: Investments in ordinary shares of unconsolidated financial institutions in which the Reporting Bank holds a major stake (incl insurance subsidiaries) | | |
| | of which: Investments in Tier 2 capital instruments of unconsolidated financial institutions in which the Reporting Bank holds a major stake (incl insurance subsidiaries) | | |

| | | | |
|---|---|---|---|
| 41B | Any other items which the Authority may specify | | |
| 42 | Regulatory adjustments applied in calculation of AT1 Capital due to insufficient Tier 2 Capital to satisfy required deductions | | |
| 43 | **Total regulatory adjustments to Additional Tier 1 capital** | | |
| 44 | **Additional Tier 1 capital (AT1)** | | |
| 45 | **Tier 1 capital (T1 = CET1 + AT1)** | | |
| | **Tier 2 capital: instruments and provisions** | | |
| 46 | Tier 2 capital instruments and share premium (if applicable) | | |
| 47 | Transitional: Ineligible capital instruments (pursuant to paragraphs 6.5.3 and 6.5.4) | | |
| 48 | Tier 2 capital instruments issued by fully-consolidated subsidiaries that meet criteria for inclusion | | |
| 49 | of which: instruments issued by subsidiaries subject to phase out | | |
| 50 | Provisions | | |
| 51 | **Tier 2 capital before regulatory adjustments** | | |
| | **Tier 2 capital: regulatory adjustments** | | |
| 52 | Investments in own Tier 2 instruments | | |
| 53 | Reciprocal cross-holdings in Tier 2 capital instruments of financial institutions | | |
| 54 | Investments in Tier 2 capital instruments of unconsolidated financial institutions in which the Reporting Bank does not hold a major stake | | |
| 55 | Investments in Tier 2 capital instruments of unconsolidated financial institutions in which the Reporting Bank holds a major stake (including insurance subsidiaries) | | |
| 56 | National specific regulatory adjustments | | |
| 56A | Any other items which the Authority may specify | | |
| 56B | Regulatory adjustments applied to Tier 2 Capital in respect of amounts subject to pre-Basel III treatment | | |
| | of which: Shortfall of TEP relative to EL under IRBA | | |
| | of which: PE/VC investments held beyond the relevant holding periods set out in MAS Notice 630 | | |
| | of which: Capital deficits in subsidiaries and associates that are regulated financial institutions | | |
| | of which: Investments in ordinary shares of unconsolidated financial institutions in which the Reporting Bank holds a major stake (incl insurance subsidiaries) | | |
| | of which: Investments in AT1 capital instruments of unconsolidated financial institutions in which the | | |

| | | | |
|---|---|---|---|
| | Reporting Bank holds a major stake (incl insurance subsidiaries) | | |
| 57 | **Total regulatory adjustments to Tier 2 capital** | | |
| 58 | **Tier 2 capital (T2)** | | |
| 59 | **Total capital (TC = T1 + T2)** | | |
| 60 | **Floor–adjusted total risk weighted assets (after incorporating the floor adjustment set out in Table 11-3A(m))** | | |
| | **Capital ratios (as a percentage of floor-adjusted risk weighted assets)** | | |
| 61 | **Common Equity Tier 1 CAR** | | |
| 62 | **Tier 1 CAR** | | |
| 63 | **Total CAR** | | |
| 64 | Bank-specific buffer requirement | | |
| 65 | of which: capital conservation buffer requirement | | |
| 66 | of which: bank specific countercyclical buffer requirement | | |
| 67 | of which: G-SIB buffer requirement (if applicable) | | |
| 68 | Common Equity Tier 1 available to meet buffers | | |
| | **National minima** | | |
| 69 | Minimum CET1 CAR | | |
| 70 | Minimum Tier 1 CAR | | |
| 71 | Minimum Total CAR | | |
| | **Amounts below the thresholds for deduction (before risk weighting)** | | |
| 72 | Investments in ordinary shares, AT1 capital and Tier 2 capital of unconsolidated financial institutions in which the Reporting Bank does not hold a major stake | | |
| 73 | Investments in ordinary shares of unconsolidated financial institutions in which the Reporting Bank holds a major stake (including insurance subsidiaries) | | |
| 74 | Mortgage servicing rights (net of related tax liability) | | |
| 75 | Deferred tax assets arising from temporary differences (net of related tax liability) | | |
| | **Applicable caps on the inclusion of provisions in Tier 2** | | |
| 76 | Provisions eligible for inclusion in Tier 2 in respect of exposures subject to standardised approach (prior to application of cap) | | |
| 77 | Cap on inclusion of provisions in Tier 2 under standardised approach | | |
| 78 | Provisions eligible for inclusion in Tier 2 in respect of exposures subject to internal ratings-based approach (prior to application of cap) | | |
| 79 | Cap for inclusion of provisions in Tier 2 under internal ratings-based approach | | |

| | **Capital instruments subject to phase-out arrangements (only applicable between 1 Jan 2013 and 1 Jan 2022)** | | |
|---|---|---|---|
| 80 | Current cap on CET1 instruments subject to phase out arrangements | | |
| 81 | Amount excluded from CET1 due to cap (excess over cap after redemptions and maturities) | | |
| 82 | Current cap on AT1 instruments subject to phase out arrangements | | |
| 83 | Amount excluded from AT1 due to cap (excess over cap after redemptions and maturities) | | |
| 84 | Current cap on T2 instruments subject to phase out arrangements | | |
| 85 | Amount excluded from T2 due to cap (excess over cap after redemptions and maturities) | | |

Items marked with a hash [#] are elements where a more conservative definition has been applied relative to those set out under the Basel III capital standards.

**Annex 11F**

## LEVERAGE RATIO SUMMARY COMPARISON TABLE

Table 11F-1: Leverage Ratio Summary Comparison Table

| | |
|---|---|
| Purpose | To reconcile the total assets in the published financial statements to the leverage ratio exposure measure. |
| Scope of application | The table is mandatory for all Reporting Banks. |
| Content | Quantitative information. The Leverage Ratio follows the same scope of regulatory consolidation as used for the risk-based capital framework. Disclosures must be reported on a quarter-end basis. However, Reporting Banks may, with prior approval of the Authority, use more frequent calculations[819] as long as they do so consistently. |
| Frequency | Quarterly[820] |
| Format | Fixed |
| Accompanying narrative | Reporting Banks are required to disclose and detail the source of material differences between their total balance sheet assets (net of on-balance sheet derivative and SFT assets) as reported in their financial statements and their on-balance sheet exposures as set out in row 1 of Table 11G-1. Reporting Banks are required to include the basis for their disclosures.[820A] |

| | **Item** | **Amount** |
|---|---|---|
| 1 | Total consolidated assets as per published financial statements | |
| 2 | Adjustment for investments in entities that are consolidated for accounting purposes but are outside the regulatory scope of consolidation | |
| 3 | Adjustment for fiduciary assets recognised on the balance sheet in accordance with the Accounting Standards but excluded from the calculation of the exposure measure | |
| 4 | Adjustment for derivative transactions | |
| 5 | Adjustment for SFTs | |
| 6 | Adjustment for off-balance sheet items | |
| 7 | Other adjustments | |
| **8** | **Exposure measure** | |

[MAS Notice 637 (Amendment No. 3) 2017]

819 For example, daily or monthly averaging.

[MAS Notice 637 (Amendment No. 3) 2017]

820 With the prior approval of the Authority, the required disclosures from a Reporting Bank may be made with at least the same frequency as the publication of the Reporting Bank's financial statements.

[MAS Notice 637 (Amendment No. 3) 2017]

820A For example, quarter-end averaging, daily averaging or monthly averaging.

[MAS Notice 637 (Amendment No. 3) 2017]

Table 11F-2: Explanatory Notes to Leverage Ratio Summary Comparison Table

| **Explanatory Notes** | |
|---|---|
| 1 | This is the total consolidated assets of a Reporting Bank as per its published financial statements. |
| 2 | This is the adjustment for investments in entities that are consolidated for accounting purposes, but outside the regulatory scope of consolidation in accordance with paragraphs 1.2 and 1.3 of Annex 4A. |
| 3 | This relates to paragraph 2.5 of Annex 4A. |
| 4 | This is the adjustment for the difference between the calculation of derivative transactions in accordance with the Accounting Standards, and the calculation of derivative transactions in accordance with paragraphs 2.7 to 2.17 of Annex 4A ("derivative exposure measures"). |
| 5 | This is the adjustment for the difference between the calculation of SFTs in accordance with the Accounting Standards, and the calculation of SFTs in accordance with paragraphs 2.18 to 2.24 of Annex 4A ("SFT exposure measures"). |
| 6 | This is the exposure measures of off-balance sheet items in accordance with paragraph 2.25 of Annex 4A ("exposure measures of off-balance sheet items"). |
| 7 | This is the sum of any other adjustments. |
| 8 | This is the sum of rows 1 to 7. This should be consistent with row 21 of Table 11G-1 of Annex 11G. |

**Annex 11G**

## LEVERAGE RATIO COMMON DISCLOSURE TEMPLATE

Table 11G-1: Leverage Ratio Common Disclosure Template

| | |
|---|---|
| Purpose | Provide a detailed breakdown of the components of the leverage ratio denominator. |
| Scope of application | The table is mandatory for all Reporting Banks. |
| Content | Quantitative information. The disclosures must be made on a quarter-end basis. However, Reporting Banks may, with prior approval of the Authority, use more frequent calculations[820B], as long as they do so consistently. |
| Frequency | Quarterly |
| Format | Fixed |
| Accompanying narrative | Reporting Banks must describe the key factors that have had a material impact on the leverage ratio at the end of the reporting period compared to the end of the previous reporting period. Reporting Banks are required to include the basis for their disclosures.[820C] |

| | **Item** | **Amount** | |
|---|---|---|---|
| | | **Current Quarter** | **Previous Quarter** |
| | **Exposure measures of on-balance sheet items** | | |
| 1 | On-balance sheet items (excluding derivative transactions and SFTs, but including on-balance sheet collateral for derivative transactions or SFTs) | | |
| 2 | Asset amounts deducted in determining Tier 1 capital | | |
| 3 | **Total exposure measures of on-balance sheet items** (excluding derivative transactions and SFTs) | | |
| | **Derivative exposure measures** | | |
| 4 | Replacement cost associated with all derivative transactions (net of the eligible cash portion of variation margins) | | |
| 5 | Potential future exposure associated with all derivative transactions | | |
| 6 | Gross-up for derivative collaterals provided where deducted from the balance sheet assets in accordance with the Accounting Standards | | |

[820B] For example, daily or monthly averaging.

[MAS Notice 637 (Amendment No. 3) 2017]

[820C] For example, quarter-end averaging, daily averaging or monthly averaging.

[MAS Notice 637 (Amendment No. 3) 2017]

| | | | |
|---|---|---|---|
| 7 | Deductions of receivables for the cash portion of variation margins provided in derivative transactions | | |
| 8 | CCP leg of trade exposures excluded | | |
| 9 | Adjusted effective notional amount of written credit derivatives | | |
| 10 | Further adjustments in effective notional amounts and deductions from potential future exposures of written credit derivatives | | |
| 11 | **Total derivative exposure measures** | | |
| | **SFT exposure measures** | | |
| 12 | Gross SFT assets (with no recognition of accounting netting), after adjusting for sales accounting | | |
| 13 | Eligible netting of cash payables and cash receivables | | |
| 14 | SFT counterparty exposures | | |
| 15 | SFT exposure measures where a Reporting Bank acts as an agent in the SFTs | | |
| 16 | **Total SFT exposure measures** | | |
| | **Exposure measures of off-balance sheet items** | | |
| 17 | Off-balance sheet items at notional amount | | |
| 18 | Adjustments for calculation of exposure measures of off-balance sheet items | | |
| 19 | **Total exposure measures of off-balance sheet items** | | |
| | **Capital and Total exposures** | | |
| 20 | **Tier 1 capital** | | |
| 21 | **Total exposures** | | |
| | **Leverage ratio** | | |
| 22 | **Leverage ratio** | | |

[MAS Notice 637 (Amendment No. 3) 2017]

Table 11G-2: Explanatory Notes to Leverage Ratio Common Disclosure Template

| Explanatory Notes | |
|---|---|
| 1 | This is the sum of on-balance sheet assets in the calculation of the Reporting Bank's exposure measure in respect of on-balance sheet items in accordance with paragraph 2.4 of Annex 4A. |
| 2 | This is the amount of deductions from capital measure in accordance with paragraphs 1.2 and 1.3 of Annex 4A and excluded from the total exposures. Deductions shall not include liability items in accordance with paragraph 2.6 of Annex 4A. The Reporting Bank shall report a negative amount here. |
| 3 | This is the sum of rows 1 and 2. |
| 4 | This is the replacement cost associated with all derivative transactions that are not covered by a qualifying bilateral netting agreement and the net replacement cost associated with all derivative transactions that are covered by a qualifying bilateral netting agreement in accordance with paragraphs 2.7(a) and 2.8(a) of Annex 4A respectively, including exposures resulting from transactions described in paragraph 2.14 of Annex 4A. The calculation shall be net of the cash portion of variation margins received in accordance with paragraph 2.12(a) of Annex 4A. |
| 5 | This is the amount for potential future exposure associated with all derivative transactions that are not covered by a qualifying bilateral netting agreement and the add-on, "$A_{Net}$", for the potential future exposure associated with all derivative transactions that are covered by a qualifying bilateral netting agreement in accordance with paragraphs 2.7(b) and 2.8(b) of Annex 4A respectively. |
| 6 | This is the grossed-up amount of collaterals where the collaterals provided by the Reporting Bank in relation to derivative transactions that have reduced the value of its balance sheet assets in accordance with paragraph 2.10 of Annex 4A. |
| 7 | This is as defined under paragraph 2.12(b) of Annex 4A. The Reporting Bank shall report a negative amount here. |
| 8 | This is the amount of CCP trade exposures associated with the CCP leg of derivative transactions which are excluded in accordance with paragraph 2.13 of Annex 4A. The Reporting Bank shall report a negative amount here. |
| 9 | This is the adjusted effective notional amounts (i.e. the effective notional amounts reduced by any negative change in fair value amounts) for written credit derivative transactions in accordance with paragraphs 2.15 and 2.16 of Annex 4A. |
| 10 | This is the sum of:<br>• adjustments to the effective notional amounts of written credit derivative transactions in accordance with paragraphs 2.16(a) and 2.16(b) of Annex 4A; and<br>• deductions from the amounts for potential future exposure of written credit derivative transactions in accordance with paragraph 2.17 of Annex 4A. The Reporting Bank shall report a negative amount here. |
| 11 | This is the sum of rows 4–10. |
| 12 | This is the gross SFT assets with no recognition of any accounting netting but adjusted for the treatment of the following items:<br>• novation with qualifying CCPs in accordance with paragraph 2.19 of Annex 4A; |

| | |
|---|---|
| | • securities received under a SFT where the Reporting Bank has recognised the securities as an asset on its balance sheet in accordance with paragraph 2.18(a)(i) of Annex 4A; and<br>• SFTs accounted for using sales accounting in accordance with paragraph 2.22 of Annex 4A. |
| 13 | This is as defined under paragraph 2.18(a)(ii) of Annex 4A. The Reporting Bank shall report a negative amount here. |
| 14 | This is as defined under paragraph 2.18(b) of Annex 4A. |
| 15 | This is the SFT exposure measures in accordance with paragraphs 2.23 and 2.24 of Annex 4A. |
| 16 | This is the sum of rows 12 to 15. |
| 17 | This is the total notional amount of off-balance sheet items, before any adjustment for CCFs in accordance with paragraph 2.25 of Annex 4A. |
| 18 | This is the adjustment to the notional amount of off-balance sheet items due to the application of CCFs in accordance with paragraph 2.25 of Annex 4A. |
| 19 | This is the sum of rows 17 and 18. |
| 20 | This is the capital measure in accordance with Annex 2A. |
| 21 | This is the sum of rows 3, 11, 16 and 19. |
| 22 | This is the leverage ratio, expressed as a percentage and calculated in accordance with paragraph 1.1 of Annex 4A. |

**PART XIA: PUBLIC DISCLOSURE AND SUBMISSION REQUIREMENTS FOR ASSESSING GLOBAL SYSTEMICALLY IMPORTANT BANKS (G-SIBs)**

**Division 1: Scope of Application**

11A.1.1 A Reporting Bank that is required to comply with this Part shall do so at the Group level, in accordance with paragraph 3.1.1(b) of Part II.

[MAS Notice 637 (Amendment) 2016]

11A.1.1A A Reporting Bank need not comply with the requirements in this Part if –

(a) its holding or ultimate holding company is incorporated outside Singapore;

(b) it is a subsidiary of another Reporting Bank, which is subject to the requirements in this Part; or

(c) it is a subsidiary of a financial holding company which is subject to requirements similar to that set out in this Part.

[MAS Notice 637 (Amendment) 2014]
[MAS Notice 637 (Amendment) 2016]

**Division 2: General Requirements**

11A.1.2 Where a Reporting Bank –

(a) has a leverage ratio exposure measure[819] exceeding EUR 200 billion[820] ; or

(b) has been designated by the BCBS as a global systemically important bank[821] in the preceding financial year,

the Reporting Bank shall disclose the indicators set out in Annex 11A-A of this Part[822], and submit to the Authority the full set of data required by the BCBS' data collection exercise[823] to assess the systemic importance of banks at a global level.

[MAS Notice 637 (Amendment) 2016]

11A.1.3 [Deleted by MAS (Amendment) Notice (2016)]

[819] For the purpose of paragraph 11A.1.2, a Reporting Bank shall refer to the definition of "leverage ratio exposure measure" as determined by the BCBS for assessing the systemic importance of G-SIBs.

[820] A Reporting Bank shall use the year-end exchange rate provided by the BCBS for revaluing the exposure measure for the bank's leverage ratio in terms of Euro. This year-end exchange rate can be found at: www.bis.org/bcbs/gsib/index.htm.

[821] The list of G-SIBs will be designated annually based on the BCBS' methodology for assessing the systemic importance of G-SIBs.

[822] A Reporting Bank shall refer to "Global systemically important banks: updated assessment methodology and the higher loss absorbency requirement" issued by the BCBS in July 2013, and any other relevant publications issued by the BCBS for an understanding of the twelve indicators used in the assessment methodology for global systemic importance.

[823] The data template and reporting instructions can be found at: www.bis.org/bcbs/gsib/index.htm.

11A.1.4 Notwithstanding paragraph 11A.1.2, the Authority may, by notice in writing to any Reporting Bank, require the Reporting Bank to –

(a) disclose the indicators in accordance with paragraph 11A.1.2; and

(b) submit the data to the Authority in accordance with paragraph 11A.1.2,

and the Reporting Bank shall comply with any such requirement imposed by the Authority.

[MAS Notice 637 (Amendment) 2016]

**Division 3: Location, Timing and Form of Disclosures**

11A.1.5 A Reporting Bank shall disclose the information required in this Part in either its published financial statements or, at a minimum, provide a direct link in its published financial statements to the complete disclosures on its website or on publicly available regulatory reports.

11A.1.6 A Reporting Bank shall disclose the indicators based on positions as at the end of each financial year[824]. A Reporting Bank shall make the required disclosure no later than the earlier of four months after the financial year-end and the end of the month of July immediately following the financial year-end.

11A.1.7 The Authority shall have the discretion to determine the form of the disclosures required in this Part, and may require a Reporting Bank to disclose the full breakdown of the indicators as set out in the template that banks use for the data collection exercise in paragraph 11A.1.2.

[MAS Notice 637 (Amendment) 2013]

[824] The Authority may allow a Reporting Bank whose financial year ends on a date other than 31 December to report indicator values based on their positions as at 31 December.

**Annex 11A-A**

## G-SIB ASSESSMENT DISCLOSURES

### Table 11A-A-1 – Indicators used for assessing systemic importance of G-SIBs

| Category | Individual indicator |
|---|---|
| Cross-jurisdictional activity | Cross-jurisdictional claims |
| | Cross-jurisdictional liabilities |
| Size | Total exposures as defined for use in the Basel III leverage ratio |
| Interconnectedness | Intra-financial system assets |
| | Intra-financial system liabilities |
| | Securities outstanding |
| Substitutability/financial institution infrastructure | Assets under custody |
| | Payments activity |
| | Underwritten transactions in debt and equity markets |
| Complexity | Notional amount of OTC derivatives |
| | Level 3 assets |
| | Trading and available-for-sale securities |

[MAS Notice 637 (Amendment) 2013]

## PART XII: REPORTING SCHEDULES

### Division 1: Introduction

12.1.1 A Reporting Bank shall submit to the Authority, information relating to its capital adequacy calculated according to the requirements and guidelines of this Notice in the format of the reporting schedules set out in Annexes 12A to 12E and such other reporting schedules as the Authority may specify. A summary of the reporting schedules in Annexes 12A to 12E is set out in the Table 12-1 below.

Table 12-1: Summary of Reporting Schedules in Annexes 12A to 12E

| Section | | Annex/Schedule |
|---|---|---|
| **1** | **Capital Adequacy Reporting Schedules** | **Annex 12A** |
| | Statement of CET1 CAR, Tier 1 CAR and Total CAR | Schedule 1A |
| | Capital Treatment of Allowances | Schedule 1B |
| | [MAS Notice 637 (Amendment No. 2) 2012] | |
| | Leverage Ratio | Schedule 1C |
| | [MAS Notice 637 (Amendment) 2014, with effect from 31 December 2015] | |
| | Countercyclical Buffer | Schedule 1D |
| | [MAS Notice 637 (Amendment No. 2) 2017] | |
| **2** | **Credit Risk Reporting Schedules** | **Annex 12B** |
| | Summary of Credit RWA | Schedule 2 |
| 2-1 | **SA(CR)** | Schedule 2-1A |
| 2-2 | **F-IRBA for Wholesale Asset Class** | |
| | Sovereign Asset Sub-Class | Schedule 2-2A |
| | Bank Asset Sub-Class | Schedule 2-2B |
| | Corporate Asset Sub-Class | Schedule 2-2C |
| | Corporate Small Business Asset Sub-Class | Schedule 2-2D |
| | SL Asset Sub-Class : IPRE | Schedule 2-2E |
| | SL Asset Sub-Class : PF/OF/CF | Schedule 2-2F |
| | HVCRE Asset Sub-Class | Schedule 2-2G |
| | Exposures Subject to Double Default Framework | Schedule 2-2H |
| 2-3 | **A-IRBA for Wholesale Asset Class** | |
| | Sovereign Asset Sub-Class | Schedule 2-3A |
| | Bank Asset Sub-Class | Schedule 2-3B |
| | Corporate Asset Sub-Class | Schedule 2-3C |
| | Corporate Small Business Asset Sub-Class | Schedule 2-3D |
| | SL Asset Sub-Class : IPRE | Schedule 2-3E |
| | SL Asset Sub-Class : PF / OF / CF | Schedule 2-3F |
| | HVCRE Asset Sub-Class | Schedule 2-3G |

| Section | | Annex/Schedule |
|---|---|---|
| | Exposures Subject to Double Default Framework | Schedule 2-3H |
| 2-4 | **Supervisory Slotting Criteria** | Schedule 2-4A |
| 2-5 | **IRBA for Retail Asset Class** | |
| | Residential Mortgage Asset Sub-Class | Schedule 2-5A |
| | QRRE Asset Sub-Class | Schedule 2-5B |
| | Other Retail Exposures Asset Sub-Class (Excluding Exposures to Small Business) | Schedule 2-5C |
| | Other Retail Small Business Exposures Asset Sub-Class | Schedule 2-5D |
| 2-6 | **Equity Exposures** | |
| | SA(EQ) | Schedule 2-6A |
| | IRBA(EQ) | Schedule 2-6B |
| 2-7 | **Securitisation Exposures** | |
| | Securitisation | Schedule 2-7 |
| | [MAS Notice 637 (Amendment No. 2) 2017] | |
| 2-8 | **Unsettled Transactions** | Schedule 2-8A |
| | [MAS Notice 637 (Amendment No. 2) 2014] | |
| **3** | **Market Risk Reporting Schedules** | **Annex 12C** |
| | Summary of Market RWA | Schedule 3 |
| 3-1 | **SA(MR)** | |
| | Interest Rate Risk | Schedule 3-1A |
| | Interest Rate Risk (General Market Risk) | Schedule 3-1B |
| | Equity Risk | Schedule 3-1C |
| | Foreign Exchange Risk | Schedule 3-1D |
| | Commodities Risk | Schedule 3-1E |
| | Options Position Risk | Schedule 3-1F |
| 3-2 | **IMA** | Schedule 3-2A |
| **4** | **Operational Risk Reporting Schedules** | **Annex 12D** |
| | Summary of Operational RWA | Schedule 4 |
| | BIA, SA(OR), ASA, AMA | Schedule 4-1A |
| | Operational Loss Details | Schedule 4-2A |
| **5** | **Other Reporting Schedules** | **Annex 12E** |
| | Off-Balance Sheet Exposures (Excluding Derivative Transactions and Securitisation Exposures) | Schedule 5A |
| | OTC Derivative Transactions and Credit Derivatives | Schedule 5B |
| | Inflows into and Outflows from Asset Sub-classes due to Credit Protection | Schedule 5C |
| | Credit Valuation Adjustments | Schedule 5D |
| | Eligible Financial Collateral and Eligible IRBA Collateral | Schedule 5E |

| Section | | Annex/Schedule |
|---|---|---|
| | Exposures to CCPs | Schedule 5F |
| | Interest Rate Risk in the Banking Book | Schedule 5G |
| | [MAS Notice 637 (Amendment No. 2) 2014]<br>[MAS Notice 637 (Amendment No. 2) 2018] | |

**Division 2: Scope and Frequency of Reporting**

12.2.1 A Reporting Bank shall submit to the Authority, the reporting schedules –

(a) at the Solo level; and

(b) at the Group level,

at the end of each quarter, no later than the 30th of the following month.

12.2.2 The Reporting Bank shall include with the reporting schedules a written confirmation from its chief financial officer, in the format set out in Annex 12F.

12.2.3 Where a Reporting Bank is aware of material misstatements in the reporting schedules subsequent to submitting these schedules to the Authority, the Reporting Bank shall resubmit to the Authority such schedules with the information corrected, as soon as practicable.

[MAS Notice 637 (Amendment) 2014]

**Division 3: Transitional Arrangements**

12.3.1 Schedules 2-1A, 2-2A to 2-2G, 2-3A to 2-3H, 5B and 5F shall not apply to a Reporting Bank for the period from 1 January 2017 to –

(a) the day set out in a notice in writing issued by the Authority informing all Reporting Banks to comply with Annex 7O and Annex 7AJ; or

(b) the day where the Reporting Bank has elected to comply with Annex 7O and Annex 7AJ,

whichever occurs first.

12.3.2 A Reporting Bank referred to in paragraph 12.3.1 shall continue to comply with Schedules 2-1A, 2-2A to 2-2G, 2-3A to 2-3H, 5B and 5F of MAS 637, in force immediately before 1 January 2017 during the period referred to in paragraph 12.3.1.

12.3.3 Notwithstanding paragraphs 12.3.1 and 12.3.2, a Reporting Bank may elect to comply with Annex 7O and Annex 7AJ at any time before the expiry of the period referred to in paragraph 12.3.1. When a Reporting Bank elects to comply with Annex 7O and Annex 7AJ, the Reporting Bank shall give the Authority notice in writing of the date from which the Reporting Bank elects to comply with the said Annexes (the "election date") no less than 30 days before the election date and in that event, paragraph 12.3.1 shall not apply to the Reporting Bank from the election date.

[MAS Notice 637 (Amendment) 2016]

**STATEMENT OF CET1 CAR, TIER 1 CAR AND TOTAL CAR**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:** Solo/Group
(indicate as appropriate)

| | | | **Amounts** | **Amounts subject to pre-Basel III treatment** |
|---|---|---|---|---|
| | | | **(In S$ million)** | |
| **Part A: CET1, AT1 and Tier 2 Capital** | | | | |
| **Common Equity Tier 1 capital: instruments and reserves** | | | | |
| 1 Paid-up ordinary shares and share premium (if applicable) | | | | |
| 2 Retained earnings | | | | |
| 3 Accumulated other comprehensive income and other disclosed reserves | | | | |
| of which: 45% of revaluation surpluses and accumulated revaluation gains | | | | |
| 4 Directly issued capital subject to phase out from CET1 (only applicable to non-joint stock companies) | | | | |
| 5 Minority interest that meets criteria for inclusion | | | | |
| 6 **Common Equity Tier 1 capital before regulatory adjustments** | | | | |
| **Common Equity Tier 1 capital: regulatory adjustments** | | | | |
| 7 Valuation adjustment pursuant to Part VIII | | | | |
| 8 Goodwill, net of associated deferred tax liability | | | | |
| 9 Intangible assets, net of associated deferred tax liability | | | | |
| 10 Deferred tax assets that rely on future profitability | | | | |
| 11 Cash flow hedge reserve | | | | |
| 12 Shortfall of TEP relative to EL under IRBA | | | | |
| 13 Increase in equity resulting from securitisation transactions | | | | |
| 13A Net exposures to credit-enhancing interest-only strips | | | | |
| 14 Unrealised fair value gains/losses on financial liabilities and derivative liabilities arising from changes in own credit risk | | | | |
| 15 Defined benefit pension fund assets, net of associated deferred tax liability | | | | |
| 16 Investments in own shares | | | | |
| of which: Direct investments, net of qualifying short positions | | | | |
| of which: Indirect investments, net of qualifying short positions | | | | |
| 17 Reciprocal cross-holdings in ordinary shares of financial institutions | | | | |
| 18 Investments in ordinary shares of unconsolidated financial institutions in which Reporting Bank does not hold a major stake | | | | |
| Total capital holdings: | | | | |
| (i) Gross direct, indirect and synthetic holdings in banking/trading books including qualifying offsetting short positions | | | | |
| (ii) Underwriting positions held for more than five working days | | | | |
| (iii) Maximum amount that could be paid out on guarantees or capital enhancements arising from capital support provided to financial institutions | | | | |
| of which: ordinary share holdings of unconsolidated financial institutions incorporated in Singapore | | | | |
| 10% of common equity pursuant to paragraph 6.1.3(o)(i) | | | | |
| Total capital holdings in excess of 10% of common equity | | | | |
| Proportion of ordinary share holdings to total capital holdings | | | | |
| 19 Investments in ordinary shares of unconsolidated financial institutions in which Reporting Bank holds a major stake approved under s32 of Banking Act (incl insurance subsidiaries) (amount above 10% threshold) | | | | |
| Investments in aggregate | | | | |
| (i) Gross direct, indirect and synthetic holdings in banking/trading books including qualifying offsetting short positions | | | | |
| (ii) Underwriting positions held for more than five working days | | | | |
| (iii) Maximum amount that could be paid out on guarantees or capital enhancements arising from capital support provided to financial institutions | | | | |
| 10% of common equity pursuant to paragraph 6.1.3(p)(i) | | | | |
| 20 Mortgage servicing rights (amount above 10% threshold) | | | | |
| 21 Deferred tax assets arising from temporary differences (amount above 10% threshold, net of related tax liability) | | | | |
| 22 Amount exceeding the 15% threshold | | | | |
| 23 of which: investments in ordinary shares of unconsolidated financial institutions in which Reporting Bank holds a major stake approved under s32 of Banking Act (incl insurance subsidiaries) | | | | |
| 24 of which: mortgage servicing rights | | | | |
| 25 of which: deferred tax assets arising from temporary differences | | | | |
| 25A 15% of CET1 Capital | | | | |

26 National specific regulatory adjustments

26A PE/VC investments held beyond the relevant holding periods set out in MAS Notice 630

26B Capital deficits in subsidiaries and associates that are regulated financial institutions

26C Any other items which the Authority may specify

27 Regulatory adjustments applied in calculation of CET1 Capital due to insufficient AT1 Capital to satisfy required deductions

28 **Total regulatory adjustments to CET1 Capital**

29 **Common Equity Tier 1 capital (CET1)**

**Additional Tier 1 capital: instruments**

30 AT1 capital instruments and share premium (if applicable)

31 of which: classified as equity under the Accounting Standards

32 of which: classified as liabilities under the Accounting Standards

33 Transitional: Ineligible capital instruments (pursuant to paragraphs 6.5.3 and 6.5.4)

34 AT1 capital instruments issued by fully-consolidated subsidiaries that meet criteria for inclusion

35 of which: instruments issued by subsidiaries subject to phase out

36 **Additional Tier 1 capital before regulatory adjustments**

**Additional Tier 1 capital: regulatory adjustments**

37 Investments in own AT1 capital instruments

of which: Direct investments, net of qualifying short positions

of which: Indirect investments, net of qualifying short positions

38 Reciprocal cross-holdings in AT1 capital instruments of financial institutions

39 Investments in AT1 capital instruments of unconsolidated financial institutions in which Reporting Bank does not hold a major stake

(i) AT1 capital instrument holdings of unconsolidated financial institutions incorporated in Singapore

(ii) Total capital holdings in excess of 10% common equity

(iii) Proportion of AT1 capital instrument holdings to total capital holdings

40 Investments in AT1 capital instruments of unconsolidated financial institutions in which Reporting Bank holds a major stake approved under s32 of Banking Act (incl insurance subsidiaries)

(i) Gross direct, indirect and synthetic holdings in banking/trading books including qualifying offsetting short positions

(ii) Underwriting positions held for more than five working days

41 National specific regulatory adjustments

41A Any other items which the Authority may specify

41B Regulatory adjustments applied to AT1 Capital in respect of amounts subject to pre-Basel III treatment

of which:

(i) Goodwill, net of associated deferred tax liability

(ii) Intangible assets, net of associated deferred tax liability

(iii) Deferred tax assets that rely on future profitability

(iv) Cash flow hedge reserve

(v) Increase in equity resulting from securitisation transactions

(vi) Unrealised fair value gains/losses on financial liabilities and derivative liabilities arising from changes in own credit risk

(vii) Shortfall of TEP relative to EL under IRBA

(viii) PE/VC investments held beyond the relevant holding periods set out in MAS Notice 630

(ix) Capital deficits in subsidiaries and associates that are regulated financial institutions

(x) Investments in ordinary shares of unconsolidated financial institutions in which Reporting Bank holds a major stake approved under s32 of Banking Act (incl insurance subsidiaries)

(xi) Investments in Tier 2 capital instruments of unconsolidated financial institutions in which Reporting Bank holds a major stake approved under s32 of Banking Act (incl insurance subsidiaries)

42 Regulatory adjustments applied in calculation of AT1 Capital due to insufficient Tier 2 Capital to satisfy required deductions

43 **Total regulatory adjustments to Additional Tier 1 capital**

44 **Additional Tier 1 capital (AT1)**

45 **Tier 1 capital (T1 = CET1 + AT1)**

**Tier 2 capital: instruments and provisions**

46 Tier 2 capital instruments and share premium (if applicable)

47 Transitional: Ineligible capital instruments (pursuant to paragraphs 6.5.3 and 6.5.4)

48 Tier 2 capital instruments issued by fully-consolidated subsidiaries that meet criteria for inclusion

49 of which: instruments issued by subsidiaries subject to phase out

50 Provisions

51 **Tier 2 capital before regulatory adjustments**

**Tier 2 capital: regulatory adjustments**

52 Investments in own Tier 2 instruments

of which: Direct investments, net of qualifying short positions

of which: Indirect investments, net of qualifying short positions

53 Reciprocal cross-holdings in Tier 2 capital instruments of financial institutions

54 Investments in Tier 2 capital instruments of unconsolidated financial institutions in which Reporting Bank does not hold a major stake

(i) Tier 2 capital instrument holdings of unconsolidated financial institutions incorporated in Singapore

(ii) Total capital holdings in excess of 10% common equity

(iii) Proportion of Tier 2 capital instrument holdings to total capital holdings

55 Investments in Tier 2 capital instruments of unconsolidated financial institutions in which Reporting Bank holds a major stake approved under s32 of Banking Act (incl insurance subsidiaries)

(i) Gross direct, indirect and synthetic holdings in banking/trading books including qualifying offsetting short positions

(ii) Underwriting positions held for more than five working days

56 National specific regulatory adjustments

56A Any other items which the Authority may specify

56B Regulatory adjustments applied to Tier 2 Capital in respect of amounts subject to pre-Basel III treatment

of which:

(i) Shortfall of TEP relative to EL under IRBA

(ii) PE/VC investments held beyond the relevant holding periods set out in MAS Notice 630

(iii) Capital deficits in subsidiaries and associates that are regulated financial institutions

(iv) Investments in ordinary shares of unconsolidated financial institutions in which Reporting Bank holds a major stake approved under s32 of Banking Act (incl insurance subsidiaries)

(vii) Investments in AT1 capital instruments of unconsolidated financial institutions in which Reporting Bank holds a major stake approved under s32 of Banking Act (incl insurance subsidiaries)

57 **Total regulatory adjustments to Tier 2 capital**

58 **Tier 2 capital (T2)**

59 **Total capital (TC = T1 + T2)**

60 **Total risk weighted assets after floor adjustment**

**Capital ratios (as a percentage of risk weighted assets)**

61 **Common Equity Tier 1 CAR**

62 **Tier 1 CAR**

63 **Total CAR**

64 **Bank-specific buffer requirement**

65 of which: capital conservation buffer requirement

66 of which: bank specific countercyclical buffer requirement

67 of which: G-SIB buffer requirement (if applicable)

68 **Common Equity Tier 1 available to meet buffers**

**National minima**

69 Minimum CET1 CAR

70 Minimum Tier 1 CAR

71 Minimum Total CAR

**Amounts below the thresholds for deduction (before risk weighting)**

72 Investments in ordinary shares, AT1 capital and Tier 2 capital of unconsolidated financial institutions in which the bank does not hold a major stake

73 Investments in ordinary shares of unconsolidated financial institutions in which Reporting Bank holds a major stake approved under s32 of Banking Act (incl insurance subsidiaries)

74 Mortgage servicing rights (net of related tax liability)

75 Deferred tax assets arising from temporary differences (net of related tax liability)

**Applicable caps on the inclusion of provisions in Tier 2**

76 Provisions eligible for inclusion in Tier 2 in respect of exposures subject to standardised approach (prior to application of cap)

77 Cap on inclusion of provisions in Tier 2 under standardised approach

78 Provisions eligible for inclusion in Tier 2 in respect of exposures subject to internal ratings-based approach (prior to application of cap)

79 Cap for inclusion of provisions in Tier 2 under internal ratings-based approach

**PE/VC investments and investments in unconsolidated major stake companies that are not financial institutions**

80 Portion of Reporting Bank's individual PE/VC investments and investments in unconsolidated major stake companies that are not financial institutions and exceed 15% of Eligible Total Capital

80A of which: PE/VC investments

80B of which: Investments in unconsolidated major stake companies that are not financial institutions

80C 15% of Eligible Total Capital

81 For individual PE/VC investments and investments in unconsolidated major stake companies that are not financial institutions which do not exceed 15% of Eligible Total Capital, the portion of the aggregate of such investments that exceeds 60% of Eligible Total Capital

81A 60% of Eligible Total Capital

***Capital instruments subject to phase-out arrangements***
***(only applicable between 1 Jan 2013 and 1 Jan 2022)***

82 Current cap on CET1 instruments subject to phase out arrangements

83 Amount excluded from CET1 due to cap (excess over cap after redemptions and maturities)

83A Nominal amount of ineligible AT1 instruments as at 1 Jan 2013

84 Current cap on AT1 instruments subject to phase out arrangements

85 Amount excluded from AT1 due to cap (excess over cap after redemptions and maturities)

85A Nominal amount of ineligible T2 instruments as at 1 Jan 2013

86 Current cap on T2 instruments subject to phase out arrangements

87 Amount excluded from T2 due to cap (excess over cap after redemptions and maturities)

[MAS Notice 637 (Amendment) 2017]

**STATEMENT OF CET1 CAR, TIER 1 CAR AND TOTAL CAR**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:** Group

**88. Capital Instruments issued by Fully-Consolidated Subsidiaries that meet Criteria for Inclusion in Regulatory Capital**
(pursuant to paragraphs 6.1.4, 6.2.4, 6.2.5, 6.3.4 and 6.3.5)

**(In S$ million)**

| | | | | **Subsidiary 1** (Name) | **Subsidiary 2** (Name) | **Total** (Sum across all subsdiaries) |
|---|---|---|---|---|---|---|
| (a) | | CET1 Capital of subsidiary, net of regulatory adjustments | | | | |
| | (i) | paid-up amount, reserves, retained earnings owned by Reporting Bank, gross of all regulatory adjustments | | | | |
| | (ii) | paid-up amount, reserves, retained earnings owned by third party investors gross of all regulatory adjustments | | | | |
| (b) | | Tier 1 Capital of subsidiary, net of regulatory adjustments (after applying the provision in paragraph 6.5.3) | | | | |
| | (i) | paid-up amount, reserves, retained earnings owned by Reporting Bank, gross of all regulatory adjustments | | | | |
| | (ii) | paid-up amount, reserves, retained earnings owned by third party investors gross of all regulatory adjustments | | | | |
| (c) | | Eligible Total Capital of subsidiary, net of regulatory adjustments (after applying the provision in paragraph 6.5.3) | | | | |
| | (i) | paid-up amount, reserves, retained earnings owned by Reporting Bank, gross of all regulatory adjustments | | | | |
| | (ii) | paid-up amount, reserves, retained earnings owned by third party investors gross of all regulatory adjustments | | | | |
| (d) | | Total risk-weighted assets of subsidiary | | | | |
| (e) | | Consolidated risk-weighted assets attributable to the subsidiary | | | | |
| (f) | | CET1 Capital | | | | |
| | (i) | Surplus CET1 Capital | 86(a) - 9% x lower of 86(d) and 86(e) | | | |
| | (ii) | Surplus CET1 Capital attributable to third party investors | 86(f)(i) x 86(a)(ii)/[sum of 86(a)(i) and 86(a)(ii)] | | | |
| | (iii) | CET1 capital held by third party investors less surplus attributable to third party investors | 86(a)(ii) - 86(f)(ii) | | | |
| (g) | | Tier 1 Capital | | | | |
| | (i) | Surplus Tier 1 Capital | 86(b) - 10.5% x lower of 86(d) and 86(e) | | | |
| | (ii) | Surplus Tier 1 Capital attributable to third party investors | 86(g)(i) x 86(b)(ii)/[sum of 86(b)(i) and 86(b)(ii)] | | | |
| | (iii) | Tier 1 capital held by third party investors less surplus attributable to third party investors | 86(b)(ii) - 86(g)(ii) | | | |
| (h) | | Eligible Total Capital | | | | |
| | (i) | Surplus Eligible Total Capital | 86(c) - 12.5% x lower of 86(d) and 86(e) | | | |
| | (ii) | Surplus Eligible Total Capital attributable to third party investors | 86(h)(i) x 86(c)(ii)/[sum of 86(c)(i) and 86(c)(ii)] | | | |
| | (iii) | Total capital held by third party investors less surplus attributable to third party investors | 86(c)(ii) - 86(h)(ii) | | | |
| (i) | | CET1 Capital of subsidiary to be included in consolidated CET1 Capital | 86(f)(iii) | | | |
| (j) | | Tier 1 Capital of subsidiary to be included in consolidated AT1 Capital | 86(g)(iii) - 86(i) | | | |
| (k) | | Eligible Total Capital of subsidiary to be included in consolidated Tier 2 Capital | 86(h)(iii) - 86(i) - 86(j) | | | |

[MAS Notice 637 (Amendment) 2016]

**Part B: Capital Floors where a Reporting Bank has adopted the IRBA** — **Solo** / **Group** **(In S$ million)**

| | | Solo | | Group | |
|---|---|---|---|---|---|
| **1.** | **Approach used for Capital Floor Calculation** — Basel I / Current SA<br>Basel I means the rules in MAS Notice 637 in force immediately before 1 Jan 2008<br>Current SA means the approach described in paragraph 5.1.3A | | | | |
| **2.** | **Adjustment factor (%)** | | | | |
| **3.** | **Capital Resources Requirement using approach used for capital floors** | | | | |
| | Total Capital Resources Requirement x adjustment factor | | | | |
| | (i) 10% of the RWA calculated using approach used for capital floors | | | | |
| | (ii) Adjustments for deductions and provisions referred to in paragaph 5.1.6(a) or (b), as the case may be | | | | |
| | (iii) Total Capital Resources Requirement (i) + (ii) | | | | |
| **4.** | **Capital Resources Requirement using rules in this Notice** | | | | |
| | Total Capital Resources Requirement | | | | |
| | (i) 10% of the RWA calculated using rules in this Notice | | | | |
| | (ii) Regulatory adjustments in CET1, AT1 Capital and Tier 2 Capital referred to in MAS Notice 637, Part V, paragraph 5.1.6(b) | | | | |

Where the amount calculated under item 3 is higher than the amount calculated under item 4, the Reporting Bank shall include a floor adjustment to RWA in item 4 of Part C, in accordance with paragraph 5.1.3C.

**Part C: Total Risk Weighted Assets** — **Solo** / **Group** **(In S$ million)**

| | | Solo | Group |
|---|---|---|---|
| **1.** | **Credit RWA**<br>calculated under the | | |
| (a) | SA(CR), SA(EQ) | | |
| (b) | IRBA, IRBA(EQ) | | |
| (c) | SEC-IRBA, SEC-ERBA, SEC-SA, and RWA from Securitisation Exposures to which the SEC-IRBA, SEC-ERBA, and SEC-SA cannot be applied | | |
| (d) | CVA RWA | | |
| (e) | CCP RWA | | |
| (f) | RWA pursuant to paragraph 6.1.3(p)(iii) | | |
| | Total Credit RWA | | |

[MAS Notice 637 (Amendment No. 2) 2017]

| | | Solo | Group |
|---|---|---|---|
| **2.** | **Market RWA**<br>calculated under the | | |
| (a) | SA(MR) | | |
| (b) | IMA | | |
| | Total Market RWA | | |
| **3.** | **Operational RWA**<br>calculated under the | | |
| (a) | BIA | | |
| (b) | SA(OR) | | |
| (c) | ASA | | |
| (d) | AMA | | |
| | Total Operational RWA | | |
| **4.** | **Total RWA** | | |
| (a) | Total RWA before floor adjustment | | |
| (b) | Floor adjustment to RWA (if any) | | |
| (c) | Total RWA after floor adjustment | | |

[MAS Notice 637 (Amendment) 2017]

## CAPITAL TREATMENT OF ALLOWANCES

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**(In S$ million)**

**1. General Allowances**

| | | | |
|---|---|---|---|
| (a) | General Allowances | | A |
| | Less: associated deferred tax assets | | |
| (b) | Net General Allowances | | |

[MAS Notice 637 (Amendment) 2012]

**2. General Allowances Attributable to SA(CR), SA(EQ), SEC-ERBA, SEC-SA, and RWA from Securitisation Exposures to which the SEC-IRBA, SEC-ERBA and SEC-SA cannot be applied**

| | | | |
|---|---|---|---|
| (a) | Proportion of credit RWA attributable to SA(CR), SA(EQ), SEC-ERBA, SEC-SA, and RWA from Securitisation Exposures to which the SEC-IRBA, SEC-ERBA, and SEC-SA cannot be applied (%) calculated in accordance with paragraph 6.3.1B | | B |
| (b) | General Allowances attributable to SA(CR), SA(EQ), SEC-ERBA, SEC-SA, and RWA from Securitisation Exposures to which the SEC-IRBA, SEC-ERBA, and SEC-SA cannot be applied | B x A | C |
| (c) | Limit on General Allowances acceptable as Tier 2 Capital calculated in accordance with paragraph 6.3.1(d) | | D |
| (d) | Eligible General Allowances recognised as Tier 2 Capital | MIN(C,D) | E |

[MAS Notice 637 (Amendment No. 2) 2014]
[MAS Notice 637 (Amendment No. 3) 2017]

**3. TEP and EL Amount under IRBA**

| | | | |
|---|---|---|---|
| (a) | Proportion of credit RWA attributable to IRBA (%) calculated in accordance with paragraph 6.3.1C | | F |
| (b) | General Allowances included in TEP | F x A | G |
| (c) | Specific Allowances included in TEP | | |

| | | | **Total** |
|---|---|---|---|
| (i) | Sovereign Asset Sub-class | F-IRBA | |
| | | A-IRBA | |
| (ii) | Bank Asset Sub-class | F-IRBA | |
| | | A-IRBA | |
| (iii) | Corporate Asset Sub-class | F-IRBA | |
| | | A-IRBA | |
| (iv) | SL Asset Sub-class (IPRE) | F-IRBA | |
| | | A-IRBA | |
| (v) | SL Asset Sub-class (PF/ OF / CF) | F-IRBA | |
| | | A-IRBA | |
| (vi) | HVCRE Asset Sub-class | F-IRBA | |
| | | A-IRBA | |
| (vii) | SL Asset Sub-class (IPRE)- supervisory slotting criteria | | |
| (viii) | SL Asset Sub-class(PF/ OF / CF)- supervisory slotting criteria | | |
| (ix) | HVCRE Asset Sub-class - supervisory slotting criteria | | |
| (x) | Corporate Small Business Asset Sub-class | F-IRBA | |
| | | A-IRBA | |
| (xi) | Residential Mortgage Asset Sub-class | | |
| (xii) | QRRE Asset Sub-class | | |
| (xiii) | Other Retail Exposures Asset Sub-class (excluding exposures to small business) | | |
| (xiv) | Other Retail Exposures Asset Sub-class (exposures to small business) | | |

| | | | |
|---|---|---|---|
| | **Total Specific Allowances included in TEP** | | H |
| (d) | TEP under IRBA | G+H | I |

**MAS NOTICE 637: CAPITAL ADEQUACY REPORTING SCHEDULES**
**SCHEDULE 1B**

**Annex 12A**

## CAPITAL TREATMENT OF ALLOWANCES

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

(e) EL Amount under IRBA

| | | | | Total |
|---|---|---|---|---|
| (i) | Sovereign Asset Sub-class | F-IRBA | | |
| | | A-IRBA | | |
| (ii) | Bank Asset Sub-class | F-IRBA | | |
| | | A-IRBA | | |
| (iii) | Corporate Asset Sub-class | F-IRBA | | |
| | | A-IRBA | | |
| (iv) | SL Asset Sub-class (IPRE) | F-IRBA | | |
| | | A-IRBA | | |
| (v) | SL Asset Sub-class (PF/ OF / CF) | F-IRBA | | |
| | | A-IRBA | | |
| (vi) | HVCRE Asset Sub-class | F-IRBA | | |
| | | A-IRBA | | |
| (vii) | SL Asset Sub-class (IPRE)- supervisory slotting criteria | | | |
| (viii) | SL Asset Sub-class(PF/ OF / CF)- supervisory slotting criteria | | | |
| (ix) | HVCRE Asset Sub-class - supervisory slotting criteria | | | |
| (x) | Corporate Small Business Asset Sub-class | F-IRBA | | |
| | | A-IRBA | | |
| (xi) | Residential Mortgage Asset Sub-class | | | |
| (xii) | QRRE Asset Sub-class | | | |
| (xiii) | Other Retail Exposures Asset Sub-class (excluding exposures to small business) | | | |
| (xiv) | Other Retail Exposures Asset Sub-class (exposures to small business) | | | |
| | **Total EL Amount** | | | J |

(f) Comparison of TEP and EL Amount

| | | | | |
|---|---|---|---|---|
| (i) | TEP less Total EL Amount | IF I>J, I-J | | K |
| (ii) | Limit on (TEP - EL Amount) acceptable as Tier 2 Capital calculated in accordance with paragraph 6.3.1(e) | | | L |
| (iii) | Eligible (TEP - EL Amount) recognised as Tier 2 Capital | MIN(K,L) | | M |
| (iv) | Excess of (EL Amount - TEP) to be included as a regulatory adjustment in the calculation of CET1 Capital | IF J>I, J-I | | N |

[MAS Notice 637 (Amendment No. 2) 2014]
[MAS Notice 637 (Amendment No. 3) 2017]

**MAS NOTICE 637: CAPITAL ADEQUACY REPORTING SCHEDULES**
**SCHEDULE 1C**

**Annex 12A**

**LEVERAGE RATIO**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:** Solo/Group (indicate as appropriate)

**(In S$ million)**

**Part A: On-balance sheet items**

| | | Accounting Balance Sheet Value | Gross Value (assuming no netting or CRM) | | Components of EM | |
|---|---|---|---|---|---|---|
| | | (a) | (b) | | (c) | |
| 1 | On-balance sheet items | | | A = B-C-D | | A |
| 2 | On-balance sheet items other than derivative transactions and SFTs | | | | | B |
| 3 | Less: Regulatory adjustments | | | | | C |
| 4 | Less: Fiduciary assets eligible for exclusion from EM | | | | | D |

**Part B: Derivative transactions**

| | | Notional Amount | Accounting Balance Sheet Value | Gross Value (assuming no netting or CRM) | | Components of EM | |
|---|---|---|---|---|---|---|---|
| | | (a) | (b) | (c) | | (d) | |
| 5 | Derivative transactions: | | | | E= F - G + H + I - J - K- L- M - N + O | | E |
| 6 | Replacement cost associated with all derivative transactions | | | | | | F |
| 7 | Written credit derivatives | | | | | | |
| 8 | Credit derivatives bought | | | | | | |
| 9 | Financial derivatives | | | | | | |
| 10 | Less: Eligible cash portion of variation margin | | | | | | G |
| 11 | Potential future exposure associated with all derivative transactions | | | | | | H |
| 12 | Written credit derivatives | | | | | | |
| 13 | Credit derivatives bought | | | | | | |
| 14 | Financial derivatives | | | | | | |
| 15 | Grossed-up assets for derivative collaterals provided where deducted from the balance sheet | | | | | | I |
| 16 | Less: Receivables assets for cash portion of variation margin provided in derivative transactions | | | | | | J |
| 17 | Less: CCP trade exposures (replacement cost) eligible for exclusion from EM | | | | | | K |
| 18 | Less: CCP trade exposures (initial margin) eligible for exclusion from EM | | | | | | L |
| 19 | Less: CCP trade exposures (potential future exposure) excluded from EM | | | | | | M |
| 20 | Less: Potential future exposure of adjustment for written credit derivatives | | | | | | N |

| | | Capped Notional Amount | Capped Notional Amount (same reference name) | | Components of EM | |
|---|---|---|---|---|---|---|
| | | (a) | (b) | | (c) | |
| 21 | Adjusted effective notional amount of written credit derivatives: | | | O = P - Q | | O |
| 22 | Written credit derivatives | | | | | P |
| 23 | Less: credit derivatives bought | | | | | Q |

**LEVERAGE RATIO**

**Name of the Reporting Bank:** 

**Statement as at:** 

**Scope of Reporting:** Solo/Group (indicate as appropriate)

**(In S$ million)**

**Part C: SFTs**

| | | Accounting Balance Sheet Value (a) | Gross Value (assuming no netting or CRM) (b) | | Components of EM (c) | |
|---|---|---|---|---|---|---|
| 24 | SFTs: | | | R = S + T - U - V + W + X | | R |
| 25 | Gross SFT assets | | | | | S |
| 26 | Adjustments for SFT sales accounting | | | | | T |
| 27 | Less: Securities received in a SFT that are recognised as an asset | | | | | U |
| 28 | Less: Eligible netting of cash payables and cash receivables | | | | | V |
| 29 | SFT counterparty exposures | | | | | W |
| 30 | SFTs where a Reporting Bank acts as an agent and provide a guarantee for the difference | | | | | X |

**Part D: Off-balance sheet items**

| | | Notional Amount (a) | | Components of EM (b) | |
|---|---|---|---|---|---|
| 31 | Off-balance sheet items: | | Y = Z + AA + AB + AC | | Y |
| 32 | Off-balance sheet items with a 10% CCF as per Annex 4B or Annex 4C of the Notice | | | | Z |
| 33 | of which: Unconditionally cancellable credit cards commitments | | | | |
| 34 | of which: Other unconditionally cancellable commitments | | | | |
| 35 | Off-balance sheet items with a 20% CCF as per Annex 4B of the Notice | | | | AA |
| 36 | Off-balance sheet items with a 50% CCF as per Annex 4B or Annex 4C of the Notice | | | | AB |
| 37 | Off-balance sheet items with a 100% CCF as per Annex 4B or Annex 4C of the Notice | | | | AC |

**Part E: Calculation of Leverage ratio**

| | | | Amount (S$ million) | |
|---|---|---|---|---|
| 38 | CM | | | AD |
| 39 | EM | AE = A + E + R + Y | | AE |

| | | | LR (%) | |
|---|---|---|---|---|
| 40 | LR | AF = AD ÷ AE | | AF |

[MAS Notice 637 (Amendment) 2014]

**SCHEDULE 1D**

## COUNTERCYCLICAL BUFFER

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

### 1. Private Sector Credit Exposures

| Jurisdiction | Effective Country-Specific Countercyclical Buffer Requirement (%) | RWA for Private Sector Credit Exposures (In S$ million) | | | | Weighting applied to Effective Country-Specific Countercyclical Buffer Requirement (%) |
|---|---|---|---|---|---|---|
| | | Banking Book | Trading Book | Total | | |
| | (a) | (b) | (c) | (d=b+c) | | (e=d/D) |
| | | | | | | |
| | | | | | | |
| All others | | | | | | |
| **Total** | | | | | D | |

### 2. Bank-Specific Countercyclical Buffer Requirement

Countercyclical Buffer (%) | | SUMPRODUCT(a,e)

[MAS Notice 637 (Amendment No. 2) 2017]

**MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES** **Annex 12B**
**SCHEDULE 2**

**SUMMARY OF CREDIT RWA**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**1. Credit RWA**

| | | Amount (S$ million) | |
|---|---|---|---|
| **(a)** | **SA(CR), SA(EQ), SEC-ERBA, SEC-SA** | **Total Credit RWA** | |
| (i) | Cash and Cash Equivalents | | |
| (ii) | Central Government and Central Bank Asset Class | | |
| (iii) | PSE Asset Class | | |
| (iv) | MDB Asset Class | | |
| (v) | Bank Asset Class | | |
| (vi) | Corporate Asset Class | | |
| (vii) | Regulatory Retail Asset Class | | |
| (viii) | Residential Mortgage Asset Class | | |
| (ix) | CRE Asset Class | | |
| (x) | Other Exposures Asset Class | | |
| (xi) | SA(EQ) RWA | | A |
| (xii) | SEC-ERBA RWA | | |
| (xiii) | SEC-SA RWA | | |
| (xiv) | RWA from Securitisation Exposures to which the SEC-IRBA, SEC-ERBA, and SEC-SA cannot be applied | | |
| (xv) | Unsettled Trades | | |
| | **SA(CR) RWA + SA(EQ) RWA + SEC-ERBA RWA + SEC-SA RWA + RWA from Securitisation Exposures to which the SEC-IRBA, SEC-ERBA, and SEC-SA cannot be applied** | | B |

| | | | F-IRBA (a) | A-IRBA (b) | Total Credit RWA (c=a+b) | |
|---|---|---|---|---|---|---|
| **(b)** | **IRBA, IRBA(EQ), SEC-IRBA** | | | | | |
| (i) | Sovereign Asset Sub-class | | | | | C |
| (ii) | Bank Asset Sub-class | | | | | D |
| (iii) | Corporate Asset Sub-class | | | | | |
| | Corporate | | | | | |
| | Corporate - double default | | | | | |
| | Total Corporate Asset Sub-Class | | | | | E |
| (iv) | SL Asset Sub-class | | | | | |
| | IPRE | | | | | |
| | PF/OF/CF | | | | | |
| | IPRE - double default | | | | | |
| | PF/OF/CF - double default | | | | | |
| | IPRE - supervisory slotting criteria | | | | | |
| | PF/OF/CF - supervisory slotting criteria | | | | | |
| | Total SL Asset Sub-class | | | | | F |
| (v) | HVCRE Asset Sub-class | | | | | |
| | HVCRE | | | | | |
| | HVCRE - double default | | | | | |
| | HVCRE - supervisory slotting criteria | | | | | |
| | Total HVCRE Asset Sub-class | | | | | G |
| (vi) | Corporate Small Business Asset Sub-class | | | | | |
| | Corporate Small Business | | | | | |
| | Corporate Small Business - double default | | | | | |
| | Total Corporate Small Business Asset Sub-class | | | | | H |
| (vi) | Residential Mortgage Asset Sub-class | | | | | I |
| (vii) | QRRE Asset Sub-class | | | | | J |
| (viii) | Other Retail Exposures Asset Sub-class | | | | | |
| | Other Retail Exposures (excluding exposures to small business) | | | | | |
| | Exposures to Small Business | | | | | |
| | Total Other Retail Exposures Asset Sub-class | | | | | K |
| | IRBA RWA | SUM(C:K) | | | | L |
| (ix) | IRBA(EQ) RWA (exposures other than those subject to 1250% risk weight) | | | | | M |
| | IRBA(EQ) RWA (exposures subject to 1250% risk weight) | | | | | N |
| (x) | SEC-IRBA RWA | | | | | O |
| | IRBA RWA and IRBA(EQ) RWA Subject to Scaling Factor | L+M | | | | Q |
| | Adjusted RWA post Scaling Factor of 1.06 | 1.06 x Q | | | | R |
| | **IRBA RWA + IRBA(EQ) RWA + SEC-IRBA RWA** | R+N+O | | | | S |

| | | | | |
|---|---|---|---|---|
| **(c)** | **Total CVA RWA** | | | T |
| **(d)** | **Total CCP RWA** | | | U |
| | | [MAS Notice 637 (Amendment) 2012] | | |
| **(e)** | **RWA pursuant to paragraph 6.1.3(p)(iii)** | | | V |
| **(f)** | **Total Credit RWA** | B+S+T+U+V | | |

[MAS Notice 637 (Amendment) 2012]
[MAS Notice 637 (Amendment No. 2) 2017]
[MAS Notice 637 (Amendment No. 3) 2017]

**MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES** **Annex 12B**
**SCHEDULE 2**

**SUMMARY OF CREDIT RWA**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**2. Coverage**

**(a) IRBA, IRBA(EQ) and SEC-IRBA Coverage (applicable at Group level only)**

| | | | Amount (S$ million) | |
|---|---|---|---|---|
| (i) | IRBA RWA + IRBA(EQ) RWA + SEC-IRBA RWA | S | | W |
| | Total Credit RWA<br>(To exclude SA(EQ) RWA in Total Credit RWA if equity exposures are excluded from IRBA(EQ) based on immateriality) | (B+S) or (B+S-A) | | X |
| | **IRBA, IRBA(EQ), SEC-IRBA Coverage (%)** | W/X | | |
| (ii) | SA(CR) RWA + SA(EQ) RWA + SEC-ERBA RWA + SEC-SA RWA<br>+ RWA from securitisation exposures to which the SEC-IRBA, SEC-ERBA, and SEC-SA cannot be applied | B or (B-A) | | Y |
| | Total Credit RWA<br>(To exclude SA(EQ) RWA if equity exposures are excluded from IRBA(EQ) based on immateriality) | (B+S) or (B+S-A) | | Z |
| | **Coverage of SA(CR), SA(EQ), SEC-ERBA, SEC-SA, and RWA from Securitisation Exposures to which the SEC-IRBA, SEC-ERBA, and SEC-SA cannot be applied (%)** | Y/Z | | |

**(b) Equity Exposures (applicable at Group level only)**

| | | | |
|---|---|---|---|
| Aggregate Equity Exposures | | | AA |
| Eligible Total Capital | | | BB |
| Ratio of Aggregate Equity Exposures over Eligible Total Capital | AA/BB | | |

**(c) Asset Classes/Sub-Classes under SA(CR), SA(EQ), SEC-ERBA, SEC-SA or Securitisation Exposures to which the SEC-IRBA, SEC-ERBA, and SEC-SA cannot be applied**
(To list by asset class/sub-class or portfolios and legal entities and indicate by ticking if exposures are exempted from or transitioning to IRBA, IRBA(EQ) or SEC-IRBA)

| No | Asset Sub-Class/Portfolios by Entities within Group | Status (please tick) | | Expected date of Transitioning (for Transitioning Exposures) | Credit RWA (in $ million) |
|---|---|---|---|---|---|
| | | Exempted | Transitioning | | |
| | | | | | |
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[MAS Notice 637 (Amendment) 2013]
[MAS Notice 637 (Amendment No. 2) 2014]
[MAS Notice 637 (Amendment No. 2) 2017]
[MAS Notice 637 (Amendment No. 3) 2017]

**SCHEDULE 2-1A**

**SA(CR)**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

| **(In S$ million)** | | **Notional Amount** | **Risk Weight** | **Credit RWA** |
|---|---|---|---|---|
| | | (a) | (b) | (c=axb) |
| **1.** | **Cash Items** | | | |
| (a) | Cash and cash equivalents | | 0% | |
| (b) | Gold bullion held in own vault or on an allocated basis backed by gold bullion liabilities | | 0% | |
| (c) | Receivable funds from DvP transactions up to and including the fourth business day after the settlement date | | 0% | |
| (d) | Cheques and other items in process of collection | | 20% | |
| | Total for Cash Items | | | A |

| | Before CRM | | | | CRM Adjustments | | | | After CRM | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Gross Exposure | | | | | | | | | |
| | **Notional Amount** | **Before applying qualifying bilateral netting agreements** | **After applying qualifying bilateral netting agreements (other than SFTs)** | **Net Exposure** | **(Outflows) due to Credit Protection Bought** | **Inflows due to Credit Protection Sold** | **Redistribution of Net Exposures due to FC(SA)** | **Decrease in Net Exposure due to FC(CA)** | **Net Exposure** | **Risk Weight** | **Credit RWA** |
| | | | | (d) | (e) | (f) | (g) | (h) | (i=d+e+f+g+h) | (j) | (k=ixj) |
| **2. Central Government and Central Bank Asset Class** | | | | | | | | | | | |
| (a) On-balance Sheet Exposures | | | | | | | | | | | |
| Risk Weight 0% | | | | | | | | | | 0% | |
| Risk Weight 20% | | | | | | | | | | 20% | |
| Risk Weight 50% | | | | | | | | | | 50% | |
| Risk Weight 100% | | | | | | | | | | 100% | |
| Risk Weight 150% | | | | | | | | | | 150% | |
| Sub-Total | | | | | | | Sum to zero | | | | |
| (b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs) | | | | | | | | | | | |
| Risk Weight 0% | | | | | | | | | | 0% | |
| Risk Weight 20% | | | | | | | | | | 20% | |
| Risk Weight 50% | | | | | | | | | | 50% | |
| Risk Weight 100% | | | | | | | | | | 100% | |
| Risk Weight 150% | | | | | | | | | | 150% | |
| Sub-Total | | | | | | | Sum to zero | | | | |
| (c) OTC Derivative Transactions | | | | | | | | | | | |
| Risk Weight 0% | | | | | | | | | | 0% | |
| Risk Weight 10% | | | | | | | | | | 10% | |
| Risk Weight 20% | | | | | | | | | | 20% | |
| Risk Weight 50% | | | | | | | | | | 50% | |
| Risk Weight 100% | | | | | | | | | | 100% | |
| Risk Weight 150% | | | | | | | | | | 150% | |
| Sub-Total | | | | | | | Sum to zero | | | | |
| (d) SFTs | | | | | | | | | | | |
| Risk Weight 0% | | | | | | | | | | 0% | |
| Risk Weight 10% | | | | | | | | | | 10% | |
| Risk Weight 20% | | | | | | | | | | 20% | |
| Risk Weight 50% | | | | | | | | | | 50% | |
| Risk Weight 100% | | | | | | | | | | 100% | |
| Risk Weight 150% | | | | | | | | | | 150% | |
| Sub-Total | | | | | | | Sum to zero | | | | |
| Total for Central Government and Central Bank Asset Class | | | | | | | | | | | |

| | Materiality Threshold Amount | Risk Weight | Credit RWA |
|---|---|---|---|
| (e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on a SA exposure | | 1250% | |
| Total for Central Government and Central Bank Asset Class (Inclusive of the RWA due to the materality threshold) | | | B |

**SA(CR)**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

| | | Before CRM | | | CRM Adjustments | | | | After CRM | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Gross Exposure | | | | | | | | | |
| | Notional Amount | Before applying qualifying bilateral netting agreements | After applying qualifying bilateral netting agreements (other than SFTs) | Net Exposure | (Outflows) due to Credit Protection Bought | Inflows due to Credit Protection Sold | Redistribution of Net Exposures due to FC(SA) | Decrease in Net Exposure due to FC(CA) | Net Exposure | Risk Weight | Credit RWA |
| | | | | (d) | (e) | (f) | (g) | (h) | (i=d+e+f+g+h) | (j) | (k=ixj) |
| **3. PSE Asset Class** | | | | | | | | | | | |
| (a) On-balance Sheet Exposures | | | | | | | | | | | |
| Risk Weight 0% | | | | | | | | | | 0% | |
| Risk Weight 20% | | | | | | | | | | 20% | |
| Risk Weight 50% | | | | | | | | | | 50% | |
| Risk Weight 100% | | | | | | | | | | 100% | |
| Risk Weight 150% | | | | | | | | | | 150% | |
| Sub-Total | | | | | | | Sum to zero | | | | |
| (b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs) | | | | | | | | | | | |
| Risk Weight 0% | | | | | | | | | | 0% | |
| Risk Weight 20% | | | | | | | | | | 20% | |
| Risk Weight 50% | | | | | | | | | | 50% | |
| Risk Weight 100% | | | | | | | | | | 100% | |
| Risk Weight 150% | | | | | | | | | | 150% | |
| Sub-Total | | | | | | | Sum to zero | | | | |
| (c) OTC Derivative Transactions | | | | | | | | | | | |
| Risk Weight 0% | | | | | | | | | | 0% | |
| Risk Weight 10% | | | | | | | | | | 10% | |
| Risk Weight 20% | | | | | | | | | | 20% | |
| Risk Weight 50% | | | | | | | | | | 50% | |
| Risk Weight 100% | | | | | | | | | | 100% | |
| Risk Weight 150% | | | | | | | | | | 150% | |
| Sub-Total | | | | | | | Sum to zero | | | | |
| (d) SFTs | | | | | | | | | | | |
| Risk Weight 0% | | | | | | | | | | 0% | |
| Risk Weight 10% | | | | | | | | | | 10% | |
| Risk Weight 20% | | | | | | | | | | 20% | |
| Risk Weight 50% | | | | | | | | | | 50% | |
| Risk Weight 100% | | | | | | | | | | 100% | |
| Risk Weight 150% | | | | | | | | | | 150% | |
| Sub-Total | | | | | | | Sum to zero | | | | |
| Total for PSE Asset Class | | | | | | | | | | | |
| | | | | | | | | | Materiality Threshold Amount | | |
| (e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on a SA exposure | | | | | | | | | | 1250% | |
| Total for PSE Asset Class (Inclusive of the RWA due to the materality threshold) | | | | | | | | | | | C |
| **4. MDB Asset Class** | | | | | | | | | | | |
| (a) On-balance Sheet Exposures | | | | | | | | | | | |
| Risk Weight 0% | | | | | | | | | | 0% | |
| Risk Weight 20% | | | | | | | | | | 20% | |
| Risk Weight 50% | | | | | | | | | | 50% | |
| Risk Weight 100% | | | | | | | | | | 100% | |
| Risk Weight 150% | | | | | | | | | | 150% | |
| Sub-Total | | | | | | | Sum to zero | | | | |
| (b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs) | | | | | | | | | | | |
| Risk Weight 0% | | | | | | | | | | 0% | |
| Risk Weight 20% | | | | | | | | | | 20% | |
| Risk Weight 50% | | | | | | | | | | 50% | |
| Risk Weight 100% | | | | | | | | | | 100% | |
| Risk Weight 150% | | | | | | | | | | 150% | |
| Sub-Total | | | | | | | Sum to zero | | | | |
| (c) OTC Derivative Transactions | | | | | | | | | | | |
| Risk Weight 0% | | | | | | | | | | 0% | |
| Risk Weight 10% | | | | | | | | | | 10% | |
| Risk Weight 20% | | | | | | | | | | 20% | |
| Risk Weight 50% | | | | | | | | | | 50% | |
| Risk Weight 100% | | | | | | | | | | 100% | |
| Risk Weight 150% | | | | | | | | | | 150% | |
| Sub-Total | | | | | | | Sum to zero | | | | |
| (d) SFTs | | | | | | | | | | | |
| Risk Weight 0% | | | | | | | | | | 0% | |
| Risk Weight 10% | | | | | | | | | | 10% | |
| Risk Weight 20% | | | | | | | | | | 20% | |
| Risk Weight 50% | | | | | | | | | | 50% | |
| Risk Weight 100% | | | | | | | | | | 100% | |
| Risk Weight 150% | | | | | | | | | | 150% | |
| Sub-Total | | | | | | | Sum to zero | | | | |
| Total for MDB Asset Class | | | | | | | | | | | |
| | | | | | | | | | Materiality Threshold Amount | | |
| (e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on a SA exposure | | | | | | | | | | 1250% | |
| Total for MDB Asset Class (Inclusive of the RWA due to the materality threshold) | | | | | | | | | | | D |

**SCHEDULE 2-1A**

**SA(CR)**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

| | Before CRM | | | | CRM Adjustments | | | | After CRM | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Notional Amount | Gross Exposure: Before applying qualifying bilateral netting agreements | Gross Exposure: After applying qualifying bilateral netting agreements (other than SFTs) | Net Exposure | (Outflows) due to Credit Protection Bought | Inflows due to Credit Protection Sold | Redistribution of Net Exposures due to FC(SA) | Decrease in Net Exposure due to FC(CA) | Net Exposure | Risk Weight | Credit RWA |
| | | | | (d) | (e) | (f) | (g) | (h) | (i=d+e+f+g+h) | (j) | (k=ixj) |
| **5. Bank Asset Class** | | | | | | | | | | | |
| (a) On-balance Sheet Exposures | | | | | | | | | | | |
| Risk Weight 0% | | | | | | | | | | 0% | |
| Risk Weight 20% | | | | | | | | | | 20% | |
| Risk Weight 50% | | | | | | | | | | 50% | |
| Risk Weight 100% | | | | | | | | | | 100% | |
| Risk Weight 150% | | | | | | | | | | 150% | |
| Sub-Total | | | | | | | Sum to zero | | | | |
| (b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs) | | | | | | | | | | | |
| Risk Weight 0% | | | | | | | | | | 0% | |
| Risk Weight 20% | | | | | | | | | | 20% | |
| Risk Weight 50% | | | | | | | | | | 50% | |
| Risk Weight 100% | | | | | | | | | | 100% | |
| Risk Weight 150% | | | | | | | | | | 150% | |
| Sub-Total | | | | | | | Sum to zero | | | | |
| (c) OTC Derivative Transactions | | | | | | | | | | | |
| Risk Weight 0% | | | | | | | | | | 0% | |
| Risk Weight 10% | | | | | | | | | | 10% | |
| Risk Weight 20% | | | | | | | | | | 20% | |
| Risk Weight 50% | | | | | | | | | | 50% | |
| Risk Weight 100% | | | | | | | | | | 100% | |
| Risk Weight 150% | | | | | | | | | | 150% | |
| Sub-Total | | | | | | | Sum to zero | | | | |
| (d) SFTs | | | | | | | | | | | |
| Risk Weight 0% | | | | | | | | | | 0% | |
| Risk Weight 10% | | | | | | | | | | 10% | |
| Risk Weight 20% | | | | | | | | | | 20% | |
| Risk Weight 50% | | | | | | | | | | 50% | |
| Risk Weight 100% | | | | | | | | | | 100% | |
| Risk Weight 150% | | | | | | | | | | 150% | |
| Sub-Total | | | | | | | Sum to zero | | | | |
| Total for Bank Asset Class | | | | | | | | | | | |
| | | | | | | | | | Materiality Threshold Amount | | |
| (e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on a SA exposure | | | | | | | | | | 1250% | |
| Total for Bank Asset Class (Inclusive of the RWA due to the materality threshold) | | | | | | | | | | | E |
| **6. Corporate Asset Class** | | | | | | | | | | | |
| (a) On-balance Sheet Exposures | | | | | | | | | | | |
| Risk Weight 0% | | | | | | | | | | 0% | |
| Risk Weight 20% | | | | | | | | | | 20% | |
| Risk Weight 50% | | | | | | | | | | 50% | |
| Risk Weight 100% | | | | | | | | | | 100% | |
| Risk Weight 150% | | | | | | | | | | 150% | |
| Sub-Total | | | | | | | Sum to zero | | | | |
| (b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs) | | | | | | | | | | | |
| Risk Weight 0% | | | | | | | | | | 0% | |
| Risk Weight 20% | | | | | | | | | | 20% | |
| Risk Weight 50% | | | | | | | | | | 50% | |
| Risk Weight 100% | | | | | | | | | | 100% | |
| Risk Weight 150% | | | | | | | | | | 150% | |
| Sub-Total | | | | | | | Sum to zero | | | | |
| (c) OTC Derivative Transactions | | | | | | | | | | | |
| Risk Weight 0% | | | | | | | | | | 0% | |
| Risk Weight 10% | | | | | | | | | | 10% | |
| Risk Weight 20% | | | | | | | | | | 20% | |
| Risk Weight 50% | | | | | | | | | | 50% | |
| Risk Weight 100% | | | | | | | | | | 100% | |
| Risk Weight 150% | | | | | | | | | | 150% | |
| Sub-Total | | | | | | | Sum to zero | | | | |
| (d) SFTs | | | | | | | | | | | |
| Risk Weight 0% | | | | | | | | | | 0% | |
| Risk Weight 10% | | | | | | | | | | 10% | |
| Risk Weight 20% | | | | | | | | | | 20% | |
| Risk Weight 50% | | | | | | | | | | 50% | |
| Risk Weight 100% | | | | | | | | | | 100% | |
| Risk Weight 150% | | | | | | | | | | 150% | |
| Sub-Total | | | | | | | Sum to zero | | | | |
| Total for Corporate Asset Class | | | | | | | | | | | |
| | | | | | | | | | Materiality Threshold Amount | | |
| (e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on a SA exposure | | | | | | | | | | 1250% | |
| Total for Corporate Asset Class (Inclusive of the RWA due to the materality threshold) | | | | | | | | | | | F |

**SA(CR)**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

| | Before CRM | | | | CRM Adjustments | | | | After CRM | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Notional Amount | Gross Exposure: Before applying qualifying bilateral netting agreements | Gross Exposure: After applying qualifying bilateral netting agreements (other than SFTs) | Net Exposure | (Outflows) due to Credit Protection Bought | Inflows due to Credit Protection Sold | Redistribution of Net Exposures due to FC(SA) | Decrease in Net Exposure due to FC(CA) | Net Exposure | Risk Weight | Credit RWA | |
| | | | | (d) | (e) | (f) | (g) | (h) | (i=d+e+f+g+h) | (j) | (k=ixj) | |
| **7. Regulatory Retail Asset Class** | | | | | | | | | | | | |
| (a) On-balance Sheet Exposures | | | | | | | | | | | | |
| Risk Weight 0% | | | | | | | | | | 0% | | |
| Risk Weight 20% | | | | | | | | | | 20% | | |
| Risk Weight 50% | | | | | | | | | | 50% | | |
| Risk Weight 75% - Exposures to individuals | | | | | | | | | | 75% | | |
| Risk Weight 75% - Exposures to small business | | | | | | | | | | 75% | | |
| Risk Weight 100% | | | | | | | | | | 100% | | |
| Risk Weight 150% | | | | | | | | | | 150% | | |
| Sub-Total | | | | | | | Sum to zero | | | | | |
| (b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs) | | | | | | | | | | | | |
| Risk Weight 0% | | | | | | | | | | 0% | | |
| Risk Weight 20% | | | | | | | | | | 20% | | |
| Risk Weight 50% | | | | | | | | | | 50% | | |
| Risk Weight 75% - Exposures to individuals | | | | | | | | | | 75% | | |
| Risk Weight 75% - Exposures to small business | | | | | | | | | | 75% | | |
| Risk Weight 100% | | | | | | | | | | 100% | | |
| Risk Weight 150% | | | | | | | | | | 150% | | |
| Sub-Total | | | | | | | Sum to zero | | | | | |
| (c) OTC Derivative Transactions | | | | | | | | | | | | |
| Risk Weight 0% | | | | | | | | | | 0% | | |
| Risk Weight 10% | | | | | | | | | | 10% | | |
| Risk Weight 20% | | | | | | | | | | 20% | | |
| Risk Weight 50% | | | | | | | | | | 50% | | |
| Risk Weight 75% - Exposures to individuals | | | | | | | | | | 75% | | |
| Risk Weight 75% - Exposures to small business | | | | | | | | | | 75% | | |
| Risk Weight 100% | | | | | | | | | | 100% | | |
| Risk Weight 150% | | | | | | | | | | 150% | | |
| Sub-Total | | | | | | | Sum to zero | | | | | |
| (d) SFTs | | | | | | | | | | | | |
| Risk Weight 0% | | | | | | | | | | 0% | | |
| Risk Weight 10% | | | | | | | | | | 10% | | |
| Risk Weight 20% | | | | | | | | | | 20% | | |
| Risk Weight 50% | | | | | | | | | | 50% | | |
| Risk Weight 75% - Exposures to individuals | | | | | | | | | | 75% | | |
| Risk Weight 75% - Exposures to small business | | | | | | | | | | 75% | | |
| Risk Weight 100% | | | | | | | | | | 100% | | |
| Risk Weight 150% | | | | | | | | | | 150% | | |
| Sub-Total | | | | | | | Sum to zero | | | | | |
| Total for Regulatory Retail Asset Class | | | | | | | | | | | | |
| | | | | | | | | | Materiality Threshold Amount | | | |
| (e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on a SA exposure | | | | | | | | | | 1250% | | |
| Total for Regulatory Retail Asset Class (Inclusive of the RWA due to the materality threshold) | | | | | | | | | | | | G |
| **8. Residential Mortgage Asset Class** | | | | | | | | | | | | |
| (a) On-balance Sheet Exposures | | | | | | | | | | | | |
| Risk Weight 0% | | | | | | | | | | 0% | | |
| Risk Weight 20% | | | | | | | | | | 20% | | |
| Risk Weight 35% | | | | | | | | | | 35% | | |
| Risk Weight 50% | | | | | | | | | | 50% | | |
| Risk Weight 75% | | | | | | | | | | 75% | | |
| Risk Weight 100% | | | | | | | | | | 100% | | |
| Sub-Total | | | | | | | Sum to zero | | | | | |
| (b) Off-balance Sheet Exposures | | | | | | | | | | | | |
| Risk Weight 0% | | | | | | | | | | 0% | | |
| Risk Weight 20% | | | | | | | | | | 20% | | |
| Risk Weight 35% | | | | | | | | | | 35% | | |
| Risk Weight 50% | | | | | | | | | | 50% | | |
| Risk Weight 75% | | | | | | | | | | 75% | | |
| Risk Weight 100% | | | | | | | | | | 100% | | |
| Sub-Total | | | | | | | Sum to zero | | | | | |
| Total for Residential Mortgage Asset Class | | | | | | | | | | | | |
| | | | | | | | | | Materiality Threshold Amount | | | |
| (c) Materiality threshold below which no payment will be made by the protection provider in the event of loss on a SA exposure | | | | | | | | | | 1250% | | |
| Total for Residential Mortgage Asset Class (Inclusive of the RWA due to the materality threshold) | | | | | | | | | | | | H |
| **8A. CRE Asset Class** | | | | | | | | | | | | |
| (a) On-balance Sheet Exposures | | | | | | | | | | | | |
| Risk Weight 0% | | | | | | | | | | 0% | | |
| Risk Weight 20% | | | | | | | | | | 20% | | |
| Risk Weight 35% | | | | | | | | | | 35% | | |
| Risk Weight 50% | | | | | | | | | | 50% | | |
| Risk Weight 75% | | | | | | | | | | 75% | | |
| Risk Weight 100% | | | | | | | | | | 100% | | |
| Risk Weight 150% | | | | | | | | | | 150% | | |
| Sub-Total | | | | | | | Sum to zero | | | | | |
| (b) Off-balance Sheet Exposures | | | | | | | | | | | | |
| Risk Weight 0% | | | | | | | | | | 0% | | |
| Risk Weight 20% | | | | | | | | | | 20% | | |
| Risk Weight 35% | | | | | | | | | | 35% | | |
| Risk Weight 50% | | | | | | | | | | 50% | | |
| Risk Weight 75% | | | | | | | | | | 75% | | |
| Risk Weight 100% | | | | | | | | | | 100% | | |
| Risk Weight 150% | | | | | | | | | | 150% | | |
| Sub-Total | | | | | | | Sum to zero | | | | | |
| Total for CRE Asset Class | | | | | | | | | | | | |
| | | | | | | | | | Materiality Threshold Amount | | | |
| (c) Materiality threshold below which no payment will be made by the protection provider in the event of loss on a SA exposure | | | | | | | | | | 1250% | | |
| Total for CRE Asset Class (Inclusive of the RWA due to the materality threshold) | | | | | | | | | | | | I |

**SCHEDULE 2-1A**

**SA(CR)**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

| | | Net exposure before CRM, where applicable | Net exposure (after CRM, where applicable) | Risk Weight | Credit RWA |
|---|---|---|---|---|---|
| **9.** | **Other Exposures Asset Class** | | | | |
| (a) | Premises, plant and equipment and other fixed assets | | | 100% | |
| (b) | Real Estate | | | 100% | |
| (c) | Exposures to individuals excluded from regulatory retail asset class | | | 100% | |
| (d) | Other exposures/assets not included in above categories and not included in the IRBA, SA(EQ), IRBA(EQ), SEC-SA, SEC-ERBA, SEC-IRBA and Securitisation Exposures to which the SEC-IRBA, SEC-ERBA, and SEC-SA cannot be applied (Pls itemise and specify) | | | 100% | |
| | Total for Other Exposures Asset Class | | | | |
| | | | Materiality Threshold Amount | | |
| (e) | Materiality threshold below which no payment will be made by the protection provider in the event of loss on a SA exposure | | | 1250% | |
| | Total for Other Exposures Asset Class (Inclusive of the RWA due to the materality threshold) | | | | J |
| **10.** | Total SA(CR) net exposures after CRM, where applicable | | | | |
| | **Total SA(CR) RWA** | | | K=SUM(A:J) | |

[MAS Notice 637 (Amendment) 2016]
[MAS Notice 637 (Amendment No. 2) 2017]

**MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES** **Annex 12B**
**SCHEDULE 2-2A**

**F-IRBA - SOVEREIGN ASSET SUB-CLASS**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-2A-RWA**
**(In S$ million)**

| Internal Rating System | | | | Before CRM | | | Adjustments for CRM | | | After CRM | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Obligor Grade | PD range (%) | | | Notional Amount | | Gross Exposure | (Outflows) due to Credit Protection Bought | Inflows due to Credit Protection Sold | Adjustments to SFTs | EAD | Exposure Weighted Average PD (%) | Exposure Weighted Average LGD (%) | Exposure Weighted Average M (years) | Number of Obligors | EL Amount | Credit RWA |
| | Lower | Upper | Average | | | | | | | | | | | | | |
| (a) | | | (b) | | | (c) | (d) | (e) | (f) | (g=c+d+e+f) | | (k) from 2-2A-LGD | | | | |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(d) SFTs** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **Total for Sovereign Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | | | | | |
| **Total for Sovereign Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | **Materiality Threshold Amount** | | | |
| **(e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** | | | | | | | | | | | | | | 1250% | | |
| **Total for Sovereign Asset Sub-Class (include defaulted loans) (Inclusive of the RWA due to the materality threshold)** | | | | | | | | | | | | | | | | |
| **Total for Sovereign Asset Sub-Class (exclude defaulted loans) (Inclusive of the RWA due to the materality threshold)** | | | | | | | | | | | | | | | | |

**F-IRBA - SOVEREIGN ASSET SUB-CLASS**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-2A-LGD**
**(In S$ million)**

| Obligor Grade | Average PD | Total EAD | EAD segmented by collateral/facility type | | | | | | | | | Exposure Weighted Average LGD (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Subordinated claims | Unsecured senior claims | Eligible Physical Collateral - Industrial Properties | Eligible Physical Collateral - Land in Singapore | Other Eligible Physical Collateral | Eligible CRE | Eligible RRE | Eligible receivables | Eligible financial collateral | |
| | | | LGD = 75% | LGD = 45% | LGD = 40% | LGD = 40% | LGD = 40% | LGD = 35% | LGD = 35% | LGD = 35% | LGD = 0% | |
| (a) from 2-2A-RWA | (b) from 2-2A-RWA | (a=b+c+d+e+f+g+h+i+j) (g) from 2-2A-RWA | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)** | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | |
| **(d) SFTs** | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | |
| **Total for Sovereign Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | |
| **Total for Sovereign Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | | |

[MAS Notice 637 (Amendment) 2016]

**F-IRBA - BANK ASSET SUB-CLASS**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-2B-RWA**
**(In S$ million)**

**1. Bank Asset Sub-Class Exposure, excluding exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637**

| Internal Rating System | | | | Before CRM | | | Adjustments for CRM | | | After CRM | | | | Number of Obligors | EL Amount | Credit RWA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Obligor Grade | PD range (%) | | | Notional Amount | | Gross Exposure | (Outflows) due to Credit Protection Bought | Inflows due to Credit Protection Sold | Adjustments to SFTs | EAD | Exposure Weighted Average PD (%) | Exposure Weighted Average LGD (%) | Exposure Weighted Average M (years) | | | |
| | Lower | Upper | Average | | | | | | | | | | | | | |
| (a) | | | (b) | | | (c) | (d) | (e) | (f) | (g=c+d+e+f) | | (k) from 2-2B-LGD | | | | |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(d) SFTs** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **Sub-Total for Bank Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | | | | | |
| **Sub-Total for Bank Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | | | | | | |

**(Exclude exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637)**

| | Materiality Threshold Amount | | Credit RWA |
|---|---|---|---|
| **(e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** | | 1250% | |

| | Credit RWA |
|---|---|
| **Sub-total for Bank Asset Sub-Class (include defaulted loans) (inclusive of the RWA due to the materality threshold)** | |
| **Sub-total for Bank Asset Sub-Class (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)** | |

**(Exclude exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637)**

2. Bank Asset Sub-class Exposure to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637

| Internal Rating System | | | | Before CRM | | | Adjustments for CRM | | | After CRM | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Obligor Grade | PD range (%) | | | Notional Amount | | Gross Exposure | (Outflows) due to Credit Protection Bought | Inflows due to Credit Protection Sold | Adjustments to SFTs | EAD | Exposure Weighted Average PD (%) | Exposure Weighted Average LGD (%) | Exposure Weighted Average M (years) | Number of Obligors | EL Amount | Credit RWA |
| | Lower | Upper | Average | | | | | | | | | | | | | |
| (a) | | | (b) | | | (c) | (d) | (e) | (f) | (g=c+d+e+f) | | (k) from 2-2B-LGD | | | | |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(d) SFTs** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **Sub-Total for Bank Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | | | | | |
| **Sub-Total for Bank Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | | | | | | |

**(Only include exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637)**

| | Materiality Threshold Amount | | Credit RWA |
|---|---|---|---|
| **(e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** | | 1250% | |

| | Credit RWA |
|---|---|
| **Sub-total for Bank Asset Sub-Class (include defaulted loans) (inclusive of the RWA due to the materality threshold)** | |
| **Sub-total for Bank Asset Sub-Class (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)** | |

**(Only include exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637)**

3. Total Bank Asset Sub-Class Exposure

| | Gross Exposure | (Outflows) due to Credit Protection Bought | Inflows due to Credit Protection Sold | Adjustments to SFTs | EAD | Exposure Weighted Average PD (%) | Exposure Weighted Average LGD (%) | Exposure Weighted Average M (years) | Number of Obligors | EL Amount | Credit RWA |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total for Bank Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | |
| **Total for Bank Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | |

| | Credit RWA |
|---|---|
| **Total for Bank Asset Sub-Class (include defaulted loans) (inclusive of the RWA due to the materality threshold)** | |
| **Total for Bank Asset Sub-Class (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)** | |

**F-IRBA - BANK ASSET SUB-CLASS**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-2B-LGD**
**(In S$ million)**

| | Obligor Grade | Average PD | Total EAD | EAD segmented by collateral/facility type | | | | | | | | | Exposure Weighted Average LGD (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Subordinated claims | Unsecured senior claims | Eligible Physical Collateral - Industrial Properties | Eligible Physical Collateral - Land in Singapore | Other Eligible Physical Collateral | Eligible CRE | Eligible RRE | Eligible receivables | Eligible financial collateral | |
| | | | | LGD = 75% | LGD = 45% | LGD = 40% | LGD = 40% | LGD = 40% | LGD = 35% | LGD = 35% | LGD = 35% | LGD = 0% | |
| | (a) from 2-2B-RWA | (b) from 2-2B-RWA | (a=b+c+d+e+f+g+h+i+j) (g) from 2-2B-RWA Panel 1 & 2 | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) |
| **(a)** | **On-balance Sheet Exposures** | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | | Default (100%) | | | | | | | | | | | |
| | Sub-Total (include defaulted loans) | | | | | | | | | | | | |
| | Sub-Total (exclude defaulted loans) | | | | | | | | | | | | |
| **(b)** | **Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)** | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | | Default (100%) | | | | | | | | | | | |
| | Sub-Total (include defaulted loans) | | | | | | | | | | | | |
| | Sub-Total (exclude defaulted loans) | | | | | | | | | | | | |
| **(c)** | **OTC Derivative Transactions** | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | | Default (100%) | | | | | | | | | | | |
| | Sub-Total (include defaulted loans) | | | | | | | | | | | | |
| | Sub-Total (exclude defaulted loans) | | | | | | | | | | | | |
| **(d)** | **SFTs** | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | | Default (100%) | | | | | | | | | | | |
| | Sub-Total (include defaulted loans) | | | | | | | | | | | | |
| | Sub-Total (exclude defaulted loans) | | | | | | | | | | | | |
| **Total for Bank Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | | |
| **Total for Bank Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | | | |

[MAS Notice 637 (Amendment) 2016]

**MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES** **Annex 12B**
**SCHEDULE 2-2C**

**F-IRBA - CORPORATE ASSET SUB-CLASS**
(Exposures not subject to double default framework)

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-2C-RWA**
**(In S$ million)**

**1. Corporate Asset Sub-Class Exposure, excluding exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637**

| Internal Rating System | | | | Before CRM | | | Adjustments for CRM | | | After CRM | | | | Number of Obligors | EL Amount | Credit RWA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Obligor Grade | PD range (%) | | | Notional Amount | | Gross Exposure | (Outflows) due to Credit Protection Bought | Inflows due to Credit Protection Sold | Adjustments to SFTs | EAD | Exposure Weighted Average PD (%) | Exposure Weighted Average LGD (%) | Exposure Weighted Average M (years) | | | |
| | Lower | Upper | Average | | | | | | | | | | | | | |
| (a) | | | (b) | | | (c) | (d) | (e) | (f) | (g=c+d+e+f) | | (k) from 2-2C-LGD | | | | |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(d) SFTs** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **Sub-Total for Corporate Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | | | | | |
| **Sub-Total for Corporate Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | | | | | | |

**(Not subject to Double Default Framework)**
**(Exclude exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637)**

| | Materiality Threshold Amount | | Credit RWA |
|---|---|---|---|
| **(e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** | | 1250% | |

**Sub-total for Corporate Asset Sub-Class (include defaulted loans) (inclusive of the RWA due to the materality threshold)**
**Sub-total for Corporate Asset Sub-Class (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)**
**(Not subject to Double Default Framework)**
**(Exclude exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637)**

| | Gross Exposure | Exposure Weighted Average M (years) | Number of Obligors | EL Amount: Default risk | EL Amount: Dilution risk | Credit RWA: Default risk | Credit RWA: Dilution risk |
|---|---|---|---|---|---|---|---|
| **(f) Purchased Receivables** | | | | | | | |

2. Corporate Asset Sub-class Exposure to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637

| Internal Rating System | | | | Before CRM | | | Adjustments for CRM | | | After CRM | | | | Number of Obligors | EL Amount | Credit RWA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Obligor Grade | PD range (%) | | | Notional Amount | | Gross Exposure | (Outflows) due to Credit Protection Bought | Inflows due to Credit Protection Sold | Adjustments to SFTs | EAD | Exposure Weighted Average PD (%) | Exposure Weighted Average LGD (%) | Exposure Weighted Average M (years) | | | |
| | Lower | Upper | Average | | | | | | | | | | | | | |
| (a) | | | (b) | | | (c) | (d) | (e) | (f) | (g=c+d+e+f) | | (k) from 2-2C-LGD | | | | |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(d) SFTs** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **Sub-Total for Corporate Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | | | | | |
| **Sub-Total for Corporate Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | | | | | | |
| **(Not subject to Double Default Framework)** | | | | | | | | | | | | | | | | |
| **(Only include exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637)** | | | | | | | | | | | | | | | | |

| | Materiality Threshold Amount | | Credit RWA |
|---|---|---|---|
| **(e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** | | 1250% | |
| **Sub-total for Corporate Asset Sub-Class (include defaulted loans) (inclusive of the RWA due to the materality threshold)** | | | |
| **Sub-total for Corporate Asset Sub-Class (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)** | | | |
| **(Not subject to Double Default Framework)** | | | |
| **(Only include exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637)** | | | |

| | Gross Exposure | Exposure Weighted Average M (years) | Number of Obligors | EL Amount: Default risk | EL Amount: Dilution risk | Credit RWA: Default risk | Credit RWA: Dilution risk |
|---|---|---|---|---|---|---|---|
| **(f) Purchased Receivables** | | | | | | | |

**3. Total Corporate Asset Sub-Class Exposure**

| | Gross Exposure | (Outflows) due to Credit Protection Bought | Inflows due to Credit Protection Sold | Adjustments to SFTs | EAD | Exposure Weighted Average PD (%) | Exposure Weighted Average LGD (%) | Exposure Weighted Average M (years) | Number of Obligors | EL Amount | Credit RWA |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total for Corporate Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | |
| **Total for Corporate Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | |
| **(Not subject to Double Default Framework)** | | | | | | | | | | | |
| **Total for Corporate Asset Sub-Class (include defaulted loans) (inclusive of the RWA due to the materality threshold)** | | | | | | | | | | | |
| **Total for Corporate Asset Sub-Class (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)** | | | | | | | | | | | |
| **(Not subject to Double Default Framework)** | | | | | | | | | | | |

**F-IRBA - CORPORATE ASSET SUB-CLASS**
(Exposures not subject to double default framework)

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-2C-LGD**
**(In S$ million)**

| Obligor Grade | Average PD | Total EAD | EAD segmented by collateral/facility type | | | | | | | | | Exposure Weighted Average LGD (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Subordinated claims | Unsecured senior claims | Eligible Physical Collateral - Industrial Properties | Eligible Physical Collateral - Land in Singapore | Other Eligible Physical Collateral | Eligible CRE | Eligible RRE | Eligible receivables | Eligible financial collateral | |
| | | | LGD = 75% | LGD = 45% | LGD = 40% | LGD = 40% | LGD = 40% | LGD = 35% | LGD = 35% | LGD = 35% | LGD = 0% | |
| (a) from 2-2C-RWA | (b) from 2-2C-RWA | (a=b+c+d+e+f+g+h+i+j) (g) from 2-2C-RWA Panel 1 & 2 | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)** | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | |
| **(d) SFTs** | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | |
| **Total for Corporate Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | |
| **Total for Corporate Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | | |

[MAS Notice 637 (Amendment) 2016]

**MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES** **Annex 12B**
**SCHEDULE 2-2D**

**F-IRBA - CORPORATE SMALL BUSINESS ASSET SUB-CLASS**
(Exposures not subject to double default framework)

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-2D-RWA**
**(In S$ million)**

**1. Corporate Small Business Asset Sub-Class Exposure, excluding exposures to financial institutions that meet the criteria stated in Para 7.4.22A of MAS Notice 637**

| Internal Rating System | | | | Before CRM | | | Adjustments for CRM | | | After CRM | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Obligor Grade | PD range (%) | | | Notional Amount | | Gross Exposure | (Outflows) due to Credit Protection Bought | Inflows due to Credit Protection Sold | Adjustments to SFTs | EAD | Exposure Weighted Average PD (%) | Exposure Weighted Average LGD (%) | Exposure Weighted Average M (years) | Exposure Weighted Average Firm Size | Number of Obligors | EL Amount | Credit RWA |
| | Lower | Upper | Average | | | | | | | | | | | | | | |
| (a) | | | (b) | | | (c) | (d) | (e) | (f) | (g=c+d+e+f) | | (k) from 2-2D-LGD | | | | | |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)** | | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(d) SFTs** | | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **Sub-total for Corp Small Business Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | | | | | | |
| **Sub-total for Corp Small Business Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | | | | | | | |

**(Not subject to Double Default Framework)**
**(Exclude exposures to financial institutions that meet the criteria stated in Para 7.4.22A of MAS Notice 637)**

| | Materiality Threshold Amount | | Credit RWA |
|---|---|---|---|
| **(e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** | | 1250% | |
| **Sub-total for Corp Small Business Asset Sub-Class (include defaulted loans) (inclusive of the RWA due to the materiality threshold)** | | | |
| **Sub-total for Corp Small Business Asset Sub-Class (exclude defaulted loans) (inclusive of the RWA due to the materiality threshold)** | | | |

**(Not subject to Double Default Framework)**
**(Exclude exposures to financial institutions that meet the criteria stated in Para 7.4.22A of MAS Notice 637)**

| | Gross Exposure | | Number of Obligors | EL Amount: Default risk | EL Amount: Dilution risk | Credit RWA: Default risk | Credit RWA: Dilution risk |
|---|---|---|---|---|---|---|---|
| **(f) Purchased Receivables** | | | | | | | |

2. Corporate Small Business Asset Sub-Class Exposure to financial institutions that meet the criteria stated in Para 7.4.22A of MAS Notice 637

| Internal Rating System | | | | Before CRM | | | Adjustments for CRM | | | After CRM | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Obligor Grade | PD range (%) Lower | Upper | Average | Notional Amount | | Gross Exposure | (Outflows) due to Credit Protection Bought | Inflows due to Credit Protection Sold | Adjustments to SFTs | EAD | Exposure Weighted Average PD (%) | Exposure Weighted Average LGD (%) | Exposure Weighted Average M (years) | Exposure Weighted Average Firm Size | Number of Obligors | EL Amount | Credit RWA |
| (a) | | | (b) | | | (c) | (d) | (e) | (f) | (g=c+d+e+f) | | (k) from 2-2D-LGD | | | | | |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)** | | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(d) SFTs** | | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **Sub-total for Corp Small Business Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | | | | | | |
| **Sub-total for Corp Small Business Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | | | | | | | |

**(Not subject to Double Default Framework)**
**(Only include exposures to financial institutions that meet the criteria stated in Para 7.4.22A of MAS Notice 637)**

| | Materiality Threshold Amount | | Credit RWA |
|---|---|---|---|
| **(e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** | | 1250% | |
| **Sub-total for Corp Small Business Asset Sub-Class (include defaulted loans) (inclusive of the RWA due to the materality threshold)** | | | |
| **Sub-total for Corp Small Business Asset Sub-Class (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)** | | | |

**(Not subject to Double Default Framework)**
**(Only include exposures to financial institutions that meet the criteria stated in Para 7.4.22A of MAS Notice 637)**

| | Gross Exposure | Exposure Weighted Average M (years) | Number of Obligors | EL Amount Default risk | EL Amount Dilution risk | Credit RWA Default risk | Credit RWA Dilution risk |
|---|---|---|---|---|---|---|---|
| **(f) Purchased Receivables** | | | | | | | |

**3. Total Corporate Small Business Asset Sub-Class Exposure**

| | Gross Exposure | (Outflows) due to Credit Protection Bought | Inflows due to Credit Protection Sold | Adjustments to SFTs | EAD | Exposure Weighted Average PD (%) | Exposure Weighted Average LGD (%) | Exposure Weighted Average M (years) | Exposure Weighted Average Firm Size | Number of Obligors | EL Amount | Credit RWA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total for Corp Small Business Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | |
| **Total for Corp Small Business Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | | |

**(Not subject to Double Default Framework)**

| | Credit RWA |
|---|---|
| **Total for Corp Small Business Asset Sub-Class (include defaulted loans) (inclusive of the RWA due to the materality threshold)** | |
| **Total for Corp Small Business Asset Sub-Class (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)** | |

**(Not subject to Double Default Framework)**

**F-IRBA - CORPORATE SMALL BUSINESS ASSET SUB-CLASS**
(Exposures not subject to double default framework)

**Name of the Reporting Bank:** ____________________

**Statement as at:** ____________________

**Scope of Reporting:** ____________________

**Table 2-2D-LGD**
**(In S$ million)**

| Obligor Grade | Average PD | Total EAD | EAD segmented by collateral/facility type | | | | | | | | | Exposure Weighted Average LGD (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Subordinated claims | Unsecured senior claims | Eligible Physical Collateral - Industrial Properties | Eligible Physical Collateral - Land in Singapore | Other Eligible Physical Collateral | Eligible CRE | Eligible RRE | Eligible receivables | Eligible financial collateral | |
| | | | LGD = 75% | LGD = 45% | LGD = 40% | LGD = 40% | LGD = 40% | LGD = 35% | LGD = 35% | LGD = 35% | LGD = 0% | |
| (a) from 2-2D-RWA | (b) from 2-2D-RWA | (a=b+c+d+e+f+g+h+i+j)<br>(g) from 2-2D-RWA Panel 1 & 2 | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)** | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | |
| **(d) SFTs** | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | |
| **Total for Corp Small Business Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | |
| **Total for Corp Small Business Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | | |

[MAS Notice 637 (Amendment) 2016]

MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES
SCHEDULE 2-2E

Annex 12B

**F-IRBA - SL ASSET SUB-CLASS: IPRE**
(Exposures not subject to double default framework)

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-2E-RWA**
**(In S$ million)**

**1. SL Asset Sub-Class: IPRE Exposure, excluding exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637**

| Internal Rating System | | | | Before CRM | | | Adjustments for CRM | | After CRM | | | | Number of Obligors | EL Amount | Credit RWA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Obligor Grade | PD range (%) Lower | Upper | Average | Notional Amount | | Gross Exposure | (Outflows) due to Credit Protection Bought | Inflows due to Credit Protection Sold | EAD | Exposure Weighted Average PD (%) | Exposure Weighted Average LGD (%) | Exposure Weighted Average M (years) | | | |
| (a) | | | (b) | | | (c) | (d) | (e) | (f=c+d+e) | | (k) from 2-2E-LGD | | | | |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions)** | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | |
| **(d) Sub-total for SL Asset Sub-Class: IPRE (include defaulted loans)** | | | | | | | | | | | | | | | |
| **Sub-total for SL Asset Sub-Class: IPRE (exclude defaulted loans)** | | | | | | | | | | | | | | | |

**(Not subject to Double Default Framework)**
**(Exclude exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637)**

| | Materiality Threshold Amount | | Credit RWA |
|---|---|---|---|
| **(e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** | | 1250% | |
| **Sub-total for SL Asset Sub-Class: IPRE (include defaulted loans) (Inclusive of the RWA due to the materality threshold)** | | | |
| **Sub-total for SL Asset Sub-Class: IPRE (exclude defaulted loans) (Inclusive of the RWA due to the materality threshold)** | | | |

**(Not subject to Double Default Framework)**
**(Exclude exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637)**

| | Gross Exposure | Exposure Weighted Average M (years) | Number of Obligors | EL Amount Default risk | EL Amount Dilution risk | Credit RWA Default risk | Credit RWA Dilution risk |
|---|---|---|---|---|---|---|---|
| **(f) Purchased Receivables** | | | | | | | |

2. SL Asset Sub-Class: IPRE Exposure to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637

| Internal Rating System | | | | Before CRM | | | Adjustments for CRM | | After CRM | | | | Number of Obligors | EL Amount | Credit RWA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Obligor Grade | PD range (%) | | | Notional Amount | | Gross Exposure | (Outflows) due to Credit Protection Bought | Inflows due to Credit Protection Sold | EAD | Exposure Weighted Average PD (%) | Exposure Weighted Average LGD (%) | Exposure Weighted Average M (years) | | | |
| | Lower | Upper | Average | | | | | | | | | | | | |
| (a) | | | (b) | | | (c) | (d) | (e) | (f=c+d+e) | | (k) from 2-2E-LGD | | | | |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions)** | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | |

**(d) Sub-total for SL Asset Sub-Class: IPRE (include defaulted loans)**
**Sub-total for SL Asset Sub-Class: IPRE (exclude defaulted loans)**
**(Not subject to Double Default Framework)**
**(Only include exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637)**

| | Materiality Threshold Amount | | Credit RWA |
|---|---|---|---|
| **(e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** | | 1250% | |

**Sub-total for SL Asset Sub-Class: IPRE (include defaulted loans) (Inclusive of the RWA due to the materality threshold)**
**Sub-total for SL Asset Sub-Class: IPRE (exclude defaulted loans) (Inclusive of the RWA due to the materality threshold)**
**(Not subject to Double Default Framework)**
**(Only include exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637)**

| | EL Amount: Default risk | EL Amount: Dilution risk | Credit RWA: Default risk | Credit RWA: Dilution risk |
|---|---|---|---|---|
| **(f) Purchased Receivables** | | | | |

**3. Total SL Asset Sub-Class: IPRE Exposure**

**Total for SL Asset Sub-Class: IPRE (include defaulted loans)**
**Total for SL Asset Sub-Class: IPRE (exclude defaulted loans)**
**(Not subject to Double Default Framework)**

**Total for SL Asset Sub-Class: IPRE (include defaulted loans) (inclusive of the RWA due to the materality threshold)**
**Total for SL Asset Sub-Class: IPRE (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)**
**(Not subject to Double Default Framework)**

**F-IRBA - SL ASSET SUB-CLASS: IPRE**
(Exposures not subject to double default framework)

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-2E-LGD**
**(In S$ million)**

| | Obligor Grade | Average PD | Total EAD | EAD segmented by collateral/facility type | | | | | | | | | Exposure Weighted Average LGD (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Subordinated claims | Unsecured senior claims | Eligible Physical Collateral - Industrial Properties | Eligible Physical Collateral - Land in Singapore | Other Eligible Physical Collateral | Eligible CRE | Eligible RRE | Eligible receivables | Eligible financial collateral | |
| | | | | LGD = 75% | LGD = 45% | LGD = 40% | LGD = 40% | LGD = 40% | LGD = 35% | LGD = 35% | LGD = 35% | LGD = 0% | |
| | (a) from 2-2E-RWA | (b) from 2-2E-RWA | (a=b+c+d+e+f+g+h+i+j) (f) from 2-2E-RWA Panel 1 & 2 | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) |
| **(a)** | **On-balance Sheet Exposures** | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | | Default (100%) | | | | | | | | | | | |
| | Sub-Total (include defaulted loans) | | | | | | | | | | | | |
| | Sub-Total (exclude defaulted loans) | | | | | | | | | | | | |
| **(b)** | **Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)** | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | | Default (100%) | | | | | | | | | | | |
| | Sub-Total (include defaulted loans) | | | | | | | | | | | | |
| | Sub-Total (exclude defaulted loans) | | | | | | | | | | | | |
| **(c)** | **OTC Derivative Transactions** | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | | Default (100%) | | | | | | | | | | | |
| | Sub-Total (include defaulted loans) | | | | | | | | | | | | |
| | Sub-Total (exclude defaulted loans) | | | | | | | | | | | | |
| **Total for SL Asset Sub-Class: IPRE (include defaulted loans)** | | | | | | | | | | | | | |
| **Total for SL Asset Sub-Class: IPRE (exclude defaulted loans)** | | | | | | | | | | | | | |

[MAS Notice 637 (Amendment No. 2) 2014]
[MAS Notice 637 (Amendment) 2016]

MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES
SCHEDULE 2-2F

Annex 12B

**F-IRBA - SL ASSET SUB-CLASS: PF/OF/CF**
(Exposures not subject to double default framework)

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-2F-RWA**
**(In S$ million)**

| Internal Rating System | | | | Before CRM | | | Adjustments for CRM | | After CRM | | | | Number of Obligors | EL Amount | Credit RWA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Obligor Grade | PD range (%) | | | Notional Amount | | Gross Exposure | (Outflows) due to Credit Protection Bought | Inflows due to Credit Protection Sold | EAD | Exposure Weighted Average PD (%) | Exposure Weighted Average LGD (%) | Exposure Weighted Average M (years) | | | |
| | Lower | Upper | Average | | | | | | | | | | | | |
| (a) | | | (b) | | | (c) | (d) | (e) | (f=c+d+e) | | (k) from 2-2F-LGD | | | | |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions)** | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | |
| **(d) Total for SL Asset Sub-Class: PF/OF/CF (include defaulted loans)** | | | | | | | | | | | | | | | |
| **Total for SL Asset Sub-Class: PF/OF/CF (exclude defaulted loans)** | | | | | | | | | | | | | | | |
| **(Not subject to Double Default Framework)** | | | | | | | | | | | | | | | |

| | Materiality Threshold Amount | | Credit RWA |
|---|---|---|---|
| **(e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** | | 1250% | |
| **Total for SL Asset Sub-Class: PF/OF/CF (include defaulted loans) (inclusive of the RWA due to the materality threshold)** | | | |
| **Total for SL Asset Sub-Class: PF/OF/CF (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)** | | | |
| **(Not subject to Double Default Framework)** | | | |

| | Gross Exposure | Exposure Weighted Average M (years) | Number of Obligors | EL Amount: Default risk | EL Amount: Dilution risk | Credit RWA: Default risk | Credit RWA: Dilution risk |
|---|---|---|---|---|---|---|---|
| **(f) Purchased Receivables** | | | | | | | |

**F-IRBA - SL ASSET SUB-CLASS: PF/OF/CF**
(Exposures not subject to double default framework)

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-2F-LGD**
**(In S$ million)**

| Obligor Grade | Average PD | Total EAD | EAD segmented by collateral/facility type | | | | | | | | | Exposure Weighted Average LGD (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Subordinated claims | Unsecured senior claims | Eligible Physical Collateral - Industrial Properties | Eligible Physical Collateral - Land in Singapore | Other Eligible Physical Collateral | Eligible CRE | Eligible RRE | Eligible receivables | Eligible financial collateral | |
| | | | LGD = 75% | LGD = 45% | LGD = 40% | LGD = 40% | LGD = 40% | LGD = 35% | LGD = 35% | LGD = 35% | LGD = 0% | |
| (a) from 2-2F-RWA | (b) from 2-2F-RWA | (a=b+c+d+e+f+g+h+i+j) (f) from 2-2F-RWA | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)** | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| . | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | |
| **Total for SL Asset Sub-Class: PF/OF/CF (include defaulted loans)** | | | | | | | | | | | | |
| **Total for SL Asset Sub-Class: PF/OF/CF (exclude defaulted loans)** | | | | | | | | | | | | |

[MAS Notice 637 (Amendment) 2016]

**MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES** **Annex 12B**
**SCHEDULE 2-2G**

**F-IRBA - HVCRE ASSET SUB-CLASS**
(Exposures not subject to double default framework)

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-2G-RWA**
**(In S$ million)**

| Internal Rating System | | | | Before CRM | | | Adjustments for CRM | | After CRM | | | | Number of Obligors | EL Amount | Credit RWA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Obligor Grade | PD range (%) | | | Notional Amount | | Gross Exposure | (Outflows) due to Credit Protection Bought | Inflows due to Credit Protection Sold | EAD | Exposure Weighted Average PD (%) | Exposure Weighted Average LGD (%) | Exposure Weighted Average M (years) | | | |
| | Lower | Upper | Average | | | | | | | | | | | | |
| (a) | | | (b) | | | (c) | (d) | (e) | (f=c+d+e) | | (k) from 2-2G-LGD | | | | |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions)** | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | |
| **(d) Total for HVCRE Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | | | | |
| **Total for HVCRE Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | | | | | |
| **(Not subject to Double Default Framework)** | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | **Materiality Threshold Amount** | | | |
| **(e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** | | | | | | | | | | | | | 1250% | | |
| **Total for HVCRE Asset Sub-Class (include defaulted loans) (inclusive of the RWA due to the materality threshold)** | | | | | | | | | | | | | | | |
| **Total for HVCRE Asset Sub-Class (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)** | | | | | | | | | | | | | | | |
| **(Not subject to Double Default Framework)** | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | **Default risk** / **Dilution risk** | **Default risk** / **Dilution risk** |
| **(f) Purchased Receivables** | | | | | | | | | | | | | | | |

MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES
SCHEDULE 2-2G

Annex 12B

**F-IRBA - HVCRE ASSET SUB-CLASS**
(Exposures not subject to double default framework)

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-2G-LGD**
**(In S$ million)**

| | Obligor Grade | Average PD | Total EAD | EAD segmented by collateral/facility type: Subordinated claims LGD = 75% | Unsecured senior claims LGD = 45% | Eligible Physical Collateral - Industrial Properties LGD = 40% | Eligible Physical Collateral - Land in Singapore LGD = 40% | Other Eligible Physical Collateral LGD = 40% | Eligible CRE LGD = 35% | Eligible RRE LGD = 35% | Eligible receivables LGD = 35% | Eligible financial collateral LGD = 0% | Exposure Weighted Average LGD (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (a) from 2-2G-RWA | (b) from 2-2G-RWA | (a=b+c+d+e+f+g+h+i+j) (f) from 2-2G-RWA | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) |
| (a) | On-balance Sheet Exposures | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | | Default (100%) | | | | | | | | | | | |
| | Sub-Total (include defaulted loans) | | | | | | | | | | | | |
| | Sub-Total (exclude defaulted loans) | | | | | | | | | | | | |
| (b) | Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs) | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | | Default (100%) | | | | | | | | | | | |
| | Sub-Total (include defaulted loans) | | | | | | | | | | | | |
| | Sub-Total (exclude defaulted loans) | | | | | | | | | | | | |
| (c) | OTC Derivative Transactions | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | . | | | | | | | | | | | | |
| | | Default (100%) | | | | | | | | | | | |
| | Sub-Total (include defaulted loans) | | | | | | | | | | | | |
| | Sub-Total (exclude defaulted loans) | | | | | | | | | | | | |
| **Total for HVCRE Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | | |
| **Total for HVCRE Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | | | |

[MAS Notice 637 (Amendment) 2016]

MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES
SCHEDULE 2-2H

Annex 12B

**F-IRBA - EXPOSURES SUBJECT TO DOUBLE DEFAULT FRAMEWORK**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

(In S$ million)

| Internal Rating System | | | | Before CRM | | | Adjustments for CRM | After CRM | | | Number of Obligors | EL Amount | Credit RWA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Obligor Grade | PD range (%) | | | Notional Amount | | Gross Exposure | Adjustments to SFTs | Exposure Weighted Average PD (%) | Exposure Weighted Average LGD (%) | Exposure Weighted Average Maturity (years) | | | |
| | Lower | Upper | Average | | | | | | | | | | |

1. Corporate Asset Sub-Class Exposure, excluding exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637

(a) On-balance Sheet Exposures

| Obligor Grade | Lower | Upper | Average | Notional Amount | | Gross Exposure | Adjustments to SFTs | EW Average PD (%) | EW Average LGD (%) | EW Average Maturity (years) | Number of Obligors | EL Amount | Credit RWA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | PD1 | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | |
| . | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | |

(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)

| Obligor Grade | Lower | Upper | Average | Notional Amount | | Gross Exposure | Adjustments to SFTs | EW Average PD (%) | EW Average LGD (%) | EW Average Maturity (years) | Number of Obligors | EL Amount | Credit RWA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | PD1 | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | |
| . | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | |

(c) OTC Derivative Transactions

| Obligor Grade | Lower | Upper | Average | Notional Amount | | Gross Exposure | Adjustments to SFTs | EW Average PD (%) | EW Average LGD (%) | EW Average Maturity (years) | Number of Obligors | EL Amount | Credit RWA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | PD1 | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | |
| . | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | |

(d) SFTs

| Obligor Grade | Lower | Upper | Average | Notional Amount | | Gross Exposure | Adjustments to SFTs | EW Average PD (%) | EW Average LGD (%) | EW Average Maturity (years) | Number of Obligors | EL Amount | Credit RWA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | PD1 | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | |
| . | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | |

**Total Corporate Asset Sub-Class (include defaulted loans)**
**Total Corporate Asset Sub-Class (exclude defaulted loans)**
**(Subject to Double Default Framework)**
**(Exclude exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637)**

| | Materiality Threshold Amount | | Credit RWA |
|---|---|---|---|
| (e) **Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** | | 1250% | |

**Sub-total for Corporate Asset Sub-Class (include defaulted loans) (inclusive of the RWA due to the materality threshold)**
**Sub-total for Corporate Asset Sub-Class (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)**
**(Subject to Double Default Framework)**
**(Exclude exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637)**

2. Corporate Asset Sub-class Exposure to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637

(a) On-balance Sheet Exposures

| Obligor Grade | Lower | Upper | Average | Notional Amount | | Gross Exposure | Adjustments to SFTs | EW Average PD (%) | EW Average LGD (%) | EW Average Maturity (years) | Number of Obligors | EL Amount | Credit RWA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | PD1 | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | |
| . | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | |

(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)

| Obligor Grade | Lower | Upper | Average | Notional Amount | | Gross Exposure | Adjustments to SFTs | EW Average PD (%) | EW Average LGD (%) | EW Average Maturity (years) | Number of Obligors | EL Amount | Credit RWA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | PD1 | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | |
| . | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | |

**(c) OTC Derivative Transactions**

| | | | |
|---|---|---|---|
| 1 | | | PD1 |
| 2 | | | PD2 |
| 3 | | | PD3 |
| . | | | PD4 |
| . | | | |
| . | | | |
| Sub-Total (include defaulted loans) | | | |
| Sub-Total (exclude defaulted loans) | | | |

**(d) SFTs**

| | | | |
|---|---|---|---|
| 1 | | | PD1 |
| 2 | | | PD2 |
| 3 | | | PD3 |
| . | | | PD4 |
| . | | | |
| . | | | |
| Sub-Total (include defaulted loans) | | | |
| Sub-Total (exclude defaulted loans) | | | |

**Total Corporate Asset Sub-Class (include defaulted loans)**
**Total Corporate Asset Sub-Class (exclude defaulted loans)**
**(Subject to Double Default Framework)**
**(Only include exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637)**

| | Materiality Threshold Amount | |
|---|---|---|
| **(e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** | | 1250% |

**Sub-total for Corporate Asset Sub-Class (include defaulted loans) (inclusive of the RWA due to the materality threshold)**
**Sub-total for Corporate Asset Sub-Class (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)**
**(Subject to Double Default Framework)**
**(Only include exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637)**

**Total for Corporate Asset Sub-Class (include defaulted loans)**
**Total for Corporate Asset Sub-Class (exclude defaulted loans)**
**(Subject to Double Default Framework)**

**Total for Corporate Asset Sub-Class (include defaulted loans) (inclusive of the RWA due to the materality threshold)**
**Total for Corporate Asset Sub-Class (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)**
**(Subject to Double Default Framework)**

**3. Corporate Small Business Asset Sub-Class Exposure, excluding exposures to financial institutions that meet the criteria stated in Para 7.4.22A of MAS Notice 637**

**(a) On-balance Sheet Exposures**

| | | |
|---|---|---|
| 1 | | PD1 |
| 2 | | PD2 |
| 3 | | PD3 |
| . | | PD4 |
| . | | |
| . | | |
| Sub-Total (include defaulted loans) | | |
| Sub-Total (exclude defaulted loans) | | |

**(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)**

| | | |
|---|---|---|
| 1 | | PD1 |
| 2 | | PD2 |
| 3 | | PD3 |
| . | | PD4 |
| . | | |
| . | | |
| Sub-Total (include defaulted loans) | | |
| Sub-Total (exclude defaulted loans) | | |

**(c) OTC Derivative Transactions**

| | | |
|---|---|---|
| 1 | | PD1 |
| 2 | | PD2 |
| 3 | | PD3 |
| . | | PD4 |
| . | | |
| . | | |
| Sub-Total (include defaulted loans) | | |
| Sub-Total (exclude defaulted loans) | | |

**(d) SFTs**

| | | |
|---|---|---|
| 1 | | PD1 |
| 2 | | PD2 |
| 3 | | PD3 |
| . | | PD4 |
| . | | |
| . | | |
| Sub-Total (include defaulted loans) | | |
| Sub-Total (exclude defaulted loans) | | |

**Total Corp Small Business Asset Sub-Class (include defaulted loans)**
**Total Corp Small Business Asset Sub-Class (exclude defaulted loans)**
**(Subject to Double Default Framework)**
**(Exclude exposures to financial institutions that meet the criteria stated in Para 7.4.22A of MAS Notice 637)**

| | Materiality Threshold Amount | |
|---|---|---|
| **(e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** | | 1250% |

**Sub-total for Corp Small Business  Asset Sub-Class (include defaulted loans) (inclusive of the RWA due to the materality threshold)**
**Sub-total for Corp Small Business Asset Sub-Class (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)**
**(Subject to Double Default Framework)**
**(Exclude exposures to financial institutions that meet the criteria stated in Para 7.4.22A of MAS Notice 637)**

**4. Corporate Small Business Asset Sub-Class Exposure to financial institutions that meet the criteria stated in Para 7.4.22A of MAS Notice 637**

**(a) On-balance Sheet Exposures**

| | | |
|---|---|---|
| 1 | | PD1 |
| 2 | | PD2 |
| 3 | | PD3 |
| . | | PD4 |
| . | | |
| . | | |
| Sub-Total (include defaulted loans) | | |
| Sub-Total (exclude defaulted loans) | | |

**(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)**

| | | |
|---|---|---|
| 1 | | PD1 |
| 2 | | PD2 |
| 3 | | PD3 |
| . | | PD4 |
| . | | |
| . | | |
| Sub-Total (include defaulted loans) | | |
| Sub-Total (exclude defaulted loans) | | |

**(c) OTC Derivative Transactions**

| | | |
|---|---|---|
| 1 | | PD1 |
| 2 | | PD2 |
| 3 | | PD3 |
| . | | PD4 |
| . | | |
| . | | |
| Sub-Total (include defaulted loans) | | |
| Sub-Total (exclude defaulted loans) | | |

**(d) SFTs**

| | | |
|---|---|---|
| 1 | | PD1 |
| 2 | | PD2 |
| 3 | | PD3 |
| . | | PD4 |
| . | | |
| . | | |
| Sub-Total (include defaulted loans) | | |
| Sub-Total (exclude defaulted loans) | | |

**Total Corp Small Business Asset Sub-Class (include defaulted loans)**
**Total Corp Small Business Asset Sub-Class (exclude defaulted loans)**
**(Subject to Double Default Framework)**
**(Only include exposures to financial institutions that meet the criteria stated in Para 7.4.22A of MAS Notice 637)**

| | Materiality Threshold Amount | |
|---|---|---|
| **(e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** | | 1250% |

**Sub-total for Corp Small Business Asset Sub-Class (include defaulted loans) (inclusive of the RWA due to the materality threshold)**
**Sub-total for Corp Small Business Asset Sub-Class (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)**
**(Subject to Double Default Framework)**
**(Only include exposures to financial institutions that meet the criteria stated in Para 7.4.22A of MAS Notice 637)**

**Total for Corp Small Business Asset Sub-Class (include defaulted loans)**
**Total for Corp Small Business Asset Sub-Class (exclude defaulted loans)**
**(Subject to Double Default Framework)**

**Total for Corp Small Business Asset Sub-Class (include defaulted loans) (inclusive of the RWA due to the materality threshold)**
**Total for Corp Small Business Asset Sub-Class (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)**
**(Subject to Double Default Framework)**

**5. SL Asset Sub-Class: IPRE**

**(a) On-balance Sheet Exposures**

| | |
|---|---|
| 1 | PD1 |
| 2 | PD2 |
| 3 | PD3 |
| . | PD4 |
| . | |
| . | |
| Sub-Total (include defaulted loans) | |
| Sub-Total (exclude defaulted loans) | |

**(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)**

| | |
|---|---|
| 1 | PD1 |
| 2 | PD2 |
| 3 | PD3 |
| . | PD4 |
| . | |
| . | |
| Sub-Total (include defaulted loans) | |
| Sub-Total (exclude defaulted loans) | |

**(c) OTC Derivative Transactions**

| | |
|---|---|
| 1 | PD1 |
| 2 | PD2 |
| 3 | PD3 |
| . | PD4 |
| . | |
| . | |
| Sub-Total (include defaulted loans) | |
| Sub-Total (exclude defaulted loans) | |

**Total SL Asset Sub-Class: IPRE (include defaulted loans)**
**Total SL Asset Sub-Class: IPRE (exclude defaulted loans)**
**(Subject to Double Default Framework)**

**Materiality Threshold Amount**

**(d) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** — 1250%

**Total SL Asset Sub-Class: IPRE (include defaulted loans) (inclusive of the RWA due to the materality threshold)**
**Total SL Asset Sub-Class: IPRE (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)**
**(Subject to Double Default Framework)**

**6. SL Asset Sub-Class: PF/OF/CF**

**(a) On-balance Sheet Exposures**

| | |
|---|---|
| 1 | PD1 |
| 2 | PD2 |
| 3 | PD3 |
| . | PD4 |
| . | |
| . | |
| Sub-Total (include defaulted loans) | |
| Sub-Total (exclude defaulted loans) | |

**(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)**

| | |
|---|---|
| 1 | PD1 |
| 2 | PD2 |
| 3 | PD3 |
| . | PD4 |
| . | |
| . | |
| Sub-Total (include defaulted loans) | |
| Sub-Total (exclude defaulted loans) | |

**(c) OTC Derivative Transactions**

| | |
|---|---|
| 1 | PD1 |
| 2 | PD2 |
| 3 | PD3 |
| . | PD4 |
| . | |
| . | |
| Sub-Total (include defaulted loans) | |
| Sub-Total (exclude defaulted loans) | |

**Total SL Asset Sub-Class: PF/OF/CF (include defaulted loans)**
**Total SL Asset Sub-Class: PF/OF/CF (exclude defaulted loans)**
**(Subject to Double Default Framework)**

**Materiality Threshold Amount**

**(d) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** — 1250%

**Total SL Asset Sub-Class: PF/OF/CF (include defaulted loans) (inclusive of the RWA due to the materality threshold)**
**Total SL Asset Sub-Class: PF/OF/CF (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)**
**(Subject to Double Default Framework)**

**7. HVCRE Asset Sub-Class**

**(a) On-balance Sheet Exposures**

| | | | |
|---|---|---|---|
| 1 | | | PD1 |
| 2 | | | PD2 |
| 3 | | | PD3 |
| . | | | PD4 |
| . | | | |
| . | | | |
| Sub-Total (include defaulted loans) | | | |
| Sub-Total (exclude defaulted loans) | | | |

**(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)**

| | | | |
|---|---|---|---|
| 1 | | | PD1 |
| 2 | | | PD2 |
| 3 | | | PD3 |
| . | | | PD4 |
| . | | | |
| . | | | |
| Sub-Total (include defaulted loans) | | | |
| Sub-Total (exclude defaulted loans) | | | |

**(c) OTC Derivative Transactions**

| | | | |
|---|---|---|---|
| 1 | | | PD1 |
| 2 | | | PD2 |
| 3 | | | PD3 |
| . | | | PD4 |
| . | | | |
| . | | | |
| Sub-Total (include defaulted loans) | | | |
| Sub-Total (exclude defaulted loans) | | | |

**Total HVCRE Asset Sub-Class (include defaulted loans)**
**Total HVCRE Asset Sub-Class (exclude defaulted loans)**
**(Subject to Double Default Framework)**

| Materiality Threshold Amount | |
|---|---|
| | 1250% |

**(d) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure**

**Total HVCRE Asset Sub-Class (include defaulted loans) (inclusive of the RWA due to the materality threshold)**
**Total HVCRE Asset Sub-Class (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)**
**(Subject to Double Default Framework)**

**Total Exposures (include defaulted loans)**
**Total Exposures (exclude defaulted loans)**
**(Subject to Double Default Framework)**

**Total Exposures (include defaulted loans) (inclusive of the RWA due to the materality threshold)**
**Total Exposures (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)**
**(Subject to Double Default Framework)**

[MAS Notice 637 (Amendment) 2016]

**A-IRBA - SOVEREIGN ASSET SUB-CLASS**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-3A-RWA**
**(In S$ million)**

| Internal Rating System | | | | Before CRM | | | Adjustments for CRM | | | After CRM | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Obligor Grade | PD range (%) | | | Notional Amount | | Gross Exposure | (Outflows) due to Credit Protection Bought | Inflows due to Credit Protection Sold | Adjustments to SFTs | EAD | Exposure Weighted Average PD (%) | Exposure Weighted Average LGD (%) | Exposure Weighted Average M (years) | Number of Obligors | EL Amount | Credit RWA |
| | Lower | Upper | Average | | | | | | | | | | | | | |
| (a) | | | (b) | | | (c) | (d) | (e) | (f) | (g=c+d+e+f) | | (p) from 2-3A-LGD | | | | |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(d) SFTs** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **Total for Sovereign Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | | | | | |
| **Total for Sovereign Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | | | | | | |

| | Materiality Threshold Amount | | Credit RWA |
|---|---|---|---|
| **(e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** | | 1250% | |
| **Total for Sovereign Asset Sub-Class (include defaulted loans) (Inclusive of the RWA due to the materality threshold)** | | | |
| **Total for Sovereign Asset Sub-Class (exclude defaulted loans) (Inclusive of the RWA due to the materality threshold)** | | | |

MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES
SCHEDULE 2-3A

Annex 12B

**A-IRBA - SOVEREIGN ASSET SUB-CLASS**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-3A-LGD**
**(In S$ million)**

| | Obligor Grade | Average PD | Total EAD | EAD segmented by facility grade | | | | | | | | | | | | | | Exposure Weighted Average LGD (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | |
| | (a) from 2-3A-RWA | (b) from 2-3A-RWA | (a=SUM(b:o)) (g) from 2-3A-RWA | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | (m) | (n) | (o) | (p) |
| (a) | **On-balance Sheet Exposures** | | | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | | | |
| | . | | | | | | | | | | | | | | | | | |
| | . | | | | | | | | | | | | | | | | | |
| | . | | | | | | | | | | | | | | | | | |
| | | Default (100%) | | | | | | | | | | | | | | | | |
| | Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| | Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| (b) | **Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)** | | | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | | | |
| | . | | | | | | | | | | | | | | | | | |
| | . | | | | | | | | | | | | | | | | | |
| | . | | | | | | | | | | | | | | | | | |
| | | Default (100%) | | | | | | | | | | | | | | | | |
| | Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| | Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| (c) | **OTC Derivative Transactions** | | | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | | | |
| | . | | | | | | | | | | | | | | | | | |
| | . | | | | | | | | | | | | | | | | | |
| | . | | | | | | | | | | | | | | | | | |
| | | Default (100%) | | | | | | | | | | | | | | | | |
| | Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| | Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| (d) | **SFTs** | | | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | | | |
| | . | | | | | | | | | | | | | | | | | |
| | . | | | | | | | | | | | | | | | | | |
| | . | | | | | | | | | | | | | | | | | |
| | | Default (100%) | | | | | | | | | | | | | | | | |
| | Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| | Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **Total for Sovereign Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | | | | | | | |
| **Total for Sovereign Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | | | | | | | | |

**MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES**
**SCHEDULE 2-3A**

**A-IRBA - SOVEREIGN ASSET SUB-CLASS**

| | |
|---|---|
| **Name of the Reporting Bank:** | |
| **Statement as at:** | |
| **Scope of Reporting:** | |

**Table 2-3A-CCF**
**(In S$ million)**

| Nature of Transaction | Notional Amount | Credit Conversion Factor | Credit Equivalent Amounts |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| **Total for Sovereign Asset Sub-class** | | | |

[MAS Notice 637 (Amendment) 2016]

**MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES** **Annex 12B**
**SCHEDULE 2-3B**

**A-IRBA - BANK ASSET SUB-CLASS**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-3B-RWA**
**(In S$ million)**

**1. Bank Asset Sub-Class Exposure, excluding exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637**

| Internal Rating System | | | | Before CRM | | | Adjustments for CRM | | | After CRM | | | | Number of Obligors | EL Amount | Credit RWA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Obligor Grade | PD range (%) | | | Notional Amount | | Gross Exposure | (Outflows) due to Credit Protection Bought | Inflows due to Credit Protection Sold | Adjustments to SFTs | EAD | Exposure Weighted Average PD (%) | Exposure Weighted Average LGD (%) | Exposure Weighted Average M (years) | | | |
| | Lower | Upper | Average | | | | | | | | | | | | | |
| (a) | | | (b) | | | (c) | (d) | (e) | (f) | (g=c+d+e+f) | | (p) from 2-3B-LGD | | | | |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(d) SFTs** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **Sub-Total for Bank Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | | | | | |
| **Sub-Total for Bank Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | | | | | | |

**(Exclude exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637)**

| | Materiality Threshold Amount | | Credit RWA |
|---|---|---|---|
| **(e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** | | 1250% | |
| **Sub-total for Bank Asset Sub-Class (include defaulted loans) (Inclusive of the RWA due to the materality threshold)** | | | |
| **Sub-total for Bank Asset Sub-Class (exclude defaulted loans) (Inclusive of the RWA due to the materality threshold)** | | | |

**(Exclude exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637)**

2. Bank Asset Sub-class Exposure to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637

| Internal Rating System | | | | Before CRM | | | Adjustments for CRM | | | After CRM | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Obligor Grade | PD range (%) | | | Notional Amount | | Gross Exposure | (Outflows) due to Credit Protection Bought | Inflows due to Credit Protection Sold | Adjustments to SFTs | EAD | Exposure Weighted Average PD (%) | Exposure Weighted Average LGD (%) | Exposure Weighted Average M (years) | Number of Obligors | EL Amount | Credit RWA |
| | Lower | Upper | Average | | | | | | | | | | | | | |
| (a) | | | (b) | | | (c) | (d) | (e) | (f) | (g=c+d+e+f) | | (p) from 2-3B-LGD | | | | |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(d) SFTs** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **Sub-Total for Bank Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | | | | | |
| **Sub-Total for Bank Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | | | | | | |

**(Only include exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637)**

| | Materiality Threshold Amount | | Credit RWA |
|---|---|---|---|
| **(e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** | | 1250% | |

**Sub-total for Bank Asset Sub-Class (include defaulted loans) (Inclusive of the RWA due to the materiality threshold)**
**Sub-total for Bank Asset Sub-Class (exclude defaulted loans) (Inclusive of the RWA due to the materiality threshold)**
**(Only include exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637)**

3. Total Bank Asset Sub-Class Exposure

**Total for Bank Asset Sub-Class (include defaulted loans)**
**Total for Bank Asset Sub-Class (exclude defaulted loans)**

**Total for Bank Asset Sub-Class (include defaulted loans) (Inclusive of the RWA due to the materiality threshold)**
**Total for Bank Asset Sub-Class (exclude defaulted loans) (Inclusive of the RWA due to the materiality threshold)**

**A-IRBA - BANK ASSET SUB-CLASS**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-3B-LGD**
**(In S$ million)**

| Obligor Grade | Average PD | Total EAD | EAD segmented by facility grade | | | | | | | | | | | | | | Exposure Weighted Average LGD (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | |
| (a) from 2-3B-RWA | (b) from 2-3B-RWA | (a=SUM(b:o))<br>(g) from 2-3B-RWA Panel 1 & 2 | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | (m) | (n) | (o) | (p) |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | |
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| . | | | | | | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)** | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | |
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| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | |
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| . | | | | | | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(d) SFTs** | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **Total for Bank Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | | | | | | |
| **Total for Bank Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | | | | | | | |

**MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES**
**SCHEDULE 2-3B**

**A-IRBA - BANK ASSET SUB-CLASS**

| | |
|---|---|
| **Name of the Reporting Bank:** | |
| **Statement as at:** | |
| **Scope of Reporting:** | |

**Table 2-3B-CCF**
**(In S$ million)**

| Nature of Transaction | Notional Amount | Credit Conversion Factor | Credit Equivalent Amounts |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| **Total for Bank Asset Sub-class** | | | |

[MAS Notice 637 (Amendment) 2016]

MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES
SCHEDULE 2-3C

Annex 12B

**A-IRBA - CORPORATE ASSET SUB-CLASS**
(Exposures not subject to double default framework)

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-3C-RWA**
**(In S$ million)**

**1. Corporate Asset Sub-Class Exposure, excluding exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637**

| Internal Rating System | | | | Before CRM | | | Adjustments for CRM | | | After CRM | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Obligor Grade | PD range (%) Lower | PD range (%) Upper | PD range (%) Average | Notional Amount | | Gross Exposure | (Outflows) due to Credit Protection Bought | Inflows due to Credit Protection Sold | Adjustments to SFTs | EAD | Exposure Weighted Average PD (%) | Exposure Weighted Average LGD (%) | Exposure Weighted Average M (years) | Number of Obligors | EL Amount | Credit RWA |
| (a) | | | (b) | | | (c) | (d) | (e) | (f) | (g=c+d+e+f) | | (p) from 2-3C-LGD | | | | |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(d) SFTs** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **Sub-Total for Corporate Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | | | | | |
| **Sub-Total for Corporate Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | | | | | | |

**(Not subject to Double Default Framework)**
**(Exclude exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637)**

| | Materiality Threshold Amount | | Credit RWA |
|---|---|---|---|
| **(e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** | | 1250% | |

| | Credit RWA |
|---|---|
| **Sub-total for Corporate Asset Sub-Class (include defaulted loans) (inclusive of the RWA due to the materality threshold)** | |
| **Sub-total for Corporate Asset Sub-Class (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)** | |

**(Not subject to Double Default Framework)**
**(Exclude exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637)**

| | Gross Exposure | Exposure Weighted Average M (years) | Number of Obligors | EL Amount Default risk | EL Amount Dilution risk | Credit RWA Default risk | Credit RWA Dilution risk |
|---|---|---|---|---|---|---|---|
| **(f) Purchased Receivables** | | | | | | | |

**2. Corporate Asset Sub-class Exposure to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637**

| Internal Rating System | | | | Before CRM | | | Adjustments for CRM | | | After CRM | | | | Number of Obligors | EL Amount | Credit RWA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Obligor Grade | PD range (%) | | | Notional Amount | | Gross Exposure | (Outflows) due to Credit Protection Bought | Inflows due to Credit Protection Sold | Adjustments to SFTs | EAD | Exposure Weighted Average PD (%) | Exposure Weighted Average LGD (%) | Exposure Weighted Average M (years) | | | |
| | Lower | Upper | Average | | | | | | | | | | | | | |
| (a) | | | (b) | | | (c) | (d) | (e) | (f) | (g=c+d+e+f) | | (p) from 2-3C-LGD | | | | |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **(d) SFTs** | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | |
| **Sub-Total for Corporate Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | | | | | |
| **Sub-Total for Corporate Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | | | | | | |

**(Not subject to Double Default Framework)**
**(Only include exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637)**

| | Materiality Threshold Amount | | Credit RWA |
|---|---|---|---|
| **(e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** | | 1250% | |
| **Sub-total for Corporate Asset Sub-Class (include defaulted loans) (inclusive of the RWA due to the materality threshold)** | | | |
| **Sub-total for Corporate Asset Sub-Class (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)** | | | |

**(Not subject to Double Default Framework)**
**(Only include exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637)**

| | Gross Exposure | Exposure Weighted Average M (years) | Number of Obligors | EL Amount Default risk | EL Amount Dilution risk | Credit RWA Default risk | Credit RWA Dilution risk |
|---|---|---|---|---|---|---|---|
| **(f) Purchased Receivables** | | | | | | | |

**3. Total Corporate Asset Sub-Class Exposure**

| | Gross Exposure | (Outflows) due to Credit Protection Bought | Inflows due to Credit Protection Sold | Adjustments to SFTs | EAD | Exposure Weighted Average PD (%) | Exposure Weighted Average LGD (%) | Exposure Weighted Average M (years) | Number of Obligors | EL Amount | Credit RWA |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total for Corporate Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | |
| **Total for Corporate Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | |

**(Not subject to Double Default Framework)**

| | Credit RWA |
|---|---|
| **Total for Corporate Asset Sub-Class (include defaulted loans) (inclusive of the RWA due to the materality threshold)** | |
| **Total for Corporate Asset Sub-Class (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)** | |

**(Not subject to Double Default Framework)**

**MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES** **Annex 12B**
**SCHEDULE 2-3C**

**A-IRBA - CORPORATE ASSET SUB-CLASS**
(Exposures not subject to double default framework)

**Name of the Reporting Bank:** ____________________

**Statement as at:** ____________________

**Scope of Reporting:** ____________________

**Table 2-3C-LGD**
**(In S$ million)**

| Obligor Grade | Average PD | Total EAD | EAD segmented by facility grade | | | | | | | | | | | | | | Exposure Weighted Average LGD (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | |
| (a) from 2-3C-RWA | (b) from 2-3C-RWA | (a=SUM(b:o))<br>(g) from 2-3C-RWA Panel 1 & 2 | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | (m) | (n) | (o) | (p) |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | |
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| | Default (100%) | | | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)** | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | |
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| | Default (100%) | | | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
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| | Default (100%) | | | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(d) SFTs** | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | |
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| | Default (100%) | | | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **Total for Corporate Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | | | | | | |
| **Total for Corporate Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | | | | | | | |

**A-IRBA - CORPORATE ASSET SUB-CLASS**
(Exposures not subject to double default framework)

| Name of the Reporting Bank: | |
|---|---|
| Statement as at: | |
| Scope of Reporting: | |

**Table 2-3C-CCF**
**(In S$ million)**

| Nature of Transaction | Notional Amount | Credit Conversion Factor | Credit Equivalent Amounts |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
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| | | | |
| | | | |
| Total for Corporate Asset Sub-class | | | |

[MAS Notice 637 (Amendment) 2016]

**MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES**
**SCHEDULE 2-3D**

**Annex 12B**

**A-IRBA - CORPORATE SMALL BUSINESS ASSET SUB-CLASS**
(Exposures not subject to double default framework)

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-3D-RWA**
**(In S$ million)**

**1. Corporate Small Business Asset Sub-Class Exposure, excluding exposures to financial institutions that meet the criteria stated in Para 7.4.22A of MAS Notice 637**

| Internal Rating System | | | | Before CRM | | | Adjustments for CRM | | | After CRM | | | | | Number of Obligors | EL Amount | Credit RWA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Obligor Grade | PD range (%) | | | Notional Amount | | Gross Exposure | (Outflows) due to Credit Protection Bought | Inflows due to Credit Protection Sold | Adjustments to SFTs | EAD | Exposure Weighted Average PD (%) | Exposure Weighted Average LGD (%) | Exposure Weighted Average M (years) | Exposure Weighted Average Firm Size | | | |
| | Lower | Upper | Average | | | | | | | | | | | | | | |
| (a) | | | (b) | | | (c) | (d) | (e) | (f) | (g=c+d+e+f) | | (p) from 2-3D-LGD | | | | | |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | | |
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| . | | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)** | | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | | |
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| . | | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(d) SFTs** | | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **Sub-Total for Corp Small Business Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | | | | | | |
| **Sub-Total for Corp Small Business Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | | | | | | | |

**(Not subject to Double Default Framework)**
**(Exclude exposures to financial institutions that meet the criteria stated in Para 7.4.22A of MAS Notice 637)**

| | Materiality Threshold Amount | | |
|---|---|---|---|
| **(e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** | | 1250% | |

**Total for Corp Small Business Asset Sub-Class (include defaulted loans) (inclusive of the RWA due to the materality threshold)**
**Total for Corp Small Business Asset Sub-Class (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)**
**(Not subject to Double Default Framework)**
**(Exclude exposures to financial institutions that meet the criteria stated in Para 7.4.22A of MAS Notice 637)**

| | Gross Exposure | Materiality Threshold Amount | Number of Obligors | EL Amount: Default risk | EL Amount: Dilution risk | Credit RWA: Default risk | Credit RWA: Dilution risk |
|---|---|---|---|---|---|---|---|
| **(f) Purchased Receivables** | | | | | | | |

**2. Corporate Small Business Asset Sub-Class Exposure to financial institutions that meet the criteria stated in Para 7.4.22A of MAS Notice 637**

| Internal Rating System | | | | Before CRM | | | Adjustments for CRM | | | After CRM | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Obligor Grade | PD range (%) | | | Notional Amount | | Gross Exposure | (Outflows) due to Credit Protection Bought | Inflows due to Credit Protection Sold | Adjustments to SFTs | EAD | Exposure Weighted Average PD (%) | Exposure Weighted Average LGD (%) | Exposure Weighted Average M (years) | Exposure Weighted Average Firm Size | Number of Obligors | EL Amount | Credit RWA |
| | Lower | Upper | Average | | | | | | | | | | | | | | |
| (a) | | | (b) | | | (c) | (d) | (e) | (f) | (g=c+d+e+f) | | (p) from 2-3D-LGD | | | | | |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | | |
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| . | | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)** | | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | | |
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| . | | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | | |
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| . | | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(d) SFTs** | | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **Sub-total for Corp Small Business Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | | | | | | C |
| **Sub-total for Corp Small Business Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | | | | | | | C |

**(Not subject to Double Default Framework)**
**(Only include exposures to financial institutions that meet the criteria stated in Para 7.4.22A of MAS Notice 637)**

| | Materiality Threshold Amount | | Credit RWA |
|---|---|---|---|
| **(e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** | | 1250% | |
| **Sub-total for Corp Small Business Asset Sub-Class (include defaulted loans) (inclusive of the RWA due to the materality threshold)** | | | |
| **Sub-total for Corp Small Business Asset Sub-Class (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)** | | | |

**(Not subject to Double Default Framework)**
**(Only include exposures to financial institutions that meet the criteria stated in Para 7.4.22A of MAS Notice 637)**

| | Gross Exposure | Exposure Weighted Average M (years) | Number of Obligors | EL Amount: Default risk | EL Amount: Dilution risk | Credit RWA: Default risk | Credit RWA: Dilution risk |
|---|---|---|---|---|---|---|---|
| **(f) Purchased Receivables** | | | | | | | |

**3. Total Corporate Small Business Asset Sub-Class Exposure**

| | Gross Exposure | (Outflows) due to Credit Protection Bought | Inflows due to Credit Protection Sold | Adjustments to SFTs | EAD | Exposure Weighted Average PD (%) | Exposure Weighted Average LGD (%) | Exposure Weighted Average M (years) | Exposure Weighted Average Firm Size | Number of Obligors | EL Amount | Credit RWA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total for Corp Small Business Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | |
| **Total for Corp Small Business Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | | |

**(Not subject to Double Default Framework)**

| | Credit RWA |
|---|---|
| **Total for Corp Small Business Asset Sub-Class (include defaulted loans) (inclusive of the RWA due to the materality threshold)** | |
| **Total for Corp Small Business Asset Sub-Class (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)** | |

**(Not subject to Double Default Framework)**

MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES
SCHEDULE 2-3D

**Annex 12B**

**A-IRBA - CORPORATE SMALL BUSINESS ASSET SUB-CLASS**
(Exposures not subject to double default framework)

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-3D-LGD**
**(In S$ million)**

| | Obligor Grade | Average PD | Total EAD | EAD segmented by facility grade | | | | | | | | | | | | | | Exposure Weighted Average LGD (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | |
| | (a) from 2-3D-RWA | (b) from 2-3D-RWA | (a=SUM(b:o))<br>(g) from 2-3D-RWA Panel 1 & 2 | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | (m) | (n) | (o) | (p) |
| (a) | On-balance Sheet Exposures | | | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | | | |
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| | Default (100%) | | | | | | | | | | | | | | | | | |
| | Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| | Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| (b) | Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs) | | | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | | | |
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| | Default (100%) | | | | | | | | | | | | | | | | | |
| | Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| | Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| (c) | OTC Derivative Transactions | | | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | | | |
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| | Default (100%) | | | | | | | | | | | | | | | | | |
| | Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| | Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| (d) | SFTs | | | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | | | |
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| | . | | | | | | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | | | | | | | |
| | Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| | Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| Total for Corp Small Business Asset Sub-Class (include defaulted loans) | | | | | | | | | | | | | | | | | | |
| Total for Corp Small Business Asset Sub-Class (exclude defaulted loans) | | | | | | | | | | | | | | | | | | |

**MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES**
**SCHEDULE 2-3D**

**A-IRBA - CORPORATE SMALL BUSINESS ASSET SUB-CLASS**
(Exposures not subject to double default framework)

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-3D-CCF**
**(In S$ million)**

| Nature of Transaction | Notional Amount | Credit Conversion Factor | Credit Equivalent Amounts |
|---|---|---|---|
| | | | |
| | | | |
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| | | | |
| **Total for Corp Small Business Asset Sub-class** | | | |

[MAS Notice 637 (Amendment) 2016]

**MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES** **Annex 12B**
**SCHEDULE 2-3E**

**A-IRBA - SL ASSET SUB-CLASS : IPRE**
(Exposures not subject to double default framework)

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-3E-RWA**
**(In S$ million)**

| Internal Rating System | | | | Before CRM | | | Adjustments for CRM | | After CRM | | | | Number of Obligors | EL Amount | Credit RWA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Obligor Grade | PD range (%) | | | Notional Amount | | Gross Exposure | (Outflows) due to Credit Protection Bought | Inflows due to Credit Protection Sold | EAD | Exposure Weighted Average PD (%) | Exposure Weighted Average LGD (%) | Exposure Weighted Average M (years) | | | |
| | Lower | Upper | Average | | | | | | | | | | | | |
| (a) | | | (b) | | | (c) | (d) | (e) | (f=c+d+e) | | (p) from 2-3E-LGD | | | | |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions)** | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | |
| **(d) Total for SL Asset Sub-Class: IPRE (include defaulted loans)** | | | | | | | | | | | | | | | |
| **Total for SL Asset Sub-Class: IPRE (exclude defaulted loans)** **(Not subject to Double Default Framework)** | | | | | | | | | | | | | | | |

| | Materiality Threshold Amount | | Credit RWA |
|---|---|---|---|
| **(e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** | | 1250% | |
| **Total for SL Asset Sub-Class: IPRE (include defaulted loans) (inclusive of the RWA due to the materality threshold)** | | | |
| **Total for SL Asset Sub-Class: IPRE (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)** **(Not subject to Double Default Framework)** | | | |

| | Gross Exposure | Exposure Weighted Average M (years) | Number of Obligors | EL Amount: Default risk | EL Amount: Dilution risk | Credit RWA: Default risk | Credit RWA: Dilution risk |
|---|---|---|---|---|---|---|---|
| **(f) Purchased Receivables** | | | | | | | |

MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES
SCHEDULE 2-3E

Annex 12B

**A-IRBA - SL ASSET SUB-CLASS : IPRE**
(Exposures not subject to double default framework)

Name of the Reporting Bank:

Statement as at:

Scope of Reporting:

Table 2-3E-LGD
(In S$ million)

| | | | EAD segmented by facility grade | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Obligor Grade | Average PD | Total EAD | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | Exposure Weighted Average LGD (%) |
| (a) from 2-3E-RWA | (b) from 2-3E-RWA | (a=SUM(b:o))<br>(f) from 2-3E-RWA | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | (m) | (n) | (o) | (p) |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
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| | Default (100%) | | | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)** | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
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| | Default (100%) | | | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
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| | Default (100%) | | | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **Total for SL Asset Sub-Class: IPRE (include defaulted loans)** | | | | | | | | | | | | | | | | | |
| **Total for SL Asset Sub-Class: IPRE (exclude defaulted loans)** | | | | | | | | | | | | | | | | | |

**MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES**
**SCHEDULE 2-3E**

**A-IRBA - SL ASSET SUB-CLASS : IPRE**
(Exposures not subject to double default framework)

| | |
|---|---|
| **Name of the Reporting Bank:** | |
| **Statement as at:** | |
| **Scope of Reporting:** | |

**Table 2-3E-CCF**
**(In S$ million)**

| Nature of Transaction | Notional Amount | Credit Conversion Factor | Credit Equivalent Amounts |
|---|---|---|---|
| | | | |
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| | | | |
| **Total for SL Asset Sub-class: IPRE** | | | |

[MAS Notice 637 (Amendment) 2016]

**A-IRBA - SL ASSET SUB-CLASS : PF/OF/CF**
(Exposures not subject to double default framework)

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-3F-RWA**
**(In S$ million)**

| Internal Rating System | | | | Before CRM | | | Adjustments for CRM | | After CRM | | | | Number of Obligors | EL Amount | Credit RWA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Obligor Grade | PD range (%) | | | Notional Amount | | Gross Exposure | (Outflows) due to Credit Protection Bought | Inflows due to Credit Protection Sold | EAD | Exposure Weighted Average PD (%) | Exposure Weighted Average LGD (%) | Exposure Weighted Average M (years) | | | |
| | Lower | Upper | Average | | | | | | | | | | | | |
| (a) | | | (b) | | | (c) | (d) | (e) | (f=c+d+e) | | (p) from 2-3F-LGD | | | | |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions)** | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | |
| | | | Default (100%) | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | |
| **(d) Total for SL Asset Sub-Class: PF/OF/CF (include defaulted loans)** | | | | | | | | | | | | | | | |
| **Total for SL Asset Sub-Class: PF/OF/CF (exclude defaulted loans)** | | | | | | | | | | | | | | | |
| **(Not subject to Double Default Framework)** | | | | | | | | | | | | | | | |

| | Materiality Threshold Amount | | Credit RWA |
|---|---|---|---|
| **(e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** | | 1250% | |
| **Total for SL Asset Sub-Class: PF/OF/CF (include defaulted loans) (inclusive of the RWA due to the materality threshold)** | | | |
| **Total for SL Asset Sub-Class: PF/OF/CF (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)** | | | |
| **(Not subject to Double Default Framework)** | | | |

| | Gross Exposure | | Number of Obligors | EL Amount: Default risk | EL Amount: Dilution risk | Credit RWA: Default risk | Credit RWA: Dilution risk |
|---|---|---|---|---|---|---|---|
| **(f) Purchased Receivables** | | | | | | | |

**MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES** **Annex 12B**
**SCHEDULE 2-3F**

**A-IRBA - SL ASSET SUB-CLASS : PF/OF/CF**
(Exposures not subject to double default framework)

**Name of the Reporting Bank:** [ ]

**Statement as at:** [ ]

**Scope of Reporting:** [ ]

**Table 2-3F-LGD**
**(In S$ million)**

| Obligor Grade | Average PD | Total EAD | EAD segmented by facility grade | | | | | | | | | | | | | | Exposure Weighted Average LGD (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | |
| (a) from 2-3F-RWA | (b) from 2-3F-RWA | (a=SUM(b:o))<br>(f) from 2-3F-RWA | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | (m) | (n) | (o) | (p) |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | |
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| . | | | | | | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)** | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | |
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| | Default (100%) | | | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | |
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| . | | | | | | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **Total for SL Asset Sub-Class: PF/OF/CF (include defaulted loans)** | | | | | | | | | | | | | | | | | |
| **Total for SL Asset Sub-Class: PF/OF/CF (exclude defaulted loans)** | | | | | | | | | | | | | | | | | |

MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES
SCHEDULE 2-3F

**A-IRBA - SL ASSET SUB-CLASS : PF/OF/CF**
(Exposures not subject to double default framework)

| | |
|---|---|
| **Name of the Reporting Bank:** | |
| **Statement as at:** | |
| **Scope of Reporting:** | |

**Table 2-3F-CCF**
**(In S$ million)**

| Nature of Transaction | Notional Amount | Credit Conversion Factor | Credit Equivalent Amounts |
|---|---|---|---|
| | | | |
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| | | | |
| | | | |
| | | | |
| **Total for SL Asset Sub-class: PF/ OF/ CF** | | | |

[MAS Notice 637 (Amendment) 2016]

**MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES** **Annex 12B**
**SCHEDULE 2-3G**

**A-IRBA - HVCRE ASSET SUB-CLASS**
(Exposures not subject to double default framework)

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-3G-RWA**
**(In S$ million)**

| Internal Rating System | | | | Before CRM | | | Adjustments for CRM | | After CRM | | | | Number of Obligors | EL Amount | | Credit RWA | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Obligor Grade | PD range (%) | | | Notional Amount | | Gross Exposure | (Outflows) due to Credit Protection Bought | Inflows due to Credit Protection Sold | EAD | Exposure Weighted Average PD (%) | Exposure Weighted Average LGD (%) | Exposure Weighted Average M (years) | | | | | |
| | Lower | Upper | Average | | | | | | | | | | | | | | |
| (a) | | | (b) | | | (c) | (d) | (e) | (f=c+d+e) | | (p) from 2-3G-LGD | | | | | | |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | Default (100%) | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions)** | | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | Default (100%) | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | Default (100%) | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(d) Total for HVCRE Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | | | | | | |
| **Total for HVCRE Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | | | | | | | |
| **(Not subject to Double Default Framework)** | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | **Materiality Threshold Amount** | | | | | |
| **(e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** | | | | | | | | | | | | | 1250% | | | | |
| **Total for HVCRE Asset Sub-Class (include defaulted loans) (inclusive of the RWA due to the materality threshold)** | | | | | | | | | | | | | | | | | |
| **Total for HVCRE Asset Sub-Class (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)** | | | | | | | | | | | | | | | | | |
| **(Not subject to Double Default Framework)** | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | **Default risk** | **Dilution risk** | **Default risk** | **Dilution risk** |
| **(f) Purchased Receivables** | | | | | | | | | | | | | | | | | |

**MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES** **Annex 12B**
**SCHEDULE 2-3G**

**A-IRBA - HVCRE ASSET SUB-CLASS**
(Exposures not subject to double default framework)

**Name of the Reporting Bank:** 

**Statement as at:** 

**Scope of Reporting:** 

**Table 2-3G-LGD**
**(In S$ million)**

| | | | EAD segmented by facility grade | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Obligor Grade | Average PD | Total EAD | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | Exposure Weighted Average LGD (%) |
| (a) from 2-3G-RWA | (b) from 2-3G-RWA | (a=SUM(b:o))<br>(f) from 2-3G-RWA | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | (m) | (n) | (o) | (p) |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | |
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| | Default (100%) | | | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)** | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **Total for HVCRE Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | | | | | | |
| **Total for HVCRE Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | | | | | | | |

**MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES**
**SCHEDULE 2-3G**

**A-IRBA - HVCRE ASSET SUB-CLASS**
(Exposures not subject to double default framework)

| | |
|---|---|
| **Name of the Reporting Bank:** | |
| **Statement as at:** | |
| **Scope of Reporting:** | |

**Table 2-3G-CCF**
**(In S$ million)**

| Nature of Transaction | Notional Amount | Credit Conversion Factor | Credit Equivalent Amounts |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| **Total for HVCRE Asset Sub-class** | | | |

[MAS Notice 637 (Amendment) 2016]

MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES
SCHEDULE 2-3H

Annex 12B

## A-IRBA - EXPOSURES SUBJECT TO DOUBLE DEFAULT FRAMEWORK

Name of the Reporting Bank:

Statement as at:

Scope of Reporting:

(In S$ million)

| Internal Rating System | | | | Before CRM | | | Adjustments for CRM | After CRM | | | Number of Obligors | EL Amount | Credit RWA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Obligor Grade | PD range (%) | | | Notional Amount | | Gross Exposure | Adjustments to SFTs | Exposure Weighted Average PD (%) | Exposure Weighted Average LGD (%) | Exposure Weighted Average Maturity (years) | | | |
| | Lower | Upper | Average | | | | | | | | | | |
| **1. Corporate Asset Sub-Class Exposure, excluding exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637** | | | | | | | | | | | | | |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | |
| . | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)** | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | |
| . | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | |
| . | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | |
| **(d) SFTs** | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | |
| . | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | |
| **Total Corporate Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | | |
| **Total Corporate Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | | | |
| **(Subject to Double Default Framework)** | | | | | | | | | | | | | |
| **(Exclude exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637)** | | | | | | | | | | | | | |
| | | | | | | | | | | **Materiality Threshold Amount** | | | |
| **(e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** | | | | | | | | | | | 1250% | | |
| **Sub-total for Corporate Asset Sub-Class (include defaulted loans) (inclusive of the RWA due to the materality threshold)** | | | | | | | | | | | | | |
| **Sub-total for Corporate Asset Sub-Class (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)** | | | | | | | | | | | | | |
| **(Subject to Double Default Framework)** | | | | | | | | | | | | | |
| **(Exclude exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637)** | | | | | | | | | | | | | |
| **2. Corporate Asset Sub-class Exposure to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637** | | | | | | | | | | | | | |
| **(a) On-balance Sheet Exposures** | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | |
| . | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)** | | | | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | | | | |
| 2 | | | PD2 | | | | | | | | | | |
| 3 | | | PD3 | | | | | | | | | | |
| . | | | PD4 | | | | | | | | | | |
| . | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | |

**(c) OTC Derivative Transactions**

| | | | |
|---|---|---|---|
| 1 | | | PD1 |
| 2 | | | PD2 |
| 3 | | | PD3 |
| . | | | PD4 |
| . | | | |
| . | | | |

Sub-Total (include defaulted loans)
Sub-Total (exclude defaulted loans)

**(d) SFTs**

| | | | |
|---|---|---|---|
| 1 | | | PD1 |
| 2 | | | PD2 |
| 3 | | | PD3 |
| . | | | PD4 |
| . | | | |
| . | | | |

Sub-Total (include defaulted loans)
Sub-Total (exclude defaulted loans)

**Total Corporate Asset Sub-Class (include defaulted loans)**
**Total Corporate Asset Sub-Class (exclude defaulted loans)**
**(Subject to Double Default Framework)**
**(Only include exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637)**

**Materiality Threshold Amount**

**(e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** — 1250%

**Sub-total for Corporate Asset Sub-Class (include defaulted loans) (Inclusive of the RWA due to the materality threshold)**
**Sub-total for Corporate Asset Sub-Class (exclude defaulted loans) (Inclusive of the RWA due to the materality threshold)**
**(Subject to Double Default Framework)**
**(Only include exposures to financial institutions that meet the criteria stated in Para 7.4.21 of MAS Notice 637)**

**Total for Corporate Asset Sub-Class (include defaulted loans)**
**Total for Corporate Asset Sub-Class (exclude defaulted loans)**
**(Subject to Double Default Framework)**

**Total for Corporate Asset Sub-Class (include defaulted loans) (Inclusive of the RWA due to the materality threshold)**
**Total for Corporate Asset Sub-Class (exclude defaulted loans) (Inclusive of the RWA due to the materality threshold)**
**(Subject to Double Default Framework)**

3. **Corporate Small Business Asset Sub-Class Exposure, excluding exposures to financial institutions that meet the criteria stated in Para 7.4.22A of MAS Notice 637**

**(a) On-balance Sheet Exposures**

| | | | |
|---|---|---|---|
| 1 | | | PD1 |
| 2 | | | PD2 |
| 3 | | | PD3 |
| . | | | PD4 |
| . | | | |
| . | | | |

Sub-Total (include defaulted loans)
Sub-Total (exclude defaulted loans)

**(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)**

| | | | |
|---|---|---|---|
| 1 | | | PD1 |
| 2 | | | PD2 |
| 3 | | | PD3 |
| . | | | PD4 |
| . | | | |
| . | | | |

Sub-Total (include defaulted loans)
Sub-Total (exclude defaulted loans)

**(c) OTC Derivative Transactions**

| | | | |
|---|---|---|---|
| 1 | | | PD1 |
| 2 | | | PD2 |
| 3 | | | PD3 |
| . | | | PD4 |
| . | | | |
| . | | | |

Sub-Total (include defaulted loans)
Sub-Total (exclude defaulted loans)

**(d) SFTs**

| | | | |
|---|---|---|---|
| 1 | | | PD1 |
| 2 | | | PD2 |
| 3 | | | PD3 |
| . | | | PD4 |
| . | | | |
| . | | | |

Sub-Total (include defaulted loans)
Sub-Total (exclude defaulted loans)

**Total Corp Small Business Asset Sub-Class (include defaulted loans)**
**Total Corp Small Business Asset Sub-Class (exclude defaulted loans)**
**(Subject to Double Default Framework)**
**(Exclude exposures to financial institutions that meet the criteria stated in Para 7.4.21A of MAS Notice 637)**

**Materiality Threshold Amount**

**(e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** — 1250%

**Sub-total for Corp Small Business  Asset Sub-Class (include defaulted loans) (inclusive of the RWA due to the materality threshold)**
**Sub-total for Corp Small Business Asset Sub-Class (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)**
**(Subject to Double Default Framework)**
**(Exclude exposures to financial institutions that meet the criteria stated in Para 7.4.22A of MAS Notice 637)**

4. **Corporate Small Business Asset Sub-Class Exposure to financial institutions that meet the criteria stated in Para 7.4.22A of MAS Notice 637**

**(a) On-balance Sheet Exposures**

| | | | |
|---|---|---|---|
| 1 | | | PD1 |
| 2 | | | PD2 |
| 3 | | | PD3 |
| . | | | PD4 |
| . | | | |
| . | | | |

Sub-Total (include defaulted loans)
Sub-Total (exclude defaulted loans)

**(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)**

| | | | |
|---|---|---|---|
| 1 | | | PD1 |
| 2 | | | PD2 |
| 3 | | | PD3 |
| . | | | PD4 |
| . | | | |
| . | | | |

Sub-Total (include defaulted loans)
Sub-Total (exclude defaulted loans)

**(c) OTC Derivative Transactions**

| | | | |
|---|---|---|---|
| 1 | | | PD1 |
| 2 | | | PD2 |
| 3 | | | PD3 |
| . | | | PD4 |
| . | | | |
| . | | | |

Sub-Total (include defaulted loans)
Sub-Total (exclude defaulted loans)

**(d) SFTs**

| | | | |
|---|---|---|---|
| 1 | | | PD1 |
| 2 | | | PD2 |
| 3 | | | PD3 |
| . | | | PD4 |
| . | | | |
| . | | | |

Sub-Total (include defaulted loans)
Sub-Total (exclude defaulted loans)

**Total Corp Small Business Asset Sub-Class (include defaulted loans)**
**Total Corp Small Business Asset Sub-Class (exclude defaulted loans)**
**(Subject to Double Default Framework)**
**(Only include exposures to financial institutions that meet the criteria stated in Para 7.4.22A of MAS Notice 637)**

**Materiality Threshold Amount**

**(e) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** — 1250%

**Sub-total for Corp Small Business Asset Sub-Class (include defaulted loans) (inclusive of the RWA due to the materality threshold)**
**Sub-total for Corp Small Business Asset Sub-Class (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)**
**(Subject to Double Default Framework)**
**(Only include exposures to financial institutions that meet the criteria stated in Para 7.4.22A of MAS Notice 637)**

**Total for Corp Small Business Asset Sub-Class (include defaulted loans)**
**Total for Corp Small Business Asset Sub-Class (exclude defaulted loans)**
**(Subject to Double Default Framework)**

**Total for Corp Small Business Asset Sub-Class (include defaulted loans) (inclusive of the RWA due to the materality threshold)**
**Total for Corp Small Business Asset Sub-Class (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)**
**(Subject to Double Default Framework)**

5. **SL Asset Sub-Class: IPRE**

(a) **On-balance Sheet Exposures**

| | | | |
|---|---|---|---|
| 1 | | | PD1 |
| 2 | | | PD2 |
| 3 | | | PD3 |
| . | | | PD4 |
| . | | | |
| . | | | |
| Sub-Total (include defaulted loans) | | | |
| Sub-Total (exclude defaulted loans) | | | |

(b) **Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)**

| | | | |
|---|---|---|---|
| 1 | | | PD1 |
| 2 | | | PD2 |
| 3 | | | PD3 |
| . | | | PD4 |
| . | | | |
| . | | | |
| Sub-Total (include defaulted loans) | | | |
| Sub-Total (exclude defaulted loans) | | | |

(c) **OTC Derivative Transactions**

| | | | |
|---|---|---|---|
| 1 | | | PD1 |
| 2 | | | PD2 |
| 3 | | | PD3 |
| . | | | PD4 |
| . | | | |
| . | | | |
| Sub-Total (include defaulted loans) | | | |
| Sub-Total (exclude defaulted loans) | | | |

**Total SL Asset Sub-Class: IPRE (include defaulted loans)**
**Total SL Asset Sub-Class: IPRE (exclude defaulted loans)**
**(Subject to Double Default Framework)**

| | Materiality Threshold Amount | | |
|---|---|---|---|
| (d) **Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** | | 1250% | |

**Total SL Asset Sub-Class: IPRE (include defaulted loans) (inclusive of the RWA due to the materality threshold)**
**Total SL Asset Sub-Class: IPRE (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)**
**(Subject to Double Default Framework)**

6. **SL Asset Sub-Class: PF/OF/CF**

(a) **On-balance Sheet Exposures**

| | | | |
|---|---|---|---|
| 1 | | | PD1 |
| 2 | | | PD2 |
| 3 | | | PD3 |
| . | | | PD4 |
| . | | | |
| . | | | |
| Sub-Total (include defaulted loans) | | | |
| Sub-Total (exclude defaulted loans) | | | |

(b) **Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)**

| | | | |
|---|---|---|---|
| 1 | | | PD1 |
| 2 | | | PD2 |
| 3 | | | PD3 |
| . | | | PD4 |
| . | | | |
| . | | | |
| Sub-Total (include defaulted loans) | | | |
| Sub-Total (exclude defaulted loans) | | | |

(c) **OTC Derivative Transactions**

| | | | |
|---|---|---|---|
| 1 | | | PD1 |
| 2 | | | PD2 |
| 3 | | | PD3 |
| . | | | PD4 |
| . | | | |
| . | | | |
| Sub-Total (include defaulted loans) | | | |
| Sub-Total (exclude defaulted loans) | | | |

**Total SL Asset Sub-Class: PF/OF/CF (include defaulted loans)**
**Total SL Asset Sub-Class: PF/OF/CF (exclude defaulted loans)**
**(Subject to Double Default Framework)**

| | Materiality Threshold Amount | | |
|---|---|---|---|
| (d) **Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** | | 1250% | |

**Total SL Asset Sub-Class: PF/OF/CF (include defaulted loans) (inclusive of the RWA due to the materality threshold)**
**Total SL Asset Sub-Class: PF/OF/CF (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)**
**(Subject to Double Default Framework)**

**7. HVCRE Asset Sub-Class**

**(a) On-balance Sheet Exposures**

| | | | |
|---|---|---|---|
| 1 | | | PD1 |
| 2 | | | PD2 |
| 3 | | | PD3 |
| . | | | PD4 |
| . | | | |
| . | | | |
| Sub-Total (include defaulted loans) | | | |
| Sub-Total (exclude defaulted loans) | | | |

**(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions & SFTs)**

| | | | |
|---|---|---|---|
| 1 | | | PD1 |
| 2 | | | PD2 |
| 3 | | | PD3 |
| . | | | PD4 |
| . | | | |
| . | | | |
| Sub-Total (include defaulted loans) | | | |
| Sub-Total (exclude defaulted loans) | | | |

**(c) OTC Derivative Transactions**

| | | | |
|---|---|---|---|
| 1 | | | PD1 |
| 2 | | | PD2 |
| 3 | | | PD3 |
| . | | | PD4 |
| . | | | |
| . | | | |
| Sub-Total (include defaulted loans) | | | |
| Sub-Total (exclude defaulted loans) | | | |

**Total HVCRE Asset Sub-Class (include defaulted loans)**
**Total HVCRE Asset Sub-Class (exclude defaulted loans)**
**(Subject to Double Default Framework)**

| | Materiality Threshold Amount | |
|---|---|---|
| **(d) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA exposure** | | 1250% |

**Total HVCRE Asset Sub-Class (include defaulted loans) (inclusive of the RWA due to the materality threshold)**
**Total HVCRE Asset Sub-Class (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)**
**(Subject to Double Default Framework)**

**Total Exposures (include defaulted loans)**
**Total Exposures (exclude defaulted loans)**
**(Subject to Double Default Framework)**

**Total Exposures (include defaulted loans) (inclusive of the RWA due to the materality threshold)**
**Total Exposures (exclude defaulted loans) (inclusive of the RWA due to the materality threshold)**
**(Subject to Double Default Framework)**

[MAS Notice 637 (Amendment) 2016]

**IRBA - SUPERVISORY SLOTTING CRITERIA**
(For SL Asset Sub-class and HVCRE Asset Sub-class)

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**(In S$ million)**

| | Notional Amount | EAD | Expected Loss | | Unexpected Loss | |
|---|---|---|---|---|---|---|
| | | | Risk Weight | EL Amount | Risk Weight | Credit RWA |
| | | (a) | (b) | (c=axbx8%) | (d) | (e=axd) |
| **1. SL Asset Sub-Class : IPRE** | | | | | | |
| **(a) On-balance Sheet Exposures** | | | | | | |
| Strong | | | 5% | | 70% | |
| Strong (Remaining maturity < 2.5 years) | | | 0% | | 50% | |
| Good | | | 10% | | 90% | |
| Good (Remaining maturity < 2.5 years) | | | 5% | | 70% | |
| Satisfactory | | | 35% | | 115% | |
| Weak | | | 100% | | 250% | |
| Default | | | 625% | | 0% | |
| Sub-Total (include defaulted loans) | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions )** | | | | | | |
| Strong | | | 5% | | 70% | |
| Strong (Remaining maturity < 2.5 years) | | | 0% | | 50% | |
| Good | | | 10% | | 90% | |
| Good (Remaining maturity < 2.5 years) | | | 5% | | 70% | |
| Satisfactory | | | 35% | | 115% | |
| Weak | | | 100% | | 250% | |
| Default | | | 625% | | 0% | |
| Sub-Total (include defaulted loans) | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | |
| Strong | | | 5% | | 70% | |
| Strong (Remaining maturity < 2.5 years) | | | 0% | | 50% | |
| Good | | | 10% | | 90% | |
| Good (Remaining maturity < 2.5 years) | | | 5% | | 70% | |
| Satisfactory | | | 35% | | 115% | |
| Weak | | | 100% | | 250% | |
| Default | | | 625% | | 0% | |
| Sub-Total (include defaulted loans) | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | |
| **Total SL Asset Sub-Class: IPRE (include defaulted loans)** | | | | | | |
| **Total SL Asset Sub-Class: IPRE (exclude defaulted loans)** | | | | | | |
| **2. SL Asset Sub-Class : PF/OF/CF** | | | | | | |
| **(a) On-balance Sheet Exposures** | | | | | | |
| Strong | | | 5% | | 70% | |
| Strong (Remaining maturity < 2.5 years) | | | 0% | | 50% | |
| Good | | | 10% | | 90% | |
| Good (Remaining maturity < 2.5 years) | | | 5% | | 70% | |
| Satisfactory | | | 35% | | 115% | |
| Weak | | | 100% | | 250% | |
| Default | | | 625% | | 0% | |
| Sub-Total (include defaulted loans) | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions )** | | | | | | |
| Strong | | | 5% | | 70% | |
| Strong (Remaining maturity < 2.5 years) | | | 0% | | 50% | |
| Good | | | 10% | | 90% | |
| Good (Remaining maturity < 2.5 years) | | | 5% | | 70% | |
| Satisfactory | | | 35% | | 115% | |
| Weak | | | 100% | | 250% | |
| Default | | | 625% | | 0% | |
| Sub-Total (include defaulted loans) | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | |
| Strong | | | 5% | | 70% | |
| Strong (Remaining maturity < 2.5 years) | | | 0% | | 50% | |
| Good | | | 10% | | 90% | |
| Good (Remaining maturity < 2.5 years) | | | 5% | | 70% | |
| Satisfactory | | | 35% | | 115% | |
| Weak | | | 100% | | 250% | |
| Default | | | 625% | | 0% | |
| Sub-Total (include defaulted loans) | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | |
| **Total SL Asset Sub-Class: PF/OF/CF (include defaulted loans)** | | | | | | |
| **Total SL Asset Sub-Class: PF/OF/CF (exclude defaulted loans)** | | | | | | |
| **3. HVCRE Asset Sub-Class** | | | | | | |
| **(a) On-balance Sheet Exposures** | | | | | | |
| Strong | | | 5% | | 95% | |
| Strong (Remaining maturity < 2.5 years) | | | 5% | | 70% | |
| Good | | | 5% | | 120% | |
| Good (Remaining maturity < 2.5 years) | | | 5% | | 95% | |
| Satisfactory | | | 35% | | 140% | |
| Weak | | | 100% | | 250% | |
| Default | | | 625% | | 0% | |
| Sub-Total (include defaulted loans) | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | |
| **(b) Off-balance Sheet Exposures (excluding OTC Derivative Transactions )** | | | | | | |
| Strong | | | 5% | | 95% | |
| Strong (Remaining maturity < 2.5 years) | | | 5% | | 70% | |
| Good | | | 5% | | 120% | |
| Good (Remaining maturity < 2.5 years) | | | 5% | | 95% | |
| Satisfactory | | | 35% | | 140% | |
| Weak | | | 100% | | 250% | |
| Default | | | 625% | | 0% | |
| Sub-Total (include defaulted loans) | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | |
| **(c) OTC Derivative Transactions** | | | | | | |
| Strong | | | 5% | | 95% | |
| Strong (Remaining maturity < 2.5 years) | | | 5% | | 70% | |
| Good | | | 5% | | 120% | |
| Good (Remaining maturity < 2.5 years) | | | 5% | | 95% | |
| Satisfactory | | | 35% | | 140% | |
| Weak | | | 100% | | 250% | |
| Default | | | 625% | | 0% | |
| Sub-Total (include defaulted loans) | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | |
| **Total HVCRE Asset Sub-Class (include defaulted loans)** | | | | | | |
| **Total HVCRE Asset Sub-Class (exclude defaulted loans)** | | | | | | |
| **Total SL and HVCRE Asset Sub-Class (include defaulted loans)** | | | | | | |
| **Total SL and HVCRE Asset Sub-Class (exclude defaulted loans)** | | | | | | |

**IRBA - RESIDENTIAL MORTGAGE ASSET SUB-CLASS**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-5A-RWA**
**(In S$ million)**

| Internal Rating System | | | | EAD | Exposure Weighted Average PD (%) | LGD or Exposure Weighted Average LGD (%) | Number of Obligors | Capital Requirements | EL Amount | Credit RWA |
|---|---|---|---|---|---|---|---|---|---|---|
| Pool | PD range (%) | | | | | | | | | |
| | Lower | Upper | Average | | | | | | | |
| (a) | | | (b) | (c) | | (p) from 2-5A-LGD | | | | |
| **(a) Facilities Secured by Private Residential Property** | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | |
| 2 | | | PD2 | | | | | | | |
| 3 | | | PD3 | | | | | | | |
| . | | | PD4 | | | | | | | |
| . | | | | | | | | | | |
| . | | | | | | | | | | |
| | | | Default (100%) | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | |
| **(b) Facilities Secured by HDB** | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | |
| 2 | | | PD2 | | | | | | | |
| 3 | | | PD3 | | | | | | | |
| . | | | PD4 | | | | | | | |
| . | | | | | | | | | | |
| . | | | | | | | | | | |
| | | | Default (100%) | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | |
| **(c) Others (pls specify, if applicable)** | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | |
| 2 | | | PD2 | | | | | | | |
| 3 | | | PD3 | | | | | | | |
| . | | | PD4 | | | | | | | |
| . | | | | | | | | | | |
| . | | | | | | | | | | |
| | | | Default (100%) | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | |
| **Total for Residential Mortgage Asset Sub-Class (include defaulted loans)** | | | | | | | | | | |
| **Total for Residential Mortgage Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | |

| | EL Amount: Default risk | EL Amount: Dilution risk | Credit RWA: Default risk | Credit RWA: Dilution risk |
|---|---|---|---|---|
| **(d) Purchased Receivables** | | | | |

**IRBA - RESIDENTIAL MORTGAGE ASSET SUB-CLASS**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-5A-LGD**
**(In S$ million)**

| Obligor Grade | Average PD | Total EAD | EAD segmented by facility grade | | | | | | | | | | | | | | Exposure Weighted Average LGD (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | |
| (a) from 2-5A-RWA | (b) from 2-5A-RWA | (a=SUM(b:o)) (c) from 2-5A-RWA | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | (m) | (n) | (o) | (p) |
| **(a) Facilities Secured by Private Residential Property** | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(b) Facilities Secured by HDB** | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(c) Others (pls specify, if applicable)** | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **Total for Residential Mortgage Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | | | | | | |
| **Total for Residential Mortgage Asset Sub-Class (exclude defaulted loans)** | | | | | | | | | | | | | | | | | |

**MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES**
**SCHEDULE 2-5A**

**IRBA - RESIDENTIAL MORTGAGE ASSET SUB-CLASS**

| | |
|---|---|
| **Name of the Reporting Bank:** | |
| **Statement as at:** | |
| **Scope of Reporting:** | |

**Table 2-5A-CCF**
**(In S$ million)**

| Nature of Transaction | Notional Amount | Credit Conversion Factor | Credit Equivalent Amounts |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| Total for Residential Mortgage Asset Sub-class | | | |

MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES
SCHEDULE 2-5B

Annex 12B

## IRBA - QRRE ASSET SUB-CLASS

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-5B-RWA**
**(In S$ million)**

| Internal Rating System | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Pool | PD range (%) | | | EAD | Exposure Weighted Average PD (%) | LGD or Exposure Weighted Average LGD (%) | Number of Obligors | Capital Require-ments | EL Amount | Credit RWA |
| | Lower | Upper | Average | | | | | | | |
| (a) | | | (b) | (c) | | (p) from 2-5B-LGD | | | | |
| **(a) Credit Cards** | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | |
| 2 | | | PD2 | | | | | | | |
| 3 | | | PD3 | | | | | | | |
| . | | | PD4 | | | | | | | |
| . | | | | | | | | | | |
| . | | | | | | | | | | |
| | | | Default (100%) | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | |
| **(b) Unsecured Overdraft Facilities** | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | |
| 2 | | | PD2 | | | | | | | |
| 3 | | | PD3 | | | | | | | |
| . | | | PD4 | | | | | | | |
| . | | | | | | | | | | |
| . | | | | | | | | | | |
| | | | Default (100%) | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | |
| **(c) Others (pls specify, if applicable)** | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | |
| 2 | | | PD2 | | | | | | | |
| 3 | | | PD3 | | | | | | | |
| . | | | PD4 | | | | | | | |
| . | | | | | | | | | | |
| . | | | | | | | | | | |
| | | | Default (100%) | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | |
| **Total for QRRE Asset Sub-class (include defaulted loans)** | | | | | | | | | | |
| **Total for QRRE Asset Sub-class (exclude defaulted loans)** | | | | | | | | | | |

| | EL Amount: Default risk | EL Amount: Dilution risk | Credit RWA: Default risk | Credit RWA: Dilution risk |
|---|---|---|---|---|
| **(d) Purchased Receivables** | | | | |

MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES
SCHEDULE 2-5B

Annex 12B

**IRBA - QRRE ASSET SUB-CLASS**

**Name of the Reporting Bank:** 

**Statement as at:** 

**Scope of Reporting:** 

**Table 2-5B-LGD**
**(In S$ million)**

| Obligor Grade | Average PD | Total EAD | EAD segmented by facility grade | | | | | | | | | | | | | | Exposure Weighted Average LGD (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | |
| (a) from 2-5A-RWA | (b) from 2-5A-RWA | (a=SUM(b:o))<br>(c) from 2-5A-RWA | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | (m) | (n) | (o) | (p) |
| **(a) Credit Cards** | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(b) Unsecured Overdraft Facilities** | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(c) Others (pls specify, if applicable)** | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| . | | | | | | | | | | | | | | | | | |
| | Default (100%) | | | | | | | | | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **Total for QRRE Asset Sub-class (include defaulted loans)** | | | | | | | | | | | | | | | | | |
| **Total for QRRE Asset Sub-class (exclude defaulted loans)** | | | | | | | | | | | | | | | | | |

MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES
SCHEDULE 2-5B

IRBA - QRRE ASSET SUB-CLASS

Name of the Reporting Bank:

Statement as at:

Scope of Reporting:

Table 2-5B-CCF
(In S$ million)

| Nature of Transaction | Notional Amount | Credit Conversion Factor | Credit Equivalent Amounts |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| Total for QRRE Asset Sub-class | | | |

 

## IRBA - OTHER RETAIL EXPOSURES ASSET SUB-CLASS (EXCLUDING EXPOSURES TO SMALL BUSINESS)

| | |
|---|---|
| Name of the Reporting Bank: | |
| Statement as at: | |
| Scope of Reporting: | |

**Table 2-5C-RWA**
**(In S$ million)**

| Internal Rating System | | | | EAD | Exposure Weighted Average PD (%) | LGD or Exposure Weighted Average LGD (%) | Number of Obligors | Capital Require-ments | EL Amount | Credit RWA |
|---|---|---|---|---|---|---|---|---|---|---|
| Pool | PD range (%) | | | | | | | | | |
| | Lower | Upper | Average | | | | | | | |
| (a) | | | (b) | (c) | | (p) from 2-5C-LGD | | | | |
| **(a) Auto Loans** | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | |
| 2 | | | PD2 | | | | | | | |
| 3 | | | PD3 | | | | | | | |
| . | | | PD4 | | | | | | | |
| . | | | | | | | | | | |
| . | | | | | | | | | | |
| | | Default (100%) | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | |
| **(b) Others (pls specify, if appropriate)** | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | |
| 2 | | | PD2 | | | | | | | |
| 3 | | | PD3 | | | | | | | |
| . | | | PD4 | | | | | | | |
| . | | | | | | | | | | |
| . | | | | | | | | | | |
| | | Default (100%) | | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | |
| **Total Other Retail Exposures Asset Sub-Class (include defaulted loans)** | | | | | | | | | | |
| **Total Other Retail Exposures Asset Sub-Class (exclude defaulted loans) (Excluding Exposures to Small Businesses)** | | | | | | | | | | |

| | Number of Obligors | Capital Require-ments | EL Amount: Default risk | EL Amount: Dilution risk | Credit RWA: Default risk | Credit RWA: Dilution risk |
|---|---|---|---|---|---|---|
| **(c) Purchased Receivables** | | | | | | |

## IRBA - OTHER RETAIL EXPOSURES ASSET SUB-CLASS (EXCLUDING EXPOSURES TO SMALL BUSINESS)

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-5C-LGD**
**(In S$ million)**

| | Obligor Grade | Average PD | Total EAD | EAD segmented by facility grade | | | | | | | | | | | | | | Exposure Weighted Average LGD (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | LGD Upper = % Lower = % Average = % | |
| | (a) from 2-5C-RWA | (b) from 2-5C-RWA | (a=SUM(b:o)) (c) from 2-5C-RWA | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | (m) | (n) | (o) | (p) |
| (a) | Auto Loans | | | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | | | |
| | . | | | | | | | | | | | | | | | | | |
| | . | | | | | | | | | | | | | | | | | |
| | . | | | | | | | | | | | | | | | | | |
| | | Default (100%) | | | | | | | | | | | | | | | | |
| | Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| | Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| (b) | Others (pls specify, if applicable) | | | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | | | |
| | . | | | | | | | | | | | | | | | | | |
| | . | | | | | | | | | | | | | | | | | |
| | . | | | | | | | | | | | | | | | | | |
| | | Default (100%) | | | | | | | | | | | | | | | | |
| | Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| | Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| | **Total Other Retail Exposures Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | | | | | | |
| | **Total Other Retail Exposures Asset Sub-Class (exclude defaulted loans) (Excluding Exposures to Small Businesses)** | | | | | | | | | | | | | | | | | |

MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES
SCHEDULE 2-5C

## IRBA - OTHER RETAIL EXPOSURES ASSET SUB-CLASS (EXCLUDING EXPOSURES TO SMALL BUSINESS)

Name of the Reporting Bank:

Statement as at:

Scope of Reporting:

Table 2-5C-CCF
(In S$ million)

| Nature of Transaction | Notional Amount | Credit Conversion Factor | Credit Equivalent Amounts |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| Total Other Retail Exposures Asset Sub-Class (Excluding Exposures to Small Businesses) | | | |

**IRBA - OTHER RETAIL EXPOSURES ASSET SUB-CLASS (EXPOSURES TO SMALL BUSINESS)**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-5D-RWA**
**(In S$ million)**

| Internal Rating System | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Pool | PD range (%) | | | EAD | Exposure Weighted Average PD (%) | LGD or Exposure Weighted Average LGD (%) | Number of Obligors | Capital Require-ments | EL Amount | Credit RWA |
| | Lower | Upper | Average | | | | | | | |
| (a) | | | (b) | (c) | | (p) from 2-5D-LGD | | | | |
| **(a) Auto Loans** | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | |
| 2 | | | PD2 | | | | | | | |
| 3 | | | PD3 | | | | | | | |
| . | | | PD4 | | | | | | | |
| . | | | | | | | | | | |
| . | | | | | | | | | | |
| | | | Default (100%) | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | |
| **(b) Others (pls specify, if appropriate)** | | | | | | | | | | |
| 1 | | | PD1 | | | | | | | |
| 2 | | | PD2 | | | | | | | |
| 3 | | | PD3 | | | | | | | |
| . | | | PD4 | | | | | | | |
| . | | | | | | | | | | |
| . | | | | | | | | | | |
| | | | Default (100%) | | | | | | | |
| Sub-Total (include defaulted loans) | | | | | | | | | | |
| Sub-Total (exclude defaulted loans) | | | | | | | | | | |
| **Total Other Retail Exposures Asset Sub-Class (include defaulted loans)** | | | | | | | | | | |
| **Total Other Retail Exposures Asset Sub-Class (exclude defaulted loans) (Exposures to small business)** | | | | | | | | | | |

| | Number of Obligors | Capital Require-ments | EL Amount: Default risk | EL Amount: Dilution risk | Credit RWA: Default risk | Credit RWA: Dilution risk |
|---|---|---|---|---|---|---|
| **(c) Purchased Receivables** | | | | | | |

MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES
SCHEDULE 2-5D

Annex 12B

**IRBA - OTHER RETAIL EXPOSURES ASSET SUB-CLASS (EXPOSURES TO SMALL BUSINESS)**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 2-5D-LGD**
**(In S$ million)**

| | Obligor Grade | Average PD | Total EAD | EAD segmented by facility grade | | | | | | | | | | | | | | Exposure Weighted Average LGD (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | LGD<br>Upper = %<br>Lower = %<br>Average = % | |
| | (a) from 2-5D-RWA | (b) from 2-5D-RWA | (a=SUM(b:o))<br>(c) from 2-5D-RWA | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | (m) | (n) | (o) | (p) |
| **(a)** | **Auto Loans** | | | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | | | |
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| | . | | | | | | | | | | | | | | | | | |
| | . | | | | | | | | | | | | | | | | | |
| | | Default (100%) | | | | | | | | | | | | | | | | |
| | Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| | Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **(b)** | **Others (pls specify, if applicable)** | | | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | | | |
| | . | | | | | | | | | | | | | | | | | |
| | . | | | | | | | | | | | | | | | | | |
| | . | | | | | | | | | | | | | | | | | |
| | | Default (100%) | | | | | | | | | | | | | | | | |
| | Sub-Total (include defaulted loans) | | | | | | | | | | | | | | | | | |
| | Sub-Total (exclude defaulted loans) | | | | | | | | | | | | | | | | | |
| **Total Other Retail Exposures Asset Sub-Class (include defaulted loans)** | | | | | | | | | | | | | | | | | | |
| **Total Other Retail Exposures Asset Sub-Class (exclude defaulted loans) (Exposures to small business)** | | | | | | | | | | | | | | | | | | |

MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES
SCHEDULE 2-5D

## IRBA - OTHER RETAIL EXPOSURES ASSET SUB-CLASS (EXPOSURES TO SMALL BUSINESS)

Name of the Reporting Bank:

Statement as at:

Scope of Reporting:

Table 2-5D-CCF
(In S$ million)

| Nature of Transaction | Notional Amount | Credit Conversion Factor | Credit Equivalent Amounts |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| Total Other Retail Exposures Asset Sub-Class (Exposures to small business) | | | |

**MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES** **Annex 12B**
**SCHEDULE 2-6A**

## SA(EQ)

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**(In S$ million)**

| | Gross Exposures (before CRM) | Net Exposures (after CRM) | Risk Weight | SA(EQ) RWA |
|---|---|---|---|---|
| **1. Equity Exposures** | | | | |
| **(a) Equity exposures in unconsolidated financial institutions, excluding equity investments in funds, in which the Reporting Bank does not hold a major stake (as stated in para 6.1.3 (o)(iii), 6.2.3 (d)(iii) and 6.3.3 (d)(iii) of Part VI)** | | | 100% | |
| **(b) Other equity exposures, excluding equity investments in funds** | | | 100% | |

| | Materiality Threshold Amount | Risk Weight | SA(EQ) RWA |
|---|---|---|---|
| **(c) Materiality threshold below which no payment will be made by the protection provider in the event of loss on an SA(EQ) exposure** | | 1250% | |

| | Net Exposures (as per paragraph 7.2.3(a), using carrying value of the equity investment on the Reporting Bank's balance sheet, after CRM) | Risk Weight | SA(EQ) RWA |
|---|---|---|---|
| **2. Equity Investments in Funds** | | | |
| **(a) Equity investments in funds for which risk-weighted exposure amounts are computed using only the LTA** | | | |
| **(b) Equity investments in funds for which risk-weighted exposure amounts are computed using only the MBA** | | | |
| **(c) Equity investments in funds for which risk-weighted exposure amounts are computed using only the FBA** | | 1250% | |
| **(d) Equity investments in funds for which risk-weighted exposure amounts are computed using any combination of the LTA, MBA or FBA** | | | |

| | Gross Exposures (before CRM) | Net Exposures (after CRM) | Risk Weight | SA(EQ) RWA |
|---|---|---|---|---|
| **3. PE/VC investments and investments in unconsolidated major stake companies that are not financial institutions, which are subject to a risk weight of 1250%, pursuant to paragraphs 6.3.6(i) and 6.3.6(ii)** | | | 1250% | |
| **4. Total SA(EQ) RWA** | | | | |

[MAS Notice 637 (Amendment) 2016]
[MAS Notice 637 (Amendment No. 3) 2017]

**MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES** **Annex 12B**
**SCHEDULE 2-6B**

## IRBA(EQ)

**Name of the Reporting Bank:** ______

**Statement as at:** ______

**Scope of Reporting:** ______

**(In S$ million)**

| | | Gross Exposures (before CRM) | Net Exposures (after CRM) | Risk Weight | IRBA(EQ) RWA |
|---|---|---|---|---|---|
| | | | (a) | (b) | (c=axb) |
| **1.** | **Simple Risk Weight Method** | | | | |
| **(a)** | **Equity exposures in unconsolidated financial institutions, excluding equity investments in funds, in which the Reporting Bank does not hold a major stake (as stated in para 6.1.3 (o)(iii), 6.2.3 (d)(iii) and 6.3.3 (d)(iii) of Part VI)** | | | | |
| | Listed securities | | | 300% | |
| | Other equity exposures | | | 400% | |
| **(b)** | **Other equity exposures, excluding equity investments in funds** | | | | |
| | Listed securities | | | 300% | |
| | Other equity exposures | | | 400% | |
| | **Total for Equity Exposures under Simple Risk Weight Method** | | | | |

| | | Gross Exposures (before CRM) | Net Exposures (after CRM) | Exposures subject to minimum risk weights: EAD | Exposures subject to minimum risk weights: Minimum Risk Weight | Exposures subject to minimum risk weights: IRBA(EQ) RWA using minimum risk weight | Exposures subject to internal models method (not subject to minimum risk weights): EAD | Exposures subject to internal models method (not subject to minimum risk weights): Potential loss | Exposures subject to internal models method (not subject to minimum risk weights): IRBA(EQ) RWA using internal models method | Total IRBA(EQ) RWA |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | (d) | (e) | (f) | (g=exf) | (h=d-e) | (i) | (j=ix12.5) | (k=g+j) |
| **2.** | **IMM** | | | | | | | | | |
| **(a)** | **Equity exposures in unconsolidated financial institutions, excluding equity investments in funds, in which the Reporting Bank does not hold a major stake (as stated in para 6.1.3 (o)(iii), 6.2.3 (d)(iii), 6.2.3 (d)(iii) and 6.3.3 (d)(iii) of Part VI)** | | | | | | | | | |
| | Listed securities | | | | 200% | | | | | |
| | Other equity exposures | | | | 300% | | | | | |
| **(b)** | **Other equity exposures, excluding equity investments in funds** | | | | | | | | | |
| | Listed securities | | | | 200% | | | | | |
| | Other equity exposures | | | | 300% | | | | | |
| | | | | | | | | | | |
| | | | **Materiality Threshold Amount** | | **Risk Weight** | | | | | |
| **(c)** | **Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA(EQ) exposure** | | | | 1250% | | | | | |
| | **Total IRBA(EQ) RWA (after comparing with floor) under IMM** | | | | | | | | | |

| | Estimated PD (%) | Gross Exposures (before CRM) | Net Exposures (after CRM) | EL Amounts | IRBA(EQ) RWA | | |
|---|---|---|---|---|---|---|---|
| | | | | | Before Comparing with Floor | Floor | After Comparing with Floor |
| **3. PD/LGD Method** | | | | | | | |
| **(a) Equity exposures in unconsolidated financial institutions, excluding equity investments in funds, in which the Reporting Bank does not hold a major stake (as stated in para 6.1.3 (o)(iii), 6.2.3 (d)(iii) and 6.3.3 (d)(iii) of Part VI), excluding financial institutions that meet the criteria stated in Para 7.4.21A or Para 7.4.22A of MAS Notice 637** | | | | | | | |
| (1) Listed securities (no expectations of capital gains) | | | | | | | |
| PD1 | | | | | | 100% | |
| PD2 | | | | | | 100% | |
| PD3 | | | | | | 100% | |
| PD4 | | | | | | 100% | |
| | | | | | | 100% | |
| | | | | | | 100% | |
| Default (100%) | | | | | | 100% | |
| Sub-Total | | | | | | | |
| (2) Private securities (no expectations of capital gains) | | | | | | | |
| PD1 | | | | | | 100% | |
| PD2 | | | | | | 100% | |
| PD3 | | | | | | 100% | |
| PD4 | | | | | | 100% | |
| | | | | | | 100% | |
| | | | | | | 100% | |
| Default (100%) | | | | | | 100% | |
| Sub-Total | | | | | | | |
| (3) Listed securities | | | | | | | |
| PD1 | | | | | | 200% | |
| PD2 | | | | | | 200% | |
| PD3 | | | | | | 200% | |
| PD4 | | | | | | 200% | |
| | | | | | | 200% | |
| | | | | | | 200% | |
| Default (100%) | | | | | | 200% | |
| Sub-Total | | | | | | | |
| (4) Other equity exposures | | | | | | | |
| PD1 | | | | | | 300% | |
| PD2 | | | | | | 300% | |
| PD3 | | | | | | 300% | |
| PD4 | | | | | | 300% | |
| | | | | | | 300% | |
| | | | | | | 300% | |
| Default (100%) | | | | | | 300% | |
| Sub-Total | | | | | | | |

**(b) Equity exposures in unconsolidated financial institutions, excluding equity investments in funds, in which the Reporting Bank does not hold a major stake (as stated in para 6.1.3 (o)(iii), 6.2.3 (d)(iii) and 6.3.3 (d)(iii) of Part VI) and the financial institutions meet the criteria stated in Para 7.4.21A or Para 7.4.22A of MAS Notice 637**

| | | | | | | |
|---|---|---|---|---|---|---|
| (1) Listed securities (no expectations of capital gains) | | | | | | |
| PD1 | | | | | 100% | |
| PD2 | | | | | 100% | |
| PD3 | | | | | 100% | |
| PD4 | | | | | 100% | |
| | | | | | 100% | |
| | | | | | 100% | |
| Default (100%) | | | | | 100% | |
| Sub-Total | | | | | | |
| (2) Private securities (no expectations of capital gains) | | | | | | |
| PD1 | | | | | 100% | |
| PD2 | | | | | 100% | |
| PD3 | | | | | 100% | |
| PD4 | | | | | 100% | |
| | | | | | 100% | |
| | | | | | 100% | |
| Default (100%) | | | | | 100% | |
| Sub-Total | | | | | | |
| (3) Listed securities | | | | | | |
| PD1 | | | | | 200% | |
| PD2 | | | | | 200% | |
| PD3 | | | | | 200% | |
| PD4 | | | | | 200% | |
| | | | | | 200% | |
| | | | | | 200% | |
| Default (100%) | | | | | 200% | |
| Sub-Total | | | | | | |
| (4) Other equity exposures | | | | | | |
| PD1 | | | | | 300% | |
| PD2 | | | | | 300% | |
| PD3 | | | | | 300% | |
| PD4 | | | | | 300% | |
| | | | | | 300% | |
| | | | | | 300% | |
| Default (100%) | | | | | 300% | |
| Sub-Total | | | | | | |

**(c) Other equity exposures, excluding equity investments in funds**

| | | | | | | Risk Weight | |
|---|---|---|---|---|---|---|---|
| (1) | Listed securities (no expectations of capital gains) | | | | | | |
| | PD1 | | | | | 100% | |
| | PD2 | | | | | 100% | |
| | PD3 | | | | | 100% | |
| | PD4 | | | | | 100% | |
| | | | | | | 100% | |
| | | | | | | 100% | |
| | Default (100%) | | | | | 100% | |
| | Sub-Total | | | | | | |
| (2) | Private securities (no expectations of capital gains) | | | | | | |
| | PD1 | | | | | 100% | |
| | PD2 | | | | | 100% | |
| | PD3 | | | | | 100% | |
| | PD4 | | | | | 100% | |
| | | | | | | 100% | |
| | | | | | | 100% | |
| | Default (100%) | | | | | 100% | |
| | Sub-Total | | | | | | |
| (3) | Listed securities | | | | | | |
| | PD1 | | | | | 200% | |
| | PD2 | | | | | 200% | |
| | PD3 | | | | | 200% | |
| | PD4 | | | | | 200% | |
| | | | | | | 200% | |
| | | | | | | 200% | |
| | Default (100%) | | | | | 200% | |
| | Sub-Total | | | | | | |
| (4) | Other equity exposures | | | | | | |
| | PD1 | | | | | 300% | |
| | PD2 | | | | | 300% | |
| | PD3 | | | | | 300% | |
| | PD4 | | | | | 300% | |
| | | | | | | 300% | |
| | | | | | | 300% | |
| | Default (100%) | | | | | 300% | |
| | Sub-Total | | | | | | |

| | | | Materiality Threshold Amount | | | **Risk Weight** | **IRBA(EQ) RWA** |
|---|---|---|---|---|---|---|---|
| **(d)** | **Application of a 1250% risk weight instead of calculating the credit risk-weighted exposure amount under the PD/LGD Method (as per Para 7.5.52 of MAS Notice 637)** | | | | | 1250% | |
| **(e)** | **Materiality threshold below which no payment will be made by the protection provider in the event of loss on an IRBA(EQ) exposure** | | | | | 1250% | |
| | **Total EL For Equity Exposures under PD/LGD Method** | | | | | 1250% | |
| | **Total for Equity Exposures under PD/LGD Method** | | | | | | |

| | | Net Exposures (as per paragraph 7.2.3(c), using carrying value of the equity investment on the Reporting Bank's balance sheet, after CRM) | Risk Weight | IRBA(EQ) RWA |
|---|---|---|---|---|
| **4.** | **Equity Investments in Funds** | | | |
| **(a)** | **Equity investments in funds for which risk-weighted exposure amounts are computed using only the LTA** | | | |
| **(b)** | **Equity investments in funds for which risk-weighted exposure amounts are computed using only the MBA** | | | |
| **(c)** | **Equity investments in funds for which risk-weighted exposure amounts are computed using only the FBA** | | 1250% | |
| **(d)** | **Equity investments in funds for which risk-weighted exposure amounts are computed using any combination of the LTA, MBA or FBA** | | | |
| | **Total for Equity Investments in Funds** | | | |

| | | Gross Exposures (before CRM) | Net Exposures (after CRM) | Risk Weight | IRBA(EQ) RWA |
|---|---|---|---|---|---|
| **5.** | **PE/VC investments and investments in unconsolidated major stake companies that are not financial institutions, which are subject to a risk weight of 1250%, pursuant to paragraphs 6.3.6(i) and 6.3.6(ii)** | | | 1250% | |
| **6.** | **Total IRBA(EQ) RWA (excluding exposures subject to 1250% risk weights)** | | | | |
| | **Total IRBA(EQ) RWA (only exposures subject to 1250% risk weights)** | | | | |

[MAS Notice 637 (Amendment) 2013]
[MAS Notice 637 (Amendment) 2016]
[MAS Notice 637 (Amendment No. 3) 2017]

**MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES**
**SCHEDULE 2-7**

**SECURITISATION**

**Name of the Reporting Bank:** 

**Statement as at:** 

**Scope of Reporting:** 

| | Before CRM Bought | | CRM Adjustments | | After CRM | Notional Amounts | RWA | |
|---|---|---|---|---|---|---|---|---|
| | Exposures Gross of Specific Allowances | Exposures net of Specific Allowances | Due to Credit Protection Bought | Due to Recognition of Financial Collateral | Net Exposures Net of Specific Allowances | | | |
| **1. Breakdown by Capital Computation Approach** | | | | | | | | |
| (a) Exposures Treated Under SEC-IRBA | | | | | | | | |
| Adjusted Securitisation RWA (after application of para 7.1.12 to 7.1.17 on maximum risk-weighted exposure amounts) | | | | | | | | A1 |
| Cash Advance Facilities Extended to Securitisation Transactions | | | | | | | | |
| of which, total undrawn amounts of cash advance facilities extended that are unconditionally cancellable (subject to 10% CCF) | | | | | | | | |
| **SEC-IRBA RWA** | | | | | | | | A = A1 |
| (b) Exposures Treated Under SEC-ERBA | | | | | | | | |
| Adjusted Securitisation RWA (after application of para 7.1.12 to 7.1.17 on maximum risk-weighted exposure amounts) | | | | | | | | B1 |
| Cash Advance Facilities Extended to Securitisation Transactions | | | | | | | | |
| of which, total undrawn amounts of cash advance facilities extended that are unconditionally cancellable (subject to 10% CCF) | | | | | | | | |
| **SEC-ERBA RWA** | | | | | | | | B = B1 |
| (c) Exposures Treated Under SEC-SA | | | | | | | | |
| Adjusted Securitisation RWA (after application of para 7.1.12 to 7.1.17 on maximum risk-weighted exposure amounts) | | | | | | | | C1 |
| Cash Advance Facilities Extended to Securitisation Transactions | | | | | | | | |
| of which, total undrawn amounts of cash advance facilities extended that are unconditionally cancellable (subject to 10% CCF) | | | | | | | | |
| **SEC-SA RWA** | | | | | | | | C = C1 |
| (d) Securitisation Exposures to which the SEC-IRBA, SEC-ERBA, and SEC-SA cannot be applied | | | | | | | | D |
| **Total Securitisation RWA** | | | | | | | | E = A + B + C + [ |
| **2. Breakdown by Exposure Type** | | | | | | | | |
| <u>Senior and Non-Senior Exposures</u> | | | | | | | | |
| (i) Senior Securitisation Exposures | | | | | | | | |
| (ii) Non-Senior Securitisation Exposures | | | | | | | | |
| <u>Securitisation and Resecuritisation Exposures</u> | | | | | | | | |
| (iii) Securitisation (Non-Resecuritisation) Exposures | | | | | | | | |
| (iv) Resecuritisation Exposures | | | | | | | | |
| <u>STC and Non-STC Exposures</u> | | | | | | | | |
| (v) STC Securitisation Exposures | | | | | | | | |
| (vi) Non-STC Securitisation Exposures | | | | | | | | |

| | Amount Deducted in Calculation of CET1 Capital |
|---|---|
| **3. Amounts Deducted in Calculation of CET1 Capital** | |
| (i) Gain on sale | |
| (ii) Credit-enhancing interest-only strips net of gain on sale | |

**MAS NOTICE 637: CREDIT RISK REPORTING SCHEDULES** **Annex 12B**
**SCHEDULE 2-8A**

## UNSETTLED TRANSACTIONS

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**(In S$ million)**

**1. Unsettled DvP Trades**

| | Positive Current Exposure | Risk Weight | Credit RWA |
|---|---|---|---|
| | (a) | (b) | (c=axb) |
| Number of working days after the due settlement date | | | |
| (a) From 5 to 15 | | 100% | |
| (b) From 16 to 30 | | 625% | |
| (c) From 31 to 45 | | 938% | |
| (d) 46 or more | | 1250% | |
| Sub-Total for Unsettled DvP Trades | | | |

**2. Unsettled non-DvP Trades**

A Reporting Bank shall report in 2(a), SA(CR) or IRBA exposures that are not material in aggregate and where a Reporting Bank applied a 100% risk weight in accordance with paragraphs 7.3.38 or 7.4.72(c)

| | Positive Current Exposure | Risk Weight | Credit RWA |
|---|---|---|---|
| | (d) | (e) | (f=dxe) |
| (a) Second leg less than 5 days late | | 100% | |
| (b) Second leg 5 days late or more | | 1250% | |

**3. Total**

**MAS NOTICE 637: MARKET RISK REPORTING SCHEDULES** **Annex 12C**
**SCHEDULE 3**

## SUMMARY OF MARKET RWA

| | |
|---|---|
| **Name of the Reporting Bank:** | |
| **Statement as at:** | |
| **Scope of Reporting:** | |

**1. SA(MR)**

**(a) Market Risk Capital Requirement under SA(MR)** **(In S$ million)**

| Market Risk Type | Specific Risk | General Market Risk | Additional Capital Requirement for Options | Total Capital Requirement | |
|---|---|---|---|---|---|
| | (a) | (b) | (c) | (d=a+b+c) | |
| Interest Rate Risk | | | | | |
| Equity Risk | | | | | |
| Foreign Exchange Risk | | | | | |
| Commodity Risk | | | | | |
| **Total Capital Requirement under SA(MR)** | | | | | A |

| | | | |
|---|---|---|---|
| **(b) Market RWA under SA(MR)** | Ax12.5 | | B |

**2. IMA**

**(a) Market Risk Capital Requirement under IMA** **(In S$ million)**

| | | | |
|---|---|---|---|
| **Capital Requirement for General Market Risk** | | | C |
| **Capital Requirement for Specific Risk** | | | D |
| **Capital Requirement for Incremental Risk** | | | E |
| **Total Market Risk Capital Requirement under IMA** | C+D+E | | F |
| **(b) Market RWA under IMA** | Fx12.5 | | G |

**(c) Coverage (applicable at Group level only)**

| | | |
|---|---|---|
| **General Market Risk Capital Requirement under partial SA(MR)** | A | |
| **General Market Risk Capital Requirement under IMA** | F | |
| **Proportion of General Market Risk Capital Requirement under SA(MR)** | A÷(A+F) | |

**3. Total Market Risk Capital Requirement and Market RWA**

| | | | |
|---|---|---|---|
| **(a) Total Market Risk Capital Requirement** | A+F | | H |
| **(b) Total Market RWA** | Hx12.5 | | |

**MAS NOTICE 637: MARKET RISK REPORTING SCHEDULES** **Annex 12C**
**SCHEDULE 3-1A**

**SA(MR) - INTEREST RATE RISK**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**In SGD Equivalent of Foreign Currency (S$ million)**

**1. Specific Risk**

**(i) Positions other than Securitisation Positions**

| | | Gross Position Long | Gross Position Short | Net Position Long (a) | Net Position Short (b) | Net Positions subject to Risk Charge (\|a\| + \|b\|) | Specific Risk Charge | Capital Requirement |
|---|---|---|---|---|---|---|---|---|
| **Government** | **Credit quality grade as set out in Table 7R-1** | | | | | | | |
| | 1 | | | | | | 0.00% | |
| | 2 or 3 | | | | | | | |
| | 6 months or less | | | | | | 0.25% | |
| | more than 6 and up to 24 months | | | | | | 1.00% | |
| | more than 24 months | | | | | | 1.60% | |
| | 4 or 5 | | | | | | 8.00% | |
| | 6 | | | | | | 12.00% | |
| | Unrated | | | | | | 8.00% | |
| **Qualifying** | 6 months or less | | | | | | 0.25% | |
| | more than 6 and up to 24 months | | | | | | 1.00% | |
| | more than 24 months | | | | | | 1.60% | |
| **Others** | **Credit quality grade as set out in Table 7R-1** | | | | | | | |
| | 4 | | | | | | 8.00% | |
| | 5 or 6 | | | | | | 12.00% | |
| | Unrated | | | | | | 8.00% | |
| Sub-Total | | | | | | | | |

**(ii) Securitisation/Resecuritisation Positions (Non-Correlation Trading)**

**In SGD Equivalent of Foreign Currency (S$ million)**

| | Gross Position Long | Gross Position Short | Net Position Long (a) | Net Position Short (b) | Net Positions subject to Risk Charge (\|a\| + \|b\|) | Exposure-weighted specific Risk Charge | Capital Requirement |
|---|---|---|---|---|---|---|---|
| **Positions covered under SEC-IRBA** | | | | | | | |
| **Positions covered under SEC-ERBA** | | | | | | | |
| **Positions covered under SEC-SA** | | | | | | | |
| **Positions to which SEC-IRBA, SEC-ERBA and SEC-SA cannot be applied** | | | | | | | |
| Sub-Total | | | | | | | |

**(iii) Correlation Trading Portfolio**

| Correlation Trading Portfolio | | | | | | | |
|---|---|---|---|---|---|---|---|

**Total Interest Rate (Specific Risk) Capital Requirement** | | A

[MAS Notice 637 (Amendment No.2) 2017]

**2. General Market Risk (Summary)**

**Method Used**

**SGD Equivalent (S$ million)**

| **Interest Rate Positions** | **Vertical Disallowance**<br>(a)<br>rom A or H of Sch 3-1I | **Horizontal Disallowance**<br>(b)<br>from F or M of Sch 3-1B | **Residual Unmatched Weighted Positions**<br>(c)<br>from E or L of Sch 3-1B | **Capital Requirement**<br>(d=a+b+c) |
|---|---|---|---|---|
| Singapore Dollar | | | | |
| United States Dollar | | | | |
| Australian Dollar | | | | |
| Canadian Dollar | | | | |
| Chinese Renminbi | | | | |
| Danish Krone | | | | |
| Euro | | | | |
| Hong Kong Dollar | | | | |
| Indian Rupee | | | | |
| Indonesian Rupiah | | | | |
| Japanese Yen | | | | |
| Korean Won | | | | |
| Malaysian Ringgit | | | | |
| New Taiwan Dollar | | | | |
| New Zealand Dollar | | | | |
| Norwegian Kroner | | | | |
| Philippine Peso | | | | |
| Pound Sterling | | | | |
| South African Rand | | | | |
| Swedish Krona | | | | |
| Swiss Franc | | | | |
| Thai Baht | | | | |
| Brazilian Real | | | | |
| Other Residual Currencies | | | | |

**Total Interest Rate (General Market Risk) Capital Requirement** | | B

**3. Additional Capital Requirement for Options**

| | | |
|---|---|---|
| Simplified Method | | C |
| Delta-Plus Method - Capital Requirement for Gamma Risk and Vega Risk | | D |
| Scenario Approach | | E |
| **Additional Capital Requirement for Options** | C or D or E | F |
| **4. Total Market Risk Capital Requirement for Interest Rate Risk** | A+B+F | |

[MAS Notice 637 (Amendment No.2) 2014]

**MAS NOTICE 637: MARKET RISK REPORTING SCHEDULES**
**SCHEDULE 3-1B**

**Annex 12C**

*lease use a sepa ate schedule fo each cu ency*

## SA(MR) - INTEREST RATE RISK (GENERAL MARKET RISK)

**Name of the Reporting Bank** [ ]

**Statement as at** [ ]

**Scope of Reporting** [ ]

**Method Used** [ ]

**Interest Rate Positions Denominated in** [ ]

**(In S$ m llion)**

**1. Maturity Method**

| | | Net Position (Notional Amount) | | General Risk Charge | Risk Weighted Position | | Disallowances | | | | | | | | | | | | Unmatched Position |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Vertical | | | Horizontal | | | | | | | | | |
| | | | | | | | | | | Within Zone | | | Between Zone 1 & 2 and 2 & 3 | | | Between Zone 1 & 3 | | | |
| | | Long | Short | | Long | Short | Matched Weighted | Band Matching | Require-ment | Matched Weighted | Zone Matching | Require-ment | Matched Weighted | Zone Matching | Require-ment | Matched Weighted | Zone Matching | Require-ment | |
| | | (a) | (b) | (c) | (d=axc) | (e=bxc) | (f) | (g) | (h=fxg) | (i) | (j) | (k=ixj) | (l) | (m) | (n=lxm) | (o) | (p) | (q=oxp) | ( ) |
| **Zone 1** | ime Band 1 | | | 0 00% | | | | 10 00% | | | | | | | | | | | |
| | ime Band 2 | | | 0 20% | | | | 10 00% | | | 40 00% | | | | | | | | |
| | ime Band 3 | | | 0 40% | | | | 10 00% | | | | | | 40 00% | | | | | |
| | ime Band 4 | | | 0 70% | | | | 10 00% | | | | | | | | | | | |
| **Zone 2** | ime Band 5 | | | 1 25% | | | | 10 00% | | | | | | | | | | | |
| | ime Band 6 | | | 1 75% | | | | 10 00% | | | 30 00% | | | | | | | | |
| | ime Band 7 | | | 2 25% | | | | 10 00% | | | | | | | | | | | |
| **Zone 3** | ime Band 8 | | | 2 75% | | | | 10 00% | | | | | | | | | 100 00% | | |
| | ime Band 9 | | | 3 25% | | | | 10 00% | | | | | | | | | | | |
| | ime Band 10 | | | 3 75% | | | | 10 00% | | | | | | 40 00% | | | | | |
| | ime Band 11 | | | 4 50% | | | | 10 00% | | | 30 00% | | | | | | | | |
| | ime Band 12 | | | 5 25% | | | | 10 00% | | | | | | | | | | | |
| | ime Band 13 | | | 6 00% | | | | 10 00% | | | | | | | | | | | |
| | ime Band 14 | | | 8 00% | | | | 10 00% | | | | | | | | | | | |
| | ime Band 15 | | | 12 50% | | | | 10 00% | | | | | | | | | | | |
| | | | | | | | | | A | | | B | | | C | | | D | E |

**Total Vertical Disallowance** A [ ]

**Total Horizontal Disallowance** B C D [ ]

**Interest Rate (General Market Risk) Capital Requirement - Maturity Method** A E [ ] G

**2. Duration Method**

| | | Net Position x Modified Duration | | Assume d ield Change | Risk Weighted Position | | Disallowances | | | | | | | | | | | | Unmatched Position |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Vertical | | | Horizontal | | | | | | | | | |
| | | | | | | | | | | Within Zone | | | Between Zone 1 & 2 and 2 & 3 | | | Between Zone 1 & 3 | | | |
| | | Long | Short | | Long | Short | Matched Weighted Position | Band Matching Factor | Require-ment | Matched Weighted Position | Zone Matching Factor | Require-ment | Matched Weighted Position | Zone Matching Factor | Require-ment | Matched Weighted Position | Zone Matching Factor | Require-ment | |
| | | (a') | (b') | (c') | (d) = (a) x (c) | (e) = (b) x (c) | (f) | (g) | (h) = (f) x (g) | (i) | (j) | (k) = (i) x (j) | (l) | (m) | (n) = (l) x (m) | (o) | (p) | (q) = (o) x (p) | ( ) |
| **Zone 1** | Du at on Band 1 | | | 1 00% | | | | 5 00% | | | | | | | | | | | |
| | Du at on Band 2 | | | 1 00% | | | | 5 00% | | | 40 00% | | | | | | | | |
| | Du at on Band 3 | | | 1 00% | | | | 5 00% | | | | | | 40 00% | | | | | |
| | Du at on Band 4 | | | 1 00% | | | | 5 00% | | | | | | | | | | | |
| **Zone 2** | Du at on Band 5 | | | 0 90% | | | | 5 00% | | | | | | | | | | | |
| | Du at on Band 6 | | | 0 80% | | | | 5 00% | | | 30 00% | | | | | | | | |
| | Du at on Band 7 | | | 0 75% | | | | 5 00% | | | | | | | | | | | |
| **Zone 3** | Du at on Band 8 | | | 0 70% | | | | 5 00% | | | | | | | | | 100 00% | | |
| | Du at on Band 9 | | | 0 65% | | | | 5 00% | | | | | | | | | | | |
| | Du at on Band 10 | | | 0 60% | | | | 5 00% | | | | | | 40 00% | | | | | |
| | Du at on Band 11 | | | 0 60% | | | | 5 00% | | | 30 00% | | | | | | | | |
| | Du at on Band 12 | | | 0 60% | | | | 5 00% | | | | | | | | | | | |
| | Du at on Band 13 | | | 0 60% | | | | 5 00% | | | | | | | | | | | |
| | Du at on Band 14 | | | 0 60% | | | | 5 00% | | | | | | | | | | | |
| | Du at on Band 15 | | | 0 60% | | | | 5 00% | | | | | | | | | | | |
| | | | | | | | | | H | | | I | | | J | | | K | |

**Total Vertical Disallowance** H [ ]

**Total Horizontal Disallowance** I J K [ ] M

**Interest Rate (General Market Risk) Capital Requirement - Duration Method** H M [ ] N

[MAS Notice 637 (Amendment) 2013]

**MAS NOTICE 637: MARKET RISK REPORTING SCHEDULES** **Annex 12C**
**SCHEDULE 3-1C**

## SA(MR) - EQUITY RISK

**Name of the Reporting Bank:** 

**Statement as at:** 

**Scope of Reporting:** 

**In SGD Equivalent of Foreign Currency (S$ million)**

| | Net Position / Matched Position | | Specific / General Market Risk Charge / Additional Risk Charge | Capital Requirement | |
|---|---|---|---|---|---|
| | Long | Short | | | |
| **1. Specific Risk** | | | | | |
| **(a) Qualifying equity indices** | | | | | |
| Singapore | | | 2%* | | |
| United States | | | 2%* | | |
| (Pls list and specify) | | | | | |
| **(b) Equities and equity baskets** | | | | | |
| Singapore | | | 8% | | |
| United States | | | 8% | | |
| (Pls list and specify) | | | | | |
| **(c) Other equity indices** | | | | | |
| Singapore | | | 8% | | |
| United States | | | 8% | | |
| (Pls list and specify) | | | | | |
| **Sub-Total** | | | | | A |
| **2. General Market Risk** | | | | | |
| Singapore | | | 8% | | |
| United States | | | 8% | | |
| (Pls list and specify) | | | | | |
| **Sub-Total** | | | | | B |
| **3. Additional Capital Requirement for Arbitrage Strategies** | | | | | |
| **(a)** Matched positions in same underlying index at different dates or in different market centres | | | 2% | | |
| **(b)** Matched positions in different but similar indices at the same date | | | 2% | | |
| **(c)** Index versus basket of constituent stocks comprising at least 90% of the index | | | 4% | | |
| **Sub-Total** | | | | | C |
| **4. Additional Capital Requirement for Options** | | | | | |
| Simplified Method | | | | | D |
| Delta-Plus Method - Capital Requirement for Gamma Risk and Vega Risk | | | | | E |
| Scenario Approach | | | | | F |
| **Additional Capital Requirement for Options** | | | D or E or F | | G |
| **5. Total Market Risk Capital Requirement for Equity Position Risk** | | | A+B+C+G | | |

## SA(MR) - FOREIGN EXCHANGE RISK

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**1. Foreign Exchange Positions**

**S$ Equivalent of Foreign Currency (S$ million)**

| **Currencies / Gold** | **Structural FX positions excluded under paragraph 8.1.21 of MAS 637** | **Long Position net of structural FX positions excluded under paragraph 8.1.21 of MAS 637** | **Short Position net of structural FX positions excluded under paragraph 8.1.21 of MAS 637** |
|---|---|---|---|
| Australian Dollars | | | |
| Canadian Dollars | | | |
| Chinese Renmibi | | | |
| Danish Kronor | | | |
| Euro | | | |
| Hong Kong Dollar | | | |
| Indian Rupee | | | |
| Indonesian Rupiah | | | |
| Japanese Yen | | | |
| Korean Won | | | |
| Malaysia Ringgit | | | |
| New Taiwan Dollars | | | |
| New Zealand Dollars | | | |
| Norwegian Krone | | | |
| Philipines Peso | | | |
| Pound Sterling | | | |
| Saudi Arabian Riyal | | | |
| Swedish Kroner | | | |
| Sri Lanka Rupee | | | |
| Swiss Franc | | | |
| Thai Baht | | | |
| United States Dollars | | | |
| Other Material Currencies (Please specify and itemise) | | | |
| ………………………… | | | |
| ………………………… | | | |
| ………………………… | | | |
| ………………………… | | | |
| ………………………… | | | |
| Other Non-Material Currencies | | | |
| Sum of Net Long Positions / Sum of Net Short Positions | | | |

| | | | |
|---|---|---|---|
| | **Net Position in Foreign Exchange**<br>(Higher of sum of net long positions or sum of net short positions) | | A |
| **2.** | **Gold Position**<br>Net Exposure in Gold | | B |
| **3.** | **Foreign Exchange and Gold Positions**<br>Net Exposure in Foreign Exchange and Gold | A+B | C |
| | Risk Charge | | 8% |
| **4.** | **Foreign Exchange and Gold Positions Capital Requirement** | Cx8% | D |
| **5.** | **Additional Capital Requirement for Options** | | |
| | Simplified Method | | E |
| | Delta-Plus Method - Capital Requirement for Gamma Risk and Vega Risk | | F |
| | Scenario Approach | | G |
| | **Additional Capital Requirement for Options** | E or F or G | H |
| **6.** | **Total Capital Requirement for Foreign Exchange Risk (General Market Risk)** | D+H | |

[MAS Notice 637 (Amendment) 2017]

## SA(MR) - COMMODITIES RISK

**Name of the Reporting Bank:** [ ]

**Statement as at:** [ ]

**Scope of Reporting:** [ ]

**Method Used:** [ ]

### 1. Simplified Approach

**Commodity Positions (S$ million)**

| Commodity | Gross Long Position | Gross Short Position | Absolute Net Long or Short Position | Absolute Gross Long plus Short Positions |
|---|---|---|---|---|
| Silver | | | | |
| Brent | | | | |
| Others (Pls specify and temise) | | | | |
| | | | | |
| | | | | |
| | | | | |

| | | |
|---|---|---|
| Sum of Absolute Net Pos t on | [ ] A | [ ] B |
| Risk Charge to be applied on Net Positions | | 15% |
| **Capital Requirement for Net Positions** | Ax15% | [ ] C |
| Risk Charge to be applied on Gross Pos t ons | | 3% |
| **Capital Requirement for Gross Positions** | Bx3% | [ ] D |
| **Market Risk Capital Requirement for Commodity Risk - Simplified Approach** | C+D | [ ] E |

### 2. Maturity Ladder Approach

**Commodity Positions (S$ million)**

| Commodity | Matched Position | Spread Charge | Capital Requirement for Matched Positions | Carried Forward Positions | Carry/Outright Charge | Capital Requirement for Carried Forward Positions | Total Capital Requirement |
|---|---|---|---|---|---|---|---|
| **Silver** | | | | | | | |
| Time Band 1 | | 1.50% | | | 0.60% | | |
| Time Band 2 | | 1.50% | | | 0.60% | | |
| Time Band 3 | | 1.50% | | | 0.60% | | |
| Time Band 4 | | 1.50% | | | 0.60% | | |
| Time Band 5 | | 1.50% | | | 0.60% | | |
| Time Band 6 | | 1.50% | | | 0.60% | | |
| Time Band 7 | | 1.50% | | | 0.60% | | |
| Remaining Positions | | | | | 15.0% | | |
| **Brent** | | | | | | | |
| Time Band 1 | | 1.50% | | | 0.60% | | |
| Time Band 2 | | 1.50% | | | 0.60% | | |
| Time Band 3 | | 1.50% | | | 0.60% | | |
| Time Band 4 | | 1.50% | | | 0.60% | | |
| Time Band 5 | | 1.50% | | | 0.60% | | |
| Time Band 6 | | 1.50% | | | 0.60% | | |
| Time Band 7 | | 1.50% | | | 0.60% | | |
| Remaining Positions | | | | | 15.0% | | |
| Others (Pls specify and temise) | | | | | | | |

**Market Risk Capital Requirement for Commodity Risk - Maturity Ladder Approach** [ ] F

### 3. Additional Capital Requirement for Options

| | | |
|---|---|---|
| Simplified Method | | [ ] G |
| Delta-Plus Method - Cap tal Requirement for Gamma Risk and Vega Risk | | [ ] H |
| Scenar o Approach | | [ ] I |
| **Additional Capital Requirement for Options** | G or H or I | [ ] J |

### 4. Total Market Risk Capital Requirement for Commodity Risk

E+J or F+J [ ]

MAS NOTICE 637: MARKET RISK REPORTING SCHEDULES — Annex 12C
SCHEDULE 3-1F

## SA(MR) - OPTIONS POSITION RISK

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting :**

**Method Used:**

### 1. Simplified Approach

S$ Equivalent of Foreign Currency (S$ million)

| | Risk Charge | Positions: Long Put & Long Outright Position | Positions: Long Call & Short Outright Position | Positions: Long Call | Positions: Long Put | Total Capital Charge | |
|---|---|---|---|---|---|---|---|
| **1a. Interest Rate Options** | | | | | | | |
| Specific Risk | | | | | | | |
| General Market Risk | | | | | | | |
| **Total** | | | | | | | A |
| **1b. Equity Options** | | | | | | | |
| Specific Risk | | | | | | | |
| General Market Risk | | | | | | | |
| **Total** | | | | | | | B |
| **1c. Foreign Exchange Options** | | | | | | | |
| General Market Risk | 8% | | | | | | C |
| **1d. Commodity Options** | | | | | | | |
| General Market Risk | 15% | | | | | | D |
| **1e. Total Options Position Capital Requirement** | | | | | | SUM(A:D) | E |

### 2. Delta-Plus Method

Capital requirement (S$ million)

| | Capital Requirement for Gamma Risk | Capital Requirement for Vega Risk | Capital Requirement for Gamma Risk & Vega Risk | |
|---|---|---|---|---|
| **2a. Interest Rate Options** | | | | |
| Singapore Dollar | | | | |
| Time Band 1 | | | | |
| Time Band 2 | | | | |
| Time Band 3 | | | | |
| . | | | | |
| . | | | | |
| Time Band 15 | | | | |
| United States Dollar | | | | |
| Time Band 1 | | | | |
| Time Band 2 | | | | |
| Time Band 3 | | | | |
| . | | | | |
| . | | | | |
| Time Band 15 | | | | |
| Others (Pls specify and itemise by currency type) | | | | |
| **Total Capital Requirement for Gamma Risk and Vega Risk** | | | | F |
| **2b. Equity Options** | | | | |
| Singapore | | | | |
| USA | | | | |
| Others (Pls specify and itemise by national markets) | | | | |
| **Total Capital Requirement for Gamma Risk and Vega Risk** | | | | G |
| **2c. Foreign Exchange and Gold Options** | | | | |
| Australian Dollar AUD | | | | |
| Canadian Dollar CAD | | | | |
| . | | | | |
| . | | | | |
| United States Dollar USD | | | | |
| Others (Pls specify and itemise by currency type) | | | | |
| **Total Capital Requirement for Gamma Risk and Vega Risk** | | | | H |
| **2d. Commodity Options** | | | | |
| Silver | | | | |
| Brent | | | | |
| Others (Pls specify and itemise by commodity type) | | | | |
| **Total Capital Requirement for Gamma Risk and Vega Risk** | | | | I |
| **2e. Total Capital Requirement for Gamma Risk and Vega Risk for all Options** | | | SUM(F:I) | J |

**SCHEDULE 3-1F**

## SA(MR) - OPTIONS POSITION RISK

**Name of the Reporting Bank:** [ ]

**Statement as at:** [ ]

**Scope of Reporting :** [ ]

### 3. Scenario Approach

**3a. Interest Rate Options**

**Singapore Dollar (SGD)**

Gain/Loss (S$ million)

Time Band 1: Assumed change in yield of 100 bp

| Yield | -100 bp | -66 bp | -33 bp | Current Yield | +33 bp | +66 bp | +100 bp |
|---|---|---|---|---|---|---|---|
| **Volatility** | | | | | | | |
| +25% | | | | | | | |
| Current Volatility % | | | | | | | |
| -25% | | | | | | | |

Repeat the above table for each time band relevant to the interest rate option position

**Other Currencies (Pls specify and itemise)**

Repeat the analysis for other currencies, if applicable.

**Total Interest Rate Options Capital Requirement** [ ] K

**3b. Equity Options**

**Singapore**

Gain/Loss (S$ million)

| Equity Value | -8.00% | -5.33% | -2.67% | Current Equity Value | +2.67% | +5.33% | +8.00% |
|---|---|---|---|---|---|---|---|
| **Volatility** | | | | | | | |
| +25% | | | | | | | |
| Current Volatility % | | | | | | | |
| -25% | | | | | | | |

**Other National Markets (Pls specify and itemise)**

Repeat the analysis for other national markets, if applicable.

**Total Equity Options Capital Requirement** [ ] L

**3c. Foreign Exchange Options**

**Singapore Dollar / United States Dollar** SGD/USD

Gain/Loss (S$million)

| Exchange Rate | -8.00% | -5.33% | -2.67% | Current Exchange Rate | +2.67% | +5.33% | +8.00% |
|---|---|---|---|---|---|---|---|
| **Volatility** | | | | | | | |
| +25% | | | | | | | |
| Current Volatility % | | | | | | | |
| -25% | | | | | | | |

**Other Currency Pairs (Pls specify and itemise)**

Repeat the analysis for other currency pairs, if applicable.

**Total Foreign Exchange Options Capital Requirement** [ ] M

**3d. Commodity Options**

**Brent**

Gain/Loss (S$ million)

| Commodity Position Value | -15.00% | -10.00% | -5.00% | Current Commodity Position | +5.00% | +10.00% | +15.00% |
|---|---|---|---|---|---|---|---|
| **Volatility** | | | | | | | |
| +25% | | | | | | | |
| Current Volatility % | | | | | | | |
| -25% | | | | | | | |

**Other Commodity Types (Pls specify and itemise)**

Repeat the analysis for other commodity types, if applicable.

**Total Commodity Options Capital Requirement** [ ] N

**3e. Total Options Capital Requirement** SUM(K:N) [ ] O

**IMA**

Name of the Reporting Bank:

Statement as at:

Scope of Reporting:

(In S$ million)

| | VaR Results | | No. of Backtesting Exceptions | | Scaling Factor | | | Capital Require-ment | |
|---|---|---|---|---|---|---|---|---|---|
| | End of Period result | Average results over past 60 Trading Days | Based on Hypothetical Profit & Loss | Based on Actual Profit & Loss | Initial Scaling Factor | Increase in Scaling Factor | Scaled Average VaR | | |
| **1. General Market Risk** | | | | | | | | | |
| **1a. General Market Risk (by Risk Factor Classes)** | | | | | | | | | |
| Interest Rate Risk | | | | | | | | | |
| Equity Risk | | | | | | | | | |
| Foreign Exchange Risk | | | | | | | | | |
| Commodity Risk | | | | | | | | | |
| **Total** | | | | | | | | | A |
| **1b. General Market Risk (Stressed)** | | | | | | | | | |
| **Stressed VaR** | | | | | | | | | B |
| Period used for stressed VaR calculation | | | | | | | | | |
| **1c. Total Capital Requirement for General Market Risk** | | | | | | | | | C |

**2. Details of Backtesting Exceptions for General Market Risk VaR based on Hypothetical P&L**

| No | Date of Backtesting Exception | VaR | Hypothetical P&L | Actual P&L | Reason for Backtesting Exception |
|---|---|---|---|---|---|
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |

**3. Specific Risk**

| | VaR Results | | Highest No. of Backtesting Exceptions based on any sub portfolio | | Scaling Factor | | | Capital Require-ment | |
|---|---|---|---|---|---|---|---|---|---|
| | End of Period result | Average results over past 60 Trading Days | Based on Actual Profit & Loss | Based on Hypothetical Profit & Loss | Initial Scaling Factor | Increase in Scaling Factor | Scaled Average VaR | | |
| Interest Rate Specific Risk | | | | | | | | | D |
| Equity Specific Risk | | | | | | | | | E |
| **Total** | | | | | | | | | F |
| **3b. Specific Market Risk (Stressed)** | | | | | | | | | |
| **Stressed VaR** | | | | | | | | | G |
| Period used for stressed VaR calculation | | | | | | | | | |
| **3c. Total Capital Requirement for Specific Market Risk** | | | | | | | | | H |

**4. Details of Backtesting Exceptions for Specific Risk based on Hypothetical P&L**

| No | Date of Backtesting Exception | VaR | Hypothetical P&L | Actual P&L | Description of Sub-Portfolio | Reason for Backtesting Exception |
|---|---|---|---|---|---|---|
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | | | | | | |
| 8 | | | | | | |
| 9 | | | | | | |
| 10 | | | | | | |
| 11 | | | | | | |
| 12 | | | | | | |
| 13 | | | | | | |
| 14 | | | | | | |
| 15 | | | | | | |
| 16 | | | | | | |
| 17 | | | | | | |
| 18 | | | | | | |
| 19 | | | | | | |
| 20 | | | | | | |
| .. | | | | | | |
| .. | | | | | | |

**5. Incremental Risk**

| | Results of Incremental Risk Measures | | Scaling Factor | Capital Require-ment | |
|---|---|---|---|---|---|
| | End of Period result | Average results over past 12 Weeks | | | |
| Interest Rate Incremental Risk | | | | | I |
| Equity Incremental Risk | | | | | J |
| Comprehensive Risk Measure (Higher of internal approach or standardised approach) | | | | | K |
| Internal approach for correlation trading portfolio | | | | | |
| 8% of capital charge for specific risk based on Standardised Approach | | | | | |
| **Total Capital Requirement for Incremental Risk** | | | | I + J + K | |

**6. Total Capital Requirement under IMA** C + H + L M

## MAS NOTICE 637: OPERATIONAL RISK REPORTING SCHEDULES SCHEDULE 4

**Annex 12D**

## SUMMARY OF OPERATIONAL RWA

**Name of the Reporting Bank:** 

**Statement as at:** 

**Scope of Reporting:** 

**1. Operational RWA** **(In S$ million)**

**1a. Operational Risk Capital Requirement**

| Item | Formula | Value | Ref |
|---|---|---|---|
| BIA | | | A |
| SA(OR) | | | B |
| ASA | | | C |
| AMA | | | D |
| **Total Operational Risk Capital Requirement** | SUM(A:D) | | E |

**1b. Total Operational RWA**

| Item | Formula | Value | Ref |
|---|---|---|---|
| BIA | Ax12.5 | | F |
| SA(OR) | Bx12.5 | | G |
| ASA | Cx12.5 | | H |
| AMA | Dx12.5 | | I |
| **Total Operational RWA** | Ex12.5 | | J |

**2. Partial Use Coverage (for BIA, SA(OR), ASA and AMA)**

| Item | Formula | Operational RWA as a % of Total |
|---|---|---|
| BIA | F÷J | |
| SA(OR) | G÷J | |
| ASA | H÷J | |
| AMA | I÷J | |
| **Total Operational RWA** | | 100% |

**MAS NOTICE 637: OPERATIONAL RISK REPORTING SCHEDULES** **Annex 12D**

**SCHEDULE 4-1A**

## BIA , SA(OR), ASA, AMA

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**(S$ million)**

| | Banking Activities | α and ß Factors | Gross Income | | | Operational Risk Capital Requirement | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | First Year | Second Year | Third Year | First Year | Second Year | Third Year | Average | |
| 1. | **BIA** | 15% | | | | | | | | A |
| 2. | **SA(OR)** | | | | | | | | | |
| | Corporate Finance | 18% | | | | | | | | |
| | Trading and Sales | 18% | | | | | | | | |
| | Payment and Settlement | 18% | | | | | | | | |
| | Agency Serv ces | 15% | | | | | | | | |
| | Asset Management | 12% | | | | | | | | |
| | Retail Brokerage | 12% | | | | | | | | |
| | Retail Banking | 12% | | | | | | | | |
| | Commercial Banking | 15% | | | | | | | | |
| | **Total** | | | | | | | | | B |
| 3. | **ASA** | | | | | | | | | |
| | Corporate Finance | 18% | | | | | | | | |
| | Trading and Sales | 18% | | | | | | | | |
| | Payment and Settlement | 18% | | | | | | | | |
| | Agency Serv ces | 15% | | | | | | | | |
| | Asset Management | 12% | | | | | | | | |
| | Retail Brokerage | 12% | | | | | | | | |
| | | | | | | | | | | |
| | | | **Total Loans & Advances** | | | | | | | |
| | Retail Banking | 12% | | | | | | | | |
| | Commercial Banking | 15% | | | | | | | | |
| | **Total** | | | | | | | | | C |

**4. AMA**

| | | | |
|---|---|---|---|
| **4a.** | **Stand-alone Calculation** | | |
| | Gross Capital Requirement | | |
| | Less: | | |
| | Cap tal Adjustments due to EL Captured in Business Pract ces | | |
| | Cap tal Adjustments due to Risk M tigation | | |
| | Cap tal Adjustments due to Diversif cat on | | |
| | Cap tal Adjustments due to Correlat on | | |
| | Net Cap tal Requirement | | D |
| **4b.** | **Allocation Calculation** | | |
| | Gross Capital Requirement (before Diversification Effects) | | |
| | Allocated Cap tal Requirement (after Diversification Effects) | | E |
| | Allocated Cap tal Requirement as Percentage of Parent's Operational Risk Requirement | | |
| **5.** | **Operational Risk Capital Requirement** SUM(A:E) | | |

**MAS NOTICE 637: OPERATIONAL RISK REPORTING SCHEDULES**
**SCHEDULE 4-2A**

**Annex 12D**

## OPERATIONAL LOSS DETAILS

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

(In S$ million)

| Mapping of Losses to Business Lines | | Event Type Categories: Internal Fraud | External Fraud | Employment Practices and Workplace Safety | Clients, Products & Business Practices | Damage to Physical Assets | Business Disruption and System Failures | Execution, Delivery and Process Management | Total for Each Business Line | Threshold for Data Collection: Lowest | Highest | Capital Adjustments due to EL Captured in Business Practices | Capital Adjustments due to Risk Mitigation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Corporate Finance | Number of Events | | | | | | | | | | | | |
| | Total Loss Amounts | | | | | | | | | | | | |
| | Max Single Loss | | | | | | | | | | | | |
| Trading and Sales | Number of Events | | | | | | | | | | | | |
| | Total Loss Amounts | | | | | | | | | | | | |
| | Max Single Loss | | | | | | | | | | | | |
| Payment and Settlement | Number of Events | | | | | | | | | | | | |
| | Total Loss Amounts | | | | | | | | | | | | |
| | Max Single Loss | | | | | | | | | | | | |
| Agency Services | Number of Events | | | | | | | | | | | | |
| | Total Loss Amounts | | | | | | | | | | | | |
| | Max Single Loss | | | | | | | | | | | | |
| Asset Management | Number of Events | | | | | | | | | | | | |
| | Total Loss Amounts | | | | | | | | | | | | |
| | Max Single Loss | | | | | | | | | | | | |
| Retail Brokerage | Number of Events | | | | | | | | | | | | |
| | Total Loss Amounts | | | | | | | | | | | | |
| | Max Single Loss | | | | | | | | | | | | |
| Retail Banking | Number of Events | | | | | | | | | | | | |
| | Total Loss Amounts | | | | | | | | | | | | |
| | Max Single Loss | | | | | | | | | | | | |
| Commercial Banking | Number of Events | | | | | | | | | | | | |
| | Total Loss Amounts | | | | | | | | | | | | |
| | Max Single Loss | | | | | | | | | | | | |
| Total For Each Event Type | Number of Events | | | | | | | | | | | | |
| | Gross Capital Charge | | | | | | | | | | | | |
| | Max Single Loss | | | | | | | | | | | | |

**SCHEDULE 5A**

## OFF-BALANCE SHEET EXPOSURES (EXCLUDING DERIVATIVE TRANSACTIONS AND SECURITISATION EXPOSURES)

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**(In S$ million)**

| | Included in | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | SA(CR) | | | F-IRBA | | | A-IRBA (IRBA for Retail Exposures) | | |
| | Notional Amount | CCF | Credit Equivalent Amount | Notional Amount | CCF | Credit Equivalent Amount | Notional Amount | CCF | Credit Equivalent Amount |
| **1. Non-Retail Exposures** | | | | | | | | | |
| **(a) Direct Credit Substitutes** | | | | | | | | | |
| General guarantees of indebtedness | | 100% | | | 100% | | | 100% | |
| Standby letters of credit serving as financial guarantees for loans and securities | | 100% | | | 100% | | | 100% | |
| Acceptances (including endorsements with the character of acceptances) | | 100% | | | 100% | | | 100% | |
| Total | | | | | | | | | |
| **(b) Transaction-related Contingent Items** | | | | | | | | | |
| Performance bonds, bid bonds, warranties | | 50% | | | 50% | | | | |
| Standby letters of credit related to particular transactions | | 50% | | | 50% | | | | |
| Total | | | | | | | | | |
| **(c) Short-term Self-Liquidating Trade-related Contingent Items and Underwriting Commitments** | | | | | | | | | |
| Documentary credits collateralised by underlying shipments | | 20% | | | 20% | | | | |
| Commitments with an original maturity of one year or less to underwrite debt and equity securities | | 20% | | | | | | | |
| **(d) Note Issuance Facilities (NIF) & Revolving Underwriting Facilities (RUF)** | | | | | | | | | |
| NIFs | | 50% | | | 75% | | | | |
| RUFs | | 50% | | | 75% | | | | |
| Total | | | | | | | | | |
| **(e) Transations, other than SFTs, involving the posting of securities held by the Reporting Bank as collateral** | | 100% | | | 100% | | | 100% | |
| **(f) Asset Sales with Recourse** | | | | | | | | | |
| Sale and repurchase agreements and asset sales with recourse (credit risk remains with the Reporting Bank) | | 100% | | | 100% | | | 100% | |
| **(g) Other Commitments with Certain Drawdown** | | | | | | | | | |
| Forward purchase | | 100% | | | 100% | | | 100% | |
| Forward deposits | | 100% | | | 100% | | | 100% | |
| Partly-paid securities | | 100% | | | 100% | | | 100% | |
| Others | | 100% | | | 100% | | | 100% | |
| Total | | | | | | | | | |
| **(h) Other Commitments (credit lines, formal standby facilities) (including exposures in the corporate small business asset sub-class)** | | | | | | | | | |
| Unconditionally cancellable at any time | | 0% | | | 0% | | | | |
| Original maturity up one year or less | | 20% | | | 75% | | | | |
| Original maturity of more than one year | | 50% | | | 75% | | | | |
| Total | | | | | | | | | |
| **(g) Total Non-Retail Off-Balance Sheet Exposures** (Excluding derivative transactions and securitisation exposures) | | | | | | | | | |
| **2. Retail Exposures (including exposures to small business in the other retail exposures asset sub-class)** | | | | | | | | | |
| **(a) Undrawn Commitments** | | | | | | | | | |
| Unconditionally cancellable at any time | | 0% | | | | | | | |
| Original maturity up one year or less | | 20% | | | | | | | |
| Original maturity of more than one year | | 50% | | | | | | | |
| Total | | | | | | | | | |
| **(b) Standby letters of credit** | | | | | | | | | |
| **(c) Others (Pls itemise and specify)** | | | | | | | | | |
| **(d) Total Retail Off-Balance Sheet Exposures** (Excluding derivative transactions and securitisation exposures) | | | | | | | | | |

**MAS NOTICE 637: OTHER REPORTING SCHEDULES** **Annex 12E**
**SCHEDULE 5B**

**OTC DERIVATIVE TRANSACTIONS**
(Notional Amounts, E or EAD, and Credit RWA) **- SA-CCR**
**- CCR INTERNAL MODELS METHOD**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

| (In S$ million) | Interest Rate Contracts | Foreign Exchange Contracts | Credit Contracts - Single Name | | | | | | Credit Contracts - Index | | Equity Contracts | | Commodity Contracts | | | | | Total Contracts |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Credit Quality Grade 1 | Credit Quality Grade 2 | Credit Quality Grade 3 | Credit Quality Grade 4 | Credit Quality Grade 5 | Credit Quality Grade 6 | Credit Quality Grade 1 to 3 | Credit Quality Grade 4 to 6 | Single Name | Index | Electricity | Oil/Gas | Metals | Agricultural Commodities | Other | |
| **1. SA-CCR** | | | | | | | | | | | | | | | | | | |
| i. Notional Amount | | | | | | | | | | | | | | | | | | |
| ii. Replacement Cost | | | | | | | | | | | | | | | | | | |
| iii. Potential Future Exposure | | | | | | | | | | | | | | | | | | |
| iv. **Credit Equivalent Amount (E or EAD)** | | | | | | | | | | | | | | | | | | |
| v. Incurred CVA | | | | | | | | | | | | | | | | | | |
| vi. **Credit Equivalent Amount (E or EAD), less incurred CVA** | | | | | | | | | | | | | | | | | | |
| **Total Credit RWA under SA-CCR** | | | | | | | | | | | | | | | | | | |

| **2. CCR Internal Models Method** | Interest Rates Contracts | Foreign Exchange Contracts | Credit Contracts | Equity Contracts | Commodities Contracts | SFTs | Total Contracts |
|---|---|---|---|---|---|---|---|
| **(a) Model that takes Collateral into Account** | | | | | | | |
| (i) Notional Amount | | | | | | | |
| (ii) Effective EPE | | | | | | | |
| (iii) Alpha | | | | | | | |
| **Total E or EAD** | | | | | | | |
| **Total E or EAD, less incurred CVA** | | | | | | | |
| **(b) Model that does not take Collateral into Account** | | | | | | | |
| (i) Notional Amount | | | | | | | |
| (ii) Effective EPE | | | | | | | |
| (iii) Alpha | | | | | | | |
| **Total E or EAD** | | | | | | | |
| **Total E or EAD, less incurred CVA** | | | | | | | |
| **Total Credit RWA under CCR Internal Models Method** | | | | | | | |

[MAS Notice 637 (Amendment) 2016]

## INFLOWS INTO AND OUTFLOWS FROM ASSET SUB-CLASSES DUE TO CREDIT PROTECTION

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**(In S$ million)**

| Asset Class | | Pre-CRM Net Exposure By Original Asset Class | Exposures with Credit Protection by Following Asset Classes | | | | | | Exposure Not Guaranteed | (Outflows) from Asset Class | Inflows into Asset Class | Total Exposures in Asset Class |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Central Government & Central Bank Asset Class | PSE Asset Class | MDB Asset Class | Bank Asset Class | Corporate Asset Class | Cleared through Central Counterparties | | | | |
| | | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h=a-b-c-d-e-f-g) | (i=-SUM(b:g)) | (j) | (k=a+i+j) |
| **1. SA(CR)** | | | | | | | | | | | | |
| (i) Central Government & Central Bank Asset Class | (l) | | | | | | | | | | A | |
| (ii) PSE Asset Class | (m) | | | | | | | | | | B | |
| (iii) MDB Asset Class | (n) | | | | | | | | | | C | |
| (iv) Bank Asset Class | (o) | | | | | | | | | | D | |
| (v) Corporate Asset Class | (p) | | | | | | | | | | E | |
| (vi) Regulatory Retail Asset Class | (q) | | | | | | | | | | | |
| (vii) Residential Mortgage Asset Class | (r) | | | | | | | | | | | |
| (viii) CRE Asset Class | (s) | | | | | | | | | | | |
| (ix) Securitisation Exposures | (t) | | | | | | | | | | | |
| (x) Other Exposures | (u) | | | | | | | | | | | |
| **Total Inflows into Asset Class** | (v=SUM(l:u)) | | | | | | | | | | | |
| | | | A | B | C | D | E | | | | | |

| Asset Sub-class | | Pre-CRM Gross Exposure By Original Asset Sub-Class | Sovereign Asset Sub-class | Bank Asset Sub-class | Corporate Asset Sub-class | Corporate Small Business Asset Sub-class | Cleared Through Central Counterparties | Exposure Not Guaranteed | (Outflows) from Asset Sub-Class | Inflows into Asset Sub-Class | Total Exposures in Asset Sub-Class |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (aa) | (bb) | (cc) | (dd) | (ee) | (ff) | (gg=aa-bb-cc-dd-ee-ff) | (hh=-SUM(bb:ff)) | (ii) | (jj=aa+hh+ii) |
| **2. IRBA** | | | | | | | | | | | |
| **(a) No Double Default** | | | | | | | | | | | |
| (i) Sovereign Asset Sub-class | (kk) | | | | | | | | | F | |
| (ii) Bank Asset Sub-class | (ll) | | | | | | | | | G | |
| (iii) Corporate Asset Sub-class | (mm) | | | | | | | | | H | |
| (iv) Corporate Small Business Asset Sub-class | (nn) | | | | | | | | | I | |
| (v) SL Asset Sub-class (IPRE) | (oo) | | | | | | | | | | |
| (vi) SL Asset Sub-class (OF/OF/CF) | (pp) | | | | | | | | | | |
| (vii) HVCRE Asset Sub-class | (qq) | | | | | | | | | | |
| (viii) Securitisation Exposures | (rr) | | | | | | | | | | |
| **(c) Total Inflows into Asset Sub-Class** | (ss=SUM(kk:rr) | | | | | | | | | | |
| | | | F | G | H | I | | | | | |
| **(d) Double Default** | | | | | | | | | | | |
| (i) Corporate Asset Sub-class | | | | | | | | | | | |
| (ii) Corporate Small Business Asset Sub-class | | | | | | | | | | | |
| (iii) SL Asset Sub-class (IPRE) | | | | | | | | | | | |
| (iv) SL Asset Sub-class (OF/OF/CF) | | | | | | | | | | | |
| (v) HVCRE Asset Sub-class | | | | | | | | | | | |
| **(e) Total** | | | | | | | | | | | |

[MAS Notice 637 (Amendment No. 2) 2014]

**CREDIT VALUATION ADJUSTMENTS**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**(In S$ million)**

**1. CVA Standardised Method**

**a.**

| Weight ($w_i$) | $EAD^{total}$ of each weight | Number of counterparties | Total Notional of Single Name CDS Hedges | Total Notional of Index CDS Hedges |
|---|---|---|---|---|
| 0.7% | | | | |
| 0.8% | | | | |
| 1.0% | | | | |
| 2.0% | | | | |
| 3.0% | | | | |
| 10.0% | | | | |

**b.** Total CVA RWA (Portfolio)

**2. CVA Advanced Method**

**a.** Total CVA RWA (Portfolio)

[MAS Notice 637 (Amendment No. 2) 2014]

**MAS NOTICE 637: OTHER REPORTING SCHEDULES**
**SCHEDULE 5E**

**Annex 12E**

**ELIGIBLE FINANCIAL COLLATERAL AND ELIGIBLE IRBA COLLATERAL**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 5E-Collateral for the SA(CR), SEC-ERBA and SEC-SA**
**(In S$ million)**

| | SA(CR) Asset Class | | | | | | | | | Securitisation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Central Government & Central Bank Asset Class | PSE Asset Class | MDB Asset Class | Bank Asset Class | Corporate Asset Class | Regulatory Retail Asset Class | Residential Mortgage Asset Class | CRE Asset Class | Other Exposures Asset Class | SEC-ERBA | SEC-SA | Securitisation Exposures to which the SEC-IRBA, SEC-ERBA, and SEC-SA cannot be applied | Subtotal |
| | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | = a+b+c+d+e+f+g+h+i+j+l |
| **1. Eligible Financial Collateral under FC(SA)** | | | | | | | | | | | | | |
| (a) Cash (including certificates of deposit and other similar instruments) on deposit with the Reporting Bank | | | | | | | | | | | | | |
| (b) Gold | | | | | | | | | | | | | |
| (c) Debt Security (excluding structured note) | | | | | | | | | | | | | |
| (d) Equity Security (including convertible bonds) | | | | | | | | | | | | | |
| (e) Debt security which is a structured note | | | | | | | | | | | | | |
| (f) Unit in a collective investment scheme | | | | | | | | | | | | | |
| **Sub-Total for Eligible Financial Collateral under FC(SA)** | | | | | | | | | | | | | |

[MAS Notice 637 (Amendment No. 2) 2014]

| | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | Subtotal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2. Eligible Financial Collateral under FC(CA)** | | | | | | | | | | | | | |
| (a) Cash (including certificates of deposit and other similar instruments) on deposit with the Reporting Bank | | | | | | | | | | | | | |
| (b) Gold | | | | | | | | | | | | | |
| (c) Debt Security (excluding structured note) | | | | | | | | | | | | | |
| (d) Equity Security (including convertible bonds) | | | | | | | | | | | | | |
| (e) Debt security which is a structured note | | | | | | | | | | | | | |
| (f) Unit in a collective investment scheme | | | | | | | | | | | | | |
| **Sub-Total for Eligible Financial Collateral under FC(CA)** | | | | | | | | | | | | | |

[MAS Notice 637 (Amendment No. 2) 2014]

| | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) | Subtotal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total for Collateral for the SA(CR), SEC-ERBA and SEC-SA** | | | | | | | | | | | | | |

[MAS Notice 637 (Amendment No. 2) 2017]

**ELIGIBLE FINANCIAL COLLATERAL AND ELIGIBLE IRBA COLLATERAL**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**Table 5E-Collateral for the IRBA and SEC-IRBA**
**(In S$ million)**

| | | IRBA Asset Sub-Class | | | | | | | SEC-IRBA | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Sovereign Asset Sub-class | Bank Asset Sub-class | Corporate Asset Sub-class | Corporate Small Business Asset Sub-class | SL Asset Sub-class (IPRE) | SL Asset Sub-class (PF/OF/CF) | HVCRE Asset Sub-class | Securitisation | Subtotal |
| | | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i = a+b+c+d+e+f+g+h) |
| **1.** | **Eligible Financial Collateral under FC(CA)** | | | | | | | | | |
| (a) | Cash (including certificates of deposit and other similar instruments) on deposit with the Reporting Bank | | | | | | | | | |
| (b) | Gold | | | | | | | | | |
| (c) | Debt Security (excluding structured note) | | | | | | | | | |
| (d) | Equity Security (including convertible bonds) | | | | | | | | | |
| (e) | Debt security which is a structured note | | | | | | | | | |
| (f) | Unit in a collective investment scheme | | | | | | | | | |
| | **Sub-Total for Eligible Financial Collateral under FC(CA)** | | | | | | | | | |
| **2.** | **Eligible IRBA Collateral** | | | | | | | | | |
| (a) | Eligible CRE | | | | | | | | | |
| (b) | Eligible RRE | | | | | | | | | |
| (c) | Eligible Receivables | | | | | | | | | |
| (d) | Eligible Physical Collateral - Industrial properties | | | | | | | | | |
| (e) | Eligible Physical Collateral - Land in Singapore | | | | | | | | | |
| (f) | Eligible Physical Collateral - Land in another jurisdiction | | | | | | | | | |
| (g) | Eligible Physical Collateral - Ships | | | | | | | | | |
| (h) | Eligible Physical Collateral - Aircrafts | | | | | | | | | |
| (i) | Eligible Physical Collateral - Commodities | | | | | | | | | |
| (j) | Eligible Physical Collateral - others | | | | | | | | | |
| | **Sub-Total for Eligible IRBA Collateral** | | | | | | | | | |
| | **Total for Collateral for the IRBA and SEC-IRBA** | | | | | | | | | |

[MAS Notice 637 (Amendment No. 2) 2014]

[MAS Notice 637 (Amendment No. 2) 2017]
[MAS Notice 637 (Amendment No. 2) 2018]

**EXPOSURES TO CCPs**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**(In S$ million)**

**1 Exposures to qualifying CCPs, calculated in accordance with paragraph 1.3 of Annex 7AJ**

| | | E/EAD | | CCP RWA | |
|---|---|---|---|---|---|
| (a) | CCP Trade Exposures | | | | |
| (i) | CCP Trade Exposures where a Reporting Bank is a Clearing Member of a CCP | | | | |
| | CCP 1 | | | | |
| | CCP 2 | | | | |
| | CCP 3 | | | | |
| | . | | | | |
| | . | | | | |
| | . | | | | |
| | Sub-Total | | | | A |
| (ii) | Exposures to CCPs where a Reporting Bank is a Client of a Clearing Member or lower level client and all conditions in paragraph 2.5 of Annex 7AJ are met | | | | |
| | CCP 1 | | | | |
| | CCP 2 | | | | |
| | CCP 3 | | | | |
| | . | | | | |
| | . | | | | |
| | . | | | | |
| | Sub-Total | | | | B |
| (iii) | Exposures to CCPs where a Reporting Bank is a Client of a Clearing Member or lower level client and all conditions in paragraph 2.5, except paragraph 2.5(a)(iii), of Annex 7AJ are met | | | | |
| | CCP 1 | | | | |
| | CCP 2 | | | | |
| | CCP 3 | | | | |
| | . | | | | |
| | . | | | | |
| | . | | | | |
| | Sub-Total | | | | C |
| (iv) | Exposures arising from collateral posted | | | | |
| | which are 2% risk-weighted | | | | |
| | which are 4% risk-weighted | | | | |
| | Sub-Total | | | | D |
| | **Sub-Total** | | SUM(A:D) | | E |

| | | Notional Amounts of Pre-funded Default Fund Exposures | Capital Requirements | CCP RWA | |
|---|---|---|---|---|---|
| (b) | Default Fund Exposures | | | | |
| | CCP 1 | | | | |
| | CCP 2 | | | | |
| | CCP 3 | | | | |
| | . | | | | |
| | . | | | | |
| | . | | | | |
| | Sub-Total | | | | F |

**2 Exposures to non-qualifying CCPs, calculated in accordance with paragraph 1.5 of Annex 7AJ**

| | | E/EAD | | CCP RWA | |
|---|---|---|---|---|---|
| a. | CCP Trade exposures | | | | |
| (i) | Exposures to CCPs where a Reporting Bank is a Clearing Member of a CCP | | | | |
| | CCP 1 | | | | |
| | CCP 2 | | | | |
| | CCP 3 | | | | |
| | . | | | | |
| | . | | | | |
| | . | | | | |
| | Sub-Total | | | | G |
| (ii) | Exposures to CCPs where a Reporting Bank is a Client of a Clearing Member of a CCP | | | | |
| | CCP 1 | | | | |
| | CCP 2 | | | | |
| | CCP 3 | | | | |
| | . | | | | |
| | . | | | | |
| | . | | | | |
| | Sub-Total | | | | H |
| | **Sub-Total** | | G+H | | I |

| | | Pre-funded Contributions | Unfunded Contributions | CCP RWA | |
|---|---|---|---|---|---|
| b. | Exposures arising from contribution to default funds | | | | |
| | CCP 1 | | | | |
| | CCP 2 | | | | |
| | CCP 3 | | | | |
| | . | | | | |
| | . | | | | |
| | . | | | | |
| | **Sub-Total for Default Fund exposures to non-qualifying CCPs** | | | | J |

| | | | |
|---|---|---|---|
| **3** | **Total CCP RWA** | E+F+I+J | |

**4 Exposures to CCPs which are risk-weighted according to Subdivision 3 or Subdivision 4 of Division 1 of Part VII**

| | | E/EAD | RWA |
|---|---|---|---|
| (i) | Exposures to CCPs where a Reporting Bank is a Client of a Clearing Member and conditions in paragraph 2.5 of Annex 7AJ are not met | | |
| | CCP 1 | | |
| | CCP 2 | | |
| | CCP 3 | | |
| | . | | |
| | . | | |
| | . | | |
| | Sub-Total | | |
| (ii) | Exposures arising from collateral posted which are risk-weighted according to Subdivision 3 or Subdivision 4 of Division 1 of Part — Sub-Total | | |

[MAS Notice 637 (Amendment) 2016]

**INTEREST RATE RISK IN THE BANKING BOOK**

**Name of the Reporting Bank:**

**Statement as at:**

**Scope of Reporting:**

**(In S$ million)**

**1 Computation of IRRBB for the Reporting Bank using own IMS in whole or in part (pursuant to paragraph 5.19(a), 5.19(c) or 5.20 of Annex 10A)**

**(a) Change in Economic Value of Equity (in accordance with paragraph 5.49 of Annex 10A)**

| Interest rate shock scenario | Material Currencies (Currencies that account for more than 5% of banking book assets or liabilities) | | | | | | Aggregate (across all material currencies) |
|---|---|---|---|---|---|---|---|
| | *Currency 1* | *Currency 2* | *Currency 3* | ... | ... | ... | |
| Parallel up | | | | | | | |
| Parallel down | | | | | | | |
| Steepener | | | | | | | |
| Flattener | | | | | | | |
| Short rate up | | | | | | | |
| Short rate down | | | | | | | |
| Maximum impact | | | | | | | |

**(b) Change in Net Interest Income (as measured by the Reporting Bank's IMS in accordance with paragraph 5.45 of Annex 10A)**

| Interest rate shock scenario | Material Currencies (Currencies that account for more than 5% of banking book assets or liabilities) | | | | | | Aggregate (across all material currencies) |
|---|---|---|---|---|---|---|---|
| | *Currency 1* | *Currency 2* | *Currency 3* | ... | ... | ... | |
| Parallel up | | | | | | | |
| Parallel down | | | | | | | |
| Maximum impact | | | | | | | |

**(c) Did the Reporting Bank make assumptions about the correlations of different currencies when aggregating the change in economic value of equity and net interest income across material currencies for Panels 1(a) and 1(b) respectively?**

**If so, please provide a description of the methodology and assumptions used.**

**2 Computation of IRRBB for the Reporting Bank using SA(IR) wholly, pursuant to paragraph 5.19(b) or 5.20 of Annex 10A)**

**(a) Change in Economic Value of Equity (in accordance with paragraph 5.49 of Annex 10A)**

| Interest rate shock scenario | Material Currencies (Currencies that account for more than 5% of banking book assets or liabilities) | | | | | | Aggregate (across all material currencies) |
|---|---|---|---|---|---|---|---|
| | *Currency 1* | *Currency 2* | *Currency 3* | ... | ... | ... | |
| Parallel up | | | | | | | |
| Parallel down | | | | | | | |
| Steepener | | | | | | | |
| Flattener | | | | | | | |
| Short rate up | | | | | | | |
| Short rate down | | | | | | | |
| Maximum impact | | | | | | | |

**3 Adoption of SA(IR)**

**(a) Did the Reporting Bank adopt the SA(IR):**

**(i) wholly as its IMS, in accordance with paragraph 5.19(b) of Annex 10A?** Yes / No

**(ii) in part, as its IMS, in accordance with paragraph 5.19(c) of Annex 10A?** Yes / No

**(b) If the Reporting Bank adopted the SA(IR) in part, please indicate the paragraphs of Annex 10B of MAS Notice 637 that the bank adopted.**

**Annex 12F**

**MAS NOTICE 637**

**NOTICE ON RISK BASED CAPITAL ADEQUACY REQUIREMENTS FOR BANKS INCORPORATED IN SINGAPORE**

**Reporting Schedules**

**Name of Reporting Bank:**

**Statement as at:**

**Scope of Reporting:** Solo ☐ Group ☐
*("Tick" as appropriate)*

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We certify that:

1. The information provided in the reporting schedules is, to the best of our knowledge and belief, accurate and complete.

2. The capital adequacy ratios were at any time not less than that specified under Part IV of the Notice.

______________________________
Signature of Chief Financial Officer

______________________________
Name of Chief Financial Officer

______________________________
Date

[MAS Notice 637 (Amendment) 2012]

***Endnotes of History of Amendments**

1. MAS Notice 637 (Amendment) 2012 dated 29 November 2012 with effect from 1 January 2013, except the following paragraphs on capital requirements for bank exposures to central counterparties which are effective from 1 July 2013: Paragraphs 2(a), (b), (c), (d), (e), (f), (g) and (k), paragraphs 4(a), (b), (d), (h), (i), (m), (n), (y), (jj), (kk), (ll), (mm) and (nn), and paragraphs 6(b) and (d).
2. MAS Notice 637 (Amendment No. 2) 2012 dated 28 December 2012 with effect from 1 January 2013, except paragraph 3 on the amendments in respect of Schedule 1A which is effective from 31 March 2013.
3. MAS Notice 637 (Amendment) 2013 dated 31 December 2013 with effect from 31 December 2013.
4. MAS Notice 637 (Amendment) 2014 dated 14 October 2014 with effect from 1 January 2015, except paragraphs 10(a) and 10(c) on the amendments in respect of Schedule 1C which are effective from 31 December 2015.
5. MAS Notice 637 (Amendment No. 2) 2014 dated 29 December 2014 with effect from 1 July 2015, except paragraphs 6(t), 6(u), 6(v) and 6(w) on the amendments in respect of the definition of commitment and CCFs for loans on a progressive disbursal schedule which are effective from 31 December 2015, and paragraphs 3(q), 6(x), 6(y), 6(z) and 6(dd) on the amendments in respect of the removal of structured deposits as eligible financial collateral for credit risk mitigation purposes which are effective from 1 January 2017.
6. MAS Notice 637 (Amendment) 2016 dated 17 October 2016 with effect from 1 January 2017.
7. MAS Notice 637 (Amendment) 2017 dated 22 September 2017 with effect from 22 September 2017.
8. MAS Notice 637 (Amendment No. 2) 2017 dated 29 November 2017 with effect from 1 January 2018.
9. MAS Notice 637 (Amendment No. 3) 2017 dated 28 December 2017 with effect from 1 January 2018, except where indicated otherwise.
10. MAS Notice 637 (Amendment) 2018 dated 5 October 2018 with effect from 8 October 2018.
11. MAS Notice 637 (Amendment No. 2) 2018 dated 13 November 2018 with effect from 16 November 2018, except for amendments to Parts II, X and XII relating to the implementation of the revised requirements for IRRBB which are effective from 31 December 2018, and amendments to Parts II and VI relating to requirements on TLAC holdings, Part XI, Part XIA and Schedule 1A of Part XII which are effective from 1 January 2019.