



Cross-Border Payments Interoperability Network Feasibility Study

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Foreword

The Monetary Authority of Singapore (MAS) and The Association of Banks in Singapore (ABS) in joint sponsorship with the Thai Bankers' Association (TBA) are pleased to present the "Cross-Border Payments Interoperability Network (XBPIN) Feasibility Study".

The XBPIN Feasibility study demonstrates the commitment of MAS and ABS to explore and promote bilateral payment linkages to advance interoperable cross-border payments connectivity. An interconnected ASEAN will facilitate intra-ASEAN trade, leading to better access to the larger global financial ecosystem. To drive economic integration across ASEAN, harmonisation of payments standards and infrastructure will remain a key requisite.

In order to aid financial inclusion, the envisioned ecosystem for XBPIN will be enabled via mobile and online channels that provide innovative digital finance solutions. This new ecosystem will help to expand the reach of financial services to the unbanked and under-banked populations of the region.

The XBPIN Feasibility Study provides a framework for implementation and operation of the XBPIN scheme. XBPIN's model will be integrated with the current economic framework providing added value to banks, merchants, and consumers. The move to digital payments for cross-border transactions will reduce end-to-end costs allowing banks and non-bank payment service providers to reinvest in innovative payment services.

We would like to take this opportunity to acknowledge the contributions of XBPIN study participants in sharing their industry perspective and product solutions, which were used for data inputs and validations for the project report. We would also like to thank the team from KPMG member firms in Singapore and Thailand in the production of this report. We hope that the findings of this study provide actionable insights into cross-border payments interoperability and its future benefits for the ASEAN community.

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01

Executive Summary

The Global retail payments market is a highly prized one with both new and established Payment Service Providers (PSP) working to emerge as the most popular payment platform. In ASEAN, the payments sector is an integral part of banks' services and an open playing field brimming with innovation and competition. The competitive landscape is driven by adoption of multiple mobile and lifestyle consumer-centric platforms offered by banks and non-banks. However, the landscape remains complex and fragmented due to the existence of many competing standards, options, and closed loop eco-systems.

An ASEAN inter-governmental effort - aimed at unifying PSPs and consumer ecosystems, and driving seamless cross-border payments - will help drive economic integration and inclusion of much larger portions of the combined population in the payments market. The key to enabling this is an underlying interoperable cross-border

payment rail that is open, and also robust and secure.

Efforts at making this a reality are already underway with the Association of Banks in Singapore and the Thai Bankers' Association embarking on a joint project to evaluate the feasibility of such a regional interoperable payment system across all ASEAN countries.

This report provides a summary of the main findings and includes the perspectives and feedback of stakeholder representatives interviewed in the second and third quarter of 2018. It also details the underlying assumptions and limitations of the model used for this study.

This report focuses on the economic viability of a cross-border interoperable payments network, its value proposition and a proposed framework for operational standardisation across ASEAN.



2.1 Background

Across the globe, real-time payment systems have led to clear benefits - a better consumer experience and cost savings for financial institutions.

While faster domestic payments has been in focus, there is also increased focus on real-time or near real-time cross-border payments - the feasibility of which has already been demonstrated. In November 2017, Single Euro Payments Area (SEPA) Instant Credit Transfer was launched - a "first of its kind" model initiative linking the European Union through a simplified bank transfer process.

Achieving a similar model in the ASEAN has been discussed as well. The ASEAN Economic Community (AEC) - established in 2015 to strengthen the region's economy by connecting ASEAN countries - discussed opportunities and challenges in establishing an inter-connected financial ecosystem within ASEAN in its AEC 2025 blueprint¹. It detailed out the impact of payment and settlement interoperability on increasing financial inclusion and stability in the region. However, it also highlighted the difference in the current stages of financial evolution and corresponding national infrastructures across ASEAN's 10 member countries.

Our study has the potential to spearhead ASEAN's plans to harmonise its payments landscape. Such a pan-ASEAN payments network could reach more than 625 million consumers, drive further economic integration and potentially lead to benefits for consumers and payment service providers (e.g., process efficiency driven by consolidation of methods and costs of payments). The associated ecosystem will be facilitated by mobile or online channels where consumers will trigger their payments.

2.2 Objectives of the Study

The aim of the Association of Banks in Singapore and the Thai Bankers' Association is to align with the ASEAN 2025 blueprint and specifically with three objectives - financial integration, financial inclusion, and financial stability.

The objective of the study is to examine the feasibility of the XBPIN in all ASEAN countries. The following matters were analysed:

- Potential use cases and their financial benefits
- Analysis of payment infrastructure options implied
- Product and value proposition to achieve financial benefits
- Potential operating framework to ensure harmonisation and standardisation

KPMG in Singapore developed a high-level benefit calculation populated with readily available and relevant market data variables.

2.3 Scope

The scope of this report is to evaluate ASEAN's current payment landscape and the economic impact of XBPIN on the specific identified use cases applicable for a regional payments integration (see below).

For the purpose of this study, we have assumed that the XBPIN will be accessed through mobile devices; and for intra-ASEAN regional payments, three possible scenarios were evaluated - peer-to-peer (P2P), consumer-to-business (C2B), and business-to-business (B2B).

AEC's 2025 blueprint of an inter-connected payments system called out the improvement in financial services for the consumer, with foreseeable benefit for money transfer between peers, an increase in eCommerce and payment to micro, small and medium enterprises (MSMEs).

KPMG in Singapore focused the study on the use cases below. Any other potential future use cases for cross-border interoperable payments not included will only add to the commercial viability of the platform from the perspective of rail operators and PSPs.

1. Remittance (Peer-to-Peer)
2. eCommerce (Consumer-to-Business)
3. Tourism (Consumer-to-Business)

1. Association of Southeast Asian Nations, ASEAN Economic Community <https://www.asean.org/wp-content/uploads/images/2015/November/aec-page/AEC-Blueprint-2025-FINAL.pdf>

2.4 Key use cases for assessment of feasibility

Remittance



XBPIN supports cross-border P2P transfers with one-time pay direct and recurring payment mechanisms. It also helps achieve a faster remittance process at competitive processing fees and FX rates

e-Commerce



XBPIN enhances speed and security for a C2B online shopping payment experience within ASEAN by utilising mobile number for both one-time pay direct and request-to-pay mechanisms

Tourism

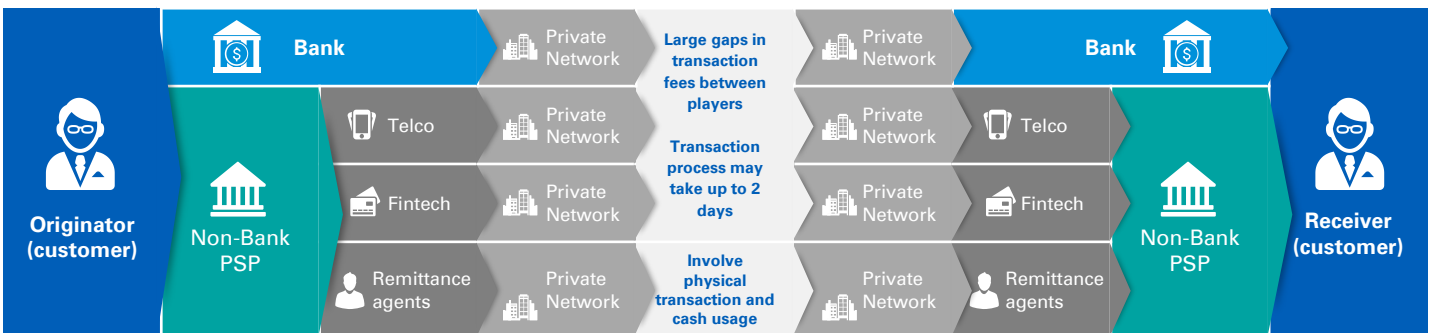


XBPIN eases C2B transactions (by utilising either QR code scan or mobile number) both for customers who are travelling overseas within ASEAN and for merchants with one-time pay direct and request-to-pay at shops

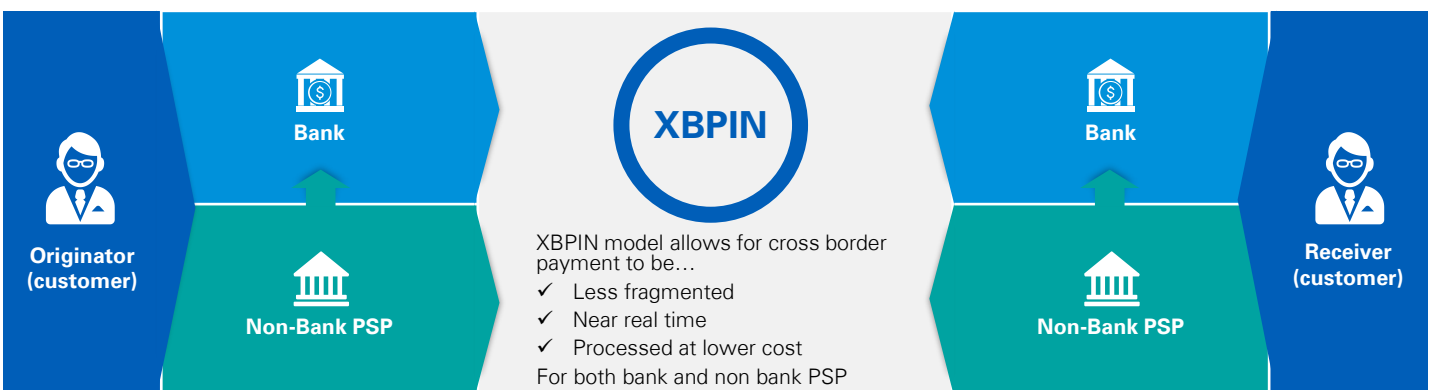
2.5 Current state and future state for consideration

The current ASEAN cross-border payments landscape is fragmented with numerous competitors (with distinct standards and systems) trying to capture transaction volume. A regional interoperability framework will standardise the processing of such payments by using a consumer-driven payment offering (with a reach possibly beyond the region). Bank and Non-bank payment providers will also achieve process efficiencies and operating cost savings.

Cross border payments pre XBPIN



Post XBPIN



2.6 Methodology

In order to assess the feasibility and potential impact of a XBPIN model within ASEAN, an economic model was developed for the scope aforementioned above. To set the different parameters, several data sources have been used including:



Interviews with six payment providers regarding their current offerings within ASEAN, their perspective on the impact of an intra-connected payment infrastructure for the region and, where applicable, potential options to achieve the connectivity.



Questionnaires were completed by over 200 consumers across Singapore and Thailand on their intra- ASEAN spending habits. The questionnaires focused on the identified use cases implied and their motivations for adopting a new payment method.

In addition, numerous banks in Singapore and Thailand were also surveyed to understand their current view on the achievability of an intra-connected infrastructure, and to benchmark the transaction value and volume to validate KPMG in Singapore's economic model inputs.

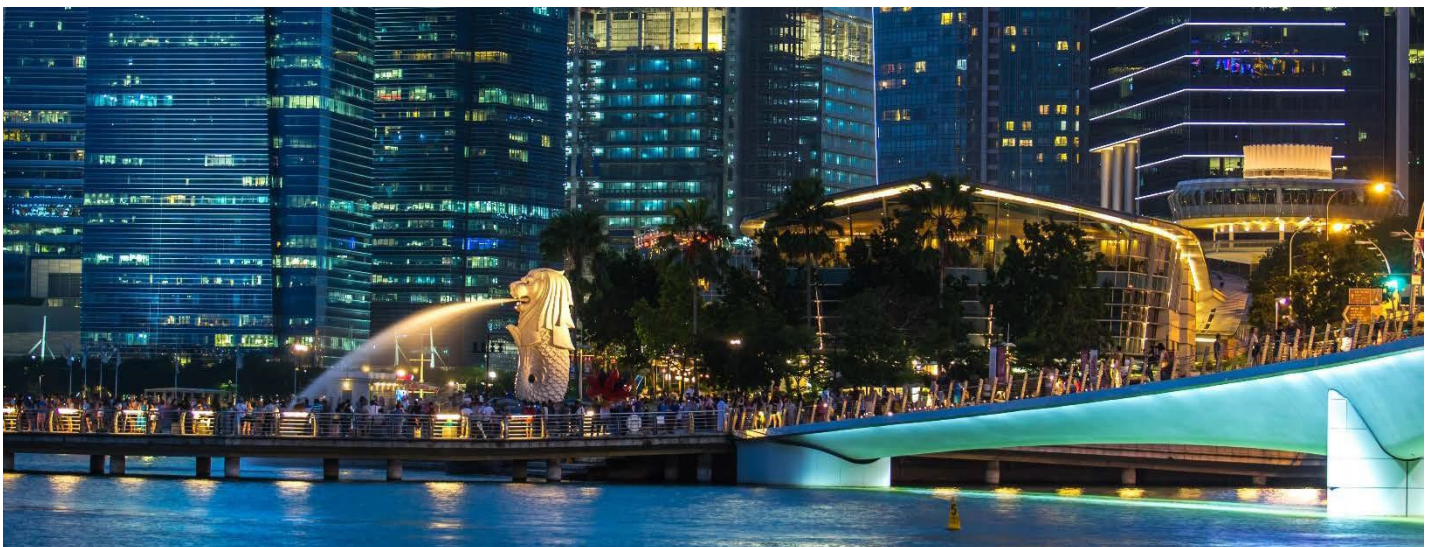


Research from published documentation from government and oversight bodies, news reports, independent studies, stakeholder and other interest group publications. All sources used are cited.

To determine the feasibility for a XBPIN platform, a holistic review of ASEAN's existing macro landscape was conducted based on these four main components:

- Trade and remittance flows
- Domestic and cross-border infrastructures
- Regulatory framework
- Current levels of digital adoption

The analysis across all 10 ASEAN countries highlighted key players, existing infrastructure readiness, regulatory environment, and payment trends. Data collected was used to provide insights from existing trends in usage of payment methods, consumer and business experiences.



03

Findings and observations

3.1 Market potential and consumer value proposition

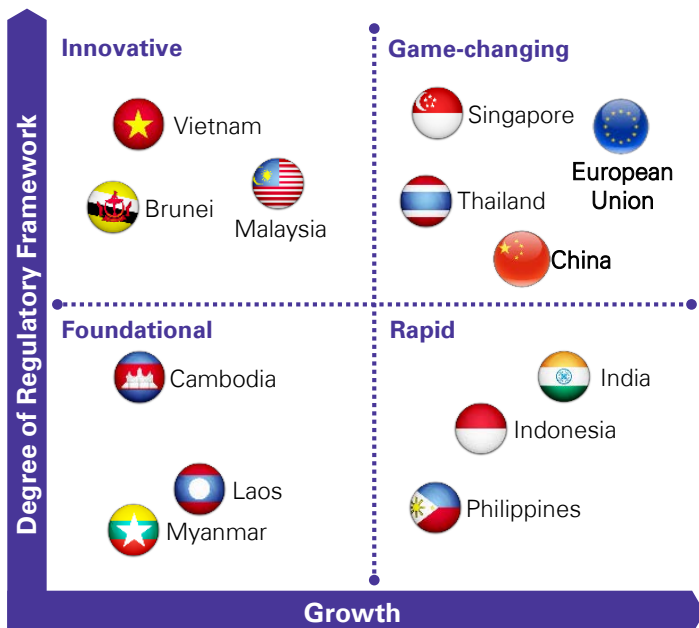
Asia has the highest expected growth rate in digital payments than any other region in the world. The current GDP in ASEAN is growing at an average annual rate of 8.1%¹. For the three identified early adoption use cases of Remittance, Tourism and eCommerce, the estimated total ASEAN payments transaction value in 2017 was US\$56 billion, which represented 2.1% of ASEAN's total GDP².

ASEAN is also experiencing an increase in the working-age population³ given the median population age of 29. The middle class, considered to be "digital natives" will increase to about 55% of ASEAN's population by 2020⁴. The corresponding increase in disposable income will drive mobility and intra-ASEAN economic activities.

While the above trends contribute to the demand for a XBPIN, its possibility depends on the regulatory environment in each ASEAN country. Many of the countries have a foundational regulatory framework that mitigates risk, aligns to international standards, and provides for consumer protection. ASEAN member states also possess varying degrees of regulatory developments to promote technological advancement and growth.

Singapore remains a clear example having converted most of its large cash-based payments to cashless. But emerging ASEAN countries - with cash-based societies, low penetration of bank accounts and high cost of expanding points of sale (POS) - have also seen significant growth in financial inclusion through digital wallets and mobile payments driven by new mobile technologies.

These regulations and corresponding trends will determine what form XBPIN needs to take e.g., facilitation via mobile or online channels, triggered by consumers etc.



Key takeaways

- When benchmarked to international regulatory environments, there are clear development areas for ASEAN in achieving similar standards
- The regulatory framework in Singapore and Thailand permits new payment methods and technology, and removes barriers to entry for non-bank providers to offer financial services. These types of initiatives will increase the possibility for interoperability in ASEAN
- Emerging stage countries should utilise Singapore and Thailand as a model to establish a regulatory framework that will quickly propel them to a similar payments ecosystem

1. ASEAN Secretariat Database, compiled/computed from country data submission, publications and/or websites of ASEAN Member States' National Statistics Offices (NSOs), Central Banks and relevant government agencies, and from the International Monetary Fund World Economic Outlook (IMF WEO) Database April 2017.

2. IMF, World Economic Outlook Database, April 2018.

Note: The total transaction value for the three use cases of Remittance, Tourism, and eCommerce were derived by public available data and assumptions where necessary to calculate the ASEAN specific transaction flows. All data sources can be found in the Reference section.

3. Central Intelligence Agency, 2017; ASEAN Macro-economic Database, 2016.

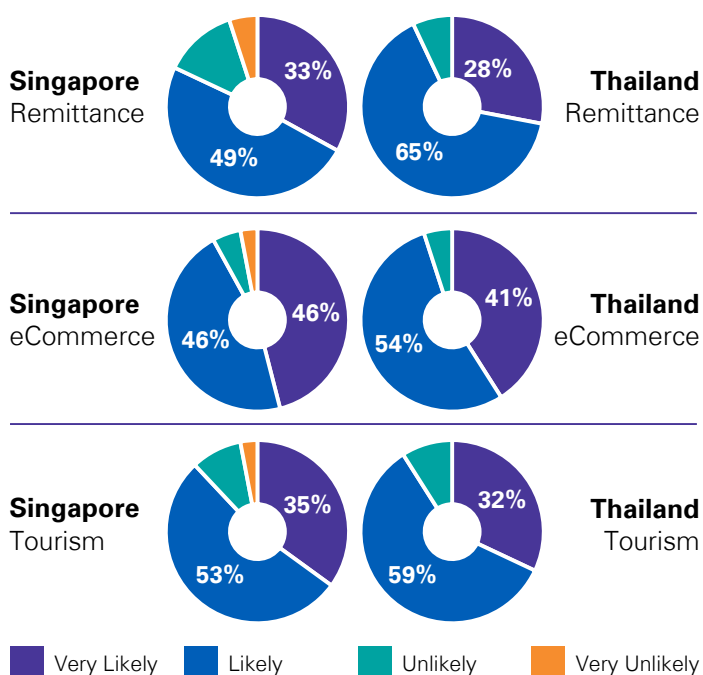
4. Nielsen ASEAN Report, 2015; HKTDC Research, 2016; Worldometers, 2017
Note: Percentage of middle class population in 2020 is derived as a portion of total ASEAN countries population forecast

Consumer questionnaire results

A consumer questionnaire was conducted to establish the customer value proposition of XBPIN. The three main objectives for administering the questionnaire were to:

1. Assess the current state of cross-border payments methods and preference
2. Assess feedback from the respondents in Singapore and Thailand on the proposed new payment method (XBPIN)
3. Assess willingness and identify relevant adoption enablers

Likelihood of adoption rate for each use case



Based on the consumer questionnaires, below are the results for likelihood of consumer adoption and the key success factors identified to promote value to consumers that will boost the adoption of XBPIN. The questionnaire results were utilised in our financial model to determine economic viability and to evaluate the requirements of a product value proposition.

Key Success Factors

-  Secure payment mechanism including personal data protection and fraud transaction prevention (e.g. strong branding to provide customer confidence)
-  24/7 availability and instant payment confirmation
-  Unbanked recipients ability to access the product offering
-  Competitive foreign exchange rate and transaction fees by payor's originating bank to compete with incumbent service providers such as money changers
-  A marketplace with wide merchant acceptance

XBPIN adoption by consumers must focus on standardising costs (part of the charging framework and central to XBPIN's product value proposition). KPMG in Singapore's study suggests that participants (banks and non-bank payment providers) should provide transparent pricing (in transaction fees and foreign exchange rates) to consumers. The pricing should include built-in flexibility to lower or waive the fees, with potential for adjustment over time for full recovery of costs and even profitability.

Adoption by merchants, also price sensitive to new payment methods, must be induced through tiered pricing and fee rebates. Price tiering should be based on business

size and volume of transactions, while cross-border payments should attract a reduced merchant discount rate. A possible fee rebate program to drive take-up rate could also be introduced in the initial years. As for implementation, the suggested method is to provide a QR code of payment.

XBPIN must strive to provide a compelling value proposition that consumers can trust as the most robust and cost efficient payment rail. As participants seamlessly integrate to the underlying XBPIN rail, consumers will gravitate towards the rail, driving demand and improving consumer experience and value.

3.2 Economic viability

A potential cumulative net revenue benefit of USD \$1.1 billion could be captured by the XBPIN model based on current intra-ASEAN transaction volume and the expected growth within the region, and all countries are onboarded by year five. This figure is predicated on the use cases and conservative adoption rates.

Beyond revenues, participants will also experience cost savings (as costs associated with cash handling and foreign exchange are eliminated with the shift to digital payments) and lower liquidity management risks (due to real-time clearing and settlement).

KPMG in Singapore's research indicates that XBPIN's net revenue benefits will accrue through wide adoption and reduced costs of transactions through platform convergence. This would allow payment service providers to reinvest and facilitate innovative value-added payment services.

Standardisation of the charging framework would ensure that banks and non-banks can compete fairly on consumer and merchant pricing.

The benefit could well reach beyond the region with a ASEAN-based payment network having already garnered interest from some members of the Regional Comprehensive Economic Partnership (RCEP)⁴. With the heightened urgency to protect and grow trade, this partnership, if concluded, would be the world's largest free trade deal. The ensuing economic benefits of other APAC countries integrated to such a network would be immense.

Key takeaways

- Revenue generation is highly dependent on the total captured volume in each country and the originating payors' spending habits
- For Singapore and Malaysia, outflow (originating) transactions make up a significant volume on XBPIN, allowing for increased opportunity to challenge competitors and incumbents and drive revenue through competitive FX and low transaction fees
- For the majority of other ASEAN countries, being inflow (beneficiary) countries, the key benefits would originate from wider adoption by cash-only merchants and other value-added services for recipients of XBPIN payments

3.3 Payment infrastructure

To achieve the connectivity across the region and reach underbanked populations, an XBPIN infrastructure would need to rely on a domestic presence of real-time payments.

The maturity assessment (based on current and/or planned implementation of domestic real-time payments infrastructure) determined that 8 of the 10 ASEAN countries would be prepared to implement an XBPIN system within the next three years. Meanwhile, three countries could drive the initial wave - Singapore, Thailand and Malaysia. While the study has a view on the order of participation, it is by no means prescriptive. A country's willingness to be involved in XBPIN can result in earlier participation if its national payments infrastructure is upgraded in a timely manner.

From KPMG in Singapore's bank questionnaire, the respondents from both Singapore and Thailand indicated that the governing structure for an XBPIN model would need to include the respective clearing houses in each country.



4. RCEP members are ASEAN plus six Asia-Pacific countries Australia, China, India, Japan, South Korea and New Zealand.

	Domestic Payments & Settlement Systems					Challengers for Cross-Border Payments		
	ACH	RTGS	Interbank ATM Network	Low Value Real Time Funds Transfer (RT- RPS)	RT-RPS Adoption of ISO20022	Social Media Apps for Payments Services	Fintech Startups	Telcos for Payments Services
Brunei Darussalam	●	●	●	●	●	●	○	●
Cambodia	●	●	●	●	○	●	○	●
Indonesia	●	●	●	●	●	●	●	●
Laos	●	●	●	●	●	●	○	●
Malaysia	●	●	●	●	●	●	●	●
Myanmar	●	●	●	●	●	●	○	●
Philippines	●	●	●	●	●	●	●	●
Singapore	●	●	●	●	●	●	●	●
Thailand	●	●	●	●	○	●	●	●
Vietnam	●	●	●	●	○	●	●	●

KEY

- Currently Operating
- Work in Progress
- Absent
- Under Review
- More than 60 FinTech
- 30 – 60 FinTech
- Less than 30 FinTech

Note: The above listing of market infrastructures and highlights is non-exhaustive, and is per information available at the time of drafting this paper. RTGS: Real Time Gross Settlement, ACH: Automated Clearing House, RT-RPS: Real Time Retail Payments System.

Source: ASEAN payment market infrastructures and ISO 20022 maturity: SWIFT.

To enable XBPIN infrastructure, a standard messaging format, such as ISO 20022, should be used to align the system with international standards and, as the network expands, allow for future global connectivity. Additionally, linkage to the various domestic payments infrastructure in each country would be necessary to reach the wider ASEAN population. Finally, the retail addressing capabilities would provide the simplicity and ease of use for consumers when sending funds or making payments for goods and services.

The current cross-border payment market within ASEAN is fragmented with numerous network payment service

providers - from traditional operators such as SWIFT, Visa and MasterCard to new blockchain entrants like Ripple and other players like Fintechs and Telcos. Currently, of the operators interviewed, only two have retail addressing capabilities that would allow search and the transmission of a mobile number or unique national ID. The other payment service providers do have plans for such a feature but they are currently unavailable. Additionally, not all of the established payment service providers are present in all 10 ASEAN countries, which would hinder the goal of connecting the entire region.

3.4 Operating Framework

In addition to the choice of rail provider, our study highlighted additional considerations for XBPIN as follows:

1. Diversified regulatory framework across the region and the know your customer (KYC) process
2. Required technical assurance and standardisation to connect the entire regional payment infrastructure
3. Foreign exchange management and consumer assurance of foreign currency exchange rates and transparency of ancillary fees
4. Need for customer education for awareness in order to drive mass adoption






In order to address the potential challenges presented,

similar to other established payment integration initiatives (e.g. European Union), a playbook that proposes an XBPIN operation framework has been produced.

The purpose of the XBPIN Playbook is to outline the key tenets for the interoperability scheme, vision and intent implied, rules of engagement by operator(s) and participants, benefits and recommended standardisation for effective operation of an interoperable model.

With the XBPIN Playbook, ASEAN member countries will have a standard model of governance, infrastructure standards and operating requirements. This will provide guidance to participants in each country around regional payment services. As a result, consumers will have a consistent operating experience and enjoy the benefits of a regional payment services product offering.

Key areas to be established for playbook ratification

<p>Operating governance</p> 	<p>Establish a governing council which will develop the initial charter, ratify the XBPIN framework, guidelines, operating procedures and facilitate participants in laying the foundation and subscribing to the network</p>
<p>Transaction standardization</p> 	<p>Specify transaction limits, transmission timing, and currency optionality</p>
<p>Technical specifications</p> 	<p>Include in the framework the minimum dataset for all participants and include both transmission and user experience requirements</p>
<p>Foreign exchange</p> 	<p>Select from two suggested options for conversion to be performed either by the originating bank or controlled by an appointed bank to provide rates for all participants</p>
<p>Payment finality</p> 	<p>Agree on the definition of finality for the cross-border real-time payment system. The proposed definition for transaction status completion is when confirmation is sent to the Originator.</p>

04

Conclusion

KPMG in Singapore’s analysis has established a baseline for the current state of the payments market in the 10 countries in ASEAN from the following perspectives: macro, infrastructure, regulatory, and digital adoption.

An interoperable ASEAN payment infrastructure can help achieve AEC’s 2025 vision of financial integration. It can remove the existing friction in cross-border payments, seamlessly connect the region's consumers with goods and services providers, and enhance economic growth. Along with a boost in revenue and reduced operating costs for payment incumbents, the resultant wider reach can help onboard more underbanked and unbanked customers, allowing for more players to thrive.

A cross-border payments interoperable infrastructure will rely on domestic presence of real-time payments and should adopt internationally accepted payment standards for ease of global integration within and beyond ASEAN.

This study has shown that a pan-ASEAN regional payments rail is feasible and economically viable.

XBPIN’s business case would improve as more countries, players and consumers converge onto it.

The recommended next step is to develop a proof-of-concept (POC) between multi-jurisdictions based on current domestic real-time payment and retail addressing capabilities. The outcome of the POC will determine the following:

- Ratification of the proposed hypotheses in the XBPIN Playbook by the POC participating countries. The XBPIN Playbook will evolve as subsequent countries come onboard.
- Promotion of XBPIN and its benefits across ASEAN to broaden the remaining countries participation.



05

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