Monetary Authority of Singapore

macroeconomic review

economic policy group
Volume XVII, Issue 2
October 2018

macroeconomic review

Volume XVII, Issue 2
October 2018

Economic Policy Group
Monetary Authority of Singapore

ISSN 0219-8908

Published in October 2018

Economic Policy Group
Monetary Authority of Singapore

http://www.mas.gov.sg

Printed by Xpress Print Singapore

Contents

LIST OF ABBREVIATIONS

ACU	Asian Currency Unit
ASEAN	Association of Southeast Asian Nations
BIS	Bank of International Settlements
CPF	Central Provident Fund
CPI	consumer price index
DBU	Domestic Banking Unit
EPG	Economic Policy Group
FAI	Fixed Asset Investment
FDI	Foreign Direct Investment
F&B	food and beverage
GST	Goods and Services Tax
ICT	information and communications technology
IMF	International Monetary Fund
IT	information technology
m-o-m	month-on-month
MSCI	Morgan Stanley Capital International
NAIRU	Non-accelerating Inflation Rate of Unemployment
NEA	Northeast Asian economies
NEER	nominal effective exchange rate
NODX	Non-oil domestic exports
OECD	Organisation for Economic Cooperation and Development
OPEC	Organisation of the Petroleum Exporting Countries
PCE	private consumption expenditure
PMET	Professionals, Managers, Executives and Technicians
PMI	Purchasing Managers' Index
PPI	producer price index
q-o-q	quarter-on-quarter
REER	real effective exchange rate
SA	seasonally adjusted
SAAR	seasonally adjusted annualised rate
SME	small and medium enterprise
ULC	unit labour cost
UN	United Nations
VA	value added
y-o-y	year-on-year

Preface

The *Macroeconomic Review* is published twice a year in conjunction with the release of the MAS Monetary Policy Statement. The *Review* documents the **Economic Policy Group's (EPG)** analysis and assessment of macroeconomic developments in the Singapore economy, and shares with market participants, analysts and the wider public, the basis for the policy decisions conveyed in the Monetary Policy Statement. It also features in-depth studies undertaken by EPG on important economic issues facing Singapore.

In this issue of the *Review*, we are pleased to present Special Feature A, which examines in detail changes in production structures and final demand in Asia at the industry level, so as to draw some implications for Singapore. Special Feature B surveys the literature on the impact of technology on inflation, including through e-commerce platforms. We are grateful to Professor Douglas Irwin of Dartmouth College for contributing Special Feature C, which traces the evolution of US trade policy through American history to shed light on the forces that are shaping global trade developments today. Our thanks go to Professor Ng Yew-Kwang from Nanyang Technological University for reviewing in Special Feature D the debate on free markets versus government intervention from both welfare-economic and mesoeconomic perspectives. We would also like to record our appreciation to Souvik Gupta and Jiae Yoo from the IMF for preparing Box A, which extends previous work on estimating monetary policy rules for Singapore within MAS' exchange rate-based framework. Finally, we would like to thank Associate Professor Peter Wilson for his assistance in editing the *Review*.

This *Macroeconomic Review* is produced by EPG, MAS. The team comprises: Abby Ang, Alvin Jason s/o John, Andrew Colquhoun, Angeline Qiu, Betty Chong, Brian Lee, Celine Sia, Chia Yan Min, Choy Keen Meng, Cyrene Chew, Edward Robinson, Erica Tay, Geraldine Koh, Grace Lim, Hema d/o Sevakerdasan, Huang Junjie, Ian Chung, Jasmine Koh, Jensen Tan, Kenny Ho, Li Tiansheng, Liew Yin Sze, Linda Ng, Marcus Fum, Michael Ng, Mohamed Ramli, Neha Varma, Ng Yi Ping, Nicholas Koh, Priscilla Ng, Seah Wee Ting, Shem Ng, Soh Wai Mei, Tan Boon Heng, Tan Choon Leng, Tan Yin Ying, Thasreen Refaya, Thum Jie Liang, Toh Ling Yan, Tu Suh Ping, Wu Jingyu and Xiong Wei.

The data used in the *Review* was drawn from the following government agencies, unless otherwise stated: BCA, CPF Board, DOS, EDB, Enterprise Singapore, IMDA, LTA, MOF, MOM, MND, MPA, MTI, STB and URA.

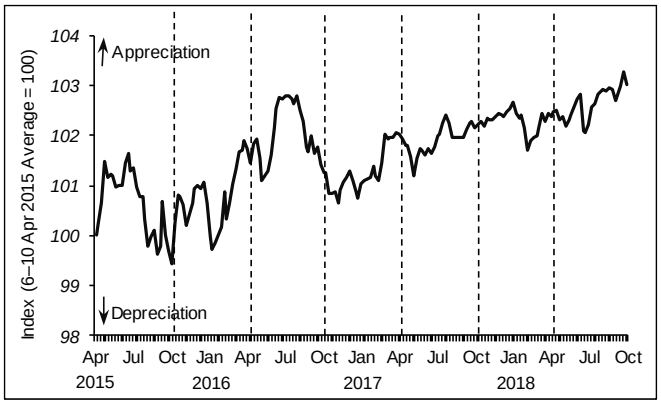
12 October 2018

Monetary Policy Statement

INTRODUCTION

1. In the April 2018 Monetary Policy Statement, MAS increased slightly the slope of the S$NEER policy band from the previous zero percent. There was no change to the width of the policy band or the level at which it was centred. This policy stance was assessed to be appropriate given that the Singapore economy was expected to remain on a steady expansion path, while MAS Core Inflation was projected to rise.

Chart 1
S$ Nominal Effective Exchange Rate (S$NEER)



----- indicates release of Monetary Policy Statement

2. Apart from brief periods of decline, the S$NEER has appreciated in the upper half of the policy band since April 2018. This reflected in part sharper depreciations in a number of regional currencies against the US dollar, relative to the S$. The three-month S$ SIBOR rose from 1.5% in April 2018 to 1.6% as at end-September.

OUTLOOK

3. The Singapore economy has largely evolved as envisaged in the April 2018 policy review, and is likely to expand at a slower but steady pace for the rest of this year and in 2019. The level of economic activity is assessed to be slightly above potential and MAS Core Inflation is projected to rise modestly in the near term before stabilising at just below 2%.

Growth Backdrop

4. According to the *Advance Estimates* released by the Ministry of Trade and Industry today, the Singapore economy grew by 4.7% on a quarter-on-quarter seasonally-adjusted annualised basis in Q3 2018, an increase from the 1.2% recorded in Q2. Compared to a year ago, GDP expanded by 2.6% in Q3 2018, following strong average growth of 4.3% in H1.

5. Over the last six months, the drivers of economic activity have shifted. The contribution of the manufacturing sector to Singapore's GDP growth has waned following several quarters of above-trend expansions. This has largely reflected the maturing of the global electronics cycle. In comparison, growth in the services sectors stayed firm, mainly driven by financial and business services, as well as wholesale & retail trade.

6. Global growth has been relatively resilient thus far. In 2019, trade frictions between some major economies and the uncertainty they pose could weigh more discernibly on global economic activity.

7. Barring a significant setback in global growth, the Singapore economy should expand at a pace close to potential in 2019. Although manufacturing will remain an important driver of GDP growth, its contribution will moderate. The ICT, financial and business services sectors will benefit from steady regional growth and domestic digitalisation efforts, while the discretionary services sectors, such as retail and food services, should see some recovery.

8. Singapore's GDP growth should come in within the upper half of the 2.5–3.5% forecast range in 2018 and moderate slightly in 2019. A small, positive output gap is expected to persist into 2019, imparting modest inflationary pressures.

Inflation Trend

9. MAS Core Inflation, which excludes the costs of accommodation and private road transport, rose to an average of 1.9% year-on-year in July–August 2018, from 1.5% in the first half of the year. This was due to stronger price increases in oil-related, as well as food and retail items. Reflecting the rise in core inflation and a slower pace of decline in accommodation costs, CPI-All Items inflation picked up to 0.7% from 0.3% over the same period.

10. In the quarters ahead, imported inflation is likely to increase on account of higher global oil and food prices. On the domestic front, the improving labour market should underpin a faster pace of wage growth in 2018 and 2019 compared to last year. Growth in unit labour cost for services has picked up recently. The pass-through of higher import and labour costs to consumer prices could increase as domestic demand strengthens further. Nevertheless, the extent of price increases will be restrained by greater market competition in several consumer segments, such as telecommunications, electricity and retail.

11. As for the non-core components of the CPI, private road transport costs are expected to increase in 2019 due to an anticipated tapering in the supply of COEs. Imputed rentals on owner-occupied homes will continue to fall, but by a lesser extent than in 2018 as rental demand gradually picks up.

12. MAS Core Inflation should edge up further to around 2% in the months ahead. For 2018 as a whole, it will come in within the forecast range of 1.5–2%, and average 1.5–2.5% in 2019. CPI-All Items inflation is projected to be about 0.5% in 2018 before picking up to 1–2% in 2019.

MONETARY POLICY

13. The Singapore economy is likely to remain on its steady expansion path in the quarters ahead, keeping output slightly above potential. MAS Core Inflation will experience modest but continuing pressures, before levelling off at just below 2% over the medium term.

14. MAS has therefore decided to increase slightly the slope of the S$NEER policy band. The width of the policy band and the level at which it is centred will be unchanged. This measured adjustment follows the slight increase in the slope of the policy band in April 2018 from zero percent previously, and is consistent with a modest and gradual appreciation path of the S$NEER policy band that will ensure medium-term price stability.

Chapter 1

The International Economy

1 The International Economy

Global Growth Resilient Amid Regional Divergences

The strong global growth alongside low inflation witnessed last year has largely carried over into 2018. However, the synchronous character of the global expansion has given way to a two-speed trajectory in which growth in the US economy is expected to be sustained, notwithstanding recent financial market volatility. Most other economies should see some moderation in growth. The impetus to the US performance stems primarily from the late-cycle fiscal stimulus, which could lift US growth by 0.5–1.0% point this year and next. As a result, the G3 economies as a whole are anticipated to maintain steady growth momentum for the next few quarters. In Asia ex-Japan, the pace of expansion has generally eased in the first half of this year, reflecting the maturation of the global business cycle and the tapering of the tech cycle compared to last year.

Growing trade frictions between the US and China, as well as a concurrent tightening of global financial conditions, could increasingly weigh on activity in the regional economies. Further hikes in US interest rates and the Federal Reserve's gradual unwinding of its balance sheet could also lead to a tightening of dollar liquidity, posing debt rollover risks for some borrowers in emerging markets. Nonetheless, barring the full materialisation of these downside risks, global growth is projected to be only marginally lower at 4.4% this year and 4.2% in 2019. (Table 1.1)

Table 1.1
Global GDP Growth

(%)

	Q1 2018	Q2 2018	2017	2018F	2019F
	q-o-q SAAR		y-o-y		
Total*	**5.0**	**3.8**	**4.5**	**4.4**	**4.2**
G3*	**1.3**	**3.0**	**2.2**	**2.2**	**2.0**
US	2.2	4.2	2.2	2.9	2.6
Japan	−0.9	3.0	1.7	1.1	1.2
Eurozone	1.6	1.8	2.4	2.0	1.8
	y-o-y				
Asia ex-Japan*	**5.5**	**5.3**	**5.4**	**5.2**	**4.9**
NEA-3*	**3.7**	**3.3**	**3.4**	**3.1**	**2.5**
Hong Kong	4.6	3.5	3.8	3.6	2.7
Korea	2.8	2.8	3.1	2.8	2.6
Taiwan	3.1	3.3	2.9	2.7	2.2
ASEAN-4*	**5.3**	**4.9**	**5.3**	**5.0**	**4.8**
Indonesia	5.1	5.3	5.1	5.2	5.2
Malaysia	5.4	4.5	5.9	4.8	4.6
Philippines	6.6	6.0	6.7	6.4	6.4
Thailand	4.9	4.6	3.9	4.5	3.8
China	**6.8**	**6.7**	**6.9**	**6.6**	**6.3**
India**	**7.7**	**8.2**	**6.7**	**7.4**	**7.5**

Source: CEIC, Consensus Economics, October 2018 and EPG, MAS estimates

* Weighted by shares in Singapore's NODX.

** Figures are reported on a Financial Year (FY) basis; FY2018 refers to the period from April 2018 to March 2019.

1.1 G3 Economies

The US Economy Will Outperform The Rest Of The G3

G3 growth rebounded to 3.0% on a sequential annualised basis in Q2 2018, from 1.3% in the preceding quarter, led by recovering activity in the US and Japan. Household spending in Q2 was robust across all the G3 economies, underpinned by tightening labour markets and faster wage increases in the US and the Eurozone. Private investment continued to chalk up healthy gains in the quarter, as firms raised capex amid more biting capacity and labour constraints. The US will continue to lead G3 growth into 2019, boosted by a strong expansionary fiscal impulse. In comparison, the Eurozone and Japan will grow at a rate closer to their potential, supported by resilience in private consumption and sustained corporate capex. All in, G3 growth is expected to hold steady at 2.2% this year, before easing to 2.0% in 2019.

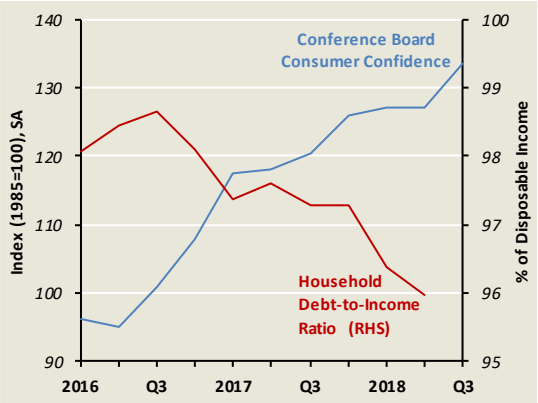
The US economy is growing above potential.

Following a relatively weak Q1 outturn of 2.2% q-o-q SAAR, US growth accelerated to 4.2% in Q2, the first time it has crossed the 3% mark since early 2015. Household spending expanded by a robust 3.8% and accounted for three-fifths of the rise in aggregate output, with large increases seen in the durable goods category. The increase in personal consumption expenditures reflected in part the stimulative effects of the reductions in income tax rates that came into effect in January 2018, alongside upbeat consumer sentiment and a still-falling household debt burden. (Chart 1.1)

Business capital expenditure remained firm in Q2, with non-residential fixed investment expanding by 8.7% q-o-q SAAR, bolstered by increases in all the key segments: structures, equipment and intellectual property products. In particular, investments in structures rose at a double-digit rate for the second consecutive quarter, driven by higher spending in the energy sector. However, a drawdown in inventories deducted 1.2% points from growth.

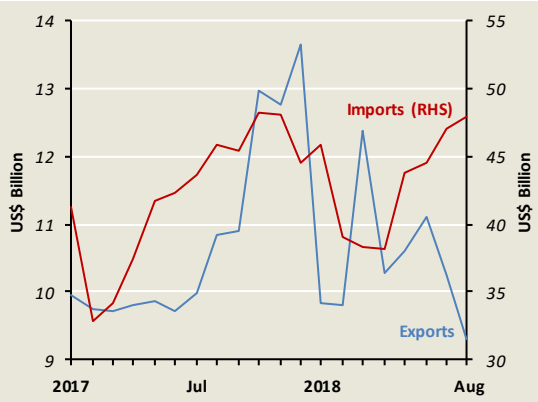
Federal spending, the government expenditure component of the fiscal injection, added 0.4% point to Q2 GDP growth. Net exports also contributed a more significant 1.2% points to the expansion in the second quarter, but this was largely due to the frontloading of soybean exports to China ahead of the imposition of tariffs in July. As the effects of trade tariffs imposed by the US and China become more apparent in the second half of 2018, growth in US trade volumes—both exports and imports—could be more adversely affected. For now, US imports from China have held up, though exports have retracted somewhat in the last two months. (Chart 1.2)

Chart 1.1
US Consumer Confidence and Household Debt-to-Income Ratio



Source: Haver Analytics and EPG, MAS estimates

Chart 1.2
US Trade in Goods with China

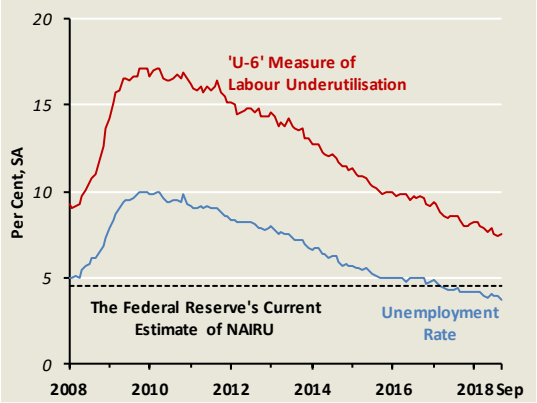


Source: Haver Analytics and EPG, MAS estimates

The effects of the fiscal stimulus have yet to peak, amid a tightening labour market.

Robust domestic demand will remain the lynchpin of economic activity in the US. The strength in the job market will support rising income growth and continued expansion of private consumption. Payroll growth has averaged 208,000 per month so far this year, well above the 182,000 recorded in 2017. The unemployment rate—which fell to 3.7% in September and is already below the estimated NAIRU of 4.5%—is anticipated to decline further. Moreover, the improvement in the labour market is broad-based, as seen in the faster decline in the 'U-6' measure of labour market slack, which includes workers marginally attached to the workforce and those working part-time who would prefer full-time work. (Chart 1.3) The growing tightness in the labour market, in turn, caused average hourly earnings to increase by 2.8% y-o-y in the third quarter of the year—the fastest pace since Q3 2009.

Chart 1.3
US Unemployment Rate and 'U-6' Measure of Labour Underutilisation



Source: Haver Analytics and EPG, MAS estimates

Some estimates also suggest that the fiscal impulse from the tax cuts and increase in federal spending limits will be felt more strongly in the next nine months, providing an added fillip to growth. Consensus forecasts currently maintain that the US economy will expand by 2.9% in 2018 and 2.6% in 2019.

However, given diminishing slack in the labour market, the pro-cyclical fiscal boost to aggregate demand may show up as an uptick in inflation, rather than just increases in output and employment. At the same time, price pressures may be accentuated by the tariffs on imports from China, which have increased in scale and scope. All in, these developments could pose upside surprises to US inflation outcomes in 2018 and 2019. PCE headline inflation has already exceeded the Federal Reserve's target of 2% in Q2, while core PCE inflation is trending towards it.

The fiscal measures are expected to increase the US budget deficit and raise federal government debt over the next decade.[1] The need to finance the deficit, alongside the Federal Reserve's ongoing unwinding of its balance sheet, will reduce the amount of liquidity in the dollar financial markets and could cause long-term US interest rates to rise, *ceteris paribus*. While this may be consonant with robust economic conditions in the US, the attendant tightening in global US dollar liquidity could pose risks to economies where growth has

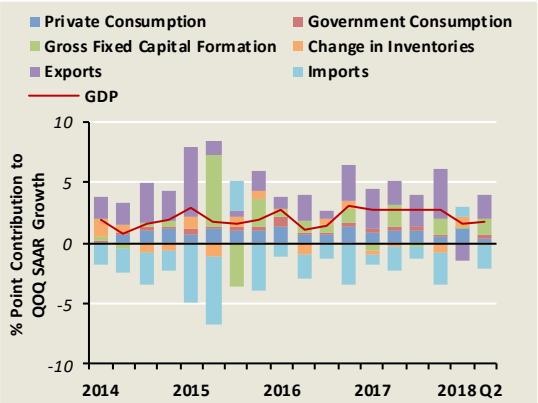
1 Congressional Budget Office (2018), "The Budget and Economic Outlook: 2018 to 2028", April.

weakened and corporate balance sheets are stretched. Debt rollover risks could also rise, especially among borrowers of US dollars in emerging market economies. Further, such risks could be exacerbated by the growing headwinds from trade frictions.

Eurozone economic activity moderated in H1 2018.

After a robust GDP outturn of 2.4% in 2017, economic activity in the Eurozone moderated to an average of 1.7% q-o-q SAAR in H1 2018. Across the monetary union, the step-down in growth was mainly due to a weaker impetus from exports compared to 2017, amid a moderation in global growth momentum and the impact of the euro's appreciation. (Chart 1.4) Higher oil prices, and widespread labour strikes in France also weighed on private consumption growth in the region, which slowed to 0.8% q-o-q SAAR in Q2 from 2.2% in Q1. Nevertheless, domestic demand remains strong. Notably, private investment growth accelerated to 5.9% q-o-q SAAR in Q2, from 0.4% in the preceding quarter, as firms in France, Spain and Italy, faced with growing capacity constraints, sought to replace their ageing capital stocks. Higher fiscal spending in Germany and Spain also lifted government consumption in the region.

Chart 1.4
Contribution to Eurozone GDP Growth



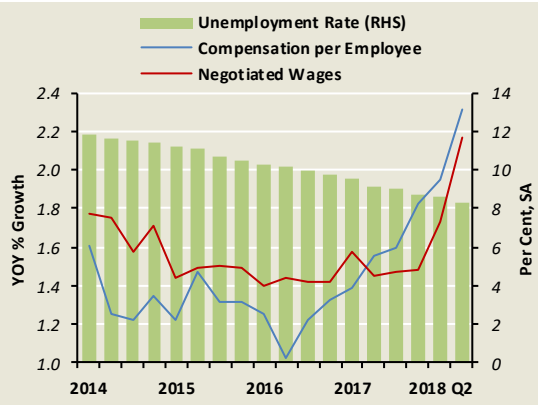
Source: Haver Analytics and EPG, MAS estimates

Growth is expected to remain steady in the coming quarters.

Although the upturn in the Eurozone likely reached a cyclical peak in late 2017, the region is still expected to expand at a steady pace in the coming quarters on the strength of domestic spending. Business and consumer confidence indicators, though off the highs earlier this year, are still well above historical levels. Household expenditure will continue to be supported by improving labour market conditions and modest wage increases. The Eurozone unemployment rate fell to 8.1% in August 2018, the lowest since November 2008, while nominal wage growth picked up to 2.3% y-o-y in Q2 2018, from 1.9% in Q1 2018 and 1.6% in 2017. (Chart 1.5)

Meanwhile, private investment will also help to bolster the region's growth. First, sustained demand for housing will keep construction investment elevated. Second, the European Central Bank has committed to keep interest rates at their present low levels at least through the summer of 2019, thus extending supportive financial conditions well into next year. Furthermore, trade tensions between the EU and the US have eased in recent months, although there remains a risk of

Chart 1.5
Eurozone Labour Market Indicators

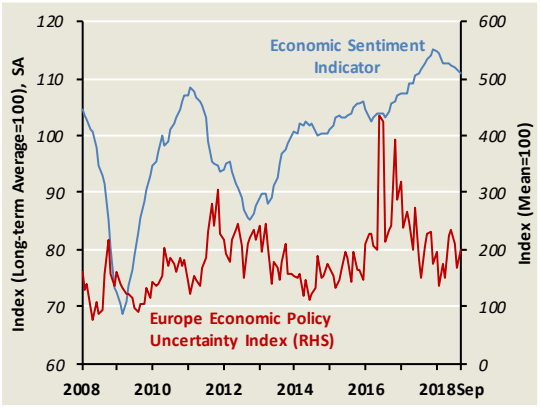


Source: Haver Analytics and EPG, MAS estimates

renewed disputes. Overall economic confidence remains near a record high, which should continue to facilitate private investment spending. (Chart 1.6)

Nonetheless, political risks remain. Notably, the new Italian government's medium-term spending plan has set it on a potential collision course with the European Commission, denting market sentiment and raising Italian bond yields. Furthermore, the final form of the future trading relationship between the UK and the EU remains unclear, and a disorderly Brexit could weaken business and consumer confidence in both economies. Barring the materialisation of these risks, growth in the Eurozone is expected to ease slightly to 2.0% in 2018 and 1.8% in 2019.

Chart 1.6
Europe Economic Policy Uncertainty Index and Economic Sentiment Indicator

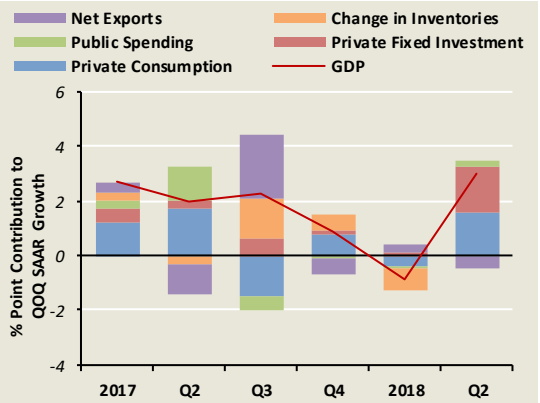


Source: Global Economic Policy Uncertainty Index and Haver Analytics

The business investment upswing will continue to underpin economic growth in Japan.

Japan's GDP grew strongly by 3.0% q-o-q SAAR in Q2 2018, following a contraction of 0.9% in the previous quarter. Spurred by a recovery in household consumption and continued strength in private investment, domestic demand contributed 3.5% points to overall growth. (Chart 1.7) Non-residential investment was supported by ongoing construction activity in preparation for the Olympics in 2020. However, private residential investment contracted for a fourth consecutive quarter in Q2, declining by 9.3% q-o-q SAAR. Meanwhile, weaker exports of machinery and equipment, together with higher imports, resulted in a small negative contribution from net exports.

Chart 1.7
Contribution to Japan's GDP Growth

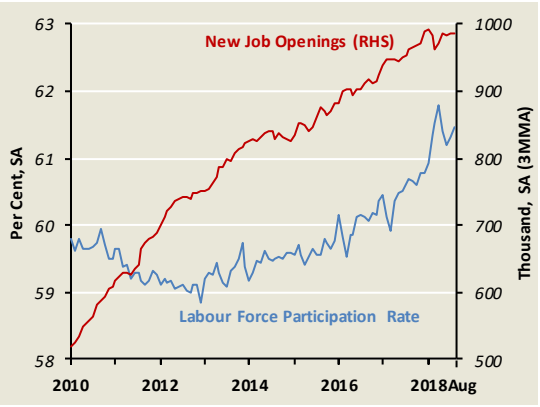


Source: Haver Analytics and EPG, MAS estimates

Although the recent spate of bad weather could adversely impact output in the short term, leading indicators suggest that underlying GDP growth will continue, albeit at a more moderate pace. As firms continue to face deeper labour shortages, greater employment opportunities and better wage prospects should encourage a further rise in the labour force participation rate, with more people aged 25 to 34 years seeking to enter or re-enter the labour force in recent months. (Chart 1.8) This positive supply-side response should help to sustain output growth and, at the same time, restrain inflation.

Meanwhile, as reflected in the latest Tankan survey, spare production capacity is expected to be further absorbed. (Chart 1.9) Firms are also likely to increase their investments in labour-saving machinery and technology, given a very tight labour market, while

Chart 1.8
Japan's Labour Market Conditions

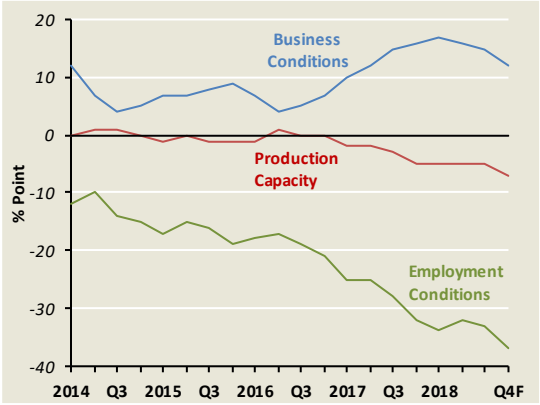


Source: Haver Analytics and EPG, MAS estimates

business sentiment has remained strong despite global trade developments. Coupled with robust corporate profits, these bode well for further capex growth.

While the consumption tax hike scheduled for October next year is expected to go ahead as planned, the government has indicated it will take mitigating fiscal measures to cushion the negative impact of the levy. On balance, Japan's GDP growth is envisaged to come in at 1.1% in 2018 and 1.2% in 2019.

Chart 1.9
Japan's Tankan All Enterprise Survey



Source: Haver Analytics and EPG, MAS estimates

Note: Negative readings indicate a greater number of respondents registering 'unfavourable' conditions, as opposed to 'favourable'. For production capacity and employment conditions, this implies tightness weighing on output expansion.

1.2 Asia

Asia Ex-Japan Is Slowing Moderately

Asia ex-Japan grew at a slower pace of 5.3% y-o-y in Q2, compared to 5.5% in the preceding quarter. Most economies saw a slight easing in GDP growth, with the exception of India, Indonesia and Taiwan, which recorded modest upticks. Across most of Asia, trade flows and production activity have moderated, but this is largely due to the maturation of global business and tech cycles. Although domestic demand should remain resilient, tighter global financial conditions can be expected to weigh on economic activity to varying degrees across the region. The impact of trade frictions on Asia's growth will also become more discernible in the quarters ahead. Partially offsetting this, the authorities in China have embarked on fiscal and other measures to shore up the economy. On balance, GDP growth in Asia ex-Japan is projected to come in at 5.2% in 2018, before moderating to 4.9% in 2019.

Asian trade and production have eased alongside maturing business and tech cycles.

Export volume growth in Asia ex-Japan has slowed since March 2018, coming in at an average of 3.2% y-o-y in Mar–Jul, from 6.5% over the period Jan 2017–Feb 2018. In tandem, manufacturing PMIs in the region have also declined from their highs late last year, although they remain in expansionary territory. (Chart 1.10) The pullback in manufacturing activity has been more pronounced in the NEA-3 economies, which are highly exposed to the global electronics industry. The nature and timing of the broad-based moderation in trade flows and manufacturing activity suggest that the key factor causing the slowdown was the maturing of the global business and electronics cycles, rather than the US-China trade tariffs implemented so far. Nonetheless, as the higher levies took effect only in July, their impact is likely to filter through more discernibly to the Asian economies in the later part of this year and in 2019.

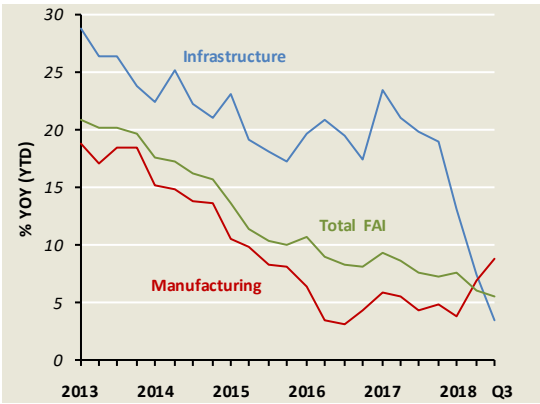
Chart 1.10
Asia ex-Japan Trade Flows and Manufacturing PMI

Source: CPB Netherlands Bureau for Economic Policy Analysis, Haver Analytics and EPG, MAS estimates

China's growth moderated on slower infrastructure investment.

China's GDP growth slipped to 6.7% y-o-y in Q2 2018, after expanding by 6.8% in each of the three prior quarters. While domestic demand as a whole held up, fixed asset investment (FAI) growth softened alongside tighter financial conditions and curbs on shadow credit. (Chart 1.11) Infrastructure FAI, which had grown faster than overall FAI for more than five years, cooled markedly in Q2 2018, even as manufacturing FAI ticked up.

Chart 1.11
China's Fixed Asset Investment Growth



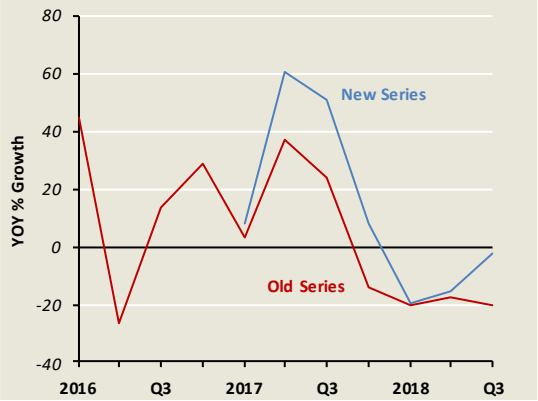
Source: CEIC and EPG, MAS estimates

Meanwhile, retail sales growth fell by 0.8% point in Q2, possibly due to reduced consumer confidence over looming external risks and households' elevated mortgage servicing burdens. China's consumer confidence index softened to 118.6 in August, from its peak of 124 in February.

In Q3 2018, China's GDP growth slowed further to 6.5% y-o-y as FAI growth decelerated further amid weaker non-bank financing. Regulatory scrutiny of the financial sector has intensified in the past year, as the authorities cracked down on irregular financial flows. Although the curbs succeeded in addressing vulnerabilities and were partly offset by a ramp-up in formal bank lending, they have also restricted funding for local government projects and the access of some private firms to credit.

On net, aggregate financing, as previously measured by the People's Bank of China, fell by 20.4% y-o-y in Q3 2018, despite a 24.1% increase in domestic currency bank loans. In October, the central bank introduced an augmented measure of aggregate financing, which showed that headline credit growth contracted at a much slower pace of 2.6% y-o-y. (Chart 1.12) In particular, the augmented measure takes into account a number of new items, including special local government bond issuances, which has picked up significantly in recent months. (Chart 1.13) In September alone, around RMB740 billion in special local government bonds were issued, more than twice the total value of issuances in H1 2018.

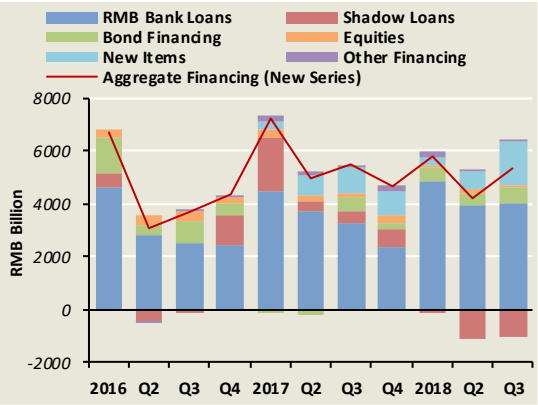
Chart 1.12
China's New and Old Aggregate Financing



Source: Haver Analytics and EPG, MAS estimates

Note: Data for the new series is only available from 2017.

Chart 1.13
China's Aggregate Financing Breakdown



Source: Haver Analytics and EPG, MAS estimates

Policy adjustments should help to stabilise China's growth.

Into 2019, China will face headwinds from the cumulative effects of regulatory tightening, slower credit creation and increased trade frictions. The authorities have implemented a slate of monetary and fiscal easing measures to stabilise growth, including three rounds of reserve requirement ratio cuts, a loosening of bank lending quotas, and tax cuts. In the coming months, policymakers are expected to unveil additional schemes targeted at improving the private sector's access to capital. These policies should support growth in the quarters ahead, and also provide an important buffer to the economy in the event that trade tensions worsen.

Despite rising trade frictions, China's exports will be propped up in the near term, as firms continue to bring forward their US-bound orders in view of prospective

tariff hikes. In 2019, the direct impact of existing US tariffs on China's export performance is estimated to be contained. However, a protracted trade conflict would have wider ramifications on economic activity through the confidence and investment channels. Overall, China's GDP growth is projected to be 6.6% in 2018, before slowing to 6.3% in 2019.

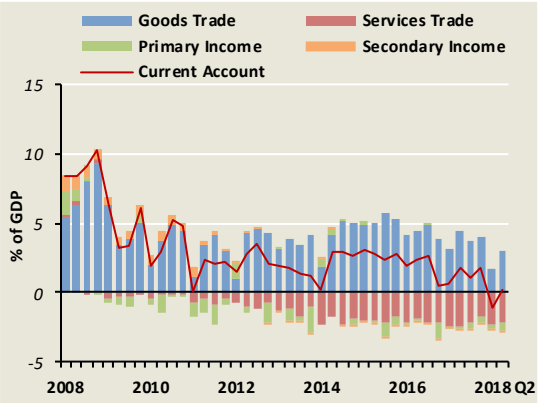
Structural developments have led to a normalisation of China's current account.

China's current account (CA) recorded a deficit of 1.1% of GDP in Q1 2018 from a surplus of 1.3% in 2017, primarily due to a weakening of its trade balance. (Chart 1.14) The surplus on merchandise trade was significantly lower in Q1, due, in part, to higher oil prices which pushed up the value of China's nominal imports. As a result, the reduced goods surplus was insufficient to cover the widening services deficit, leading to the CA deficit. In Q2 2018, the CA turned around to a small surplus of 0.2% of GDP. Overall, the CA was in deficit in H1 2018—China's first since joining the World Trade Organisation in 2001.

Looking ahead, there are structural forces acting on China's CA position in both directions. At a fundamental level, the rebalancing of the economy from capital spending to consumption suggests that both investment and savings should decline as a share of GDP, with an ambiguous net effect on the external balance. From the trade perspective, given China's already strong penetration of global markets, there is limited scope for its merchandise exports-to-GDP ratio to rise. At the same time, its services deficit is poised to widen, as Chinese consumers' demand for more sophisticated services, including overseas travel, continues to grow alongside the burgeoning ranks of its middle class. (Chart 1.15) These developments would, on their own, result in a persistent CA deficit.

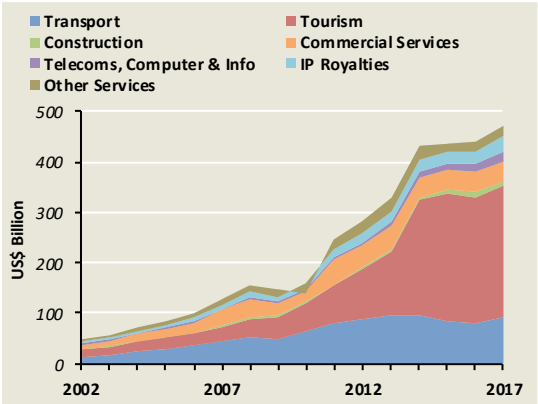
Conversely, there are other factors supporting the CA balance. First, China is in the transitory phase of ceding its dominance in low-skilled labour-intensive manufacturing to less-developed countries, while only beginning to attain capabilities in high-tech production. In time to come, China is likely to capture a greater share of the global technology value chain, reducing its need to import high-value components from the advanced economies and perhaps even exporting such products. This could support the trade balance, including through an improvement in the terms-of-trade. Second, the country's primary income balance deficit is poised to

Chart 1.14
China's Current Account Balance



Source: Haver Analytics and EPG, MAS estimates

Chart 1.15
Composition of China's Services Imports



Source: CEIC and EPG, MAS estimates

narrow, as China becomes a sizeable source of outward direct investment. In the near term, however, it is likely that China's CA will, on average, be broadly balanced.

India's growth recovery will be sustained.

India's growth accelerated to an average of 8.0% y-o-y in the first two quarters of the year as the transitional effects of the demonetisation exercise and Goods and Services Tax (GST) faded. Private consumption was the key driver of growth, rising at its fastest pace since demonetisation, on the back of higher rural incomes, which were in turn supported by increased minimum prices for agricultural produce. (Chart 1.16) Investment and government spending also stayed firm, but net trade continued to detract from growth due, in part, to a higher oil import bill.

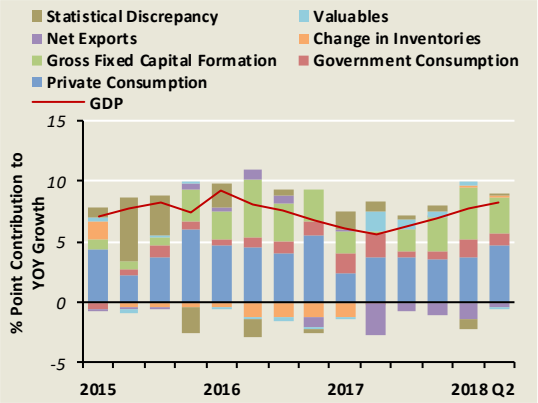
On a sectoral basis, Q2 growth was supported by expansions in the agriculture-related sectors, as well as in manufacturing, where growth reached a nine-quarter high of 13.5% y-o-y. While the latter was partly due to base effects associated with GST implementation, it was largely driven by a broad-based strengthening of domestic demand.

In the coming quarters, India's growth momentum is expected to remain firm, underpinned by strong household consumption and an incipient investment revival. Consumption will be supported by rural and urban households, as reflected in strong sales of both two-wheelers and passenger cars in recent quarters. (Chart 1.17) Official efforts to push ahead with the recapitalisation of state banks and related financial reforms should also strengthen balance sheets and facilitate a pickup in credit growth. Thus, growth in the Indian economy is likely to come in at 7.4% in FY2018 (ending March 2019), before rising to 7.5% in FY2019.

The expansion in the NEA-3 will slow as domestic and external headwinds mount.

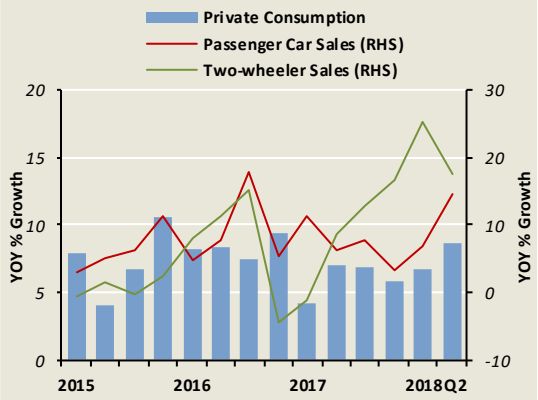
The NEA-3 economies experienced a moderation in growth to 3.3% y-o-y in Q2 2018, from 3.7% in the previous quarter. Household consumption registered a slower increase amid a softening labour market in Korea and tightening domestic financial conditions in Hong Kong. Trade-related uncertainties also weighed on capital investment, which subtracted from growth in Q2 for the first time in eight quarters. (Chart 1.18) The pullback in domestic demand, in turn, contributed to import compression, thus driving up net exports.

Chart 1.16
Contribution to India's GDP Growth by Expenditure



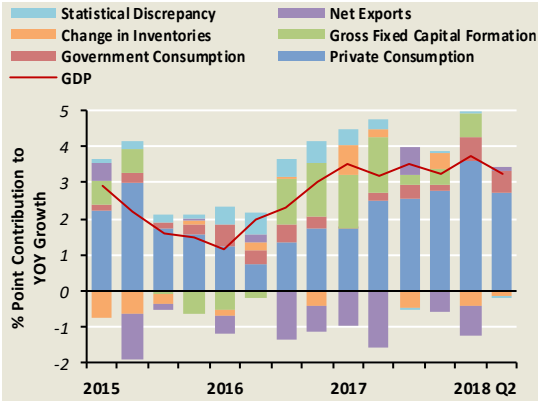
Source: CEIC and EPG, MAS estimates

Chart 1.17
India's Sales of Passenger Cars and Two-wheelers



Source: CEIC and EPG, MAS estimates

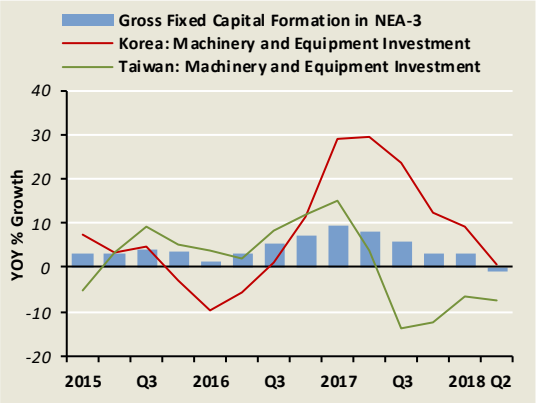
Chart 1.18
Contribution to NEA-3 GDP Growth



Source: CEIC, Haver Analytics and EPG, MAS estimates

In H2 2018, economic activity in the NEA-3 is set to moderate, as country-specific factors weigh on domestic demand and external headwinds intensify. In Hong Kong, higher interest rates will temper property market activity and curtail household spending. In Korea, the largest minimum wage hike in nearly two decades has boosted incomes, but also dampened firms' hiring and business sentiment. In addition, machinery and equipment investment in Korea and Taiwan has been on a downward trend since late 2017, in line with the maturing tech cycle. (Chart 1.19)

Chart 1.19
NEA-3 Investment



Source: Haver Analytics and EPG, MAS estimates

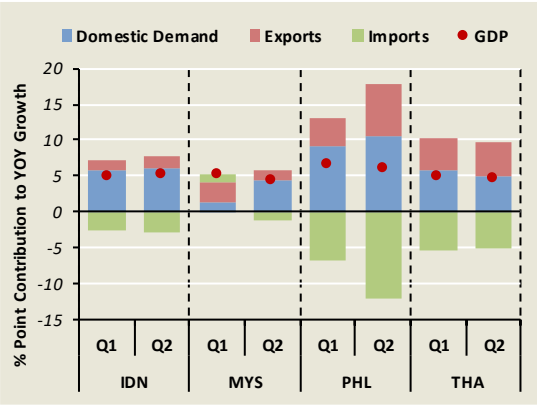
The NEA-3 economies are particularly vulnerable to negative spillovers from US-China trade frictions, given their extensive links to the region's supply chains and deep economic ties with China. For the most part, the impact of trade tariffs has yet to show up clearly in the data. However, risks have risen with the recent intensification of trade tensions. In particular, Korea and Taiwan have close cross-border production links with China, especially in the electronics industry, and would be the most adversely affected by US tariffs on Chinese IT-related products. However, there is some scope for production diversion from China to third countries not affected by tariffs, which could benefit the NEA-3 in the medium term.

Taking these factors into consideration, the NEA-3 economies are expected to grow by 3.1% in 2018 and 2.5% in 2019. These outcomes represent a moderation from the 3.4% recorded in 2017, but are nevertheless higher than the average growth of 2.4% over the five years to 2016.

Softer global demand and financial tightening are clouding the ASEAN-4 growth outlook.

GDP growth in the ASEAN-4 region decelerated from 5.3% y-o-y in Q1 2018 to 4.9% in Q2. Across these economies, private consumption growth either rose or held steady, underpinned by continued income gains, strengthening consumer confidence, and higher government transfers. Meanwhile, investment remained resilient, supported by sustained spending by the private sector. In comparison, public investment spending was lacklustre, held back by cutbacks on infrastructure projects in Indonesia and Malaysia. While exports continued to expand at a firm pace in Q2, strong domestic demand resulted in higher imports of goods and services, especially in the Philippines. (Chart 1.20)

Chart 1.20
Contribution to ASEAN-4 GDP Growth



Source: CEIC, Haver Analytics and EPG, MAS estimates

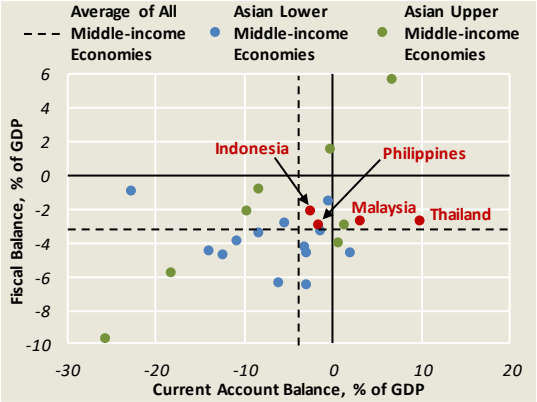
Looking ahead, growth prospects for the ASEAN-4 have dimmed somewhat as these economies are confronted with tighter financial conditions while trade tensions look set to exert a drag on exports. In the more open economies of Malaysia and Thailand, where exports amount to around three-quarters of GDP, weaker trade outturns will have considerable knock-on effects on domestic consumption and investment. Moreover, all four ASEAN economies will be impacted by rising borrowing costs as global and domestic financial conditions tighten thus adding to investment headwinds. Accordingly, the ASEAN-4 region is expected to expand at a slower pace of 5.0% in 2018 and 4.8% in 2019 from 5.3% in 2017.

Financial flows into ASEAN are complementary to trade flows.

Emerging economies have recently witnessed a rise in financial volatility associated with withdrawals in international capital flows. In this regard, the ASEAN-4 economies are on a relatively firm footing among emerging market economies. The current account and fiscal balances of ASEAN-4 countries are close to, or higher than, the average for countries at a similar level of development. (Chart 1.21) In addition, foreign reserves and banks' capital buffers have been built up substantially, and exchange rates have become more flexible, thus putting the region's economies in a better position to weather external shocks.

In fact, ASEAN economies have accommodated large two-way capital flows over the past few decades, and foreign capital has played an important role in financing their rapid economic growth. Foreign bank claims have trended up since the early 1990s, while cross-border portfolio inflows have also grown steadily over the past decade, aided by initiatives to liberalise the banking sector and the capital market. (Chart 1.22) To better understand the factors underpinning foreign holdings of ASEAN financial assets, a modified gravity model is used to examine two panel datasets, one on bank lending from 14 advanced economies to ASEAN-5 countries, and another on the portfolio investment holdings of residents in 22 countries (including ASEAN-5) in the ASEAN-6 economies (ASEAN-5 and Vietnam).[2]

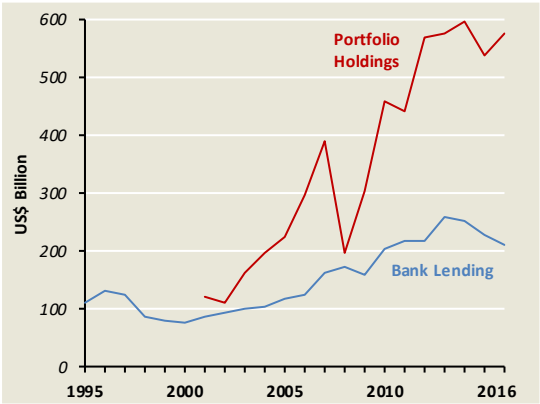
Chart 1.21
Current Account and Fiscal Balances, Middle-income Economies



Source: Haver Analytics, IMF, World Bank and EPG, MAS estimates

Note: For the ASEAN-4 economies, the current account balance is calculated using the latest four quarters of data while the fiscal balance is based on national authorities' FY2018 budgets. Other data points are based on 2018 projections from the October 2018 IMF *World Economic Outlook* for countries classified as middle-income by the World Bank.

Chart 1.22
Foreign Holdings of ASEAN-5 Assets



Source: BIS, IMF and EPG, MAS estimates

Note: The data shows bank lending from the eight source countries and portfolio holdings of the 20 source countries for which data is available for the full sample period.

[2] The ASEAN-5 countries are Indonesia, Malaysia, Philippines, Singapore and Thailand. The dataset on bank lending is taken from BIS' Locational Banking Statistics, and span about two decades (1995–2017), although only eight lender countries have observations for the full sample period. The dataset on portfolio holdings is from the IMF's *Coordinated Portfolio Investment Survey*, and is almost complete across the relevant countries but covers a shorter period of 2001–2016.

Our results broadly corroborate previous studies[3], and reveal several differences between the drivers underlying cross-border bank lending and portfolio holdings. (Table 1.2) *Geographic distance*, which can be considered a proxy for information asymmetries, was found to be a factor influencing bilateral bank lending, but not portfolio holdings (both normalised by the product of the source and recipient countries' GDP). This suggests that the availability of information matters more for decisions on bank loans whereas portfolio diversification into distant economies' assets could be a more important consideration for holders of debt and equity. In comparison, the degree of *bilateral trade integration* is a key determinant of asset holdings for both bank loans and portfolio stocks. (Chart 1.23) Stronger trade flows not only stimulate greater financial flows into the recipient country, but also help to alleviate information asymmetries and reduce transaction costs. For instance, banks may follow their customers into foreign markets to underwrite trade financing and cross-border financing for FDI, and subsequently branch into offering financial services to the recipient country's residents.[4]

The size of cross-border portfolio holdings correlates positively with the *size of capital markets* in the individual ASEAN economies. It appears that as the recipient country's capital market grows, it can attract more funds as market liquidity improves and information gaps decline with increased analyst coverage. This in turn lowers borrowing and other associated costs, creating a virtuous cycle whereby local companies can more readily tap on the international capital market to raise funds. In comparison, cross-border bank lending appears to be unaffected by capital market development. However, when total bank claims[5] with a larger sample of lending countries are used as the dependent variable in the gravity model, a significant negative relationship is found. This implies that capital market deepening in recipient economies has contributed to financial disintermediation, with firms increasingly substituting bond or equity issuance for bank lending.

Table 1.2
Gravity Model Estimation Results

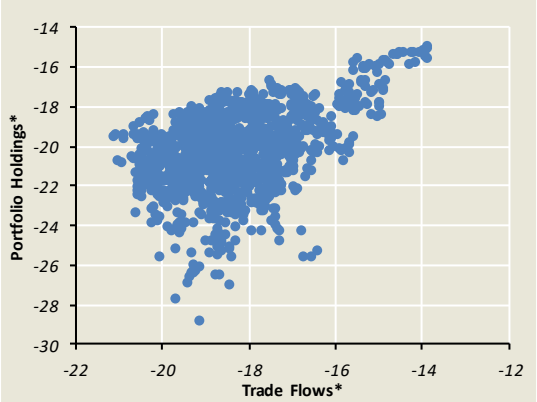
Independent Variable	Dependent Variable	
	Bank Lending	Portfolio Holdings
Distance	−1.65**	0.18
Trade	0.16*	0.22**
Capital Market Size	−0.21	0.50**
Rule of Law	0.90**	0.57*
Constant	−3.58	−25.60**
R-squared	0.47	0.15
No. of observations	832	1,591

Note: The dependent variables are normalised by the bilateral countries' GDP, and all variables are in logarithms except for 'Rule of Law'.

* Statistically significant at the 10% level.

** Statistically significant at the 5% level.

Chart 1.23
Bilateral Portfolio Holdings and Trade Flows*



Source: IMF and EPG, MAS estimates

Note: Data points for which the source country is a financial centre have been excluded.

* Normalised by the product of the source and recipient countries' GDP, in logarithmic terms.

[3] See, for instance, Choy, K M and Siregar, R (2010), "Determinants of International Bank Lending from the Developed World to East Asia", *IMF Staff Papers*, Vol. 57(2), pp. 484–516 and Ananchotikul, N, *et al* (2015), "Drivers of Financial Integration—Implications for Asia", *IMF Working Paper* No. 15/160.

[4] See the April 2018 issue of the *Macroeconomic Review* for a discussion on the drivers of Japan's outward direct investment and cross-border bank lending to the ASEAN countries.

[5] This dataset comprises total bank claims from 16 countries from the BIS' Locational Banking Statistics. Total bank claims consist mainly of lending, but also include debt securities and other components.

Meanwhile, the quality of institutions is found to have a positive effect on both foreign bank lending and holdings of portfolio assets. Specifically, the *rule of law*, which encapsulates, among other factors, the quality of contract enforcement, property rights, the police, and the courts, is found to positively impact international holdings of ASEAN financial assets.

Although most ASEAN countries have made gradual improvements in governance over the years, there is still scope to further enhance the region's attractiveness to international lenders and investors through institutional reforms. (Table 1.3) Ongoing initiatives to facilitate financial market integration in ASEAN, including plans to harmonise domestic laws and regulations, could play a useful role in this regard.

Table 1.3
Rule of Law, Percentile Ranking, 2017

Country	Percentile Ranking*		
	2000	2007	2017
Indonesia	28.7	29.7	40.9
Malaysia	60.4	63.2	64.9
Philippines	40.6	39.7	37.0
Singapore	86.1	91.4	96.6
Thailand	68.3	51.7	54.8
Cambodia	16.8	12.4	13.5
Lao PDR	20.3	18.2	18.3
Myanmar	4.0	3.8	16.8
Vietnam	41.1	38.3	55.8
China	34.2	35.4	44.7
India	62.4	56.5	52.9
Pakistan	21.8	21.1	24.0
Sri Lanka	56.9	58.4	55.3

Source: World Bank Governance Indicators

* Percentile rank among all countries; ranges from 0 (lowest) to 100 (highest) rank.

1.3 Global Inflation

Global Inflationary Pressures Remain Modest

Inflation around the world has been mostly subdued despite relatively firm global demand and diminishing economic slack. Among the G3 economies, inflation has reached about 2% in US, but still falls short of target in the Eurozone and Japan, where underlying inflationary pressures remain muted. In Asia ex-Japan, headline inflation is picking up, led by global food and energy prices and reinforced in some cases by currency depreciation. Faster-growing economies such as India and the Philippines are also seeing the emergence of broader inflationary pressures. Global headline inflation is projected to rise to 2.2% in 2018 and 2019, from 1.9% in 2017.

G3 inflation is projected to be around 2% amid tightening resource utilisation.

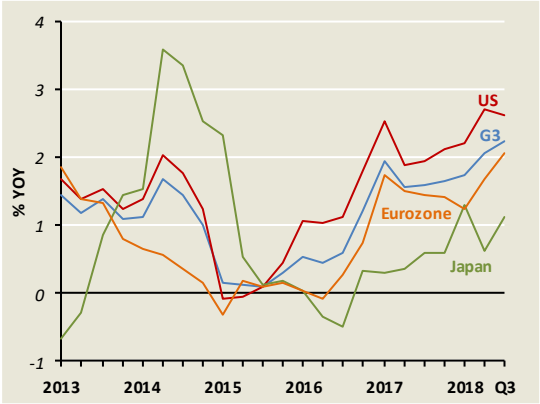
Average CPI inflation in the G3 edged up in Q3 2018, on the back of higher energy prices and sustained improvements in the labour market. (Chart 1.24) In the US, it rose to 2.7% y-o-y in Q2 and eased slightly to 2.6% in Q3. Core inflation in the US also increased to 2.2% in both Q2 and Q3, after registering outturns below 2% for four consecutive quarters from Q2 2017. Given the tight US labour market and the anticipated impact of higher tariffs on import prices, the near-term risks to inflation are on the upside.

In the Eurozone, headline CPI inflation stepped up to 2.1% y-o-y in Q3 2018 from 1.7% in Q2, led by higher energy and unprocessed food prices. However, core inflation remained subdued at 1.0% in the third quarter, unchanged from H1 2018. Nevertheless, core inflation is expected to rise in the latter half of this year and in 2019, amid tightening capacity and labour market constraints.

In Japan, higher energy prices lifted headline CPI inflation to 1.1% y-o-y in Q3 from 0.6% in Q2. While core inflation ticked up marginally to 0.9% y-o-y in Q3, the factors leading to the increase were mostly transitory, with the share of items registering price increases lower than in Q2. Going forward, headline inflation is expected to pick up further, albeit temporarily, largely due to the planned increase in the consumption tax in late 2019.

Overall, G3 inflation is projected to rise to 2.0% this year, before easing to 1.9% in 2019.

Chart 1.24
G3 CPI Inflation



Source: Haver Analytics and EPG, MAS estimates

Inflation in Asia ex-Japan is expected to continue rising with sustained GDP growth.

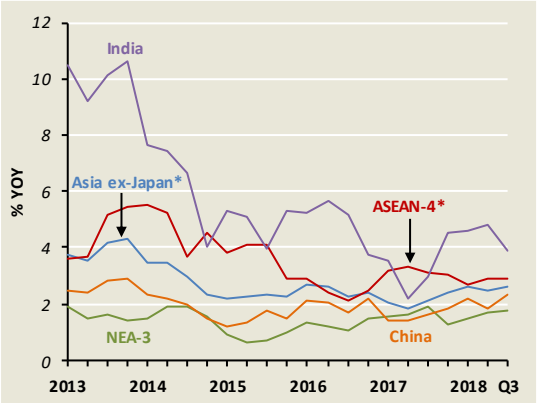
Led by higher food and energy prices, inflation in some Asia ex-Japan economies picked up in Q3 2018, bringing the average rate to around 2.6% y-o-y. (Chart 1.25) Headline inflation in the region is projected to rise to 2.6% in 2018 and 2.9% in 2019 amid sustained growth and tightening labour markets.

In China, CPI inflation rose to 2.3% y-o-y in Q3 2018 from 1.8% in Q2. Weather-related disruptions to vegetable and fruit supply raised food prices, while non-food inflation was boosted by a 20.8% jump in petrol prices. Fuel prices also helped keep PPI inflation elevated at 4.1% y-o-y for a second straight quarter in Q3, up from 3.7% in Q1. Tariffs on US imports could raise consumer and producer prices in the near term. For 2018 as a whole, CPI inflation is expected to come in at 2.1%, before rising to 2.3% next year.

India's CPI inflation eased to 3.9% y-o-y in Q3 from 4.8% in Q2 on the back of decelerating food inflation, caused by supply management measures and a favourable monsoon. This offset higher import prices for oil due in part to a weaker currency, and upward pressure on inflation from firm private consumption. For the rest of the year, inflation is expected to edge up on strong domestic demand and higher agricultural minimum support prices. CPI inflation is projected to come in at 4.7% in FY2018, before rising to 4.9% in FY2019.

CPI inflation in the NEA-3 was firm at 1.7% y-o-y in Q3, supported by higher oil and food prices. Country-specific factors such as higher private housing rentals in Hong Kong also played a role. Rising wage pressures should underpin inflation in the coming quarters, but slower growth in 2019 is likely to relieve inflationary pressures later in the year. Overall, inflation in the NEA-3 is expected to come in at 1.6% in 2018 and 1.9% in 2019, from 1.6% in 2017. Meanwhile, ASEAN-4 inflation averaged 2.9% in Jul–Aug, with higher oil and food prices being the main contributors to price increases. The reintroduction of fuel price subsidies in Indonesia and Malaysia, as well as the zero-rating of the GST in Malaysia, helped to temper price pressures. In the near term, ASEAN-4 inflation is expected to edge up on higher energy prices and the re-imposition of the Sales and Service Tax in Malaysia in September 2018. For 2018 as a whole, inflation is projected to average 3.0%, before rising to 3.3% in 2019.

Chart 1.25
Asia ex-Japan CPI Inflation



Source: Haver Analytics and EPG, MAS estimates
* ASEAN-4 inflation is based on Jul–Aug 2018 data.

Chapter 2

The Singapore Economy

2 The Singapore Economy

Slower But Enduring Growth

Since the last Review, economic uncertainties have increased. Although there has been some détente between the US and several of its trade partners, trade tensions remain at the forefront of considerations for global growth prospects. At the same time, economic and financial vulnerabilities in emerging market economies have increased as global financial conditions tighten, alongside interest rate normalisation and capital outflows from these economies.

Despite the vagaries of the external environment, the Singapore economy continued to expand at a creditable pace. GDP grew by an average of 3.4% y-o-y in Q2 and Q3 2018, slightly lower than the 4.1% growth in the preceding two quarters. Although the trade-related cluster slowed alongside the waning of the IT upturn, activity in the modern services cluster remained firm, supported primarily by the finance & insurance sector.

The trade frictions have had a limited impact on the Singapore economy thus far, but the negative spillovers could become more discernible in the latter part of this year and beyond. These could pose some downside risks to growth in the quarters ahead, together with the coincident maturation of both the global economic and tech cycles. Growth drivers are also likely to shift. The modern services cluster is expected to contribute more to growth in 2019 as digitalisation and innovation continue, benefiting segments such as IT & information and consulting services, as well as the financial sector. Meanwhile, sustained improvement in the labour market should provide some uplift to the domestic-oriented industries, although the uptick will be uneven because of ongoing structural adjustments.

Barring a significant setback in global growth, the Singapore economy is likely to expand at a slower but still firm pace for the rest of this year and in 2019. Accordingly, GDP growth should come in within the upper half of the 2.5–3.5% forecast range in 2018 and moderate slightly in 2019.

2.1 Recent Economic Developments

Resilience Amid Uncertainty

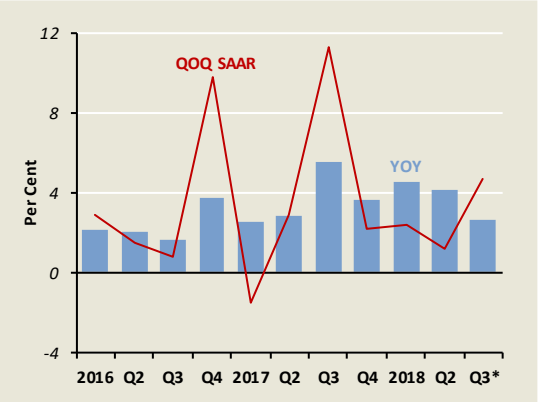
The Singapore economy has continued on a steady expansion path in recent quarters. While the trade-related cluster remained the main pillar of growth, its contribution has waned as reflected in the cooling of IT-related activities after several quarters of above-trend expansions, and in tandem with the global electronics cycle. In comparison, growth in the modern services cluster stayed firm, largely underpinned by robust demand for financial services. Meanwhile, the performance of the domestic-oriented cluster was lacklustre, as the nascent pickup seen earlier was not sustained.

The Singapore economy was resilient in the face of global headwinds.

Notwithstanding global headwinds, the Singapore economy continued to expand at a creditable pace. Compared to a year ago, GDP grew by an average of 3.4% in Q2 and Q3 2018, slightly lower than the 4.1% posted in the preceding two quarters. On a q-o-q SAAR basis, growth in the Singapore economy averaged 3.0% in Q2 and Q3 this year, an increase from the 2.2% recorded in the earlier six months. (Chart 2.1) EPG's Economic Activity Index (EAI) [1] corroborates this firm expansion over the past six months. (Chart 2.2)

Further, the VA weighted share of indicators in the EAI that recorded positive growth was well above 50% over the past two quarters, even as it declined to 60.7% in Jul–Aug 2018, from 64.5% in Q2. (Chart 2.3)

Chart 2.1
Singapore's Real GDP Growth



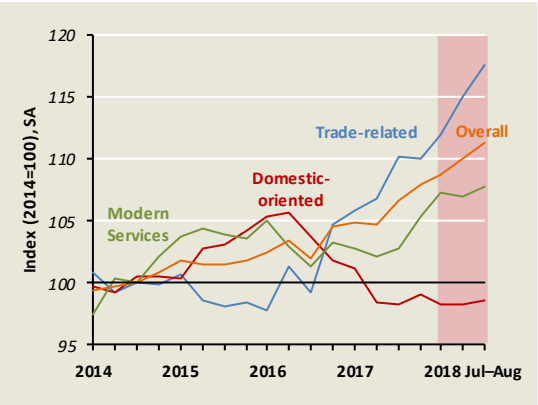
** Advance Estimates.*

The pace of expansion has converged across segments.

A detailed analysis of industries across the domestic economy showed some convergence in growth performance in recent quarters. Notably, the distribution of VA growth displayed a lower degree of skewness and kurtosis in Q2–Q3 2018 compared to Q4 2017 – Q1 2018. (Chart 2.4) Reflecting some growth moderation, the mean and median were also lower in comparison to the preceding two quarters.

This more compressed distribution was primarily due to the narrower range of growth outcomes in the

Chart 2.2
Economic Activity Index



Source: EPG, MAS estimates

[1] The EAI is a composite index that aggregates the performance of a set of coincident high-frequency indicators across the major sectors of the Singapore economy.

trade-related segments. IT-related manufacturing, such as semiconductors and precision modules & components, which grew strongly previously, registered slower outturns in more recent quarters. In contrast, former laggards such as marine & offshore engineering (M&OE) showed signs of recovery. As a result, growth in the trade-related cluster has become more even.

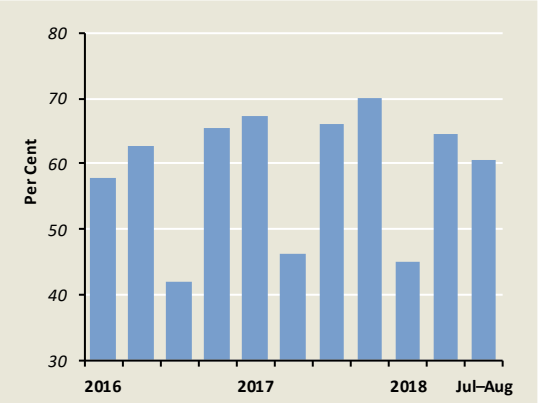
The IT-related expansion has slowed, largely because of the waning global electronics upturn.

While growth in the trade-related cluster has remained robust, the boost provided by the IT-related sectors, such as electronics and precision engineering, has diminished over the past two quarters. (Chart 2.5) This was due to a general slowdown in the global IT industry. Growth in Singapore's electronics industry eased to a modest 4.4% y-o-y in Jul–Aug 2018 from 12.7% y-o-y in the preceding quarter, as the expansion in semiconductor production lost momentum following nine quarters of double-digit growth.

A regression analysis of the determinants of global chip sales suggests that the growth impetuses have shifted over time.[2] (Chart 2.6) In the earlier phase of the cycle, inventory restocking played a prominent role in supporting the cyclical performance of global chip sales, as manufacturers made up for the shortfall amid a surge in demand. However, by Q3 2017, the impulse generated by inventory dynamics had mostly faded, indicating that the market rebalancing was complete. Instead, the strong but stable growth in global chip sales recently has been underpinned by the trend term after accounting for the cyclical dynamics. This could be attributed to structural developments such as the intensification of chip applications in technology products.

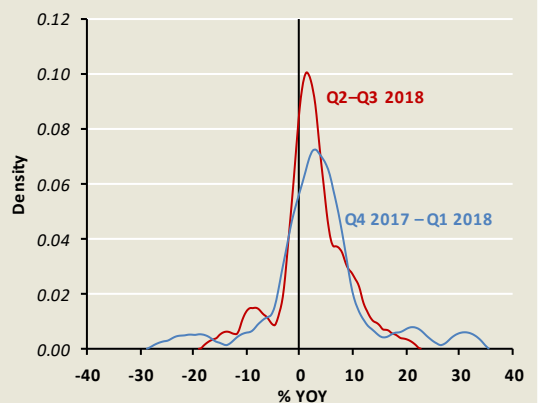
Meanwhile, the transport engineering sector staged a turnaround early this year, after 14 continuous quarters of contraction. In particular, the M&OE segment saw a 14.9% y-o-y growth in Jul–Aug, alongside higher crude oil prices and rising oil rig utilisation.[3]

Chart 2.3
Percentage of Expanding Components in the EAI



Source: EPG, MAS estimates

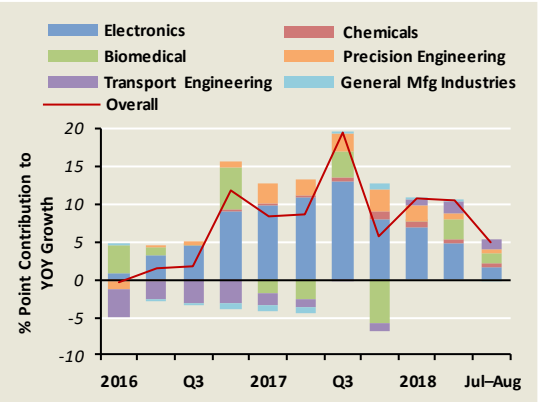
Chart 2.4
Distribution of Industry VA Growth*



Source: EPG, MAS estimates

* Estimated using a kernel smoother.

Chart 2.5
Industrial Production



[2] Global chips sales data were first decomposed into trend and cyclical components using the Friedman variable span smoother. The cyclical component was then regressed on the corresponding components in gross fixed capital formation (G3 and Asia), electronics retail sales (China and US) and the export-weighted electronics inventory-to-shipment ratio (Korea, Taiwan, US). These regressors represent investment demand, consumer demand and inventory adjustment, respectively.

[3] According to IHS Markit, global oil rig utilisation rose to 75.6% in late October 2018, from 70.6% a year ago.

Exports of chemical products (including pharmaceuticals) saw substantial growth, increasing by 16.2% y-o-y in Q3 2018, in line with the robust expansion of chemicals and biomedical production. The still-firm overall growth in industrial production has also benefited trade-related services, such as wholesale trade.

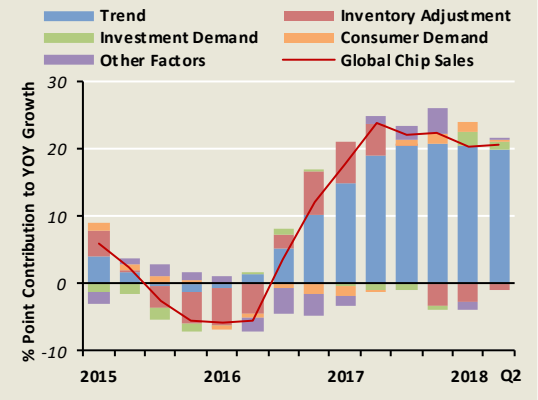
Activity in the modern services cluster remained firm.

Modern services registered robust growth in Q2 and Q3 2018, driven primarily by the finance & insurance sector. Interest rate normalisation in the US and other advanced economies benefited financial intermediation as rising rates led to an improvement in banks' net interest margins, while higher borrowing costs have thus far not dampened loan demand. Indeed, ACU non-bank loans rose by 14.6% y-o-y in Q2 2018 and 10.6% in August 2018, supported by sustained loan demand from East Asia and the Americas. In addition, increased capacity in the insurance segment boosted overall performance of the sector. For example, Swiss Re and Munich Re, which established their Asia Pacific headquarters in Singapore in January 2018, have started to underwrite their regional businesses from here, tapping into the growing demand for insurance products and services in the region.

Growth in the ICT sector continued to be driven by the IT & information services segment, as both public and private sectors ramped up on cybersecurity and digitalisation efforts. In contrast, competitive pressures in the telecommunications space weighed on its performance.

Outcomes within the business services sector were uneven. Emerging activities associated with innovation and the new economy appeared to fare better. In particular, data from the Intellectual Property Office of Singapore pointed to a robust upward trend in applications and registrations for trademarks and patents in recent years, alongside efforts to make Singapore the region's intellectual property hub. Demand for professional services such as architectural & engineering services remained resilient. In contrast, the real estate segment has been sluggish in recent quarters, although the pace of contraction slowed.

Chart 2.6
Decomposition of Global Chip Sales Growth



Source: EPG, MAS estimates

The domestic-oriented cluster continued to record sluggish growth.

The domestic-facing industries did not see a further pickup in growth in Q2 and Q3 2018, despite nascent signs of recovery in earlier quarters. Retail sales volumes (excluding motor vehicles) grew only 0.5% y-o-y in Q2 and 0.2% in Jul–Aug. (Chart 2.7) Although sales of discretionary items, such as clothing and footwear as well as watches and jewellery saw some improvement, sales of basic items such as supermarket necessities had declined. Meanwhile, sales of motor vehicles were sluggish in Q2 and registered a sharp fall of 13.5% y-o-y in Jul–Aug. Likewise, F&B spending was flat in Q2 and slid by 0.2% in Jul–Aug.

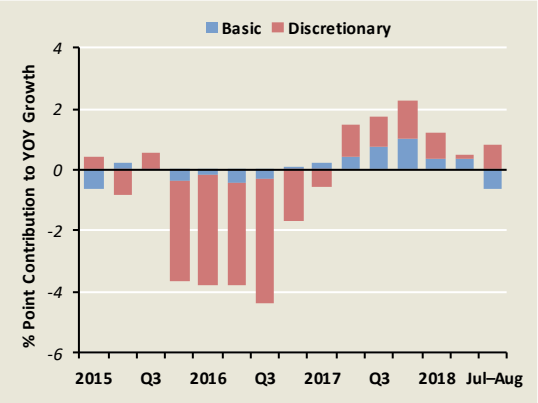
EPG's factor utilisation indicator [4] points to a slight deterioration in utilisation in the retail and F&B segments over the past two quarters, following some signs of a bottoming out. (Chart 2.8) Data from the Singapore Commercial Credit Bureau also showed a sharp jump in the proportion of late payments in the retail segment, from 29.8% in Q2 to 44.1% in Q3.

While the construction sector remained weak, the pace of decline has moderated since 2017. Indeed, nominal certified progress payments (CPP) fell by 1.6% y-o-y in the period Jul–Aug 2018, compared to the 4.9% decline in Q2. CPP for civil engineering and non-residential segments turned positive in Jul–Aug, following general declines since Q4 2016, supported by work on projects such as the North South Corridor and Deep Tunnel Sewerage System. (Chart 2.9) EPG's factor utilisation indicator for the construction sector shows that there is still considerable slack overall.

Tourism-related industries remained buoyant.

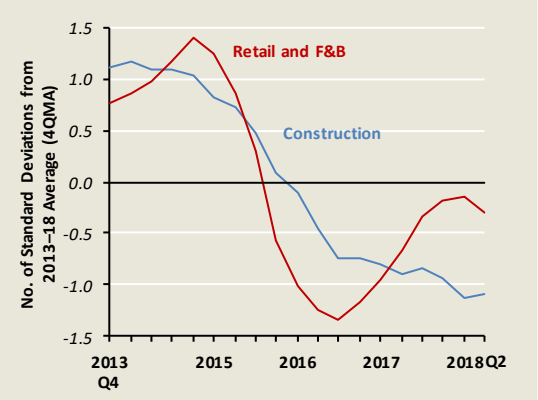
Tourist arrivals grew at a healthy 8.0% y-o-y in Q2 and 6.9% in Jul–Aug 2018, supported by visitors from ASEAN, China and India. Moreover, arrivals from Europe also picked up in Jul–Aug. Revenue per available room between Apr–Aug 2018 was higher compared to the preceding five months due to improving occupancy rates.

Chart 2.7
Growth in Retail Sales Volumes (Excluding Motor Vehicles)



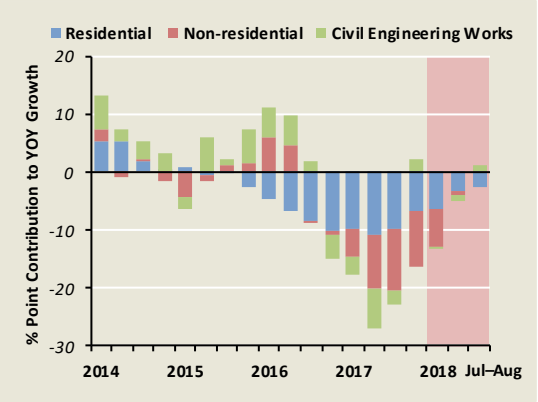
Source: EPG, MAS estimates

Chart 2.8
Factor Utilisation in the Retail, F&B and Construction Sectors



Source: EPG, MAS estimates

Chart 2.9
Certified Construction Payments



[4] The factor utilisation indicator measures the extent of slack in specific sectors. For the retail and F&B services segments, information was aggregated from net employment changes and net firm formation in each segment, and the retail occupancy rate. For the construction sector, net firm formation, employment change and imports of construction machinery were used.

2.2 Economic Outlook

Shifting Growth Drivers

Looking ahead, the coincident maturing of global economic and tech cycles could pose a mild drag on Singapore's growth over the rest of this year and into 2019. Further, trade frictions between some major economies and the resulting uncertainty could weigh more discernibly on economic activity, although some of this could be mitigated by the diversion of trade flows and production to Southeast Asia. Thus, the contribution from the trade-related cluster is expected to moderate in the coming quarters. Meanwhile, strong growth in modern services cluster should continue apace. The sustained improvement in the labour market should also boost domestic-oriented industries, although the uptick will be uneven because of ongoing structural adjustments. All in, Singapore's GDP growth should come in within the upper half of the 2.5–3.5% forecast range in 2018 and moderate slightly in 2019.

The Singapore economy is likely to expand at a slower pace for the rest of this year and in 2019.

The economic outlook has become more uncertain since the last *Review*. In particular, US trade frictions with China have risen in scale and intensity over the past six months. With the imposition of the first round of tariffs in July 2018 by both US and China, some risks have begun to materialise. The impact of these actions on global trade and production, as well as the region's export and GDP growth, is likely to become more evident in the second half of the year, although its direct effects are estimated to be contained. Apart from the global trade tensions, economic and financial vulnerabilities in emerging market economies have risen amid tightening global financial conditions. This has prompted capital outflows from these economies, which could dampen consumer and business sentiment.

On the domestic front, the coincident maturing of both the global economic and tech cycles is projected to pose a mild drag on Singapore's GDP growth in the quarters ahead. Although Singapore's trade data has not shown any discernible effects from the restrictive trade actions implemented thus far, the negative spillovers are expected to impact the Singapore economy in the latter part of this year and beyond. Nevertheless, some of the impact could be mitigated by the diversion of trade flows and production from China to Southeast Asia.

Meanwhile, the modern services cluster is set to contribute more significantly to overall GDP as digitalisation and innovation continue. The sustained improvement in the labour market should also boost domestic-oriented industries, though the uptick will be uneven because of ongoing structural adjustments.

All in, growth in the domestic economy is predicted to come in within the upper half of the 2.5–3.5% forecast range in 2018 and moderate slightly in 2019.

Corporate growth and investments continue apace despite a more subdued outlook.

Notwithstanding external uncertainties, firms remain cautiously optimistic about the business outlook in the second half of the year. The latest Q2 2018 *Business Expectations* surveys by EDB and DOS showed that most of the services firms anticipated improved business prospects in H2 2018, although the manufacturing firms were less optimistic. (Charts 2.10 and 2.11)

At the same time, the quarterly SME business survey, conducted jointly by the Singapore Business Federation and DP Information Group, points to a more subdued outlook for smaller firms. The overall index declined to 51.0 in the Q3 2018 survey, compared to 51.5 in the preceding quarter, with broad-based weakening of profit and turnover outlook across most industries.

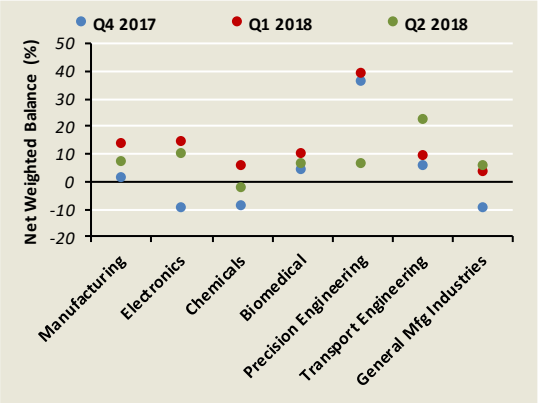
Nevertheless, despite the cautious near-term sentiment, SMEs are generally optimistic about the medium term, and continue to make plans for investments and growth. Nearly all sectors exhibited increased optimism about capital investment, led by the construction & engineering sector where firms appear to have increased their investments in response to productivity and collaboration initiatives introduced by BCA.

More broadly, business expansion has proceeded apace. (Table 2.1) Net firm formation reached 8,310 in H1 2018, up 22% from H2 2017, and was concentrated in information & communication, professional & scientific activities, financial & insurance activities and wholesale trade. At the same time, the number of retrenched workers fell to 5,350 in H1 2018, from 7,080 recorded six months earlier. In addition, growth in DBU loans extended to businesses remained firm, rising by an average of 5.5% y-o-y in H1 2018 from the 7.5% recorded in H2 2017.

Trade frictions have had limited impact on the Singapore economy thus far.

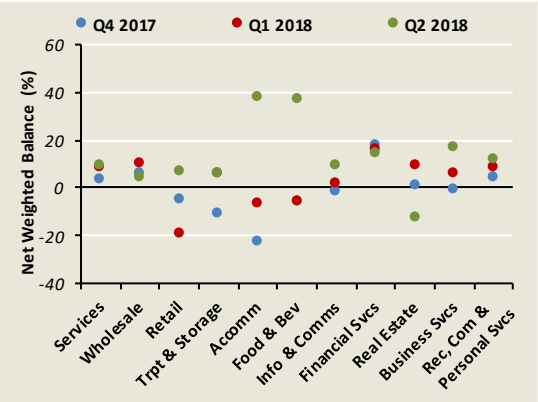
Some of the announced US trade measures on China have taken effect since the last *Review*. (Table 2.2) As noted then, Singapore could be affected by trade

Chart 2.10
Business Expectations for Manufacturing Firms



Note: Readings represent the net weighted balance of firms expecting a more favourable six-month ahead outlook, compared to the preceding six months.

Chart 2.11
Business Expectations for Services Firms



Note: Readings represent the net weighted balance of firms expecting a more favourable six-month ahead outlook, compared to the preceding six months.

Table 2.1
Corporate Indicators

	H1 2017	H2 2017	H1 2018
New Economic Entities **Net Firm Formation**	7,030	6,800	8,310
Business Expansion **DBU Non-bank Business Loans (% YOY)**	7.7	7.5	5.5
Releasing Workers **Total Retrenchments**	7,640	7,080	5,350

Note: Numbers are rounded to the nearest 10.

tensions via the indirect trade channel and confidence channel.[5] Following the implementation of the first round of tariffs in July, there has been no significant deterioration in Singapore's exports to China via the indirect trade channel. Chart 2.12 shows that Singapore's exports of tariff-affected products to China had already been declining before the tariff announcements following the general slowdown in China's economic growth.[6]

In the coming quarters, the impact via the indirect trade channel could become more evident, although the magnitude will differ across industry segments depending on the extent of their linkages with China. On the domestic exports front, the electronics segment could be more affected, as both Singapore and China are key nodes in the global electronics supply chain. About half of the trade value of Chinese electronics exports to the US is subject to higher tariff rates. Meanwhile, trade-related services such as wholesale trade and transportation & storage could also be affected due to the significant role they play in trade intermediation. In fact, Singapore's economic linkages with China appear to be driven more by services. According to estimates derived from OECD's Trade in Value Added tables, about 60% of Singapore's VA attributed to Chinese export activity originated from the services sector. (Details of Singapore's linkages with the region can be found in Special Feature A: "Shifts In Asia's Demand And Production Structure: A Value-Added Approach.")

As firms begin to reconfigure their supply chains and relocate their production facilities, the net impact of the trade frictions hinges on the degree of trade and production diversion. Indeed, there is evidence of diversion of export orders and relocation of production facilities to Southeast Asia. According to a recent survey jointly published by AmCham China and AmCham Shanghai, about one-third of 430 American companies in China have either moved or are considering moving production abroad amid the trade tensions. Among potential production sites abroad, Southeast Asia, especially Vietnam, has emerged as their top destination of choice. (Chart 2.13) The relocation of production to Southeast Asia, if sustained, could yield some positive spillovers to Singapore at the margin. In particular, trade-related services such as wholesale trade and

Table 2.2
US-China Tariffs

	Trade Value (US$ Billion)	Rate (%)	Implementation Date
US Tariffs on China	34	25	6 Jul
	16	25	23 Aug
	200	10	24 Sep
China Tariffs on US	34	25	6 Jul
	16	25	23 Aug
	60	5 to 10	24 Sep

Chart 2.12
Singapore's Exports to China

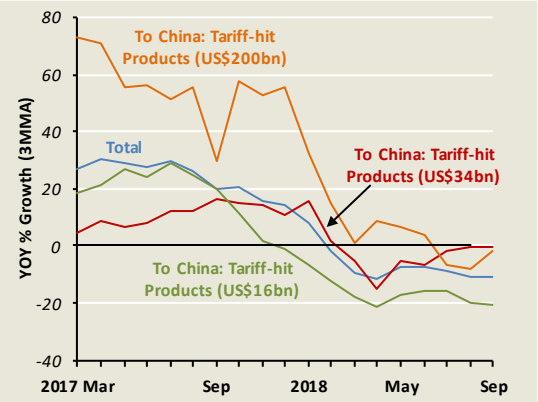
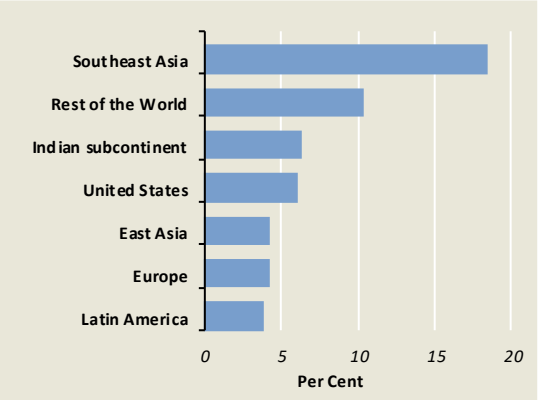


Chart 2.13
US Firms in China by Choice of Production Site Abroad



Source: American Chamber of Commerce in China and American Chamber of Commerce in Shanghai

[5] The imposition of Chinese tariffs on US imports has a smaller indirect spillover on Singapore. Hence, the focus will be on the impact from US tariffs on Chinese imports.

[6] This refers to broad product categories that are subject to higher tariffs for China's exports to the US.

transportation & storage could benefit due to Singapore's hub status.

Despite the maturing of the global tech cycle, structural trends continue to bolster growth in the electronics industry.

In the last *Review*, EPG noted a tapering in demand for final electronic products alongside the maturing of the global tech cycle. Since then, end-demand conditions have softened further. For example, the latest *Empire State Manufacturing Survey Diffusion Indices* trended down further, as US firms are more hesitant about capital expenditure and tech-related spending. (Chart 2.14) Likewise, global smartphone sales rose by only 2.1% y-o-y in Q2 2018, compared to an average growth of 3.8% in the preceding eight quarters. (Chart 2.15)

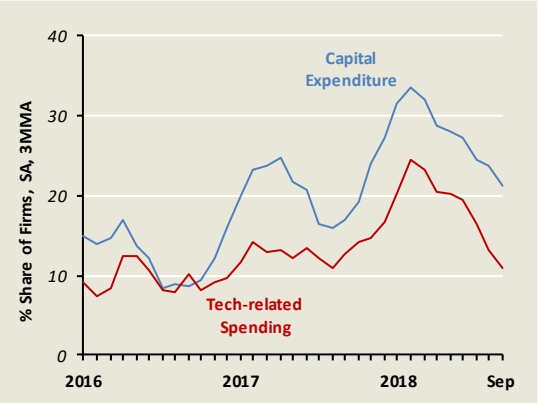
While final demand has weakened, the upstream semiconductor segment remained firm. Global chip sales expanded at a double-digit pace in Jul–Aug, after a 20.5% y-o-y gain in Q2 2018. Analysts expect global chip sales to register robust growth of 11.8–16.3% in 2018, although this would still be a step-down from the 22% surge in 2017. (Table 2.3)

The resilience in global semiconductor demand has been underpinned by two main structural factors. First, due to greater adoption of internet-based services and cloud computing, there has been rising demand for servers and data centres in recent years. Indeed, server sales have been expanding at double-digits since mid-2017, in contrast to the single-digit rate for smartphones over the same period. Going forward, these developments will buttress semiconductor sales.

Second, semiconductor content per device has been trending up, and is projected to increase further due to higher memory requirements from the adoption of 5G, higher resolution images and videos, advanced user authentication, as well as the proliferation of augmented reality applications.

Looking ahead, these two factors will help support the global semiconductor industry, as well as the domestic semiconductor segment which accounts for a significant proportion of Singapore's manufacturing output.

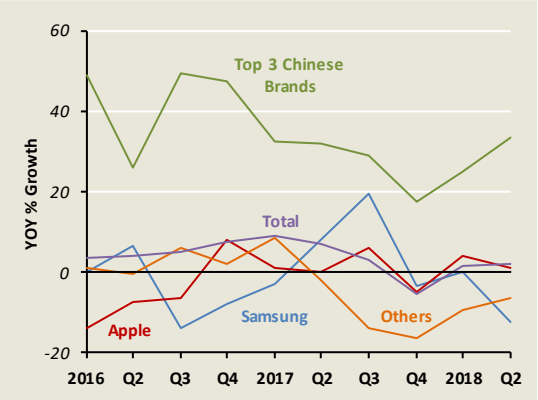
Chart 2.14
Empire State Diffusion Index



Source: Federal Reserve Bank of New York

Note: The index captures the net proportion of firms expecting to increase company expenditure six months ahead.

Chart 2.15
Global Smartphone Sales



Source: Gartner

Table 2.3
Forecasts for Global Semiconductor Revenue Growth

Analyst	2018F (%)
Gartner	11.8
WSTS	15.7
IC Insights	14.0
Semiconductor Intelligence	16.0
Cowan LRA	16.3

Modern services will still be anchored by digitalisation.

The 'digital divide' in modern services, as highlighted in the previous *Review*, will continue to characterise the cluster's growth prospects. The strong growth momentum of digital-related activities, comprising IT & information and consulting services, as well as the financial sector, is expected to be sustained. In comparison, structural headwinds will persist in segments such as telecommunications, media and publishing amid increasing competition, technological disruption and changing preferences in media consumption.

In the financial sector, digital payments have been rapidly expanding in recent years. Partly reflecting this shift, the use of cheques has declined as more convenient digital payment platforms have gained currency. Based on data from the BIS, the value of cheque transactions in Singapore fell by an average of 1.7% per annum, from $694 billion in 2012 to $636 billion in 2016. Over the same period, the value of cashless transactions grew by 7.2% per annum, from $362 billion to $514 billion.[7] However, Singapore's card payments relative to GDP in 2016, at 20.8%, was lower than that of Hong Kong (34.3%), the UK (45.5%) and the US (31.7%).[8] Further expansions by established payment players as well as more entrants in the burgeoning e-payments space could provide a fillip to growth in Singapore's financial services and ICT sector.

Nevertheless, the financial sector could be weighed down by some cyclical headwinds. Already in 2018, global financial jitters have caused a rout in emerging market assets—the *MSCI Emerging Market Index* declined by more than 10% over Jan–Sep 2018. Consequently, the strong performance of Singapore's fund management segment in 2017 is unlikely to be repeated in 2018, while other sentiment-sensitive segments such as securities dealing and forex trading could also be affected.

7 BIS Committee on Payments and Market Infrastructures (2017), "Statistics on payment, clearing and settlement systems in the CPMI countries—Figures for 2016", *CPMI Papers*, No. 172. Cashless transactions were taken as the sum of credit transfers, direct debits, card payments and e-money payment transactions.

8 Bech, M, Faruqui, U, Ougaard, F, Picillo, C (2018), "Payments are a-changin' but cash still rules", *BIS Quarterly Review*, March.

The domestic-oriented cluster should see incremental gains in the near term.

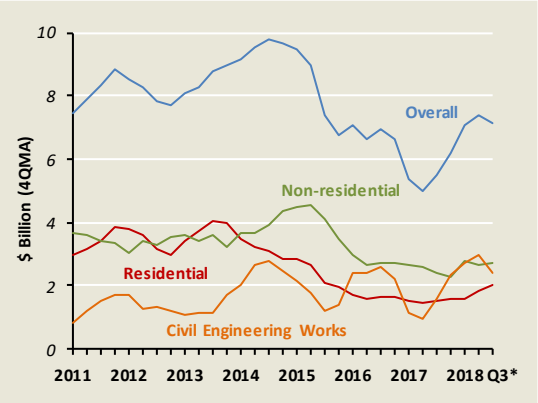
In the domestic-oriented cluster, the weakness in the construction sector should gradually dissipate. Contracts awarded, a leading indicator of construction activity, has been registering some recovery since H2 2017. (Chart 2.16) While the majority of these contracts have been awarded to civil engineering and non-residential projects, the residential segment could pick up towards end-2018, as work commences on new residential developments following the recent spate of en-bloc private property sales.

Some domestic-facing industries such as F&B and retail trade services are also expected to benefit from improvements in the labour market. However, gains in food services industries could be capped by domestic constraints. A supply-side decomposition of the F&B sector VA suggests that the weakness in the sector has been due to low productivity growth. While labour productivity has traditionally tracked VA growth closely, the two series have diverged in recent years. Since 2013, employment growth has averaged 4.0% y-o-y but real VA growth averaged only 2.0%, implying an average productivity decline of 1.9% per annum.

Despite the currently subdued sector outlook, the number of F&B outlets has continued to rise in recent years. This was due in part to the compositional shift in tenant mix in retail malls to arrest declining footfall from e-commerce competition. (Chart 2.17) The proportion of F&B space in total retail space has increased from 27% to 30% between 2012–17, relatively higher than in a comparable market such as Hong Kong (23%).

At the aggregate level, demand has not kept pace with incoming supply, resulting in a compression of profit margins for F&B operators. The availability of close substitutes has increased consumers' price sensitivity and induced F&B operators to offer price discounts and other promotions. In addition, demand patterns have also changed, in light of the cautious economic sentiment in recent years. Consumer preferences have moved towards more budget-friendly establishments, such as fast food restaurants, hawker centres and coffee shops, which tend to have lower VA. Cross-country comparisons also suggest that Singapore is already on par with, or slightly higher than, other developed economies in terms of the share of household expenditure allocated to food services. (Chart 2.18)

Chart 2.16
Construction Contracts Awarded



* Estimated based on Jul–Aug 2018 data.

Chart 2.17
Net Firm Formation for F&B Services

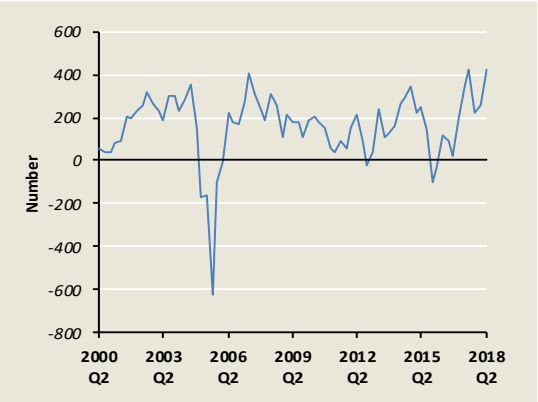
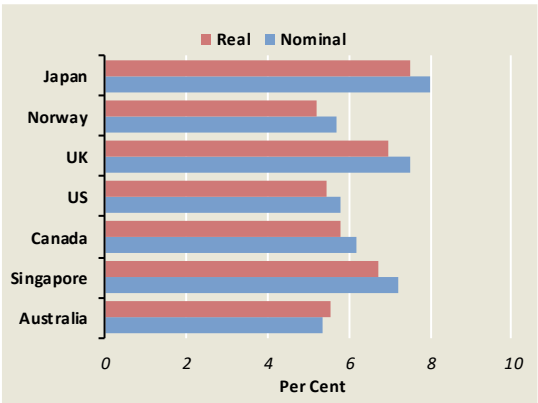


Chart 2.18
Share of Household Consumption Expenditure on Food Services



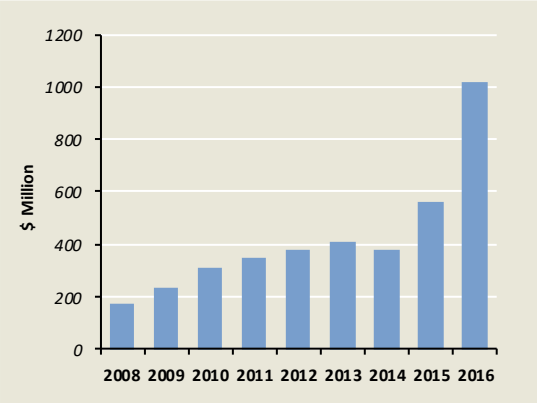
Source: OECD

Note: Data for Canada, Singapore and UK are for 2017, while the rest of the countries are for 2016.

Faced with limitations on the size of domestic demand and manpower constraints, more Singapore-based firms have looked overseas to expand their F&B operations. Singapore firms' direct investment in food services abroad more than doubled between 2014 and 2016, from $375 million to $1 billion. (Chart 2.19) Firms have also leveraged on their networks to establish joint ventures and strategic alliances in complementary business segments and markets.

Alongside the rollout of the F&B Services Industry Transformation Map, companies are also investing in new technologies, process redesign and skills training to raise productivity. As of end-2017, more than one-third of food outlets in Singapore have adopted at least one technology solution to improve productivity.

Chart 2.19
Singapore's Direct Investment in Food Services Abroad



Chapter 3

Labour Market and Inflation

3 Labour Market and Inflation

Modest But Continuing Inflationary Pressures

MAS Core Inflation rose to 1.9% y-o-y in Q3 2018, from an average of 1.5% in the first half of the year. This was mainly driven by the surge in global oil prices in Q2 which filtered through to domestic oil-related components of inflation with a lag. There was also a pickup in food and retail inflation over this period.

Overall employment expanded in H1 2018 at a similar pace to H2 last year, on account of sustained employment gains in the modern services cluster and moderating job losses in construction. While the resident unemployment rate edged up by 0.1% point in Q2 from the previous quarter, this was due to a cyclical uptick in labour supply amid a pickup in hiring intentions of employers. A broad range of indicators suggest that labour demand has strengthened further, especially in modern services, and that the slack in the labour market, at the macro level, has been absorbed. With continued improvement in employment outturns, wage growth is expected to strengthen from last year, providing an impetus to domestic price pressures towards the end of this year and into the next.

The trajectory of y-o-y MAS Core Inflation in the coming quarters will be significantly influenced by three main categories in the CPI basket: oil-related, water and public road transport. Oil-driven price increases will continue to exert a substantial impact on inflation, keeping the core rate at around 2% for the rest of this year. While their impact will lessen in H1 2019 given the anticipated stabilisation of global oil prices and the liberalisation of the domestic retail electricity market, bus and train fares are expected to rise, and core inflation will be sustained at close to 2%. In H2 next year, the dissipation of the effects of oil price increases as well as the water price hikes implemented in July 2017 and 2018 will likely lower core inflation. Overall, core inflation is projected to rise from 1.5% in 2017 to come in within the range of 1.5–2% in 2018, and 1.5–2.5% in 2019.

Meanwhile, CPI-All Items inflation is forecast to be about 0.5% in 2018, slightly lower than in 2017, as the rise in core inflation and the more gradual decline in accommodation costs are likely to be outweighed by the fall in private road transport inflation. In 2019, headline inflation is expected to pick up to 1–2%, with the non-core components accounting for the bulk of the increase.

3.1 Labour Market

Continued Improvement In The Labour Market

Overall employment increased by about 10,000 in H1 2018, following a similar expansion in H2 last year. This reflected continued employment gains in the modern services cluster, alongside a reduction in job losses in construction. The resident unemployment rate edged up by 0.1% point in Q2 from Q1, as more job-seekers entered the labour force amid the improvement in the labour market. Several forward-looking indicators, such as job vacancies and hiring outlook surveys suggest that labour demand will increase further, especially in modern services. As slack in the labour market has effectively been absorbed at the aggregate level, wage growth is expected to strengthen from last year.

Total employment continued to expand in the first half of 2018.

Overall employment expanded by 10,100 in H1 2018, following the 10,400 increase in H2 2017. (Chart 3.1) This was driven by the modern services cluster, with strong job gains in financial & insurance, ICT and professional services. The trade-related cluster also grew slightly, notwithstanding the continued shedding of jobs in the transport equipment and electronics manufacturing industries. Meanwhile, hiring in the wholesale trade segment rose further, while that in the transportation & storage industry also increased strongly, driven by firmer demand for land transport.

In comparison, the domestic-oriented cluster recorded a small decline in employment. The construction industry continued to reduce headcount, albeit at a slower pace, while the headcount reductions in retail trade and F&B services were in excess of seasonal losses and accelerated in Q2. Competitive pressures could be causing firms in these industries to consolidate in order to restore profitability. However, hiring in the community, social & personal services (CSP) sector remained firm, with strong job gains in the health & social services industry.

Chart 3.1
Employment Change by Cluster[1]

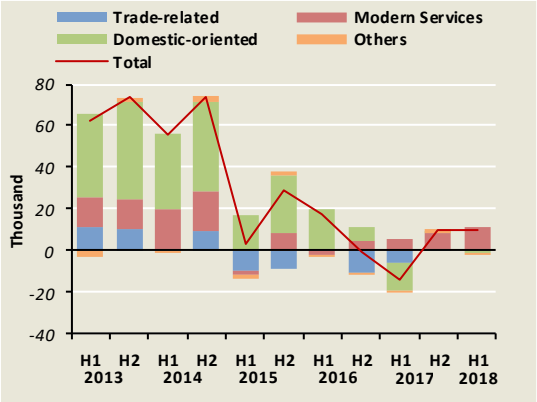
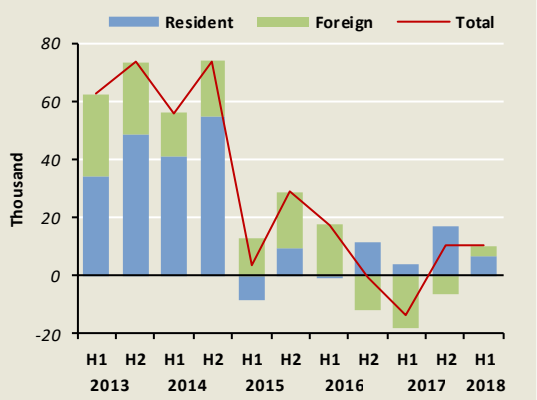


Chart 3.2
Resident and Foreign Employment Change



[1] The modern services cluster comprises ICT, financial & insurance, real estate services and professional services. The trade-related cluster consists of manufacturing, wholesale trade and transportation & storage industries. The domestic-oriented cluster contains retail trade, F&B, administrative & support services, CSP (excluding arts, entertainment & recreation), construction and utilities & others. 'Others' is made up of accommodation as well as arts, entertainment & recreation industries.

Resident employment expanded by 6,500 in H1 2018, despite the drag from domestic-oriented services which hire a larger proportion of locals. (Chart 3.2) The increase was largely due to gains in the modern services cluster. Meanwhile, foreign employment reversed several quarters of decline to grow by 3,600, mainly on account of a slower pace of job losses in the construction industry. The hiring of Employment Pass (EP) holders fell as the EP qualifying salary was raised in January 2017, while the number of S Pass Holders continued to increase from H2 2017.

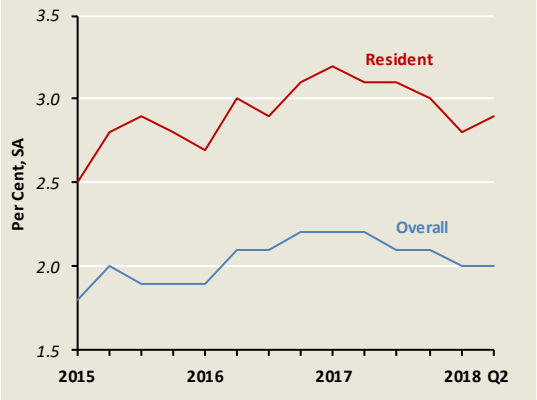
The labour market continued its cyclical recovery, as stronger hiring prospects encouraged more entrants to the labour market.

The seasonally adjusted resident unemployment rate rose sequentially by 0.1% point in Q2 to 2.9%, following the 0.2% point decline in Q1. (Chart 3.3) This occurred as more job-seekers entered the labour force amid an improvement in hiring prospects. Notably, recruitment rates have trended up from a year ago, with almost all industries experiencing improvements. The increase in the resident unemployment rate in Q2 was, therefore, mainly due to a supply-side boost rather than weakness in labour demand.

Retrenchments continued to fall sequentially across the trade-related, modern services and domestic-oriented clusters in H1 2018. (Chart 3.4) The top reason cited for retrenchment across industries continued to be 'reorganisation/restructuring', which relates to firm-specific factors, while layoffs due to 'recession/downturn in industry' declined further. The cyclical recovery also caused the re-entry rate among retrenched residents to rise by 3% points to 64% in Q2, with broad-based improvements across occupation, education and age group, except those below 30 years of age. (Chart 3.5) Further, there is evidence of intensifying labour utilisation, with average weekly paid hours worked per employee ticking up, despite the long-term trend towards shorter working hours.

The number of job vacancies (SA) has trended up since Q2 2017, hitting a three-year high in Q2 2018. As the increase in unemployed persons was relatively smaller, the ratio of job vacancies to unemployed persons rose

Chart 3.3
Unemployment Rates



Note: Figure refers to data at the last month of each quarter.

Chart 3.4
Retrenchments by Cluster

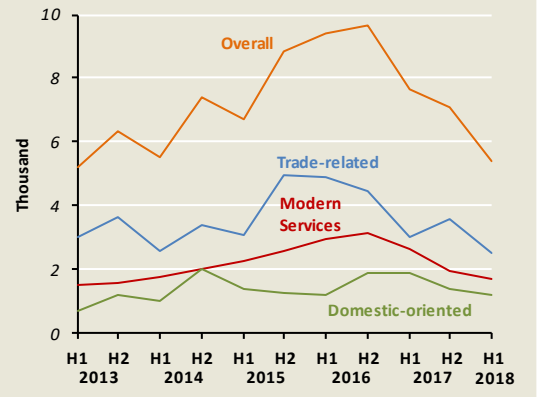
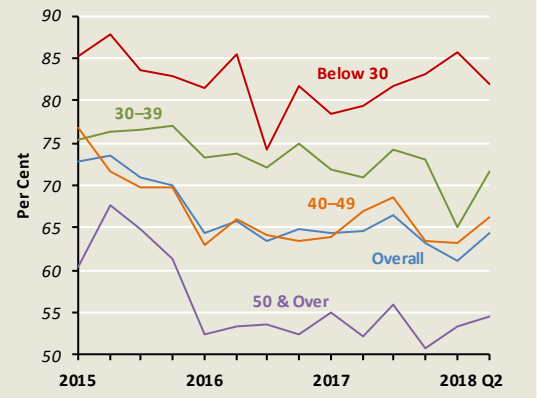


Chart 3.5
Resident Rates of Re-entry by Age



to 1.08, extending the steady improvement since the trough of 0.77 in Q4 2016. (Chart 3.6) Overall, EPG's Labour Market Pressure Indicator—a summary statistic which captures the extent of labour market tightness using 31 indicators—remained close to zero for a second consecutive quarter, suggesting that labour market slack, at the aggregate level, has been absorbed. (Chart 3.7)

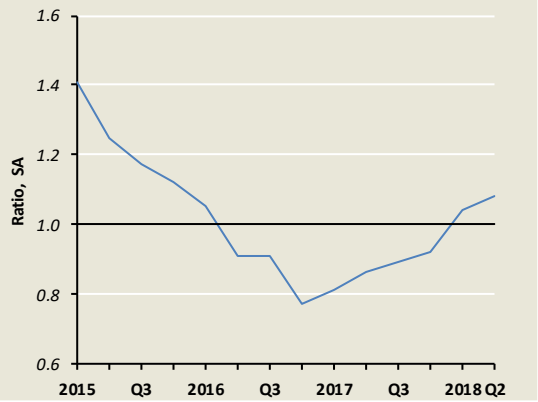
There are some mismatches in the labour market that may take time to resolve.

Nonetheless, there remains a pool of residents who are unable to secure employment within half a year, as evidenced by the resident long-term unemployment rate (non-seasonally adjusted) edging up from 0.7% in Q1 2018 to 0.9% in Q2. (Chart 3.8) The long-term unemployment rates for older residents remain elevated.

Some degree of mismatch is expected as the economy continues to restructure. A closer look at unemployed residents by their previous occupations shows that the increase in recent years was concentrated among professionals and managers & administrators, who might have found it more difficult to make career transitions. (Chart 3.9) According to MOM's *Job Vacancies 2017* report, the predominant reason for not being able to find local hires for PMET positions was the candidates' lack of relevant work experience (cited by more than 60% of employers of managers & administrators as well as professionals). Meanwhile, lack of specialised skills was a much less commonly cited factor (12.3% for managers & administrators and 29.1% for professionals).

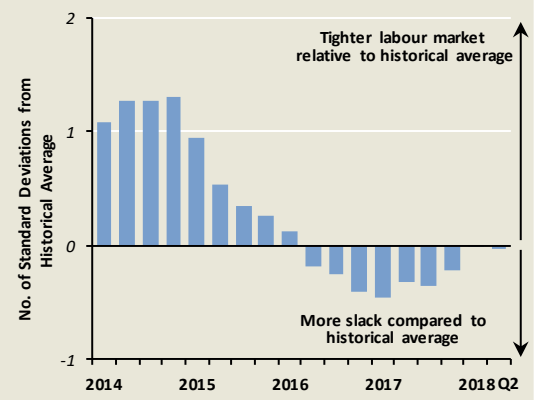
Nevertheless, the recent pickup in vacancies could reduce unemployment, with jobseekers also aided by a wide range of support under MOM's Adapt and Grow initiative. In particular, the Professional Conversion Programmes and Career Support Programme provide training and wage support to help bridge skills and reduce mismatches in wage expectations.

Chart 3.6
Ratio of Vacancies to Unemployed Persons



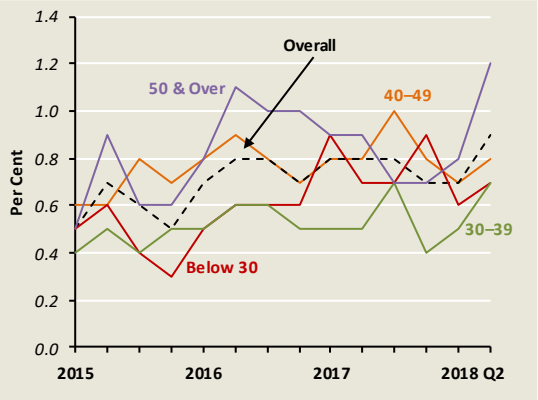
Note: Figure refers to data at the last month of each quarter.

Chart 3.7
Labour Market Pressure Indicator



Source: EPG, MAS estimates

Chart 3.8
Resident Long-term Unemployment Rates by Age



Note: Figure refers to data at the last month of each quarter.

The hiring outlook is robust for the modern services and trade-related clusters, but has become more cautious for consumer-facing sectors.

The rise in vacancy rates, especially in the modern services and trade-related clusters, bodes well for jobseekers. The overall vacancy rate (non-seasonally adjusted) rose by 0.3% point in H1 2018 to 2.7% compared to a year ago, with the PMET vacancy rate rising by 0.3% point over the same period. (Chart 3.10)

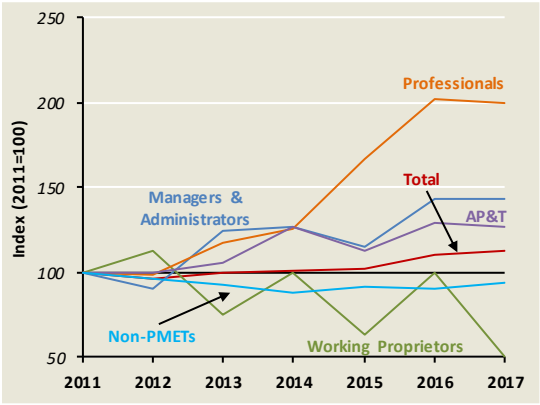
Within modern services, strong gains were recorded in professional, ICT and financial & insurance services. The vacancy rate in the ICT sector in Q1 was at its highest level since Q3 2000 amid the dotcom boom. Despite concerns over global trade tensions, activity and thus labour demand in the trade-related cluster remained positive, with vacancy rates rising in manufacturing, wholesale trade and transportation & storage. Meanwhile, the vacancy rate in the accommodation industry also surged to a historical peak in Q2 on the back of strong tourist arrivals, as well as higher hotel occupancy and room rates.

The strong hiring outlook was corroborated by ManpowerGroup's Q3 2018 *Employment Outlook Survey*, which reported that the seasonally adjusted net employment outlook for the whole economy was +12%, up from +4% a year ago. In particular, the finance, insurance & real estate industry posted a reading of +26% compared to +3% last year.

In the domestic-oriented cluster, hiring intentions have become more conservative in retail and F&B services, as a result of weaker sales outturns. (See Chapter 2.1 for more details) At the same time, hiring prospects in the health and social services sector remain firm, while the construction sector should also continue to see a gradual recovery in line with output growth, as work commences on private residential construction projects following earlier en-bloc sales.

Notwithstanding firms' hiring intentions, the resident unemployment rate may be relatively sticky because of the increase in number of entrants to the labour force. This may be exacerbated by weaker-than-usual H2 job creation in the F&B and retail trade industries.

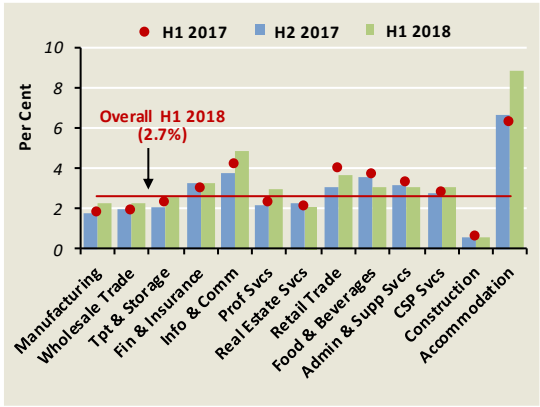
Chart 3.9
Unemployed Residents by Previous Occupation



Source: EPG, MAS estimates

Note: 'AP&T' refers to associate professionals and technicians. 2011–14 data is based on Singapore Standard Occupational Classification (SSOC) 2010 definitions, and 2015–17 data is based on SSOC 2015.

Chart 3.10
Vacancy Rates by Industry



Note: Figure refers to data at the last month of each quarter.

Wage growth should remain firm.

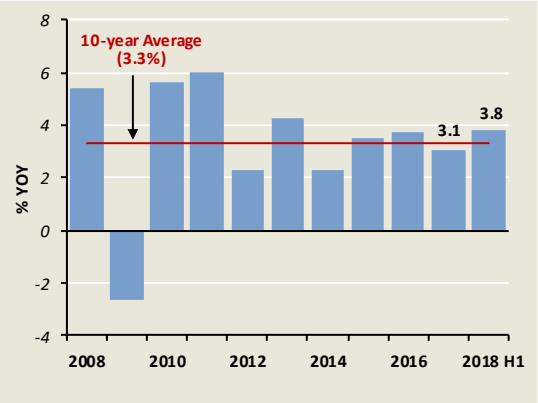
Resident wages, based on average monthly earnings, exhibited firm and broad-based growth averaging 3.8% y-o-y in H1 2018, compared to 3.1% in 2017. (Chart 3.11) The improvement in overall labour market conditions is likely to support higher wage growth in 2018 and 2019 compared to last year.

In recent years, wage growth has been slightly lower than predicted by empirical relationships, including the Phillips curve. In a counterfactual analysis where the age composition of employed residents was held fixed at 2013 levels, the projected four-year (2013–17) compound annual growth rate of resident wages was higher by 0.3% point.[2] Thus, realised wage growth could reflect, in part, the increase in the proportion of the resident labour force aged 60 years and above, from 11% in 2013 to 14% in 2017, as the distribution of wages across age groups follows an inverted U-shape, peaking at 40–44 years. [3] Looking ahead, this demographic compositional effect is likely to persist.

Labour productivity growth will moderate from its cyclical high.

Meanwhile, labour productivity growth remained high in H1 2018 at 3.9% y-o-y, largely due to the manufacturing sector, particularly electronics and finance & insurance. (Chart 3.12) Going forward, productivity growth should ease from its cyclical high as growth in electronics manufacturing tapers off. As a result of moderating productivity and firming wage growth, overall ULC is expected to rise in 2018 and 2019, reversing the decline in 2017.

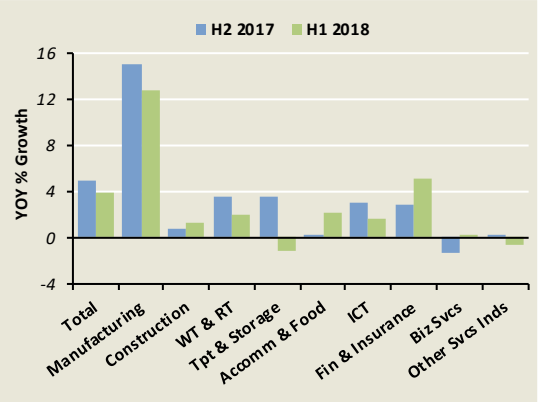
Chart 3.11
Resident Wage Growth



Source: EPG, MAS estimates

Note: Based on average monthly earnings.

Chart 3.12
Productivity Growth by Sector



Source: EPG, MAS estimates

Note: Other Services Industries (labelled 'Other Svcs Inds') corresponds approximately to Community, Social & Personal Services. 'WT & RT' refers to the wholesale trade & retail trade sector.

[2] This counterfactual was based on gross monthly income from work, excluding employer CPF contributions, from the MOM *Labour Force in Singapore Employment Tables*.

[3] This analysis is not able to strip out the effects of changing education levels and occupational distribution across the different cohorts. For example, the more educated younger cohorts tend to command higher wages now than in the past.

3.2 Consumer Price Developments

Core Inflation Firms

MAS Core Inflation and CPI-All Items inflation rose to 1.9% y-o-y and 0.7% y-o-y in Q3 2018, respectively, from 1.5% and 0.3% in the first half of the year. This was largely due to a surge in global oil prices in Q2, which filtered through to domestic oil-related components of the CPI with a lag. Imported inflation is likely to continue picking up, while domestic price pressures should have a more discernible impact on core inflation towards the end of this year and into 2019. At the same time, the trajectory of core inflation will be partly influenced by several administrative price measures. In 2018, MAS Core Inflation is expected to come in at 1.5–2%, while CPI-All Items inflation should average around 0.5%. In 2019, core and headline inflation are projected to be in the ranges of 1.5–2.5% and 1–2%, respectively.

Inflation has picked up in recent months, largely due to higher oil prices.

MAS Core Inflation was broadly stable in the first half of 2018, averaging 1.5% y-o-y, but subsequently rose to 1.9% in Q3 as higher oil prices in Q2 passed through to electricity and gas tariffs. There was also a pickup in food and retail inflation over this period. Meanwhile, CPI-All Items inflation rose from 0.3% y-o-y in H1 to 0.7% in Q3, due to the rise in core inflation as well as a slower fall in accommodation costs. (Charts 3.13 and 3.14)

External sources of inflation have picked up.

There are signs of a pickup in external sources of inflation. Singapore's overall Import Price Index (IPI) rose by a steeper 9.6% y-o-y in Jul–Aug, up from 5.7% in Q2, and 0.4% in Q1. This was largely on account of higher inflation for mineral fuel imports as global oil prices shot up in Q2. Abstracting from this, non-oil IPI reversed three consecutive quarters of y-o-y decline to increase by 0.4% in Jul–Aug. Import prices of manufactured goods picked up more strongly, although the impact on the increase in IPI was mainly due to a smaller contraction in the import prices of machinery & transportation equipment. The decline in the IPI for food & live animals also eased from 2.3% in Q2 to 0.2% in Jul–Aug. (Chart 3.15)

Oil prices came in substantially higher than previously envisaged, but are expected to be relatively stable in 2019.

Since the previous *Review*, the Brent oil benchmark had climbed steadily to touch US$80 in mid-May, reflecting a confluence of tightening oil inventory balances, strong global economic growth and heightened geopolitical

Chart 3.13
CPI-All Items and MAS Core Inflation

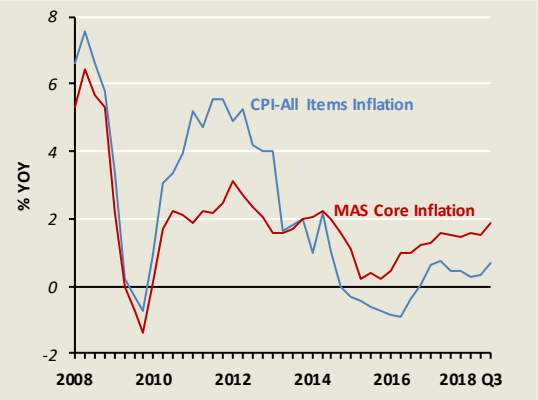
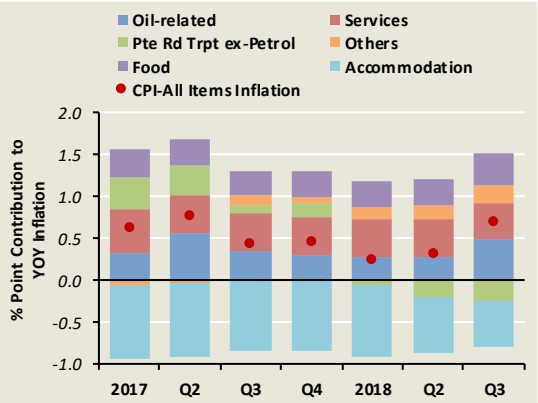


Chart 3.14
Contribution to CPI-All Items Inflation



Source: EPG, MAS estimates

risks. Oil prices subsequently eased to average US$74 in Q2 2018, as production expanded in several key oil-producing countries while intensifying trade frictions weighed on the outlook for global demand. However, oil prices have since picked up to above US$80 in early October on supply-side concerns, notably, the risk of disruption to global oil supplies amid the uncertainty surrounding the impact of US sanctions on Iranian crude oil exports. Against this backdrop, oil prices are expected to average US$75 in 2018, significantly higher than the US$66 projection in the April 2018 *Review*.

In the near term, risks to oil prices are broadly balanced. Tight global inventory balances and thinner OPEC spare capacity mean further supply outages could drive up prices. (Chart 3.16) However, ongoing trade frictions and instability in emerging market economies could dampen global economic activity and have the opposite effect on demand and prices. [4] Looking further ahead, international energy monitoring agencies have maintained their projections of a modest accumulation in global oil inventories in 2019, given firm supply growth as upstream production capacity from earlier investments comes on-stream. In 2019, oil prices are projected to average around US$78.

Energy-related CPI components will continue to add to inflation for the rest of 2018 and in early 2019.

The bulk of the pass-through of higher oil prices to energy-related CPI components, such as electricity, gas and petrol, would have occurred in Q3 2018. (Chart 3.17) As global crude prices have remained elevated in recent months, oil-related items should keep core inflation at around 2% in Q4 2018. The contribution of oil-related items to inflation is anticipated to fall in 2019 as crude prices stabilise, while the progressive roll-out of the Open Electricity Market from November 2018 should also reduce electricity prices for households.

Food import prices could rise mildly and pass through to domestic non-cooked food prices.

Global food commodity prices edged down in recent months on the back of ample supply conditions in key food markets. (Chart 3.18) While supply conditions remain largely favourable, concerns have

Chart 3.15
Selected Components of Import Price Inflation

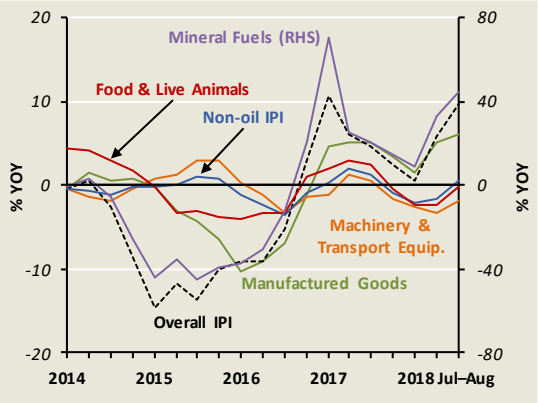
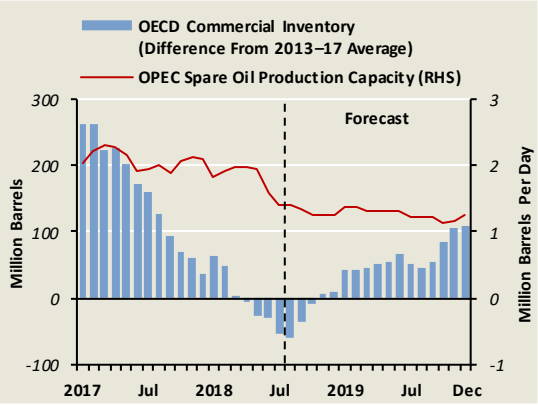
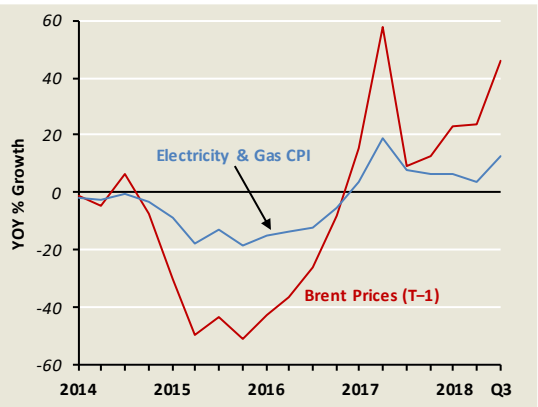


Chart 3.16
OECD Commercial Inventory and OPEC Spare Capacity



Source: US Energy Information Administration

Chart 3.17
Brent Crude Prices and Electricity & Gas CPI



Source: EPG, MAS estimates

[4] According to the World Bank's June 2018 *Global Economic Prospects*, the seven largest emerging market economies (EM7) accounted for 67% of the increase in energy consumption between 1996 and 2016. EM7 includes Brazil, China, India, Indonesia, Mexico, the Russian Federation and Turkey.

emerged regarding production prospects in some of Singapore's key food import sources.

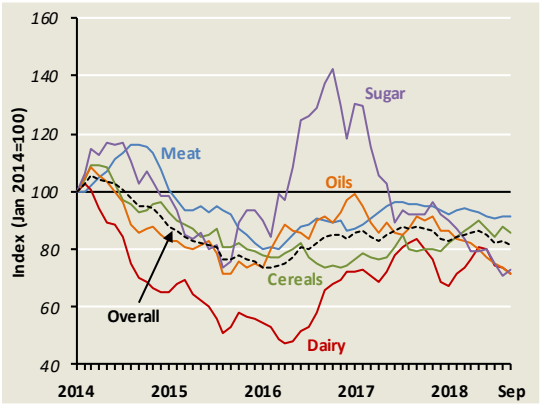
For instance, further intensification of the drought in Australia could place upward pressure on dairy import prices as Australia is Singapore's second largest import source for these products. The IPI for rice has also shown double-digit y-o-y growth since Q1 2018, surging to 41% in August as production in major import source countries was affected by unfavourable weather earlier this year.[5] While world production of paddy is expected to be higher this year, international rice prices are also forecast to increase amid greater consumption. Indeed, pressures on import prices have already begun to pass through to domestic rice prices, which increased by 3.6% y-o-y in Q3, compared to the declines recorded in H1 2018 and in 2017.

Going forward, global food prices are projected to increase mildly in 2019 on the back of improved demand, barring a significant slowdown in the emerging economies.[6] Meanwhile, weather agencies have raised the probability of El Niño conditions developing between late 2018 and early 2019, increasing the upside risk to food prices.[7] On the whole, there are signs that food import prices are picking up across a range of items and these should pass through gradually to food inflation over subsequent quarters.

Domestic cost pressures should pick up in the quarters ahead.

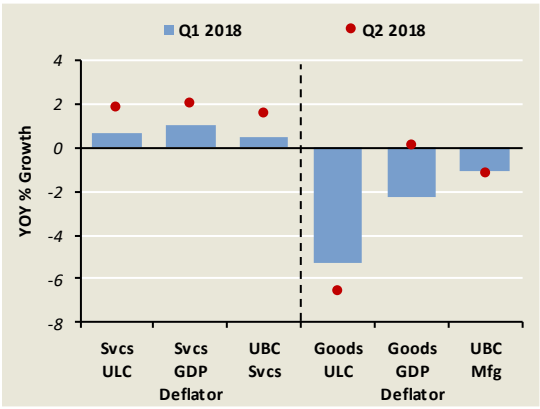
Firmer wage growth across most of the services industries contributed to the uptick in services ULC growth to 1.9% y-o-y in Q2 from 0.7% in the preceding quarter. In comparison, ULC for the goods-producing industries continued to decline, mostly on account of strong productivity growth in manufacturing. (Chart 3.19) Other sources of domestic cost pressures, such as industrial and retail rents, have generally remained subdued but office rents have risen appreciably due to the limited availability of prime office space in the Central Business District. (Chart 3.20)

Chart 3.18
Global Food Commodity Prices



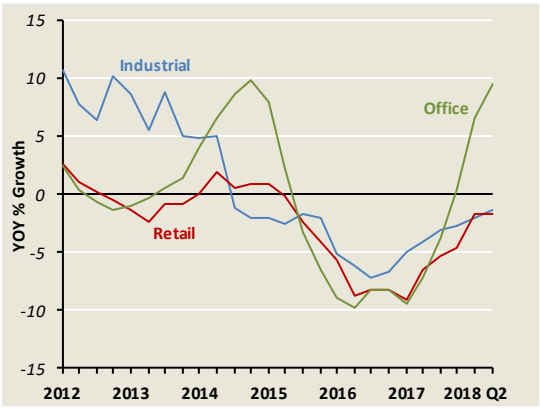
Source: UN Food and Agriculture Organization

Chart 3.19
Indicators of Domestic Cost Pressure



Source: EPG, MAS estimates

Chart 3.20
Selected Rental Indices



5 According to the UN Commodity Trade Statistics Database, Thailand and India were Singapore's top import sources for rice by value in 2017.

6 According to the World Bank's *June 2018 Global Economic Prospects*, the EM7 accounted for more than 39% of the increase in global food consumption between 1996 and 2016.

7 The International Research Institute for Climate and Society's early-October forecasts of the probability of El Niño conditions developing in Oct–Dec 2018 and Nov–Jan 2019 were 70% and 73% respectively, significantly higher than the early-April forecasts of 45% and 48%.

Productivity growth is projected to ease in the coming quarters as the cyclical uplift from 2017 diminishes, while the absorption of labour market slack should support future wage gains. Unit labour costs are therefore expected to increase moderately in the quarters ahead and could add to inflationary pressures, especially in sectors where labour costs are a higher proportion of firms' operating expenses.

The improving labour market should translate into a pickup in private consumption.

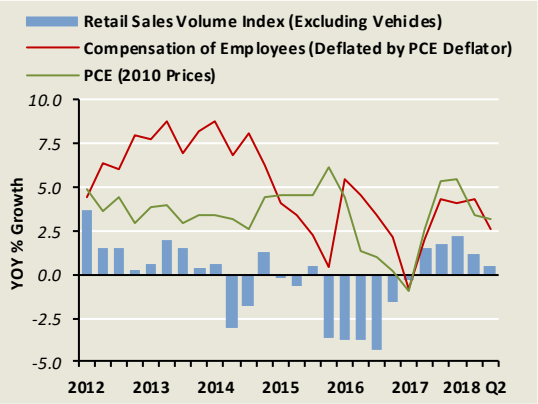
On the demand side, PCE growth remained firm at 3.2% y-o-y in Q2, supported by larger real wage gains in H1 2018. (Chart 3.21) High-frequency data suggest that this could continue in the third quarter, with growth in consumer credit card loans trending up in recent months, and the decline in restaurant sales volume easing. (Chart 3.22)

Abstracting from the drag posed by telecommunication services, inflation has risen across a broad range of services.

Food services inflation has climbed steadily since the start of the year, from 1.4% y-o-y in Q1 to 1.5% in Q2 and 1.6% in Q3. Improved consumer sentiment and higher non-cooked food and labour costs could feed into food services inflation, but there are few signs of a stronger acceleration of price pressure, given the intense competition in the F&B industry. (See Chapter 2.2)

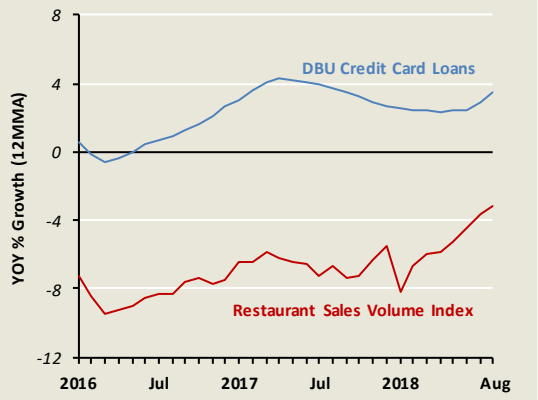
Discretionary services inflation picked up over May–Jun from April's trough but dipped again in Aug–Sep due to a decline in telecommunication services fees. (Chart 3.23) Specifically, the communication CPI[8] fell by 1.6% y-o-y in Aug–Sep, compared to a 0.7% decline in Q2 as major telecommunications operators (telcos) implemented a second round of fee cuts. Price competition leading up to the entry of the fourth telco by the end of this year could continue to dampen services inflation.

Chart 3.21
Retail Sales Volume Index, PCE and Employee Compensation



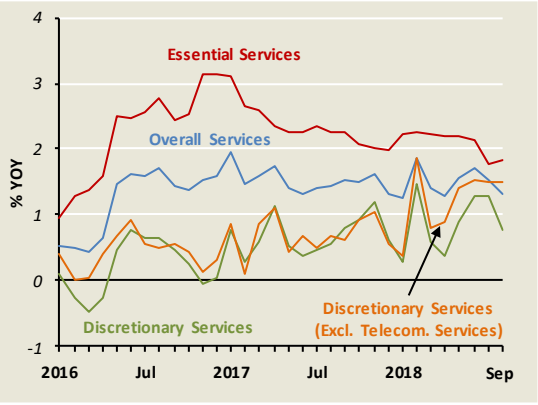
Source: EPG, MAS estimates

Chart 3.22
Other Indicators of Domestic Demand



Source: EPG, MAS estimates

Chart 3.23
Selected Services Inflation Measures



Source: EPG, MAS estimates

[8] The communication CPI category includes both telecommunication services, such as bundled subscription plans, as well as telecommunication equipment (e.g., mobile phones) that are classified as retail goods.

Meanwhile, airfares and holiday expenses, which are largely influenced by global factors, are expected to pick up on the back of global growth in business travel[9], even as higher jet fuel prices raise airlines' costs. Excluding the telecommunication services component, discretionary services inflation trended up from April to September and is expected to rise further on the back of improved domestic consumer sentiment and wage growth.

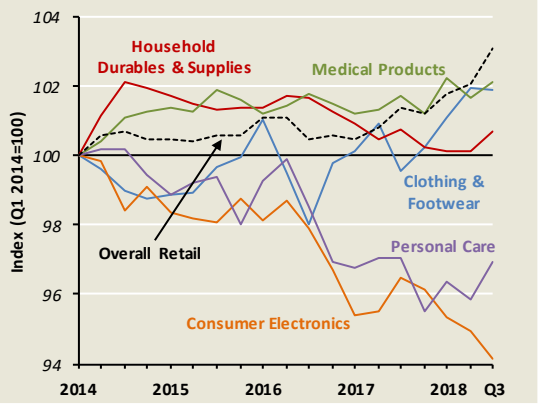
Essential services are expected to contribute to the bulk of the increase in services inflation next year.

Essential services[10] inflation has been slightly weaker than expected recently, but is expected to step up significantly in 2019 due to increases in administered prices. Higher bus and train fares will account for the bulk of the rise in services inflation should the Public Transport Commission implement the maximum allowable fare adjustment of 4.3% at the end of this year. The hike in the non-concessionary foreign domestic worker levy will add further to services inflation in April 2019 but healthcare subsidies under the Merdeka Generation Package announced in the 2018 National Day Rally are projected to lower services inflation slightly. Overall, for 2018, services inflation is expected to average 1.5%, similar to last year, before rising to slightly above 2% in 2019.

Retail inflation increased in recent months, due to nascent cost pressures.

Inflation for retail goods[11] came in at 1.7% y-o-y in Q3, compared to 1.2% in Q2. Excluding components related to water supply, and tobacco products, which were impacted by higher excise duties in February 2018, underlying inflation for retail goods rose to 0.3% y-o-y in Q3, from −0.1% in Q2. Notably, inflationary pressures have broadened across retail goods categories in recent months (Chart 3.24), possibly due to higher costs of goods and materials, which account for around 70% of the operating outlays of firms in the retail sector.[12]

Chart 3.24
Selected Components of Retail CPI Components



Source: EPG, MAS estimates

Note: 'Consumer Electronics' includes audio-visual, photographic & information processing equipment and telecommunication equipment.

9 For instance, the Global Business Travel Association expects global business travel expenditure to rise by 1.2% in 2018 compared to 2017.

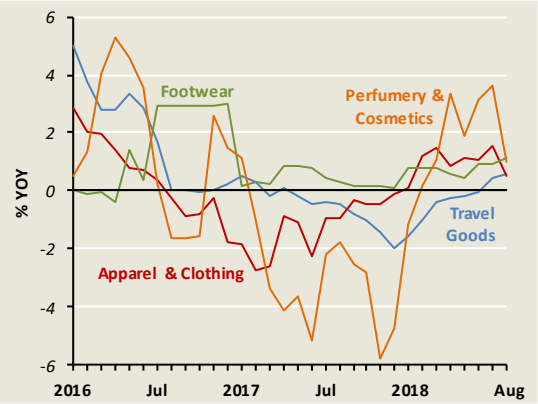
10 Essential services include CPI components which tend to be more income-inelastic and are influenced by broader demographic trends, such as healthcare, education and domestic services. They account for roughly half of the weight of the services component in the CPI basket.

11 Water supply is classified under the 'Others' category in the CPI, which includes retail goods.

12 Based on operating expenditure data from the Department of Statistics' *Services Survey Series* from 2013 to 2016.

Notably, the non-oil Domestic Supply Price Index (DSPI)[13] rose by 3.0% y-o-y in Jul–Aug after declining over the past three quarters. Price indices for a range of items recorded larger increases, suggesting that costlier retained imports could be driving the uptick in retail inflation. (Chart 3.25) Growth in ULC for the wholesale & retail trade sector also picked up, to 2.9% y-o-y in Q2 from 0.2% in Q1, reversing the decline in 2017. The combined impact of higher import and labour costs could put some upward pressure on retail goods inflation in the coming quarters, although it would be partly offset by continued declines in retail rentals.

Chart 3.25
Selected Components of the DSPI



Note: With the exception of 'Perfumery & Cosmetics', which is classified under Standard International Trade Classification (SITC) Division 5, the DSPI component indices above are from SITC Division 8.

More intense retail competition should dampen consumer price increases.

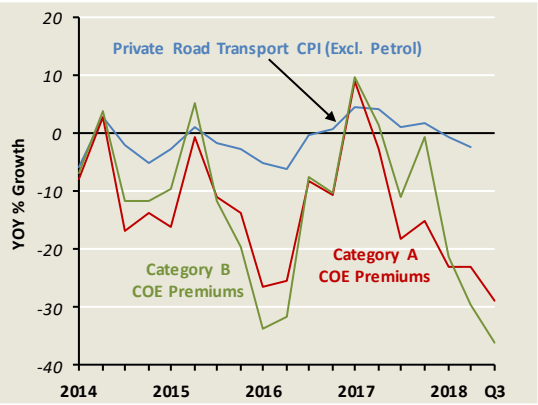
As highlighted in the April 2018 *Review*, several factors continue to constrain the pricing power of retailers, including the shift away from traditional retail formats towards e-commerce. (See Special Feature B on the impact of technology on inflation.) These structural challenges will blunt the ability of retailers to pass on higher costs to some degree.

All in, prices of retail goods (excluding components related to water supply and tobacco) are expected to register mild increases in 2018 and 2019, reversing from the y-o-y decline last year.

Excluding petrol, private road transport costs will likely weigh on headline inflation in 2018, before picking up next year.

The fall in car prices due to lower Certificate of Entitlement (COE) premiums has weighed on private road transport inflation in recent months. (Chart 3.26) Indeed, car COE premiums declined sharply to $30,300 in July and have since remained at around that level, to average $35,300 year-to-date in October, compared to $48,900 for 2017 as a whole. Market observers have cited the recent strengthening of the Japanese yen as a drag on the margins of importers and car dealerships, resulting in less aggressive bidding for COEs. In addition, the sale of rental vehicles following the exit of the ride-sharing firm Uber from Singapore in May could also have attracted buyers to the used car market, placing downward pressure on both used car prices and COE premiums in the subsequent months.

Chart 3.26
CPI for Private Road Transport (Excluding Petrol) and COE Premiums



Source: EPG, MAS estimates

[13] The DSPI measures the changes in the price level of goods manufactured locally and imported goods which are retained for use in the domestic economy by the government, business or household sectors.

For 2018 as a whole, private road transport costs excluding petrol are projected to lower headline inflation. In 2019, the supply of COE quotas should tighten as the number of car deregistrations falls more sharply due to the shrinking pool of cars between 9–10 years of age. (Chart 3.27) Accordingly, COE premiums and car prices could pick up, and the negative contribution of private road transport costs to headline inflation is expected to dissipate.

The decline in imputed housing rentals and thus accommodation costs should continue to ease.

Accommodation costs fell by a smaller 2.7% y-o-y in Q3 2018 compared to Q2, as housing rentals registered a more gradual decline. The vacancy rate for private residential properties continued to fall in the past two quarters, reflecting a tighter housing rental market with fewer private units coming on-stream, in addition to a gradual recovery in leasing demand alongside the cyclical pickup in foreign employment. (Chart 3.28) Real estate consultancies have also noted that leasing demand might be supported by homeowners displaced in earlier en-bloc sales, as the property cooling measures introduced in July could have caused them to turn to the rental market instead of committing to property purchases.

Accordingly, imputed rentals on owner-occupied homes, which comprise 80% of the CPI accommodation basket, will continue to fall more slowly in 2018 and 2019.

There are continuing inflationary pressures in the economy.

In sum, MAS Core Inflation is expected to experience moderate but continuing upward pressure over the rest of 2018 and into 2019. Rising import costs could add to food and retail goods inflation, barring any deterioration in external economic conditions. On the domestic front, the tightening labour market and higher wage growth should support private consumption and lead to a broadening of inflationary pressures. At the same time, the trajectory for core inflation will be influenced in part by administrative measures, even as greater market competition in several consumer-facing segments caps the extent of price increases.

Chart 3.27
Population of Cars Aged Between 9 to 10 Years and Number of Car Deregistrations

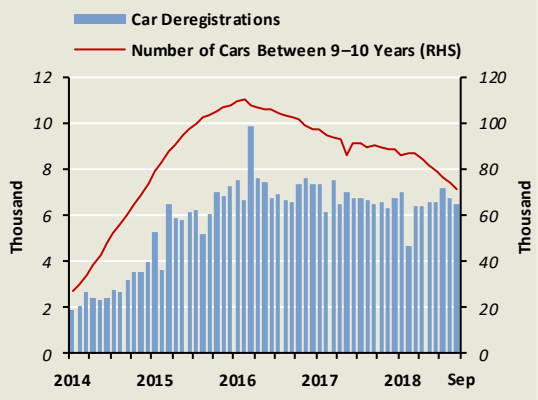
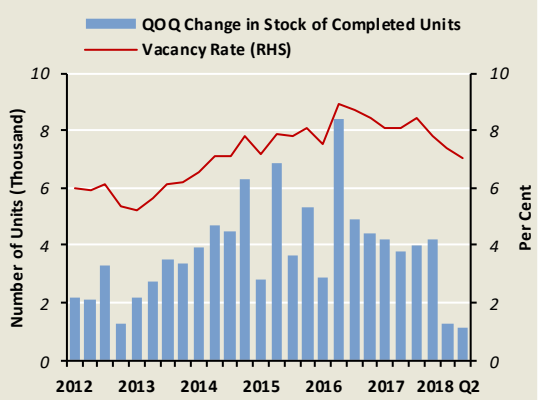


Chart 3.28
Vacancy Rate and Change in the Stock of Completed Private Residential Units



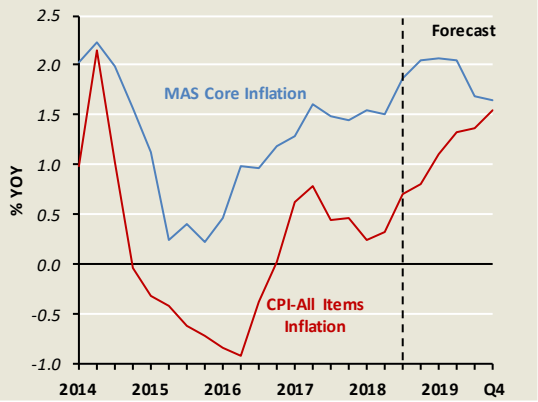
Note: Figures exclude executive condominiums.

For the rest of 2018, MAS Core Inflation is anticipated to come in around 2%, and average 1.5–2% for the year as a whole. In H1 2019, it is projected to stay at around 2% as the impact of higher public transport fares and the increase in non-concessionary foreign domestic worker levies are offset by lower inflation for energy-related items, as well as the dissipation of the inflationary effects of the hike in tobacco excise duties in February 2018. Meanwhile, core inflation should moderate in the second half of the year as the contribution of energy-related items fades and the phased increases in water tariffs over 2017 and 2018 drop out of the annual comparison. (Chart 3.29) For 2019 as a whole, core inflation is expected to fall within the range of 1.5–2.5%.

Headline inflation is expected to rise above 1.0% in 2019, from the projected 0.5% this year.

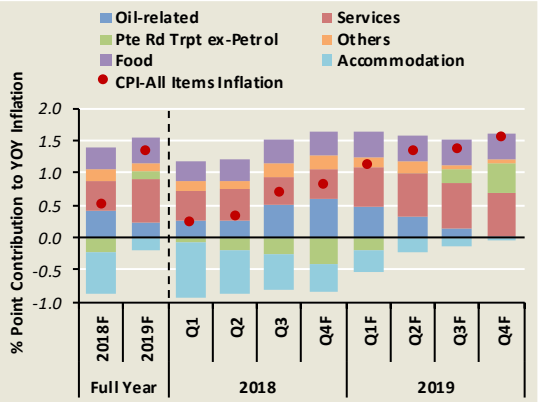
In tandem with the rise in core inflation and a smaller decline in accommodation costs, CPI-All Items inflation is forecast to increase from 0.3% y-o-y in H1 2018 to average around 0.5% for the year as a whole. Headline inflation should rise further to average 1–2% in 2019, with the non-core components contributing to the bulk of the increase. In particular, the negative contribution from accommodation costs should ease as housing rentals decline more slowly, while private road transport inflation is expected to pick up. (Chart 3.30)

Chart 3.29
CPI-All Items and MAS Core Inflation



Source: EPG, MAS estimates

Chart 3.30
% Point Contribution to CPI-All Items Inflation



Source: EPG, MAS estimates

Chapter 4

Macroeconomic Policy

4 Macroeconomic Policy

Securing Medium-Term Price Stability

In October 2018, MAS increased slightly the slope of the S$NEER policy band, continuing the gradual pace of monetary policy normalisation which began in April this year. Singapore's major trading partners have remained resilient despite growing uncertainty amid trade frictions and tightening financial conditions. Barring a significant deterioration in the global environment, the Singapore economy should keep close to its potential in 2019. Amid sustained GDP growth and improving labour market conditions, modest cost pressures are accumulating in the Singapore economy and should pass through to prices at a steady, but contained, pace. MAS Core Inflation is expected to rise slightly in the quarters ahead before moderating to just under 2% in the medium term. Against this backdrop, a further withdrawal of policy accommodation was assessed to be appropriate to ensure medium-term price stability.

On the fiscal front, Budget 2018 focused on helping firms and households adjust to the changes brought about by globalisation and technological change, and channelled resources to foster greater inclusiveness in society. The Budget also laid out the Government's plan for ensuring long-term fiscal sustainability in anticipation of spending needs that will arise in the coming decades.

In sum, the macroeconomic policy mix is assessed to be in line with the current evolution of a range of real and nominal economic variables.

4.1 Monetary Policy

A Further Measured Tightening

Since the April 2018 review, trade frictions between the US and China have intensified and financial conditions have tightened in some emerging market economies. Nevertheless, barring a significant setback to the global economy, Singapore's GDP growth should average in the upper half of the 2.5–3.5% forecast range for the whole of 2018 before easing closer to the economy's potential next year. The labour market should continue to improve, while slack in other factor markets should dissipate gradually. Against this backdrop, imported and domestic sources of inflation are picking up and will pass through to consumer prices in the year ahead. MAS Core Inflation should rise to around 2% in the next few quarters and come in within the range of 1.5–2.5% in 2019. Accordingly, in October 2018, MAS increased slightly the slope of the S$NEER policy band, with no change to its width or the level at which it was centred.

In April 2018, MAS began a gradual normalisation of monetary policy.

At the time of the April 2018 policy review, the Singapore economy had registered creditable but uneven growth, primarily driven by the trade-related industries. Despite rising trade tensions between several major economies, MAS was of the view that—barring a major escalation of trade frictions that would materially impact global growth—the Singapore economy would remain on its steady expansion path, while GDP growth would become more broad-based across the external- and domestic-oriented sectors.

Meanwhile, sustained growth would facilitate the absorption of the remaining slack in the labour market, and wage growth would rise in 2018 compared to 2017. With costs picking up and domestic demand strengthening, domestic sources of inflation would build up over 2018. Moreover, imported inflation was forecast to increase modestly as well. MAS Core Inflation was thus projected to continue on its upward trajectory and rise gradually over the course of 2018. For the year as a whole, core inflation was forecast to average in the upper half of the 1–2% forecast range, up from 1.5% in 2017.

Against the backdrop of an improving labour market supporting a rise in core inflation back to its historical average, MAS deemed it appropriate to withdraw some degree of monetary policy accommodation in the April 2018 policy review.

In determining the rate at which the policy stance should be tightened, MAS also assessed that the recovery had, thus far, been gradual and less factor-intensive than in previous recoveries. There was little risk that domestic cost pressures would accelerate despite the relatively advanced stage of the business cycle, while heightened competitive pressures in several consumer-facing segments were also capping the pace of increases in the CPI.

MAS therefore decided to increase slightly the slope of the S$NEER policy band in the April 2018 review from zero percent. This gradual approach to policy normalisation was appropriate given the baseline outlook for inflation, and also took into account the uncertainty presented by global trade tensions at the time. There was no change to the width of the policy band or the level at which it was centred. This policy stance, which was consistent with a modest and gradual appreciation path of the S$NEER policy band, was deemed to be appropriate for securing medium-term price stability given that a broad range of nominal variables in the economy had recovered after eight consecutive quarters of a zero percent slope.

MAS made a further slight increase in the slope of the S$NEER policy band in October 2018.

Following the April 2018 policy review, trade frictions between the US and China intensified with the implementation of tit-for-tat tariffs, even as tensions appeared to have eased with respect to trade relations between other regions. At the same

time, steady increases in US interest rates sparked off bouts of market volatility and a tightening of financial conditions in some emerging market economies. Notwithstanding these developments, GDP growth in the advanced economies remained relatively firm, as labour markets continued to strengthen and private consumption grew. The steady pace of expansion in global final demand is projected to continue in 2019 and will support exports in most regional economies, some of which may also be benefitting from the nascent diversion of trade and investment flows. All in, while the effects of trade frictions and tighter global financial conditions will weigh more discernibly on the global economy in the coming quarters, GDP growth in Singapore's major trade partners is projected to average 4.2% in 2019, down just slightly from 4.4% this year.

According to the *Advance Estimates*, the Singapore economy grew by 4.7% q-o-q SAAR in Q3 2018, following the 1.2% recorded in the previous quarter. Growth in the manufacturing sector moderated as anticipated, due largely to the maturing of the global IT and business cycles rather than drags associated with global trade frictions. In the services sector, growth in financial and business services and wholesale & retail trade remained firm, reflecting healthy regional demand.

In the coming quarters, GDP growth is anticipated to ease alongside the tapering in global growth from its cyclical high. The contribution of the electronics and trade-related sectors will wane, but should stay positive, while firm regional demand and domestic digitalisation initiatives will help sustain the continued expansion in the modern services clusters. The drivers of Singapore's GDP growth will, therefore, shift towards the services sectors, while lagging sectors, such as construction and marine & offshore engineering are also likely to see a modest turnaround in 2019. In addition, private consumption should continue to improve and support the recovery of the domestic-oriented segments of the economy.

GDP growth in the Singapore economy is projected to average in the upper half of the 2.5–3.5% forecast range in 2018, before slowing in 2019 to a pace that is closer to the economy's medium-term potential. At the same time, the cyclical uplift in productivity growth will continue to moderate alongside the slower expansion in the trade-related sectors.

The steady and more even pace of economic growth over the last six months has undergirded the continued improvement in labour market conditions, as anticipated in the previous policy review. Labour demand, particularly in the modern services sector, has risen alongside an upturn in the resident labour force participation rate, with the latter resulting from better employment prospects and increases in job vacancies.

In line with the ongoing reduction of excess capacity in the economy, underlying inflationary pressures have risen: unit labour costs have increased amid faster wage growth and moderating cyclical productivity gains, while slack in other domestic factor markets is also gradually dissipating. On the external front, oil prices have increased and the pass-through, mainly to electricity tariffs, has contributed significantly to the rise in core inflation to 1.9% y-o-y in Q3 2018.

Looking ahead, the shift in GDP growth drivers towards the more labour-intensive services sectors should support steady job creation into 2019. Wage growth in 2018 and 2019 is expected to come in higher than the 3% registered in 2017. Consequently, unit labour costs, particularly in the services sectors, are likely to increase faster, even though they may be capped by some improvement in underlying domestic productivity as restructuring initiatives bear fruit. Meanwhile, imported inflation will be held up by slightly higher global oil and food prices, as global demand remains firm and risks on the supply-side persist.

Businesses could also pass on accumulating costs to core inflation more rapidly in an environment where domestic demand is recovering. Conversely, the degree and speed of cost pass-through could be constrained by heightened competition in some consumer segments. For example, the progressive roll-out of the Open Electricity Market from late 2018 will reduce effective electricity prices faced by households, while competitive pressure from online platforms and new entrants could also help keep price increases contained in the retail, food and taxi services industries.

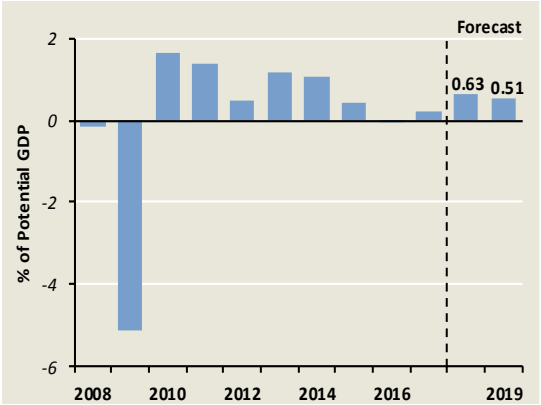
Reflecting the gradual but discernible turnaround and pickup in underlying inflationary pressures, MAS Core Inflation has, after hitting a low of 0.5% in 2015, risen by about 0.5% point every four to five quarters, and is expected to reach around 2% in the near term. For 2018 as a whole, MAS Core Inflation should come in within the forecast range of 1.5–2%, and average 1.5–2.5% next year. At the same time, CPI-All Items inflation is expected to average around 0.5% in 2018 before picking up to 1–2% in 2019.

Against the backdrop of a slightly positive output gap, improving labour market conditions and core inflation that has risen and approached 2%, MAS decided to increase slightly the slope of the S$NEER policy band in the October 2018 review. This measured adjustment followed the slight increase in the slope in April 2018, from an earlier zero percent rate of appreciation. There was no change to the width of the policy band or the level at which it was centred.

The monetary policy stance was carefully calibrated against the backdrop of persistent uncertainties in the external environment, and it is in step with the steady evolution of real and nominal economic variables.

Overall, the further measured adjustment to the policy stance in this October review is consistent with a modest and gradual appreciation path of the S$NEER policy band that keeps the economy close to potential and ensures medium-term price stability. (Chart 4.1) Chart 4.2 traces the longer-term evolution of monetary policy in relation to growth and inflation outcomes. (See Box A for a characterisation of the Singapore's monetary policy rule over 1990 to 2017.)

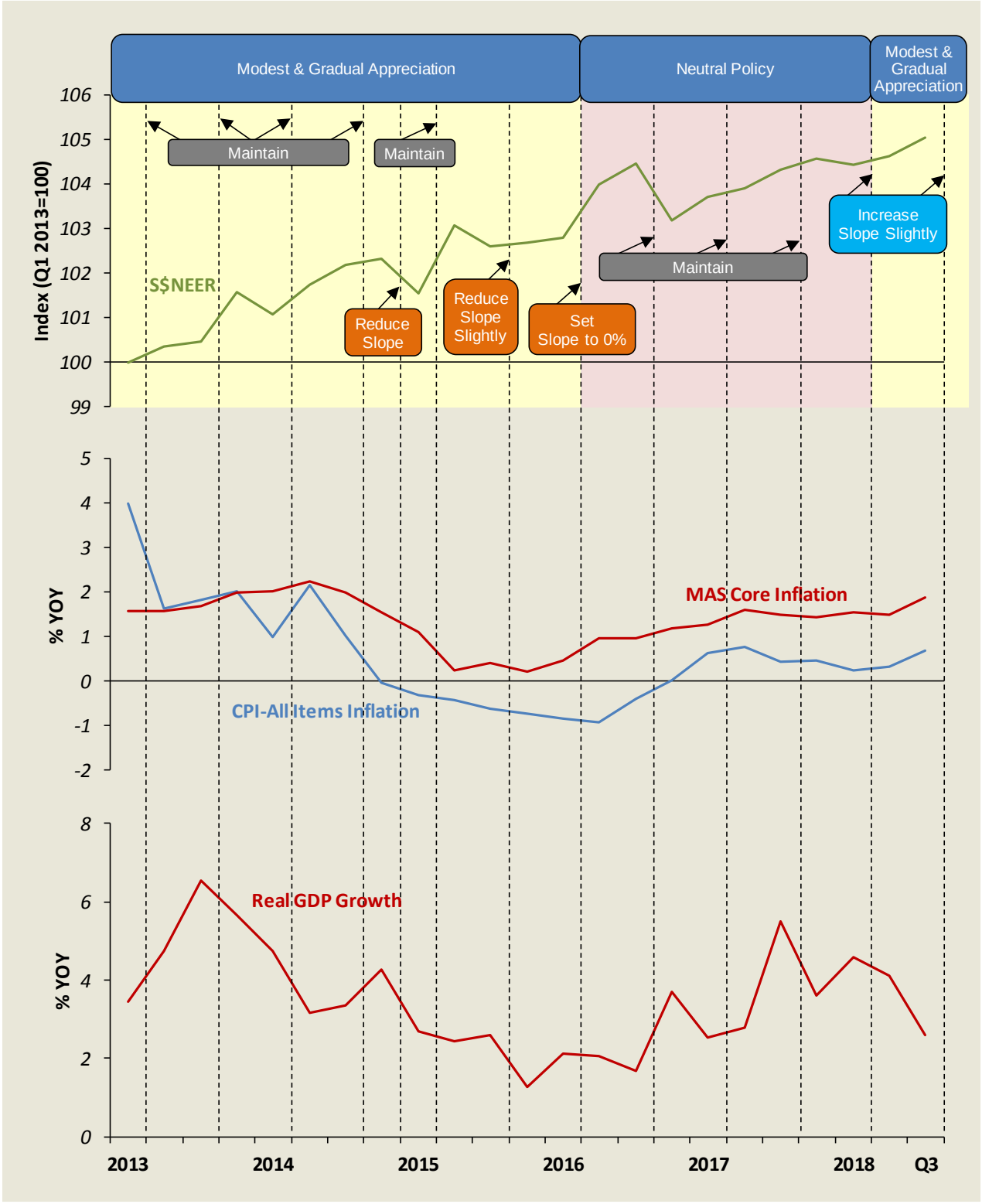
Chart 4.1
Output Gap



* EPG, MAS estimates.

Note: The output gap is derived from a weighted average of estimates from a structural vector autoregression (SVAR) approach using the Blanchard-Quah decomposition, the Friedman variable span smoother and a univariate Hodrick-Prescott filter. The forecasts for 2018 and 2019 take into account the policy stance adopted in October 2018.

Chart 4.2
Key Macroeconomic Variables and Changes in the Monetary Policy Stance



---- indicates release of Monetary Policy Statements

The S$NEER rose in the upper half of the policy band.

The S$NEER has been on a trend appreciation path since the April 2018 Monetary Policy Statement (MPS). (Chart 4.3) While there were brief periods of depreciation pressure amid global trade tensions, the S$NEER broadly rose in the upper half of the policy band as regional currencies depreciated by more against the US dollar than against the S$. Overall, the S$NEER has risen by about 0.5% since the April 2018 MPS.

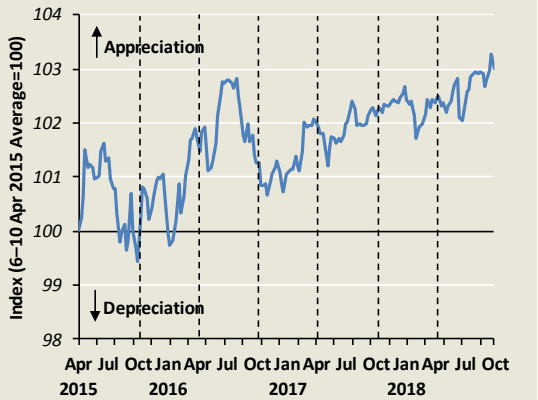
On a bilateral basis, the S$ has appreciated against most major and regional currencies, with the exception of the US dollar. For example, between the week ending 13 April 2018 and the week ending 5 October 2018, the S$ rose by between 3–5% against the Australian dollar, Indonesian rupiah, pound sterling and Chinese renminbi. (Chart 4.4) At the same time, the S$ weakened by around 5% against the US dollar over the same period.

The CPI-based S$REER continued to decline gradually.

The S$ real effective exchange rate[1] (S$REER), with CPI as the measure of prices, continued its depreciation trend over H1 2018, and as of Q2 2018, it had fallen by a cumulative 5.2% from its peak in Q4 2013. (Chart 4.5) This was driven by a 7.4% decline in relative domestic prices over this period, as CPI-All Items inflation decreased slightly while consumer prices in Singapore's major trading partners rose. In comparison, the S$NEER appreciated by a cumulative 2.5% over this period.

The owner-occupied accommodation component of Singapore's CPI has been a major drag on domestic CPI inflation in recent years. Excluding this component from Singapore's measure of consumer prices shows that the S$REER still depreciated, but by a more modest 2% since Q4 2013.

Chart 4.3
S$NEER



---- indicates release of Monetary Policy Statements

Chart 4.4
Singapore's Bilateral Exchange Rates

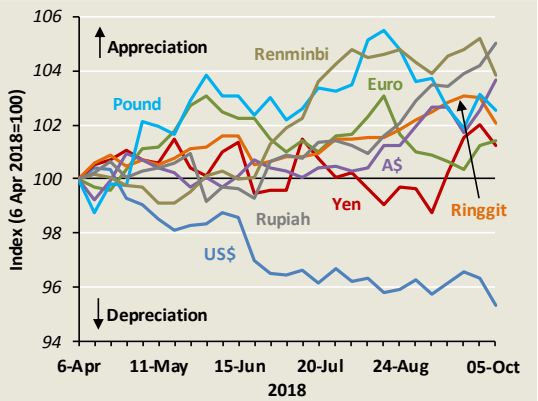
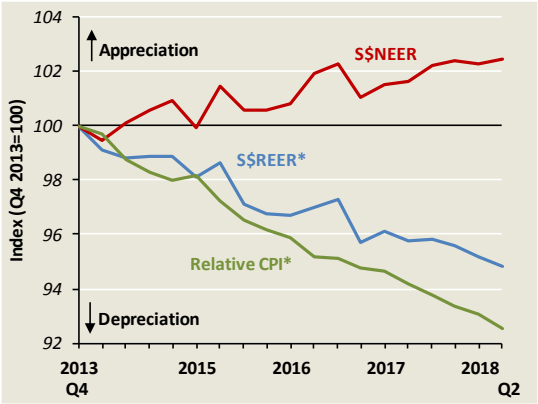


Chart 4.5
Components of the S$REER (CPI-deflated)



* EPG, MAS estimates.

[1] The S$REER is a measure of the prices of goods and services in Singapore relative to its trading partners, expressed in terms of a common currency index, the S$NEER.

S$ interbank rates have generally tracked US$ rates higher.

The three-month S$ SIBOR rose from 1.51% in April 2018 to a high of 1.64% in September. (Chart 4.6) In comparison, the three-month US$ LIBOR rose by a more modest 4 bps to 2.40% over the same period. Consequently, the discount of the S$ SIBOR to the US$ LIBOR narrowed by 9 bps to 76 bps in September 2018 from around 85 bps in April. Meanwhile, the three-month S$ Swap Offer Rate rose in tandem with the three-month S$ SIBOR to 1.64% in September, from 1.50% in April.

In line with rising domestic interest rates, the 12-month fixed deposit rate edged up to 0.40% in September 2018 from 0.34% in April 2018. However, the savings deposit rate remained unchanged at 0.16% over the same period.

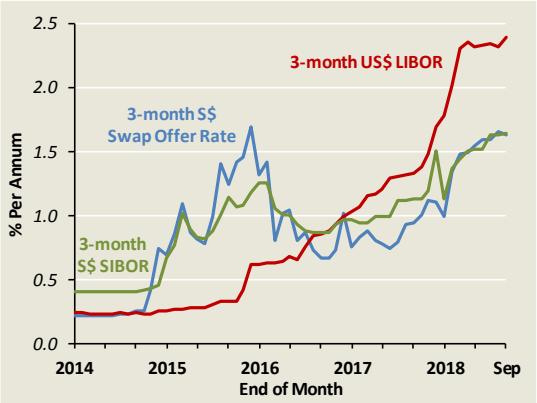
Domestic liquidity has tightened over the last six months.

As measured by changes in the Domestic Liquidity Indicator (DLI)[2], liquidity in the Singapore economy has tightened since April 2018, amid increases in the both the S$ SIBOR and the S$NEER. While rising domestic interest rates accounted for most of the tighter liquidity conditions between April and July, the sustained appreciation in the S$NEER was the main driver in August and September. (Chart 4.7)

DBU non-bank loans grew steadily.

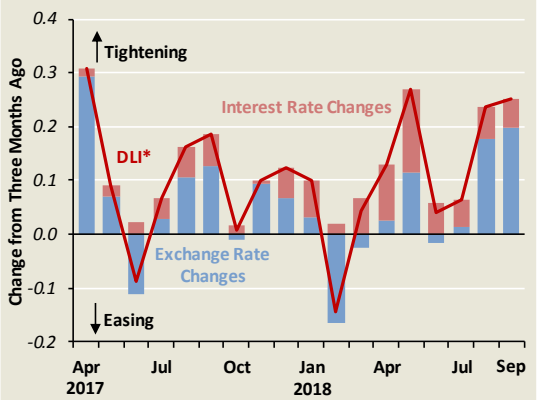
The stock of outstanding DBU non-bank loans has grown by 5.6% y-o-y since April 2018. Business loan growth picked up to 7.0% y-o-y in August 2018 from 4.7% in Q1, reflecting a faster pace of credit expansion in building and construction, as well as the manufacturing sector. This was offset by the slower rate of consumer borrowing, which eased to 3.5% y-o-y in August 2018 from an average of 5.1% in Q1, as demand for housing loans eased. (Chart 4.8)

Chart 4.6
Interbank Rates and Swap Offer Rate



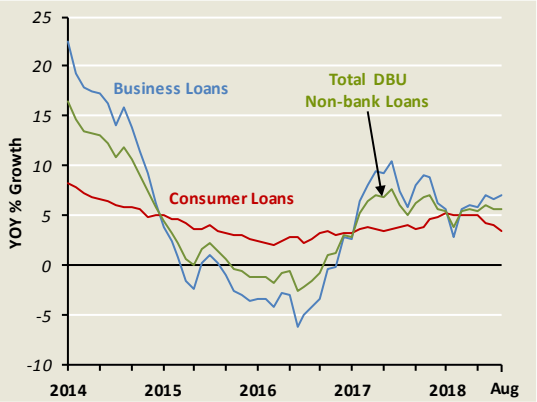
Source: ABS Benchmarks Administration Co Pte Ltd and ICE Benchmark Administration Ltd

Chart 4.7
Domestic Liquidity Indicator



* EPG, MAS estimates.

Chart 4.8
DBU Non-bank Loans



[2] The DLI captures movements in the S$NEER and the three-month S$ SIBOR.

Money supply growth has levelled off.

In year-ago terms, M1 growth fell from April 2018, alongside slower growth in both currency in active circulation and demand deposits. (Charts 4.9 and 4.10) Subsequently, it appears to have bottomed in Jul–Aug, as growth in demand deposits picked up. In contrast, growth in broader monetary aggregates, i.e. M2 and M3, has been relatively stable, averaging around 3% since the beginning of the year, with a slight uptick in August as the stock of fixed deposits rose.

Chart 4.9
Money Supply

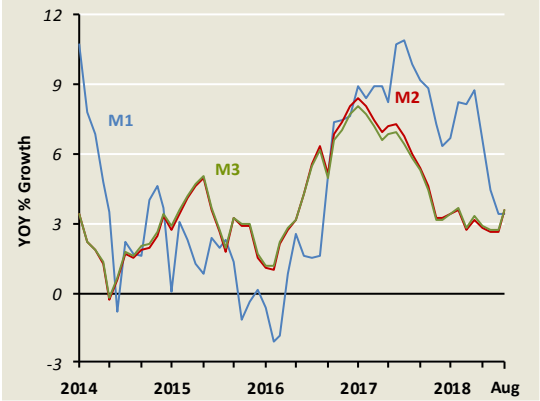
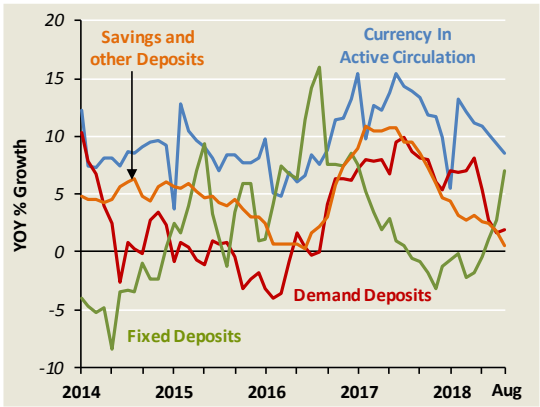


Chart 4.10
Money Supply Components



4.2 Fiscal Policy

Addressing Medium-Term Needs in a Sustainable Way

Budget 2018 focused on helping industries, firms and individuals to benefit from new opportunities and overcome challenges brought about by globalisation and the emergence of new technologies. Resources were also channelled towards fostering inclusiveness in society. In line with its medium-term orientation, the Budget laid out the Government's plan for ensuring fiscal sustainability even as spending needs rise in the coming decade. All in, the fiscal stance is estimated to be mildly expansionary for CY2018.

Budget 2018 sought to secure sustainable medium-term growth for Singapore.

With the economy emerging from a prolonged period of modest growth, Budget 2018 was centred on tackling the longer-term challenges confronting Singapore.

Accordingly, the Budget focused on facilitating restructuring and upskilling in order to help firms and individuals better position themselves to benefit from global structural shifts. While earlier initiatives in the productivity push took a broader sectoral approach, Budget 2018 rolled out more targeted schemes, laid the foundational infrastructure necessary for a more pervasive adoption of digital and smart technologies, and enhanced support for human capital deepening among Singaporeans.

At the same time, Budget 2018 reinforced efforts to foster a more equitable society by strengthening social safety nets and improving on service delivery. Steps were also taken to ensure that the overall system of taxes and transfers remained progressive, even with an eventual increase in GST rates.

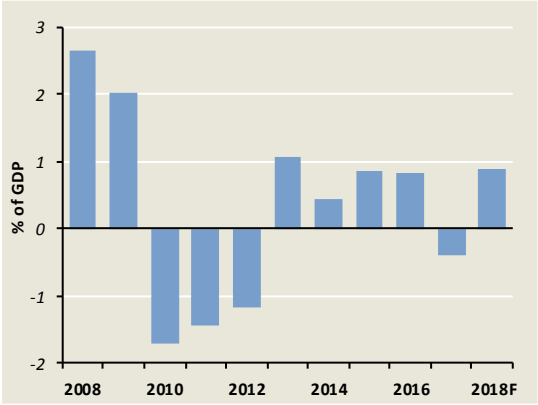
Ongoing efforts to secure Singapore's economic future and entrench social cohesiveness means that Government expenditures will rise over the next decade, especially in the areas of healthcare, infrastructure, security and education. Accordingly, the Government has put forward a plan to augment revenues by raising the GST rate by two percentage points sometime between 2021 and 2025. Statutory boards and government-owned companies undertaking infrastructure investment will also look to borrowing to spread out the cost of infrastructure investment over more years, while the Government will consider providing guarantees on some of the long-term borrowings related to critical national infrastructure.

Together, these measures will help to ensure fiscal sustainability in the coming years as spending needs rise.

The fiscal policy stance is moderately expansionary in 2018.

The fiscal impulse measure, which is an indicator of the short-term stimulus to aggregate demand arising from fiscal policy changes, is projected to be 0.9% of GDP in CY2018, implying a moderately expansionary fiscal policy stance relative to the previous year. (Chart 4.11) This stance reflects the additional spending on longer-term supply-side measures necessary for the restructuring process.

Chart 4.11
Fiscal Impulse Measure



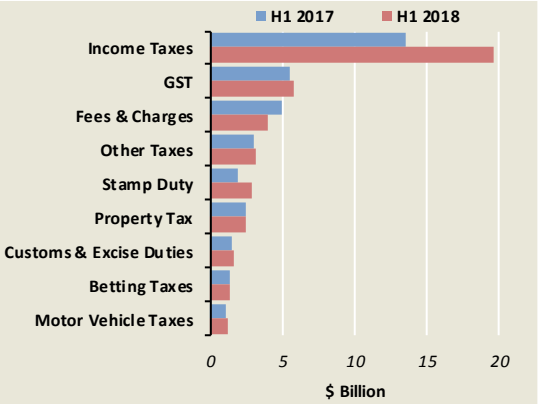
Source: EPG, MAS estimates

Government operating revenues registered gains in H1 2018 …

The following provides an overview of the government's budgetary position in the first half of CY2018 compared to the same period last year.

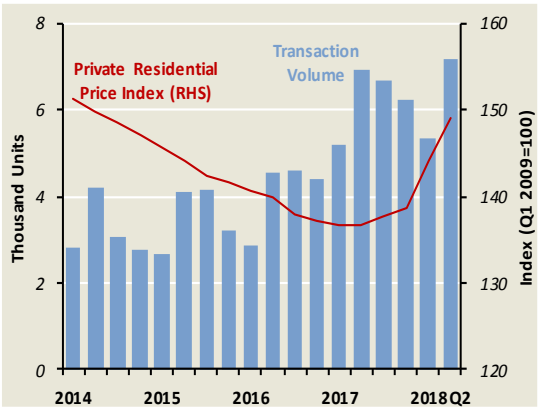
Operating revenue increased to $42.3 billion (18.5% of GDP) in H1 2018, from $35.6 billion (16.3% of GDP) in H1 2017, on the back of higher revenues from income taxes.[3] (Chart 4.12) While collections from corporate and personal income taxes registered substantial gains alongside continued economic expansion, the main driver of higher income tax receipts was a one-off contribution from MAS.[4]

Chart 4.12
Selected Components of Operating Revenue



Apart from income taxes, there was also a step-up in stamp duty collected in H1 2018 amid the increase in private residential property prices and transaction volumes. (Chart 4.13)

Chart 4.13
Private Residential Price Index and Property Transaction volumes



… while operating and development expenditures rose modestly …

Total government expenditure increased by a modest $0.6 billion to $38.8 billion (17.0% of GDP) in H1 2018, reflecting slightly higher operating and development expenditure.

Meanwhile, operating expenditure came in at $28.8 billion, similar to the $28.6 billion outlay a year earlier. While spending on social development was

[3] Income taxes include corporate and personal income tax, withholding taxes and contributions by statutory boards.

[4] The FY2017 contribution from MAS that was paid to the Government in H1 2018 was based on MAS' actual net profit for FY2016. This turned out to be higher than projected, as global financial markets rose in FY2016.

largely unchanged at $16.3 billion, its composition has shifted.[5] Reflecting the needs of an ageing population, expenses by the Ministry of Health rose by $0.5 billion to reach $4.7 billion, with larger subsidies for patient services and elderly social care services. (Chart 4.14) Meanwhile, the Ministry of Social and Family Development spent more on early childhood development to improve the accessibility, affordability and quality of preschools. In contrast, operating expenditures incurred by the Ministry of Education were lower in H1 2018 compared to H1 2017 due to the one-off provision of seed endowment grants to SIM University (UniSIM) in the previous period.

Concomitantly, development expenditure totalled $10.1 billion in H1 2018, up from $9.6 billion in H1 2017. This was mainly due to increased spending on economic development, which more than offset reduced spending on social development.[6] The Ministry of Transport has ramped up capital investment over the past year, particularly on domestic MRT projects. (Chart 4.15) In line with the Budget's focus, the Ministry of Trade and Industry channelled more funds to support EDB's Attract, Transform and Create strategy. In comparison, social development expenditure fell as spending by the Ministry of Environment and Water Resources declined following the disbursement of a capital grant for the development of Mandai and the injection of equity for constructing the Integrated Waste Management Facility.

Chart 4.14
Selected Components of Operating Expenditure

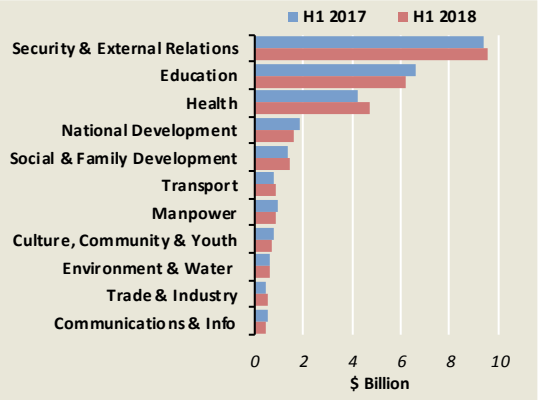
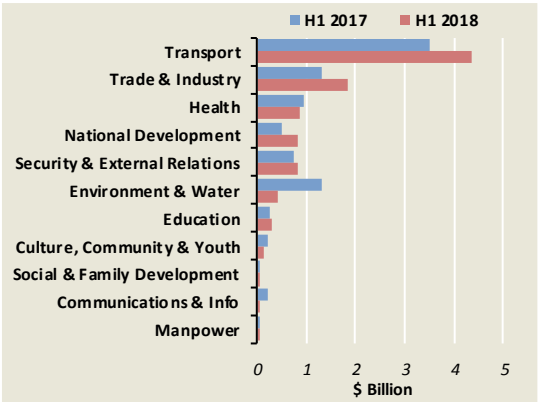


Chart 4.15
Selected Components of Development Expenditure



… leading to a turnaround in the primary and basic balance.

As the increase in operating revenue exceeded that of total expenditure, the government's primary budget balance turned from a deficit of $2.7 billion in H1 2017 to a surplus of $3.5 billion in H1 2018 (1.5% of GDP). Over this period, special transfers remained largely unchanged, mainly because higher payments under the Wage Credit Scheme offset smaller disbursements

[5] The social development category comprises Education, National Development, Health, Environment and Water Resources, Social and Family Development, Communications and Information, Culture, Community and Youth, as well as Manpower (Financial Security and Lifelong Employability for Singaporeans programme).

[6] The economic development category encompasses Transport, Trade and Industry, Manpower (excluding the Financial Security and Lifelong Employability for Singaporeans programme) and Communications and Information (Info-Communications and Media Development program).

under the Temporary Employment Credit Scheme.[7] Accordingly, the government's basic balance, which is the primary balance less special transfers, excluding top-ups to endowment and trust funds, recorded a surplus of $2.2 billion compared to a deficit of $4.0 billion a year ago.

[7] The Temporary Employment Credit (TEC) scheme was introduced as a 2014 Budget initiative to alleviate the rise in business costs due to the increase in MediSave contribution rates in 2015. It also provided additional support to help employers adjust to the cost increases associated with the changes in the employer CPF contributions which took effect from January 2016. TEC is paid to employers of Singaporean and Singapore Permanent Resident workers who were on the payroll from January 2015 to December 2017. The last TEC payout was in April 2018.

Box A
Estimating a Monetary Policy Rule for Singapore[1/]

Introduction

Singapore's monetary policy is based on a Basket, Band, and Crawl (BBC) exchange rate framework that can be characterised by a Taylor Rule-like reaction function. In this analysis, we estimate such a monetary policy function and briefly discuss the results.

Context

MAS has used the BBC monetary policy framework since 1981, with the S$ nominal effective exchange rate (S$NEER) as the policy instrument. MAS sets a target rate of change in the S$NEER policy band (slope of the band) that is consistent with its price stability objective for sustainable economic growth. MAS does not follow an inflation-targeting regime. The width of the band around the central parity can be adjusted when needed, to allow the exchange rate to absorb short-term volatility and/or transitory shocks. Over the years, the S$NEER has seen a trend appreciation.

Currently, monetary policy is geared towards achieving a 2% rate for MAS Core Inflation over the medium term. Compared with headline inflation, MAS Core Inflation provides a better gauge of underlying domestic price pressures by abstracting from the impact of administrative measures on prices. It excludes the accommodation and private road transportation components from headline inflation, but includes food and energy prices. In its monetary policy communications, usually announced twice a year, MAS provides qualitative clarification on the parameters of the BBC framework. Unlike a central bank that uses the policy interest rate as a tool, MAS does not disclose the numerical values of the BBC parameters and/or their changes. For example, the January 2015 off-cycle MAS Monetary Policy Statement said that "the slope of the policy band will be reduced". In the April 2016 statement, MAS announced a zero rate of appreciation for the policy band, which the October 2016 statement indicated would be maintained for an "extended period". MAS also publishes the level of the weekly S$NEER on a monthly basis.

Estimating a Policy Reaction Function

Empirical analyses have found strong evidence that MAS' monetary policy can be characterised succinctly by a Taylor-type rule with the S$NEER replacing the nominal interest rate as the short-term policy instrument (Parrado, 2004; McCallum, 2007; IMF, 2013 and 2015; Mihov, 2013). The literature finds that in highly open economies like Singapore, an exchange rate-based monetary policy rule that lowers exchange rate volatility generates higher welfare than the interest rate rules typically used in closed or small open economy models of inflation targeting. This analysis updates these estimates and explores some additional variables. Following Parrado (2004) and previous IMF work, this analysis postulates that the target rate of S$NEER appreciation responds to deviations of inflation from its target and the output gap, and that S$NEER appreciation adjusts to the target rate in a gradual manner:

$$\Delta e_t^* = \bar{e} + \beta(\pi_t^e - \pi_t^*) + \gamma(y_t - y_t^*) \quad (1)$$

$$\Delta e_t = \rho \Delta e_{t-1} + (1-\rho)\Delta e_t^* + \varepsilon_t \quad (2)$$

where Δe_t^* is the target rate of change in the S$NEER (positive for appreciation), $\bar{e}$ is the long-run equilibrium change in the S$NEER, $(\pi_t^e - \pi_t^*)$ is the deviation of forward-looking inflation expectations at time t from the authorities' desired level, and $(y_t - y_t^*)$ is a measure of domestic economic activity relative to its potential.

1/ This Box was contributed by Souvik Gupta and Jiae Yoo from the IMF and was adapted from Appendix V of IMF (2018), available at: https://www.imf.org/en/Publications/CR/Issues/2018/07/27/Singapore-2018-Article-IV-Consultation-Press-Release-Staff-Report-and-Statement-by-the-46131. The views expressed in this paper are those of the authors and do not necessarily represent the views of the IMF, its Executive Board, IMF management or the MAS.

We use one-period ahead inflation expectations and assume a fixed π_t^* over the estimation period. Measures of output gap and labour market conditions have been used for $(y_t - y_t^*)$. In equation (2), the coefficient ρ measures the extent of inertia in the S$NEER in adjusting to the target $(0 < \rho < 1)$.

Combining equations (1) and (2), we use the following to estimate the reaction function:

$$\Delta e_t = (1-\rho)(\bar{e} - \beta\pi^*) + \rho\Delta e_{t-1} + (1-\rho)\beta\pi_t^e + (1-\rho)\gamma(y_t - y_t^*) + \varepsilon_t \quad (3)$$

Alternative specifications use different measures of expected inflation viz., four-quarter forward moving averages of headline inflation and MAS Core Inflation, as well as unit labour cost; one-year ahead inflation expectations from the MAS *Survey of Professional Forecasters*; and one-year ahead inflation forecasts from *Consensus Economics*. Similarly, different measures of the strength in domestic economic conditions are used viz., IMF staff's estimate of the output gap, and official data on the vacancies-to-unemployed-persons ratio which is a measure of labour market slack when it is below unity. Information on market instrument-based inflation expectations is not available. Given that Singapore is a highly open economy, equation (3) is also augmented with the US Federal funds target rate to capture spillovers from monetary policy in the US. Equation (3) is estimated by Generalised Method of Moments Instrumental Variable (GMM-IV) techniques with heteroskedasticity and autocorrelation-consistent weighting matrix. Four lags of inflation and the output gap are used as instruments.

Summary of Findings

The analysis uses quarterly data over 1990–2017. As shown in Table A1, regression estimates from various specifications of equation (3) confirm the results of previous studies: MAS puts a higher weight on expected inflation than the output gap. The parameter estimates on expected inflation are much higher and statistically significant across all specifications, whereas the parameter estimates on the output gap are not always statistically significant. Also, there is a high degree of policy inertia, indicating that monetary policy does not adjust abruptly. Finally, parameter estimates for the indicator on labour market slack/tightness and changes in the US Federal funds rate are not found to be statistically significant.

Comparing across different specifications, it appears that regressions based on four-quarter ahead average headline inflation and unit labour costs, and one-year ahead inflation expectations from *Consensus Economics* perform better than those based on four-quarter ahead average MAS Core Inflation or inflation forecasts from the MAS *Survey of Professional Forecasters*.

Inflation Expectations

In recent years, Singapore's headline inflation has come down significantly and even went into negative territory in 2015–16. Inflation also underperformed short-term forecasts consistently over the past several years. While policy-induced effects on, for example, prices of motor vehicles and accommodation costs had a direct bearing on headline inflation, a steep decline in global oil prices was also a contributing factor. However, the long-term inflation expectations surveys conducted by *Consensus Economics* found that expectations have remained largely stable for the last three years. This is likely due to the credibility of Singapore's monetary policy framework, policy coordination, and overall prudent approach to macroeconomic policymaking. Gupta (2016) reports that inflation expectations in Singapore have become better anchored in the last decade. The estimation results in Table A1 corroborate the relevance of inflation expectations in explaining current inflation. This reaffirms that monetary policy has a forward-looking orientation aimed at stabilising inflation, as pointed out in previous studies (Parrado, 2004; MAS, 2013).

Table A1
Regression Results from Various Specifications

	Specification														
Dependent variable: y-o-y change in S$NEER	**M1**	**M2**	**M3**	**M4**	**M5**	**M6**	**M7**	**M8**	**M9**	**M10**	**M11**	**M12**	**M13**	**M14**	**M15**
Constant	−0.03	−0.20	−0.11	−0.70	−0.69	−0.83	−0.05	−0.55	−0.30	−0.69*	−1.49	−0.81	−0.04	0.76	−0.08
Lagged dependent variable	0.70***	0.70***	0.62***	0.67***	0.73***	0.61***	0.59***	0.59***	0.46***	0.61***	0.57***	0.56***	0.58***	0.74***	0.57***
Measures of forward-looking inflation															
Headline inflation	0.31***	0.51***	0.38***												
MAS Core Inflation				0.74**	0.92***	0.88***									
Inflation expectations from MAS Survey of Professional Forecasters							0.29***	0.42***	0.50***						
Consensus Economics										0.60***	0.58**	0.65***			
Unit labour cost													0.55***	0.31***	0.59***
Measures of domestic economic conditions															
Output gap	0.12*		0.18*	0.01		0.04	0.12*		0.10	0.13***		0.15***	−0.29*		−0.30
Vacancies-to-unemployed-persons ratio		−0.25			−0.30			0.15			0.64			−0.60	
Change in the Federal funds target rate			−1.34			−1.02			−1.90***			−0.94			0.08
Diagnostic Statistics															
Adjusted R^2	0.68	0.56	0.58	0.61	0.54	0.51	0.57	0.51	0.27	0.67	0.64	0.62	0.68	0.63	0.66
No. of observations	112	102	112	105	100	105	74	72	72	108	102	108	108	100	108

Source: IMF staff estimates
* Statistically significant at the 15% level.
** Statistically significant at the 10% level.
*** Statistically significant at the 5% level.

References

Gupta, S (2016), "Inflation and Unemployment Trends in Singapore", *Macroeconomic Review*, Vol. XV(2), pp. 56–61.

International Monetary Fund (2013), "Some Observations on Singapore's Monetary Policy Framework", *IMF Country Report* No. 13/327, November.

International Monetary Fund (2015), "Singapore—Estimating a Monetary Policy Rule for the MAS", *IMF Country Report* No. 15/199, July.

International Monetary Fund (2018), "Singapore—Estimating a Monetary Policy Rule", *IMF Country Report* No. 18/245, July.

McCallum, B T (2007), "Monetary Policy in East Asia: The Case of Singapore", *IMES Discussion Paper Series*, No. 2007-E-10.

Mihov, I (2013), "The Exchange Rate as an Instrument of Monetary Policy", *Macroeconomic Review*, Vol. XII(1), pp. 74–82.

Monetary Authority of Singapore (2013), "A New Keynesian Phillips Curve for Singapore", *Macroeconomic Review*, Vol. XII(2), pp. 39–43.

Parrado, E (2004), "Singapore's Unique Monetary Policy: How Does It Work?", *IMF Working Paper* No. 04/10.

Box B
Review of MAS Money Market Operations in FY2017/18[1/]

Money market operations in Singapore are undertaken to manage liquidity within the banking system, and are distinct from the implementation of exchange rate policy. This Box reviews MAS' money market operations in FY2017/18.

The conduct of money market operations is briefly explained in the context of Singapore's exchange rate policy framework. This is followed by a review of banks' demand for cash balances with MAS, the behaviour of autonomous money market factors, and the composition of money market operations carried out during this period.

Money Market Operations in Singapore

The open-economy trilemma posits that a country that maintains an open capital account cannot simultaneously manage its exchange rate and domestic interest rates. Given Singapore's open capital account and exchange rate-centred monetary policy, domestic interest rates and money supply are necessarily endogenous. MAS' money market operations are thus not targeted at any level of interest rate or money supply. Instead, they are aimed at ensuring that there is sufficient liquidity in the banking system to meet banks' demand for reserve and settlement balances, and to mitigate sharp interest rate volatility.

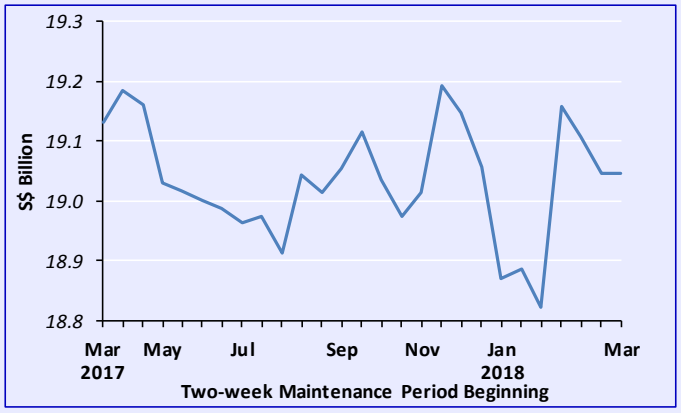
Money market operations are conducted daily by the Monetary & Domestic Markets Management Department (MDD) at MAS. The amount of liquidity required in the banking system is estimated by taking into consideration the banking sector's demand for funds and the net liquidity impact of autonomous money market factors. After carrying out money market transactions, MDD monitors market and liquidity conditions throughout the day.

Banks' Demand for Cash Balances

Banks in Singapore hold cash balances with MAS to meet reserve requirements and for settlement purposes. They are required to maintain with MAS a Minimum Cash Balance (MCB) equivalent to 3% of their liabilities base on a two-week average basis. This forms a base demand for cash balances. The total demand for reserve balances could vary across periods as banks also hold excess cash balances to make large payments (settlement purposes), or as high-quality liquid assets (regulatory purposes).

In FY2017/18, banks' demand for balances to meet reserve requirements remained relatively stable in line with a broadly unchanged liabilities base. (Chart B1)

Chart B1
Average Reserve Requirements over Two-week Maintenance Periods

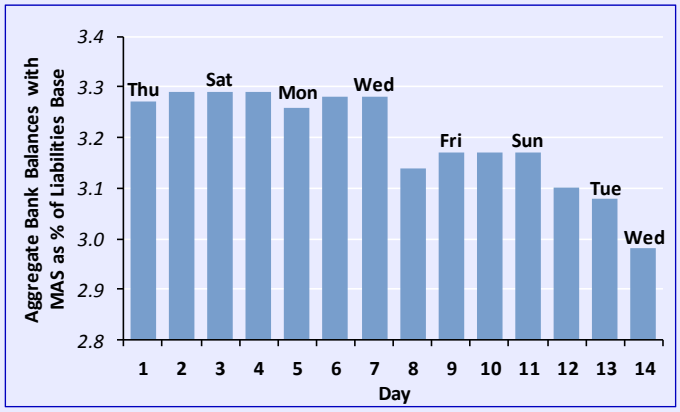


1/ This Box was contributed by the Monetary & Domestic Markets Management Department of MAS. More information on MAS' money market operations is available in the monograph "Monetary Policy Operations in Singapore" published in March 2013.

Although banks are required to keep an average MCB ratio of 3% over the two-week maintenance period, their daily effective MCB ratios may fluctuate between 2% and 4% of their liabilities base. This provides them with more flexibility in their liquidity management, which may lead to day-to-day variations in banks' demand for cash balances within each maintenance period.

Chart B2 shows the daily effective cash balances within an average maintenance period in FY2017/18. Banks tend to hold higher cash balances during the start of a maintenance period so as to avoid being caught short of cash towards the end of the period. Hence, the daily cash balances required by the banking system during the last few days of a maintenance period are usually lower.

Chart B2
Daily Effective Cash Balances as % of Liabilities Base over a Typical Two-week Maintenance Period in FY2017/18



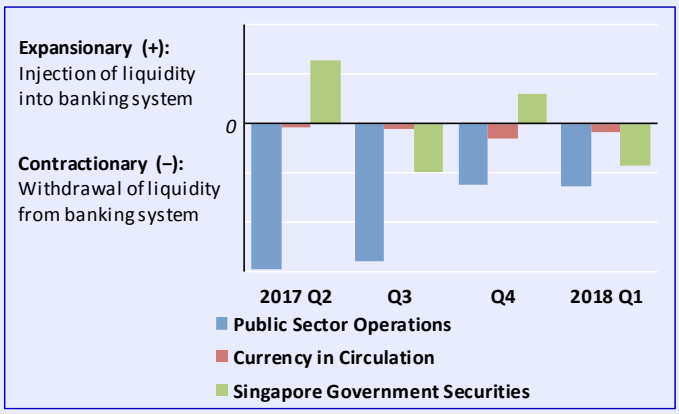
Money Market Factors

Chart B3 shows the liquidity impact of autonomous money market factors, which include: (i) public sector operations; (ii) currency in circulation; and (iii) Singapore Government Securities (SGS) and Treasury Bills (T-bills) issuance, redemption and coupon payments, over FY2017/18. Public sector operations include the Government's and CPF Board's net transfers of funds between their accounts with MAS and their deposits with commercial banks.

In FY2017/18, the liquidity impact of the autonomous money market factors was net contractionary, largely due to the withdrawal of funds through public sector operations. Increased currency in circulation also contributed to withdrawals of liquidity, albeit to a significantly smaller extent.[2/]

2/ When physical currency notes and coins are issued to the banks, this reduces the banks' balances with MAS (i.e. encashment of banks' claims in their current accounts with MAS), and hence reduces the amount of liquidity in the banking system. Conversely, when banks return physical currency notes and coins to MAS, this increases the amount of liquidity in the system (i.e. redemption). An increase in the overall currency in circulation represents a net encashment, and thus a net withdrawal of liquidity from the banking system.

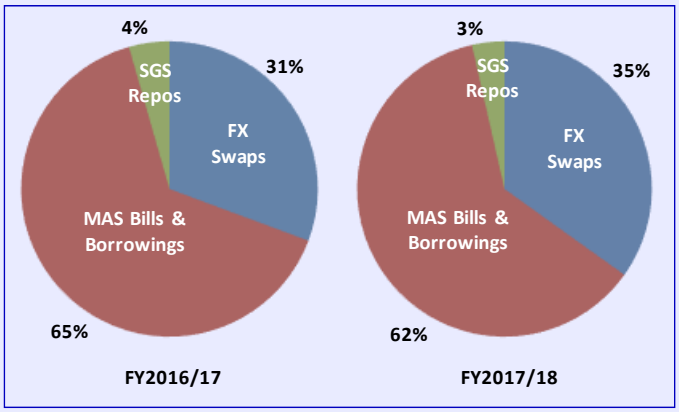
Chart B3
Liquidity Impact of Autonomous Money Market Factors



Composition of Money Market Operations

MAS relies on four money market instruments to manage liquidity in the banking system, namely: (i) FX swaps; (ii) SGS repos; (iii) clean borrowings; and (iv) MAS Bills. The composition of money market operations was largely stable between FY2016/17 and FY2017/18, with MAS Bills and clean borrowings comprising the largest share. (Chart B4)

Chart B4
Composition of Money Market Operations by Instrument



Special Features

Special Feature A

Shifts In Asia's Demand And Production Structure: A Value-Added Approach

Analysing Asian Demand Using A Value-Added Approach

With a combined real GDP of US$14.2 trillion in 2016, emerging Asia[1] is already one of the world's largest economic regions.[2] In the next decade or so, it is set to be the fastest-growing group of economies among the developing regions of the world. As a regional business and financial hub, Singapore will stand to benefit from the economic opportunities associated with this growth.

From 2000–16, Asia's GDP growth averaged 8.1%, higher than the 2.9% recorded globally. Along with exports, domestic demand was a key driver of this growth, underpinned by steady expansions in household consumption and business investment. While the longer-term trends in demand have been well-analysed, relatively less attention has been devoted to the underlying supply chain serving the Asian market. A focus on the production value-added (VA) content of final demand will therefore provide a complementary picture of the region's market opportunities.

This Special Feature utilises the OECD's Trade in Value-Added (TiVA) database to identify the VA content of Asian final demand across 64 supplying countries and 34 supplying industries.

The first part of the analysis considers how shifts in Asia's final demand and production structures have led to changes in the VA capture across supplying industries, as highlighted by the orange boxes in Figure 1.

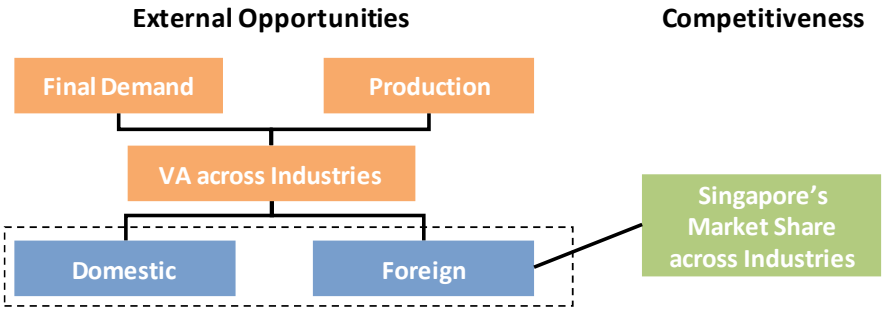
The second part analyses the distribution of the VA content of Asia's final demand across supplying countries. The VA content for each supplying industry is first separated into the portions that are domestically- and externally-sourced, as indicated by the blue boxes. The VA generated by a country accrues as domestic VA content if it is used to meet its own final demand, but as foreign VA content if it is channelled into final demand in any other country. Thereafter, this Feature considers the market share of external economies in foreign VA content, focusing in particular on Singapore, as indicated by the green box.

In the third part, the analytical framework is used to identify areas along the value chain where Singapore can tap on regional demand, given the growth potential of industries (based on trends in final demand, production structures and tradeability) as well as Singapore's revealed comparative advantage (RCA).

1 In this Special Feature, Asia refers to China, India and the ASEAN-5 economies consisting of Indonesia, Malaysia, the Philippines, Thailand and Vietnam.

2 Source: World Bank World Development Indicators. GDP is measured in US dollars, 2010 prices.

Figure 1
Components of a Foreign Country's VA Content in Asia's Final Demand



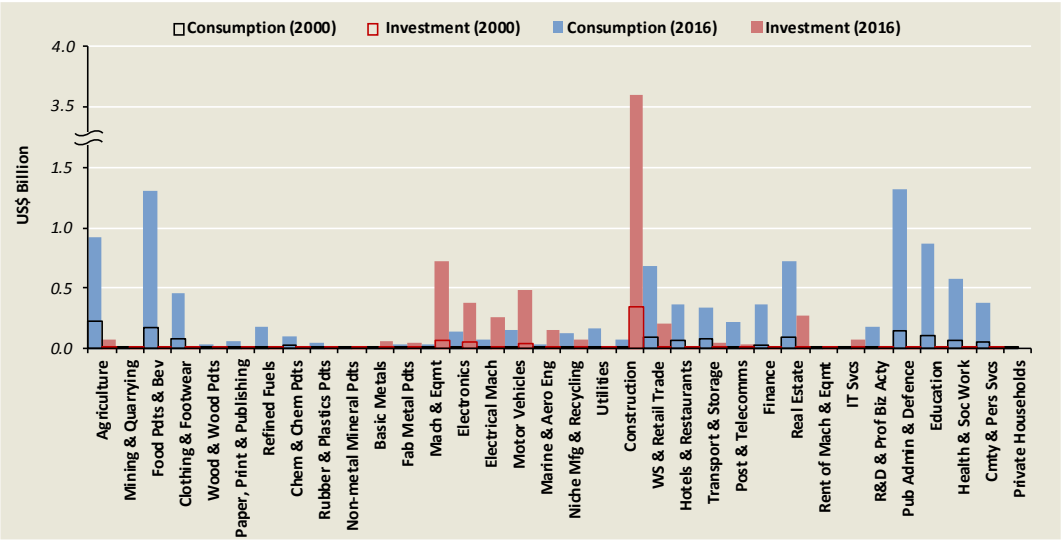
(I) From Final Demand To Value-Added Content Across Supplying Industries

Chart 1 shows how final demand was distributed across 34 industries, ranging from primary commodities (on the left) to downstream consumer services (on the right). The black (hollow) and blue (filled) bars represent consumption (household and government) in 2000 and 2016 respectively, while the hollow and filled bars in red represent business investment in 2000 and 2016 respectively.

While approximately a quarter of Asia's final consumption is still taken up by food-related necessities, spending on discretionary goods and services has risen substantially over the period. This includes expenditure on electronics and retail goods, as well as finance, hotels and restaurants, healthcare, and education.

Notwithstanding the rising importance of intangible assets (reflected in computer and R&D activities), the bulk of business investment spending continues to be on physical buildings and structures, as indicated by the significant jump in construction spending and, to a lesser extent, in machinery and equipment.

Chart 1
Asian Final Demand by Industry

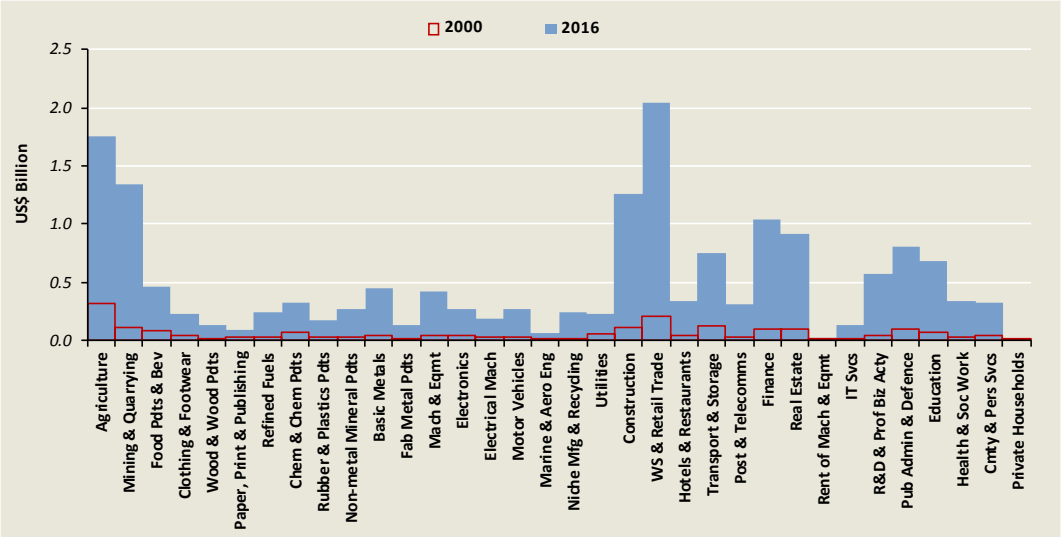


Source: OECD Inter-Country Input-Output Tables (2016) and EPG, MAS estimates

However, identifying market opportunities based solely on shifts in final demand can be misleading, as final products require intermediate inputs from other industries. The picture changes quite dramatically when the VA content of Asian final demand is examined, as depicted in Chart 2.

Although construction has the highest final demand, its dependence on other industries for raw materials implies that its VA content is much lower. Meanwhile, wholesale and retail trade emerges as the top industry in terms of VA generated, primarily due to the margins accruing to wholesale trading from across an entire range of goods and services.

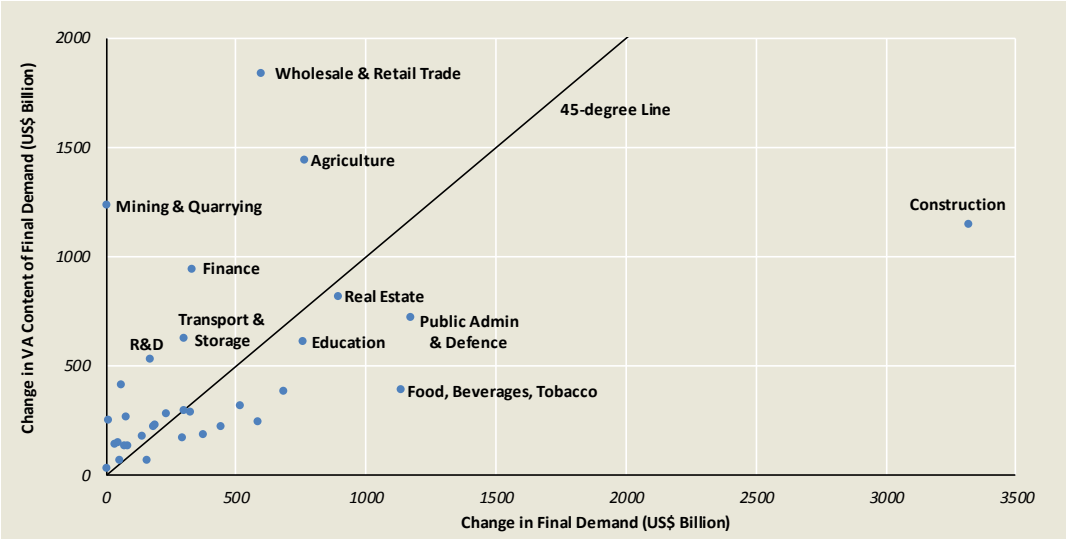
Chart 2
VA Content of Asian Final Demand by Supplying Industry



Source: OECD TiVA and EPG, MAS estimates

Chart 3 underscores this point by plotting the change in VA content supplied by industries against the change in final demand facing each industry over the period 2000 to 2016. Industries that provide significant intermediate inputs to other industries (i.e., are more upstream) lie above the 45-degree line, with the change in VA exceeding the increase in final demand. These include horizontal services such as finance, wholesale and retail trade, R&D and transport and storage, in addition to primary commodity industries, such as agriculture and mining and quarrying.

Chart 3
Change in VA Content versus Change in Final Demand (2000–16)



Source: OECD Inter-Country Input-Output Tables (2016), TiVA, and EPG, MAS estimates

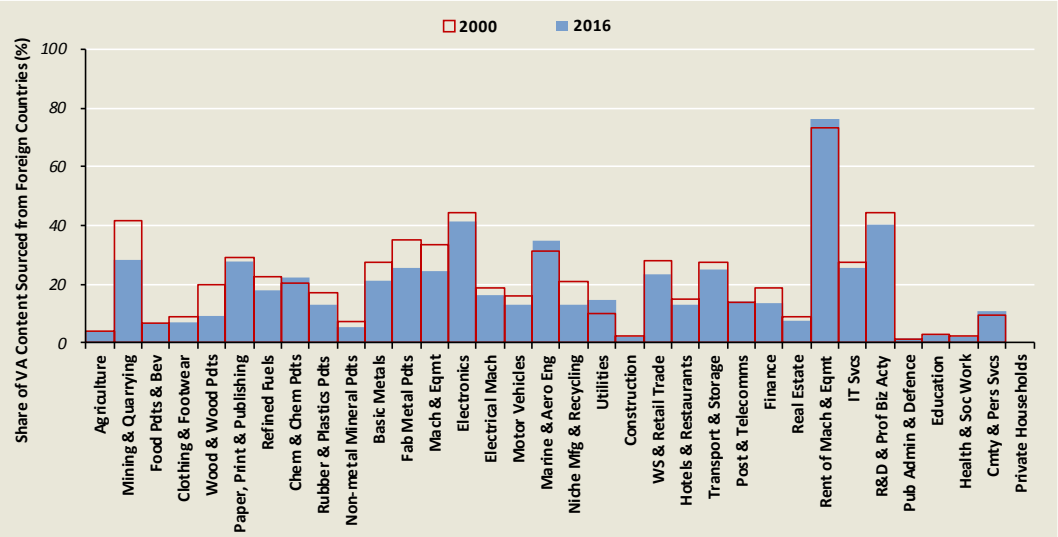
(II) Distribution Of VA Across Supplying Countries

Domestic versus Foreign VA

Having identified the industries with the highest VA content in Asian final demand, the next step is to ascertain how economies are positioning themselves across various segments of the supply chain. To analyse this, the VA content of final demand that is sourced domestically is first stripped out to obtain the share of foreign VA content. As of 2016, approximately 15% of VA embedded in Asia's final demand was not sourced domestically, although the share varies widely across industries, as seen in Chart 4.

The share of foreign VA content in each supplying industry reflects the intrinsic tradeability of output in each sector, with consumer-facing services sectors such as education and healthcare having a significantly lower share of foreign VA content compared to manufacturing sectors and modern services, such as IT services. It also reflects the ability of Asian economies to in-source parts of the value chain, given their natural endowments and developing capabilities. Notably, the foreign VA content of many manufacturing segments has declined since 2000, including machinery and equipment, alongside increasing industrialisation within the Asian economies themselves.

Chart 4
Share of Foreign VA Content across Supplying Industries



Source: OECD TiVA and EPG, MAS estimates

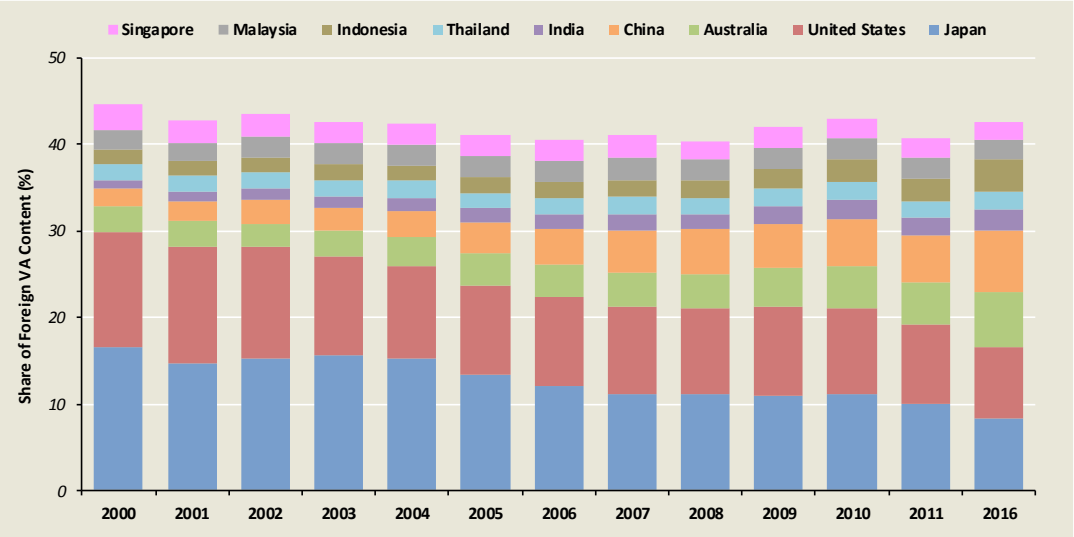
Source of Foreign VA

Chart 5 shows the market share of the top countries that supply foreign VA to Asia's final demand. Japan, the United States and China rank as the top three in terms of foreign VA content embedded in Asian final demand.

Over time, Chinese, Australian and Indonesian companies have gained significant ground at the expense of Japanese and American multinationals in the region. From 2000 to 2016, China's, Australia's and Indonesia's market shares in the Asian supply chain increased by 5.2%, 3.2% and 2.0% points, respectively, while those of Japan and the US declined by 8.2% and 5.0% points, respectively.

Meanwhile, Singapore's market share remained broadly stable over the decade at around 2–3%, supported largely by higher regional final demand, rather than deeper market penetration.

Chart 5
Country Market Share of Foreign VA Content



Source: OECD TiVA and EPG, MAS estimates

Note: OECD TiVA data is only available up to 2011. 2016 data has been projected by EPG, MAS.

Market Share and Revealed Comparative Advantage

Beyond these aggregate numbers, it would be useful to consider how each country's market share varies across industries. This will shed light on the country's comparative advantage within the regional supply chain.

Country *c*'s RCA in an industry is calculated by taking the ratio of (i) its market share of foreign VA (FVA) content in industry *i* to (ii) its overall market share in total FVA content embedded in Asian final demand:

$$RCA_{i,c} = \frac{FVA_{i,c}}{FVA_i} \div \frac{FVA_c}{FVA} \qquad (1)$$

This measure is commonly applied to gross exports, but further insights can be gleaned by applying it directly to value-added flows. An RCA larger than unity suggests that a country has a comparative advantage within a segment of the supply chain.

Conversely, a country's market share in a supplying industry can be obtained by multiplying its RCA in the industry by its overall market share in the region:

$$\frac{FVA_{i,c}}{FVA_i} = RCA_{i,c} \times \frac{FVA_c}{FVA} \qquad (2)$$

Table 1 shows the computed RCA scores for the group of top supplying countries across the various industries in 2016, with each country's overall market share included in the last row.[3] A green cell indicates that a country has a comparative advantage in the industry (RCA > 1), while a red cell indicates that it does not (RCA < 1). Cells shaded white indicate the break-even point, where RCA is equal to unity. Other than Singapore, the countries are ranked according to their market share.

Table 2 presents, in a similar format to Table 1, the change in RCA over 2000 to 2016. Green cells indicate an increase in RCA, while red cells show a decline.

[3] Using equation (2) above, a country's market share in a particular industry can be obtained by multiplying its RCA in the industry with its overall market share found in the last row of the table.

Table 1
Revealed Comparative Advantage in Supplying to Asian Final Demand, 2016

VA Source Industry	SGP	JPN	USA	CHN	SAU	DEU	KOR	IDN	IND	TWN	MYS	THA	HKG	GBR
Agriculture														
Mining & Quarrying														
Food Products & Beverages														
Clothing & Footwear														
Wood & Wood Products														
Paper, Print & Publishing														
Refined Fuels														
Chemicals & Chemical Products														
Rubber & Plastics Products														
Non-metal Mineral Products														
Basic Metals														
Fabricated Metal Products														
Machinery & Equipment														
Electronics														
Electrical Machinery														
Motor Vehicles														
Marine & Aero Engineering														
Niche Mfg & Recycling														
Utilities														
Construction														
Wholesale & Retail Trade														
Hotels & Restaurants														
Transport & Storage														
Post & Telecomms														
Finance														
Real Estate														
Rental of Machinery & Equipment														
IT Svcs														
R&D & Prof Business Activity														
Public Admin & Defence														
Education														
Health & Social Work														
Community & Personal Svcs														
2016 Overall Market Share (%)	**2.1**	**8.4**	**8.2**	**7.2**	**4.7**	**4.7**	**4.4**	**3.7**	**2.4**	**2.4**	**2.3**	**2.0**	**1.8**	**1.7**

Source: OECD TiVA and EPG, MAS estimates

Table 2
Change in Revealed Comparative Advantage in Supplying to Asian Final Demand (2000–16)

VA Source Industry	SGP	JPN	USA	CHN	SAU	DEU	KOR	IDN	IND	TWN	MYS	THA	HKG	GBR
Agriculture														
Mining & Quarrying														
Food Products & Beverages														
Clothing & Footwear														
Wood & Wood Products														
Paper, Print & Publishing														
Refined Fuels														
Chemicals & Chemical Products														
Rubber & Plastics Products														
Non-metal Mineral Products														
Basic Metals														
Fabricated Metal Products														
Machinery & Equipment														
Electronics														
Electrical Machinery														
Motor Vehicles														
Marine & Aero Engineering														
Niche Mfg & Recycling														
Utilities														
Construction														
Wholesale & Retail Trade														
Hotels & Restaurants														
Transport & Storage														
Post & Telecomms														
Finance														
Real Estate														
Rental of Machinery & Equipment														
IT Svcs														
R&D & Prof Business Activity														
Public Admin & Defence														
Education														
Health & Social Work														
Community & Personal Svcs														

Source: OECD TiVA and EPG, MAS estimates

Within the manufacturing sector, China has made significant inroads across segments ranging from basic manufactures to more sophisticated machinery and equipment over the past decade. The emerging ASEAN economies—Indonesia, Thailand and Malaysia—have maintained their comparative advantage in mid-tier manufacturing, with evidence of continued movement up the value chain (e.g., metal products and motor vehicles). The advanced economies—Japan, US, Germany, Korea, Taiwan and Singapore—retain a strong comparative advantage in higher-end manufacturing, including electronics.

Turning to trade-related services, Singapore, with its long history as an entrepôt, has a strong comparative advantage in the wholesale trade and transport and storage industries. The country has also established itself in some modern services industries, such as finance. Indeed, Singapore's RCA in finance increased sharply over 2000–16, alongside intensive efforts to develop as a key business and financial hub within the region.

In knowledge-intensive upstream business services, such as computer-related and R&D activities, Western economies such as the US, Germany and the UK continue to have a strong presence. India has the highest RCA in IT services, while Korea has also gained a comparative advantage in this area given its home-grown tech conglomerates.

Finally, for consumer-facing services, the US and the UK have the strongest advantage as education providers for students in the region. While Singapore remains an attractive destination for tourists from the region, as evidenced by the increase in RCA in hotels and restaurants, its attractiveness as a place for medical tourism has waned somewhat in relative terms.

(III) Singapore's VA Content

The analysis above shows that shifts in a country's value-added in any supplying industry serving Asia's final demand can be broken up into changes in:

(i) the VA content of the supplying industry, in turn linked to shifts in final demand and production structures;

(ii) the share of foreign VA content in the supplying industry;

(iii) the country's market share in each industry.

Table 3 brings these components together to analyse Singapore's VA content in Asian final demand, which amounted to 21.9% of its GDP in 2016. The bulk of this VA has accrued to hub-related services industries—namely wholesale and retail, transport and storage, and finance—owing to Singapore's strong comparative advantage in these areas as well as the upstream importance of these sectors to a broad range of final demand industries. At the same time, Singapore has also benefitted from specific clusters of high-end manufacturing, namely chemicals and electronics.

Singapore will need to maintain its strengths in advanced manufacturing and trade-related activities. With increasing digitalisation, upstream modern services sectors such as computer-related activities, R&D and other business activities will also continue to gain importance.

Based on the share of foreign VA content, these modern services sectors are also highly tradeable. Singapore does not yet have a strong RCA in these areas relative to its dominance in the traditional trade-related industries. In such knowledge-based industries, developing human capital is critical—continuous upgrading of Singapore's labour force alongside an appropriate strategy to attract skilled workers from abroad will be necessary. There are also opportunities to further develop Singapore's VA content in domestic-oriented services, such as education and healthcare, to cater to burgeoning regional demand. Capturing

this segment of the supply chain would likely require internationalisation, with companies moving beyond Singapore's shores for greater access to the region's domestic markets.

Finally, differences in RCA profiles between Singapore and neighbouring ASEAN countries (Table 1) indicate that there are significant opportunities for a complementary division of labour across the region. For instance, many regional economies have high RCAs in commodity- and manufacturing-related segments, while Singapore's comparative advantage lies primarily in the trade-related services. ASEAN's value as a regional production network can therefore be enhanced by leveraging on each economy's strengths.

Table 3
Factors Driving Singapore's VA Content in Asia's Final Demand, 2016

VA Source Industry	(1) Asia Final Demand (US$ Billion)	(2) VA Content of Asia Final Demand (US$ Billion)	(3) Share of VA Content Sourced from Foreign Countries (%)	(4) Singapore's Market Share (%)	(2) × (3) × (4) = (5) VA Content of Asia Final Demand from Singapore (US$ Billion)	(5) as Share of Singapore's GDP (%)
Agriculture						
Mining & Quarrying						
Food Products & Beverages						
Clothing & Footwear						
Wood & Wood Products						
Paper, Print & Publishing						
Refined Fuels						
Chemicals & Chemical Products						
Rubber & Plastics Products						
Non-metal Mineral Products						
Basic Metals						
Fabricated Metal Products						
Machinery & Equipment						
Electronics						
Electrical Machinery						
Motor Vehicles						
Marine & Aero Engineering						
Niche Mfg & Recycling						
Utilities						
Construction						
Wholesale & Retail Trade						
Hotels & Restaurants						
Transport & Storage						
Post & Telecomms						
Finance						
Real Estate						
Rental of Machinery & Equipment						
IT Svcs						
R&D & Prof Business Activity						
Public Admin & Defence						
Education						
Health & Social Work						
Community & Personal Svcs						

Source: OECD Inter-Country Input-Output Tables (2016), TiVA, and EPG, MAS estimates

Special Feature B

The Impact Of Technological Progress On Inflation: A Review

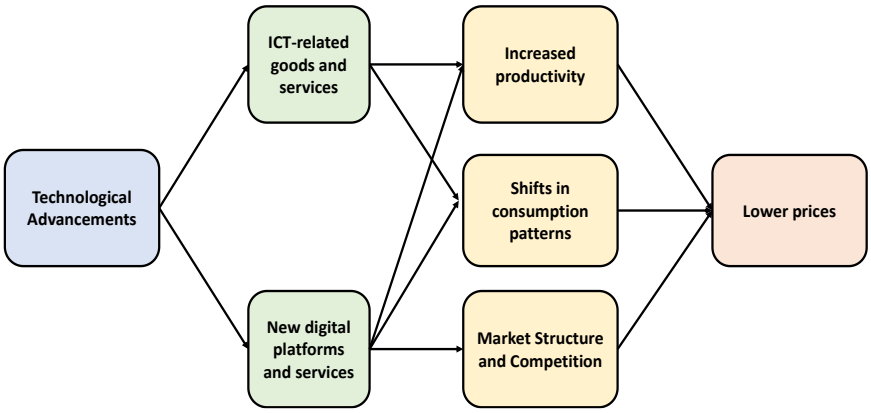
Introduction

Inflationary pressures in both advanced and developing economies have been relatively muted since the Global Financial Crisis despite firming economic growth and rising resource utilisation. This 'missing inflation' puzzle has generated much debate on the possible contributing factors, including shifts in price dynamics driven by technological advances.

This Special Feature reviews the literature and empirical research, and attempts to identify the channels through which technological progress can influence the price-setting behaviour of firms. It also draws out the implications for inflation dynamics, making reference to Singapore where applicable.

There are two main channels through which technology can affect price dynamics. (Figure 1) In the first instance, advances in technology can directly lower the prices of ICT-related goods and services. Second, technological change can indirectly influence prices by changing consumer behaviour, market structure and competition.

Figure 1
Channels Through Which Technological Change Influences Prices



The Direct Channel

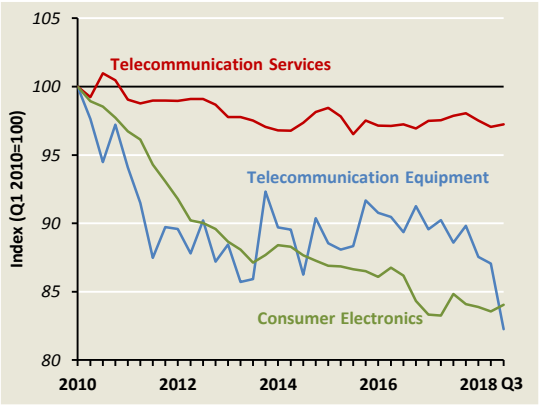
Advances in technology have contributed directly to a decline in the prices of ICT-related goods and services over time. Part of this is due to increased productivity as a result of continuous technological innovation, as embodied in, for example, the oft-cited Moore's Law.[1] At the same time, it reflects relative price adjustments as consumption patterns shift in response to advances in technology. For example, consumers are increasingly switching from cable television services to subscription-based online streaming services such as Netflix. New products that subsume a range of functions performed by other goods or replace older goods completely have

[1] Moore's Law refers to the empirical observation that computer processing speeds roughly double each year while costs halve.

also emerged. For example, Varian (2016) notes that the smartphone is a substitute for a range of goods, including cameras, GPS devices and personal computers. To the extent that tech cycles outpace the incorporation of new products and services into price statistics, reduced demand for 'transition' goods and services that are being replaced may imply a downward bias in price measures for such products, potentially suppressing inflation in the aggregate (Mersch, 2017; Goolsbee and Klenow, 2018).

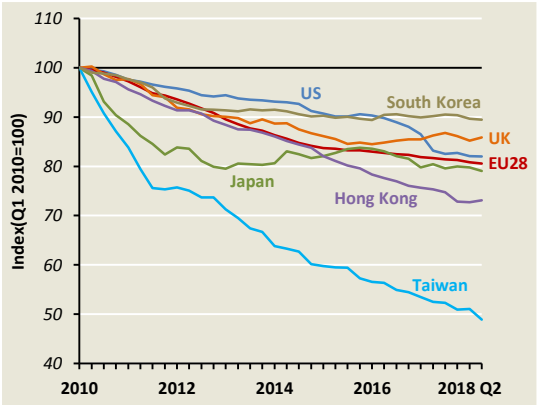
In line with broader price developments elsewhere, the prices of ICT-related goods and services in Singapore have trended down over the years.[2] (Charts 1a and 1b) For example, the prices of consumer electronics, which include audio-visual equipment (photographic goods, television sets etc.) and information processing equipment (personal computers, software and other computer peripherals) have fallen by 16% since 2010. The cost of telecommunication equipment saw a similar decline, reflecting advances in computing power and production technologies underpinning the 'smartphone revolution' that has made access to smartphones ubiquitous since the launch of the first Apple iPhone in 2007. Prices of telecommunication services have been likewise driven down by expansions in network capacity and competition among service providers as Singapore progressively deregulated its telecommunications sector.

Chart 1a
Price Indices of ICT-related Goods and Services in Singapore



Source: EPG, MAS estimates

Chart 1b
Comparison of Price Indices of ICT-related Goods and Services Across Countries



Source: National statistical agencies, Haver Analytics and EPG, MAS estimates

The Indirect Channel

The second, indirect channel through which technology can affect inflation is through its influence on consumer behaviour, market structure and competition. This is most evident in the emergence of online platforms that have altered consumer behaviour, such as social networks and ride-hailing. The increasing shift towards e-commerce has also been presented as a key force that is transforming retail markets, with broader implications for price-setting behaviour and inflation outcomes. E-commerce lowers the costs of gathering information on prices and product offerings across sellers, allowing consumers to observe more easily the distribution of product prices and verify the quality of the products they intend to purchase.

The widespread availability of price and product information online should, in theory, reduce the pricing power of sellers by making it costless for

[2] The Riksbank (2015) and the Bank of Canada (2017) have documented a similar decline in ICT-related CPI components over the past two decades for Sweden and Canada, respectively. The components of the 'ICT-related' category in Charts 1a and 1b above were selected to match those used in the above studies as closely as possible. However, certain CPI components intended to capture the effect of digitalisation on traditional goods, such as reading materials and textbooks, were excluded from the analysis.

consumers to seek a better price and greater variety elsewhere. Conversely, for sellers, the ability to change prices nearly instantaneously online lowers 'menu' costs, allowing prices to adjust more flexibly in response to shifts in demand and supply. The transparency of online platforms also enables sellers to quickly assess the demand for their own products and the pricing decisions of their competitors, which improves market efficiency (Lieber and Syverson, 2012). Online retailers typically have lower fixed cost structures compared to their brick-and-mortar counterparts, and are able to minimise inventory holding costs. They are also able to submit orders to wholesalers and third-party providers for processing and shipping directly to consumers, thus reducing distribution costs.

Through increased competition as a result of greater transparency in online markets, as well as lower overhead and distribution costs, e-commerce can act to reduce prices online. There is empirical evidence from studies of specific markets ranging from life insurance (Brown and Goolsbee, 2002), airlines (Sengupta and Wiggins, 2006; Itai and Orlov, 2015) to bookstores (Brynjolfsson and Smith, 2000) that online prices tend to be lower than those offline. At the aggregate level, some studies find that e-commerce has had a modest disinflationary impact. The European Central Bank (2017) found that increasing e-commerce adoption had a small but statistically significant effect on inflation, such that a one percentage point increase in the number of individuals looking for goods and services online contributed to a 0.025 percentage point decline in annual non-energy industrial goods inflation across the EU countries in their sample. This in turn translated into a 0.1% point decrease in inflation each year from 2003–15.

Popular accounts cite competition between online and brick-and-mortar retailers—or the 'Amazon Effect'—as having eroded retail mark-ups, placing downward pressure on prices. Analysing a large sample of products sold by Walmart and other large retailers in the US that sell both online and offline, Cavallo (2018) showed that products that were more easily found on Amazon exhibited more frequent price changes and were also more likely to be uniform across geographical locations. Moreover, the similarity in the pricing of online and offline products could reflect the use of algorithmic pricing strategies and the ability to monitor competitors' prices constantly online.

Distance is now also a less important source of friction for exchange in e-commerce markets. Lower search costs online and the ability to ship directly to consumers enable online retailers to expand their reach, while making it harder for retailers to corner geographically segmented markets (Lieber and Syverson, 2012). This increasing contestability of domestic markets through online channels can be seen as having parallels to the 'unbundling' of production into global value chains over the past decade (Baldwin, 2017).

The entry of foreign online retailers can intensify retail competition by allowing consumers and businesses to bypass local intermediaries in purchasing from sellers abroad, placing downward pressure on the margins of domestic retailers (Reserve Bank of Australia, 2016). Retailers based offshore may enjoy a cost advantage *vis-à-vis* domestic retailers, and by aggregating demand over a larger market, are able to offer a greater variety of goods compared to their domestic counterparts. Indeed, greater choice online and the lack of local availability are among the top reasons cited by Singaporeans for buying from foreign e-commerce sites.[3]

Relatively thinner mark-ups for online retailers[4], and the effects of online competition on the margins of traditional retailers could increase the sensitivity of prices to cost shocks. Consistent with a growing body of research studying the

[3] In a survey by BP Post International published on Export.gov, a market intelligence portal for US companies exporting abroad by the US Commercial Service, 48% of Singaporean respondents indicated that greater choice was the reason for their purchases from foreign e-commerce sites. The other top reasons mentioned were the lack of local availability, lower cost, better discounts and a strong Singapore dollar.

[4] Comparing the profit margins of Amazon (less than 4%) and Walmart (more than 20%), Gorodnichenko (2018) notes that significantly smaller profit margins of online-only retailers could reflect more intense price competition in e-commerce markets.

properties of online prices, Gorodnichenko and Talavera (2017) found that the pass-through of exchange rate movements to prices online was significantly higher at 60–75% compared to estimates of 20–40% for goods sold in regular stores. They attributed the relatively higher rate of exchange rate pass-through to the lower share of non-tradable costs in e-commerce transactions, as well as the more flexible adjustment of prices online. Comparing matched-product prices across countries scraped from the web, Cavallo (2018) similarly documents a sizeable increase in the impact of exchange rate movements on relative price levels over time for the US, with the magnitude of pass-through into relative prices over a two-year horizon (44%) significantly higher than estimates in other studies using retail CPI data, and approaching those of direct imports at the border.

Although they are more flexible compared to prices posted by brick-and-mortar stores, online prices can also be sticky for extended durations. In addition, they tend to adjust by a similar magnitude to offline prices, and there is little evidence of 'dynamic pricing', where sellers adjust their prices at a high frequency in response to changes in demand and supply conditions (Gorodnichenko *et al.,* 2017).

Gorodnichenko (2018) highlights the two-way strategic interactions between online and offline retailers as a potential explanation for this behaviour, noting that even as the share of retail spending on e-commerce rises, the continued presence of traditional brick-and-mortar retailers could constrain the ability of online retailers to set prices that differ too significantly.

The studies cited also note that despite reduced search costs and a greater degree of flexibility, there is still a significant degree of dispersion in prices online, even within narrowly-defined product categories. While part of this variation arises from differentiation across seller types and product quality, sellers can also manipulate the search process to insulate themselves from competition online (Goldfarb and Tucker, 2017).

For example, retailers can obfuscate their prices online by employing 'bait-and-switch' pricing strategies that attract consumers with lower-priced products before showing them more expensive or higher-quality items, or by withholding information on shipping fees and other 'add-on' costs (Ellison and Ellison, 2009; Hossain and Morgan, 2006). Recent allegations of unfair pricing practices by large online retailers and price search engines [5] have also raised concerns that the network and scale economies enjoyed by dominant online platforms could result in 'lock-in' that stifles competition (Levin, 2011).

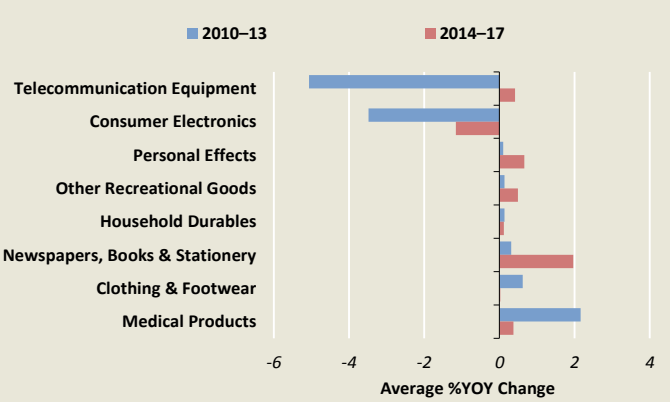
[5] Notably, the European Commission ruled in June 2017 that Google had violated anti-trust regulations by giving its own comparison shopping service an illegal advantage over other web listings. More recently, the EU Competition Commission launched a preliminary investigation into whether Amazon's collection of data on the activities of third-party merchants on its platform gave an unfair advantage to its own e-commerce business in September 2018 (Drozdiak and McLaughlin, 2018).

E-Commerce And Price Dynamics In Singapore

There has been a significant rise in e-commerce penetration in Singapore. According to the IMDA annual *Survey on Infocomm Usage in Households and Individuals*, the percentage of internet users indicating that they had purchased goods online rose from 8% in 2012 to 55% in 2017. While the share of online sales as a fraction of total retail sales remains relatively small at 4.6% as of August 2018[6], it is projected to grow. In particular, growth in online purchases has been concentrated in certain categories of retail goods, such as clothing and electronic equipment, consistent with trends in other developed countries.[7]

The Singapore Department of Statistics has progressively incorporated online prices for items commonly purchased through online channels, such as travel products and apparel, into the CPI. While there are indications that the retail categories which have seen greater e-commerce penetration have also experienced lower inflation, a broader comparison of inflation rates across the main categories of retail goods does not suggest that retail price inflation has been significantly lower in recent years. (Chart 2)

Chart 2
Selected Components
of Retail Goods Inflation in Singapore

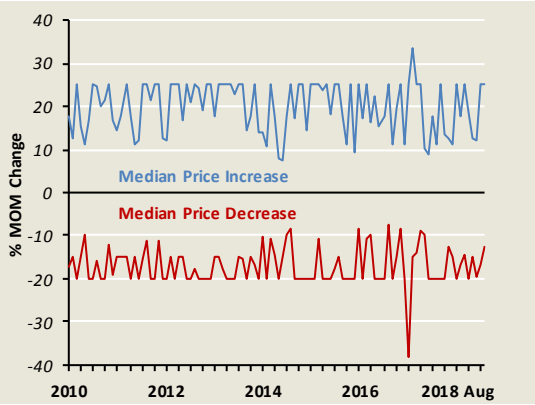


Examining individual price observations sampled in the CPI also suggests that the size of price changes for retail goods has remained largely stable. For instance, the median size of m-o-m percentage price changes for items in the 'Clothing & Footwear' CPI has remained remarkably stable over 2010 to 2017, despite accounts of intense competition between online and offline retailers in this product segment. (Chart 3a) At the same time, the percentage of observations experiencing price changes from the previous month fell for the 'Clothing & Footwear' segment, although it has generally risen across other categories of retail goods in recent years—which appears less consistent with increased price flexibility due to online-offline competition. (Chart 3b) There is thus limited *prima facie* evidence from the CPI microdata that the price-setting behaviour of domestic retailers has changed significantly in response to increasing e-commerce penetration.

6 This figure cited in the press release of the August 2018 Retail Sales Index by DOS is likely to represent a lower-bound estimate of the share of online purchases as it excludes cross-border online transactions. Estimates by Forrester Research cited in the Export.gov report indicate that up to 60% of Singapore's e-commerce sales are from cross-border transactions.

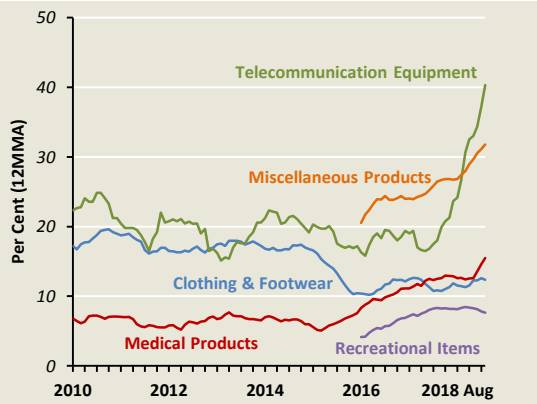
7 See, for example, Eurostat (2017).

Chart 3a
Median Price Changes of Items in the Clothing & Footwear CPI in Singapore



Note: Denotes the median m-on-m percentage price increase (decrease) of the total number of observations with price increases (decreases).

Chart 3b
Frequency of Price Changes for Selected Retail Goods in Singapore



Note: Computed as the unweighted percentage of price observations with non-zero price changes from the previous month over the total number of price observations. The 'Miscellaneous Products' category includes personal effects and personal care products, as well as alcohol & tobacco.

Emergence Of 'Near-Instant' Services Platforms

Apart from e-commerce, the emergence of large online platforms can reshape consumer behaviour and potentially influence longer-term price trends. New platforms that enable the offering of 'near-instant services', such as ride-hailing apps Grab and Uber (DotEcon, 2015) that challenge, and sometimes displace, incumbent players in the market can lower inflation through increased competition.

In Singapore, the average number of daily taxi trips per driver has fallen steeply in the years since Uber entered the domestic ride-hailing market in 2013, possibly on account of the intense competition between ride-hailing apps and traditional taxi operators.[8] (Chart 4a) While the long-run impact on fares is indeterminate, especially if ride-sharing companies manage to dominate the market and acquire substantial pricing power, consumers currently enjoy an expanded range of travel options, as well as an effective reduction in fares. Indeed, the rate of increase in taxi fares has been muted at an average of 0.3% y-o-y over Q1 2013 – Q3 2018, a significant step-down from 5.1% in 2008–2012. (Chart 4b) In addition to the impact on transport services inflation, the ubiquity of ride-hailing services has also shaped consumer perceptions about car ownership and transportation. The results of a survey by the Public Transport Council conducted in 2018 highlighted how Singaporeans were increasingly using ride-hailing services, with the proportion of respondents who took a private-hire car in the past seven days rising significantly to 70.5% in 2017 from 50% in 2016.

The shift towards ride-hailing services could arguably lower private road transport inflation in the longer term, as it is analogous to a positive productivity shock. The effective supply of transportation services provided for a given car or taxi fleet size is increased, since ride-sharing firms typically have higher utilisation rates per vehicle (Cramer and Krueger, 2016). Anecdotally, other service business models are similarly facing disruption. For instance, 'new-delivery' services such as UberEats and Deliveroo that aggregate customer orders online and coordinate delivery

[8] In Singapore, ride-hailing service providers such as Grab maintain fleets of rental vehicles through subsidiaries that are leased to drivers providing chauffeured private-hire car services. As of August 2018, the population of private-hire cars was 66,998, more than triple the size of the taxi fleet (21,366). See Tan (2018).

logistics for restaurants are likely to see rapid growth in the near future, even though fewer than 30% of food orders are estimated to be made online today (McKinsey, 2017). This could have implications for prices in the F&B industry, given that 'new-delivery' services allow establishments that did not traditionally offer catering services, such as hawker stalls and high-end restaurants, to access consumers through online channels. In a similar vein, AirBnB, which allows property owners to 'home-share' with guests, has led to an expansion of accommodation options that are cheaper than hotels.

Chart 4a
Average Number of Taxi Trips Daily and Rental Car Population in Singapore

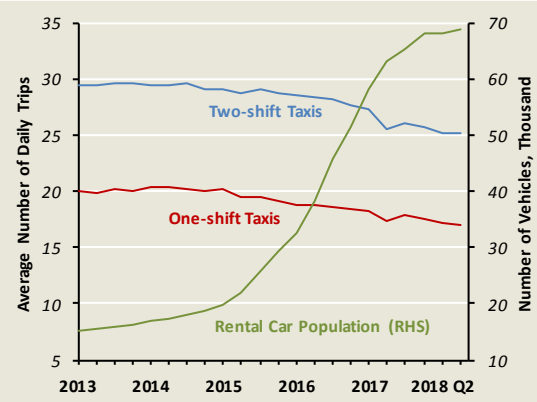
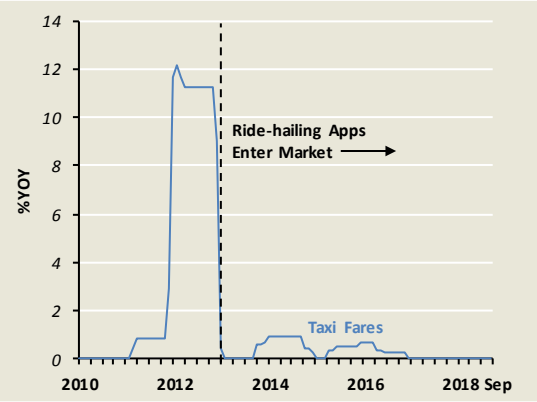


Chart 4b
CPI for Taxi Fares in Singapore



Sum-Up

Changes in price-setting behaviour by firms and consumption patterns as a result of technological progress can potentially influence inflation dynamics. More broadly, technology has fundamentally changed consumer purchasing habits, with its attendant implications for price-setting and inflation, as the shift towards e-commerce and disintermediation in retail continues apace.

The characteristics of online retail platforms—the ease of search and price comparison, less costly price adjustment for retailers and the removal of geographical barriers between consumers and businesses—have raised the possibility that inflation could respond more quickly to price and cost shocks. In particular, the influence of external factors on domestic inflation and the degree of exchange rate pass-through could change as global markets become increasingly interlinked, especially given that the share of cross-border e-commerce sales is likely to rise in Singapore. For instance, prices of goods sold online tend to be more responsive to movements in the exchange rate, while competitive factors such as the entry of foreign online retailers could potentially explain why changes in retail prices diverge from corresponding movements in import prices.

The shift towards less labour-intensive e-commerce retailing models, as well as the realisation of productivity gains through the reduction of costs associated with transactions, inventory management and advertising online could also have implications for the responsiveness of inflation to domestic slack.

Furthermore, 'near-instant' services platforms may result in changes in consumption patterns that can shape longer-term price trends. In Singapore, there is some indication that e-commerce and the emergence of new digital platforms are placing downward pressure on consumer prices in certain segments through shifts in market structure and increased competition. However, current empirical evidence does not provide a clear indication of a structural decline in inflation going forward.

References

Baldwin, R (2017), "Old, New and Future Globalisation: Understanding the Changes from a Broader Perspective", *Macroeconomic Review*, Vol. XVI(2), pp. 90–96.

Bank of Canada (2017), "Digitalization and Inflation: A Review of the Literature", *Staff Analytical Note* No. 2017–20.

Brown, J R and Goolsbee, A (2002), "Does the Internet Make Markets More Competitive? Evidence from the Life Insurance Industry", *Journal of Political Economy*, Vol. 110(3), pp. 481–507.

Brynjolfsson, E and Smith, M D (2000), "Frictionless Commerce? A Comparison of Internet and Conventional Retailers", *Management Science*, Vol. 46(4), pp. 563–585.

Cavallo, A (2017), "Are Online and Offline Prices Similar? Evidence from Large Multi-Channel Retailers", *American Economic Review*, Vol. 107(1), pp. 283–303.

Cavallo, A (2018), "More Amazon Effects: Online Competition and Pricing Behaviours", Paper presented at Federal Reserve Bank of Kansas City 2018 Economic Symposium on 'Changing Market Structures and Implications for Monetary Policy', Jackson Hole, Wyoming, August.

Cramer, J and Krueger, A B (2016), "Disruptive Change in the Taxi Business: The Case of Uber", *NBER Working Paper* No. 22083.

DotEcon Ltd (2015), *E-commerce and Its Impact on Competition Policy and Law in Singapore*, (URL: www.dotecon.com/assets/images/DotEcon-Ecommerce-Final-Report.pdf).

Drozdiak, N and McLaughlin, D (2018), "With Amazon Probe, EU Takes Cue from 'Hipster' Antitrust", *Bloomberg Technology*, September 20.

Ellison, G and Ellison, S F (2009), "Search, Obfuscation, and Price Elasticities on the Internet", *Econometrica*, Vol. 77(2), pp. 427–452.

European Central Bank (2017), "Low Inflation in the Euro Area: Causes and Consequences", *Occasional Paper Series* No. 181, pp. 71–72.

European Commission (2017), "Antitrust: Commission Fines Google €2.42 Billion for Abusing Dominance as Search Engine by Giving Illegal Advantage to Own Comparison Shopping Service", Press release by the European Commission, June 27.

Eurostat (2017), "E-commerce Statistics for Individuals", (URL: https://ec.europa.eu/eurostat/statistics-explained/index.php/E-commerce_statistics_for_individuals).

Goldfarb, A and Tucker, C (2017), "Digital Economics", *NBER Working Paper* No. 23684.

Goolsbee, A D and Klenow, P J (2018), "Internet Rising, Prices Falling: Measuring Inflation in a World of E-Commerce", *AEA Papers and Proceedings*, Vol. 108, pp. 488–492.

Gorodnichenko, Y (2018), "'More Amazon Effects: Online Competition and Pricing Behavior' by Alberto Cavallo, Discussion by Yuriy Gorodnichenko (UC Berkeley and NBER)", Remarks at Federal Reserve Bank of Kansas City 2018 Economic Symposium on 'Changing Market Structures and Implications for Monetary Policy', Jackson Hole, Wyoming, August 24.

Gorodnichenko, Y, Sheremirov, V and Talavera, O (2017), "Price Setting in Online Markets: Does IT Click?", *Journal of the European Economic Association*, forthcoming.

Gorodnichenko, Y and Talavera, O (2017), "Price Setting in Online Markets: Basic Facts, International Comparisons and Cross-Border Integration", *American Economic Review*, Vol. 107(1), pp. 249–282.

Hossain, T and Morgan, J (2006), "…Plus Shipping and Handling: Revenue (Non) Equivalence in Field Experiments on E-Bay", *Advances in Economic Analysis & Policy*, Vol. 6(2), pp. 1–27.

Itai, A and Orlov, E (2015), "The Effect of the Internet of Performance and Quality: Evidence from the Airline Industry", *Review of Economics and Statistics*, Vol. 97(1), pp. 180–194.

Levin, J D (2011), "The Economics of Internet Markets", *NBER Working Paper* No. 16852.

Lieber, E and Syverson, C (2012), "Online Versus Offline Competition", pp. 189–223, in Peitz, M and Waldfogel, J (eds.), *The Oxford Handbook of the Digital Economy*, Oxford University Press.

Mersch, Y (2017), "Central Banking in Times of Technological Progress", Speech at Bank Negara Malaysia Conference on 'Monetary Policy 2.0?', Kuala Lumpur, July 24.

McKinsey (2016), "The Changing Market for Food Delivery", (URL: https://www.mckinsey.com/industries/high-tech/our-insights/the-changing-market-for-food-delivery).

Public Transport Council (2018), "Point to Point Customer Satisfaction Survey (PCSS) 2017 Press Release", Press release by the Public Transport Council, February 23.

Reserve Bank of Australia (2016), "Why Has Retail Inflation Been So Low?", *RBA Bulletin – June Quarter 2016*, pp. 9–17.

Riksbank (2015), "Digitisation and Inflation", *Monetary Policy Report*, February, pp. 55–59.

Sengupta, A and Wiggins, S N (2006), "Airline Pricing, Price Dispersion, and Ticket Characteristics On and Off the Internet", *American Economic Journal: Economic Policy*, Vol. 6(1), pp. 272–307.

Singapore Department of Statistics (2016), "Experiences with the Use of Online Prices in Consumer Price Index", *Statistics Singapore Newsletter September 2016*, pp. 2–4.

Singapore Department of Statistics (2018), "Retail Sales Index and Food & Beverage Services Index, August 2018", Press release by the Singapore Department of Statistics, October 12.

Tan, C (2018), "Taxi Fleet Smallest in Over 10 Years", *The Straits Times*, February 8.

US Commercial Service (2018), "Singapore Country Commercial Guide: Singapore - eCommerce", (URL: https://www.export.gov/article?id=Singapore-eCommerce).

Varian, H (2016), "A Microeconomist Looks at Productivity: A View from the Valley", Presentation at Brookings Institution, Washington DC, September 8.

Special Feature C

Understanding Current US Trade Policy Through The Lens Of History

by Douglas A. Irwin[1]

Introduction

The trade policy of the Trump administration has generated consternation around the world. There is widespread concern that the United States is not just moving in a protectionist direction, but actually stepping back from its traditional role as supporter of the multilateral trading system.

A deeper question is how to understand these developments in the context of past US policy. How unusual are the trade policies of the current administration? Are there points of continuity with the past, or does the Trump administration's approach mark a permanent break in post-World War II policy?

In my recent book, *Clashing over Commerce: A History of US Trade Policy*, I examine nearly 250 years of American history and try to understand the forces that have shaped that policy over time. This essay will attempt to distil some of the lessons from that history as a way of shedding light on current developments.

The Three R's Of US Trade Policy

Over the course of history, US trade policy—specifically, the tariffs imposed on imported goods—has been directed towards achieving three principal objectives: raising revenue for the federal government, restricting imports to protect domestic producers from foreign competition, and concluding reciprocity agreements to reduce trade barriers and expand exports. These three R's—revenue, restriction, and reciprocity—have been the main purposes of US trade policy.

All three policy goals have been important throughout US history, and all of them can be seen as playing a part in US trade policy today. The use of tariffs to restrict imports is clearly evident from the protection recently given to steel and aluminium producers. The President has also stressed the importance of making trade agreements more 'reciprocal', even if his goal of getting a 'better deal' remains vague. And even though revenue has been a less important trade policy objective since the introduction of the income tax in 1913, President Trump has tweeted that the United States cannot lose by imposing tariffs since they will increase the revenue flowing into the government's coffers, even if they fail to produce a better deal with other countries.

Of course, revenue, restriction, and reciprocity as trade policy goals, are, at some level, incompatible. The desire to impose tariffs to raise revenue conflicts with their ability to protect domestic producers: modest duties on imports raise more revenue but offer less protection. And if one wants to keep protective tariffs in place, reciprocity agreements to reduce trade barriers become difficult to achieve.

[1] Douglas A. Irwin is the John French Professor of Economics at Dartmouth College. The views in this article are solely those of the author and should not be attributed to MAS.

Therefore, policymakers have to choose which of the three objectives is given priority at any point in time. My book describes how US trade policy can be divided into three eras, in each of which one of the objectives has taken precedence.

In the first era, from the establishment of the federal government until the Civil War (1789–1860), revenue was the key objective of trade policy. In the second era, from the Civil War until the Great Depression (1861–1933), the restriction of imports to protect domestic producers from foreign competition was the primary goal of trade policy. In the third era, from the Great Depression to the present (1934–today), reciprocal trade agreements to reduce tariff and non-tariff barriers to trade have been the main priority.

Given that revenue is no longer a major consideration in trade policy, how have policies of restriction and reciprocity been used in the past and how are things different today?

Early Trade Debates

From the start of the United States, there has been discussion about restriction and reciprocity as goals for trade policy. Two early government reports set the stage for the subsequent debate.

In 1791, Treasury Secretary Alexander Hamilton's famous *Report on the Subject of Manufactures* focused on whether the government should intervene to support certain industries or should refrain from doing so and pursue a *laissez-faire* policy. His report ranks among the most important policy documents in US history. Hamilton made a broad-ranging and powerful case for government promotion of domestic manufacturing, providing not only theoretical justifications for such a policy but specific proposals for action as well. The *Report on Manufactures* influenced the public debate over trade policy and the government's role in promoting manufactures for many decades to come, and to this day one still finds mention of Hamilton's report to justify government protection of certain industries.

The goal of reciprocity in trade relations has an equally long tradition in American history. The country's desire for reciprocity in trade goes back to the country's quest for independence. Among the many grievances cited in the *Declaration of Independence* in 1776 was a complaint about Britain's "cutting off our trade with all parts of the world" through its mercantilist regulations.

The reciprocity counterpart to Hamilton's report was Secretary of State Thomas Jefferson's *Report on Commercial Restrictions* in 1793. This report extolled the idea of free trade but documented the numerous barriers placed on American goods and ships in foreign markets. Jefferson's preferred course of action was 'friendly arrangements' to remove such barriers to trade. But, he argued, "should any nation, contrary to our wishes, suppose it may better find its advantage by continuing its system of prohibitions, duties, and regulations, it behooves us to protect our citizens, their commerce, and navigation, by counter prohibitions, duties, and regulations." He concluded: "Free commerce and navigation are not to be given in exchange for restrictions and vexations, nor are they likely to produce a relaxation of them." Thus, Jefferson proposed reciprocity by retaliation: "Where a nation imposed high duties on our productions, or prohibits them altogether, it may be proper for us to do the same by theirs."

As with Hamilton's report, one can still hear echoes of Jefferson in today's policy discussions. The US Trade Representative releases an annual report, the *National Trade Estimate Report on Foreign Trade Barriers*, that is remarkably similar to Jefferson's report. With respect to China today, the United States is conditioning access to its open market on negotiations to achieve reciprocal access, with the threats of reprisals in case no agreement is forthcoming. This is also reminiscent of US policy with respect to Japan in the 1980s when a similar tactic was employed.

Restriction

The Hamilton and Jefferson reports outlined different strategies that US trade policy could follow. Despite being widely discussed at the time, these reports did not have much impact on actual policy. The balance of power of political

forces in Congress determines policy outcomes, rather than lofty goals set out in high-minded reports.

In fact, trade policy has been the source of bitter political conflict throughout American history. This conflict has been fierce because dollars and jobs are at stake: depending on the policy outcome, some industries, farmers, and workers will suffer, while others will prosper. Trade policy therefore involves a struggle that pits different segments of society and regions of the country against one another. They play out this fight in Congress, which remains, to a large extent, the focal point of trade policymaking in Washington DC.

This conflict is nowhere more evident than in the case of restriction, using tariffs to protect certain industries from foreign competition. In that case, the interests of the protected industry are pitted against the interests of consumers and exporters. As James Madison, one of the American founding fathers, wrote in *Federalist No. 10*: "'Shall domestic manufactures be encouraged, and in what degree, by restrictions on foreign manufactures?' are questions which would be differently decided by the landed and the manufacturing classes, and probably by neither with a sole regard to justice and the public good." As Madison hints, the decision to impose restrictive tariffs is less the result of philosophical theorising than the outcome of special interest politics.

Political and economic geography are key determinants of power in Congress. Different regions of the country specialise in different economic activities, the location of which is persistent. For more than two centuries, cotton has been produced in Mississippi, tobacco in Kentucky and North Carolina, iron and steel in Pennsylvania, and so forth. These specialised regions have sharply different interests with respect to trade: some produce goods that are exported, while others produce goods facing competition from imports. The export-oriented industries have an interest in open trade through reciprocity agreements, whereas import-competing producers have an interest in limiting trade through protectionist tariffs. In representing these different regions, members of Congress usually vote on legislation according to the interests of their constituents, giving rise to regional voting patterns in Congress.

For much of the nation's history, the most important geographic divide over trade policy has been a North-South one. A manufacturing belt stretching across the North developed in the early and mid-nineteenth century, where cotton textiles and iron and steel were produced. These industries usually faced competition from imports and wanted high tariffs. Meanwhile, the South was the home of agricultural crops such as cotton and tobacco, both of which were exported, and these farmers wanted low tariffs. The restriction era—the period from 1861 to 1933—emerged because the Civil War redistributed political power between the different regions of the country, empowering the North at the expense of the South.

The political geography of trade policy continues to matter for Congressional decisions today. When President Trump considered withdrawing from the North American Free Trade Agreement in early 2017, he was reminded by his political advisers that many Republican members of Congress from the agricultural states of the Midwest supported the trade agreement because it granted them greater access to the Mexican market for corn, wheat, and soybeans. Without the support of Congress, any president will have difficulty making progress on his or her trade policy agenda.

Reciprocity

The shift towards reciprocity came in the mid-1930s in the wake of the disastrous Smoot-Hawley tariff of 1930. That was an opening salvo in a trade war that occurred as the world was sinking into the Great Depression. The result was a worldwide increase in trade barriers and retaliatory action against the United States specifically, resulting in widespread discrimination against US exports around the world.

The shift to reciprocity occurred because of a political realignment that took place with the 1932 election. In the midst of the Great Depression, the Democratic party, with its strong ties to the South, overwhelmed the Republican party, with its strong ties to the North. Cordell

Hull, the new Secretary of State in the Franklin Roosevelt administration, believed that trade friction between countries bred political friction and conflict, including World War I. He convinced Congress to pass the Reciprocal Trade Agreements Act of 1934 (RTAA), a landmark piece of legislation which gave the president the authority to reduce tariffs in trade agreements with other countries. Hull's main goal was to eliminate foreign discrimination against US exports. Hull called Imperial Preference—the trade bloc formed by Britain, Canada, and members of the Commonwealth and largely aimed at excluding the United States—"the greatest injury, in a commercial way, that has been inflicted on this country since I have been in public life."

The RTAA changed the politics of US trade policy. The locus of trade policy decision-making shifted from the legislative branch, which had proven susceptible to special interest politics and thus biased in favour of higher tariffs, to the executive branch, which tended to link trade policy to foreign policy and view trade policy in light of the broader national interest. The RTAA also shifted the political balance of power towards export interests at the expense of import-competing interests. By directly tying lower foreign tariffs to lower domestic tariffs, the RTAA encouraged exporters to organise in opposition to high tariffs and in support of trade agreements.

In an effort to roll back some of the protectionism of the 1930s, the United States helped organise a multilateral conference in 1947 that established the General Agreement on Tariffs and Trade (GATT). The GATT, a legal text regarding commercial policy, remains the principal framework of the world trading system today. In addition, the participating countries agreed on a package of tariff reductions, a step towards reducing the many trade barriers that had materialised during the Great Depression. While the GATT did not equalise the tariff treatment of goods in all markets, it began to chip away at the discriminatory policies targeted at American export interests.

Under the auspices of the GATT, trade barriers in developed countries came down and world trade expanded considerably in the post-World War II period. The GATT was the predecessor to the World Trade Organization (WTO) and the system of world trade that we see today, but which is now under threat.

Lessons

The post-World War II era has been one largely of reciprocity, but US trade policy has always been a mix of restriction and reciprocity.

For example, almost every recent president has succumbed to political pressure to limit imports to protect certain industries from foreign competition. In the early 1960s, President John Kennedy forced foreign exporters of cotton textiles to limit their sales to the United States. In late 1967, President Lyndon Johnson persuaded foreign exporters of steel to limit their sales to the United States. In 1971, President Richard Nixon imposed a 10% import surcharge to get other countries to allow their currencies to appreciate against the dollar and eliminate the US trade deficit. President Jimmy Carter negotiated a trigger price mechanism on imported steel and orderly marketing arrangements in footwear in the late 1970s. President Ronald Reagan oversaw many protectionist measures (automobiles, steel, textiles, sugar) in the early 1980s and threatened Japan with trade sanctions unless it opened its market to foreign goods. President George H. W. Bush and President George W. Bush renewed or instituted special measures to help the steel industry in the early 1990s and early 2000s, respectively. President Bill Clinton imposed safeguard measures to help domestic lamb producers. President Barack Obama invoked a special China safeguard measure to help domestic tire producers.

With this litany of restrictions, can one really say that the post-war period was one of reciprocity? In fact, one should not mistake these separate actions for specific industries as representing the main thrust of US trade policy. President

Kennedy also persuaded Congress to enact the Trade Expansion Act of 1962 which laid the groundwork for the Kennedy Round of GATT negotiations, concluded under President Johnson. President Nixon persuaded Congress to enact the Trade Act of 1974, which laid the groundwork for the Tokyo Round of GATT negotiations, concluded under President Carter. President Reagan persuaded Congress to enact the Omnibus Trade Act of 1988 that laid the groundwork for the Uruguay Round of GATT, which continued under President Bush and was concluded by President Clinton. President Reagan also negotiated the US-Canada Free Trade Agreement, which became the North American Free Trade Agreement under Presidents Bush and Clinton. President Bush concluded many bilateral and regional trade agreements and President Obama finalised the Trans-Pacific Partnership (TPP).

With respect to the Trump administration, there are historical continuities with the past. And yet, the tone of administration statements on trade—with the air of grievance and the obsession with the balance of trade—is different, as is the weight put on restriction versus reciprocity. The current president is no different from his predecessors in expressing a desire for reciprocity. What is different is that he also embraces protection as a good thing. President Trump has protected not just steel and aluminium (under the guise of national security), but has taken safeguard actions on washing machines and solar panels, in addition to imposing trade sanctions against China. Unlike previous presidents, he did not undertake these actions to 'cave in' to domestic political pressure, or (except in the possible case of China) to have greater bargaining leverage. Rather, he seems to be acting out of conviction rather than political calculation, believing that these were the right policies to pursue—full stop. The timing of the administration's actions is also different—in the past, presidents have responded to demands for assistance from domestic industries during difficult economic times. The current president has initiated actions during a period when US economic performance was strong (in terms of high growth and low unemployment) and even when the domestic industry did not necessarily desire it.

Will, therefore, the Trump administration mark a new break in US trade policy? Are we entering a new era of US trade policy, a fourth 'R', perhaps 'retreat'?

The delineation of US trade policy history into the three R's suggests that there have been only two major exogenous shocks to American trade politics that have produced a transition from one objective to another. The first was the Civil War, which led to a political realignment in favour of the Republicans and a shift from revenue to restriction as the primary goal of trade policy. The second was the Great Depression, which led to a political realignment in favour of the Democrats and a shift from restriction to reciprocity as the primary goal of trade policy. Within each of these three eras, existing policies were heatedly disputed by the two political parties. The status quo never went unchallenged, with one side or the other complaining that the country would be ruined if tariffs were not raised higher or lowered further. Yet, despite all the debate and controversy that different, clashing interests generated, it has proven very difficult to dislodge existing policies once they were established.

The same is true today. The President has very strong views on trade. Congress is still a key actor that seems to value the status quo. While the President has some unilateral authority to impose tariffs, under Section 301 (unfair trade) or Section 232 (national security), he may not have the unilateral authority to withdraw the US from trade agreements that have been approved by Congress.

To those who value an open, rules-based world trading system, one historical pattern may be a silver lining to the current US approach to trade policy. In the past, discrimination against US exports in major world markets has stimulated US action to address that problem through negotiations to reduce trade barriers. Every major trade initiative in the reciprocity era—the first GATT negotiation in 1947, the Kennedy Round in the 1960s, and the Uruguay Round in the 1980s—arose as a way of dealing with significant obstacles facing US exporters: Imperial Preference

in the 1930s, the creation of the European Economic Community in the 1950s, and then European agricultural subsidies and the lack of intellectual property protection in the 1980s. In each case, a broad political consensus emerged that solving the problems facing exporters through negotiations with trade partners was in the national economic interest.

With the US out of the TPP, and other countries moving ahead with new trade agreements that do not include the US and therefore create preferences that American exporters cannot take advantage of, there will be pressure at some point to level the playing field. As discrimination against US exporters in foreign markets grows, a consensus could emerge that something should be done to address that situation by rejoining trade agreements such as the TPP. Accordingly, there might be a future impetus to reengage with the world community to preserve America's place in world markets.

Conclusion

"The overriding commitment of this administration in trade policy has been to open markets and expand trade—multilaterally where possible, and bilaterally where necessary—and to enforce trade laws against unfair trade practices by other trading nations."

This statement came from the Clinton administration in 1993, but it could have described the trade policy of almost any presidential administration over the past 80 years. The declaration reflects a basic continuity of purpose in US trade policy. It even reflects, at a basic level, the beliefs of the current President, albeit with some major qualifications—an emphasis on bilateral approaches, and a questioning of the desire to expand trade, along with the focus on the consequences for trade flows and the trade deficit. And yet one can imagine the next administration jettisoning those unusual views and returning to the basic principles set out in that 1993 statement.

The Trump administration seems to mark a radical departure from these past norms. Yet it is far from obvious that the administration will usher in a new era of US trade policy that departs from the sentiments expressed in that statement.

Special Feature D

Market Versus Government: Welfare-Economic and Mesoeconomic Perspectives

by Ng Yew-Kwang[1]

This Feature discusses the central issue of free markets versus government intervention in both the micro and macroeconomic domains. From the first welfare theorem, the market is efficient under certain conditions. However, in the presence of important external effects like pollution and greenhouse gas emissions, government intervention in the form of Pigovian taxation may be desirable. Poverty reduction and equality promotion may also be appropriate. Nevertheless, in the absence of considerations for efficiency, this promotion should be in terms of overall incomes. The mesoeconomic analysis that combines elements of micro, macro and simplified general equilibrium is then used to show that a change in nominal aggregate demand (possibly from money supply) may affect either the price level alone, or also aggregate output, making both the Monetarists and the Keynesians correct in different situations. Factors affecting this include whether firms are perfectly competitive, how the costs of firms respond to prices, and aggregate output. Though justified by mathematical models elsewhere, these results are illustrated with simple diagrams of marginal revenue equalling marginal cost.

Introduction

A major, if not the main, theme of disagreement between different economists, policymakers, and at times the lay public, is that of free markets versus government intervention. Should society leave economic matters to be decided by free market forces or should the government intervene in various areas to achieve improvements? Although some intervention is present in all economies, the extent, degree and methods of desired intervention are still subject to much debate. In this Special Feature, I will do two things quickly. First, I will outline my thoughts regarding this central issue in the area of microeconomics, drawing some main conclusions, and referring readers to my previous writings for further details.

Next, I will offer a way to bridge the micro and macroeconomic domains based on my earlier contributions to mesoeconomics (explained below). The focus is on why changes in nominal aggregate demand, including changes in money supply, may or may not affect aggregate output under various conditions. This perspective also partly explains why we have big differences between two major groups—the believers (including the Monetarists) in free markets, *laissez-faire* and/or rules, and those (including the Keynesians) that favour government discretion and intervention. I believe that both sides are differently correct in important aspects, but lack the full picture.

[1] Ng Yew-Kwang is a Professor of Economics at Nanyang Technological University, Singapore. The views in this article are solely those of the author and should not be attributed to MAS.

Insights From The First Theorem In Welfare Economics

In the area of microeconomics, the most important result in economics is, in my view, the first theorem in welfare economics. This theorem states that the general equilibrium of a market economy under perfect competition results in a most efficient allocation of resources, inputs, or factors of production, and of final goods (taken to include services), as exposited in Ng (2015). Conditions needed for the theorem to hold include the absence of external effects like pollution and serious ignorance that justifies things like food safety regulation. These conditions, as well as the requirement for perfect competition, are very strict and never fully satisfied in any real economy. Nevertheless, the theorem is important as it explains why the invisible hand of the market works (even if not perfectly) and it serves as a benchmark to guide us in locating areas that might need government intervention.

For example, where there is serious environmental disruption, efficiency may be seriously violated and government intervention, if not too inefficient, may help to mitigate the devastating effects. Pigovian taxes on pollution and greenhouse gas emissions may be needed. Although Nobel laureate Ronald Coase (1960) argued against Pigovian taxation, his argument is based on ignoring the asymmetry between the costs of reducing pollution/emission which are infinitesimal at the margin of free-pollution equilibrium, and the benefits of such reduction which are high (Ng, 2007). These (marginal) damages are difficult to estimate, making the amount of Pigovian taxes (which should ideally equal these damages) difficult to determine. However, for most cases where abatement investment to reduce environmental disruption is being undertaken, it can be shown that the Pigovian taxes should at least equal the marginal costs of this investment, which are much easier to estimate. Moreover, the amount of tax revenues so collected will be more than enough to fund the optimal amount of abatement investment (Ng, 2004).

The first welfare theorem specifies only efficiency; thus, another possible area of government intervention is to reduce poverty and inequality. However, unless justified by some efficiency considerations (such as external effects), equality should be pursued in terms of overall incomes, leaving specific issues to be determined by the principle of efficiency supremacy or "a dollar is a dollar irrespective of rich or poor", as argued in Ng (1984). If a good produces external benefits/costs, it may be subsidised/taxed on the efficiency grounds of its external effects. In the absence of such efficiency considerations, a good should not be taxed/subsidised for being predominantly consumed by the rich/poor, as taxing/subsidising their incomes directly is more efficient. Thus, while progressive and negative income taxation may be justified, inadequate pricing of petrol, electricity, and water cannot. In the presence of second- and third-best considerations (on which see Lipsey and Lancaster, 1956; Lipsey, 2017; Ng, 1977a; Ng, 2017), complications may arise. For example, it is best to tax the driving of cars heavily and the use of public transport such as buses, trains, and MRTs slightly, on environmental grounds. However, if it is not feasible (technically or politically) to tax private driving, it may be better to subsidise (instead of taxing) bus/train/MRT riding as this is a close substitute to driving.

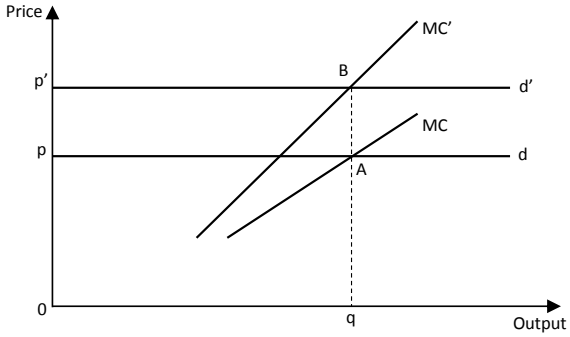
Of course, even in areas where the market fails and government intervention may be indicated, the results of intervention may yet be worse if it is too inefficient. Thus, we tell students the mistake of the Roman emperor who awarded the trophy to the second singer after just hearing the first singer. This consideration is less important in the case of Singapore, which has a good track record of efficient public policy formulation and implementation, and it is overwhelmed by the compelling importance of the issue of environmental disruption which may threaten human survival. We cannot just wait to die.

Does Money Affect Real Output Or Price Level? A Mesoeconomic Perspective

Friedman (1970) regarded the most important problem in macroeconomics to be how a change in nominal aggregate demand (as may be effected by a change in money supply or other factors) affects the price level or aggregate output. Economics students also learn that, ignoring time lags, money is neutral (i.e., affecting only the price level, not real variables). This important problem involves many aspects beyond the scope of this Feature. Here, I only shed some light on one important aspect using the method of mesoeconomic analysis I have developed over the last few decades (Ng, 1977b, 1980, 1982, 1986, 1992), with the latest perspective in Ng (2014). This is a general equilibrium analysis (but simplified to abstract away changes in relative prices and allow the use of the representative firm methodology) that takes into account the responses in both the cost side (effects of changes in aggregate output and the price level on the costs of the firm) and demand side (effects of changes in aggregate output, aggregate income/demand, and the price level on the demand for the firm's product), as well as the interaction of the firm with other firms as a whole group.[2]

For convenience, we may use the simplifying assumptions of no time lags and no money illusion or other frictions. Then, it can be shown that, if we assume in addition that firms are perfect competitors, we have the result of money neutrality, where nominal aggregate demand only affects prices, but not output or employment. This result is consistent with the fact that all models correctly producing neutrality are explicitly or implicitly based on perfect competition, as may be cross-checked.[3] The micro foundation of this neutrality is shown in Figure 1 for the short-run case, with a given number of firms. The aggregate output *Y* is then represented by the output of the representative firm on the horizontal axis. The initial equilibrium point *A* is at the intersection of the initial demand curve (horizontal due to perfect competition) for the output of the firm *d* with its marginal cost curve *MC*. A change (say an increase) in nominal aggregate demand shifts the demand curve upward to *d'*. As a higher price for the representative firm also means a higher average price or price level, the *MC* curve also shifts up by the same proportion, in the absence of time lags in adjustments in the input markets. The new intersection point of *d'* and *MC'* at *B* shows only an increase in price, with the output (hence employment) unchanged at the original point *q*. Money is then neutral.

Figure 1
Neutrality of Money under Perfect Competition



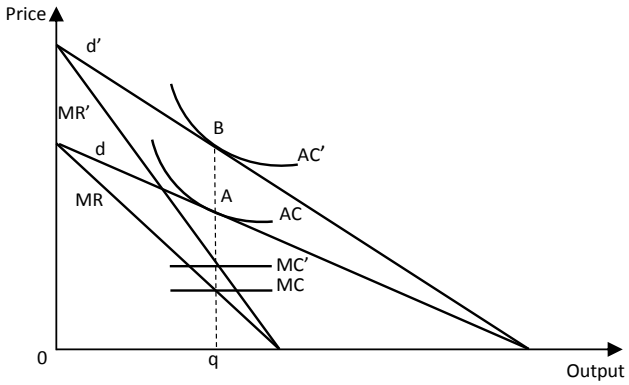
2 Strong methodological support for this analysis has been provided. Using a fully general equilibrium analysis, Ng (1986) shows: (i) the hypothetical existence of a representative firm whose changes in output and price accurately represent those of the whole economy in aggregate output and the average price for any given exogenous change; and (ii) the actual existence of a representative firm, defined by a simple weighted average of all (or a representative sample of) firms, whose changes in output and price approximately represent those of the whole economy for any exogenous change that does not result in drastic changes in relative prices.

3 The neutrality result even under imperfect competition is based on ignoring the possible existence of multiple equilibria, as shown in Ng (1998).

Now consider the case where firms need not be perfect competitors, but may be monopolistic competitors, monopolists, oligopolists, etc. While the complications with oligopoly are analysed in Ng (1986), here we just take the representative case of imperfect (or 'non-perfect' for generality) competition with each firm facing a downward-sloping demand curve. In this case, our mesoeconomic analysis shows that money may then be either neutral or non-neutral; money may still only affect just the price level, but it may also affect real variables.

The neutrality or the Monetarist case is illustrated in Figure 2. Here, an increase in nominal aggregate demand shifts the demand curve, the marginal revenue (*MR*) curve, and the cost curves (*MC* curve and *AC* or average cost curve) all vertically upward proportionately, causing the profit-maximisation equilibrium point to correspondingly shift vertically from *A* to *B*, with only an increase in price but not in output.[4]

Figure 2
Money may still be Neutral under Non-perfect Competition



However, other cases may be possible under non-perfect competition, including the contrasting Keynesian case where an increase in nominal aggregate demand increases output and employment without affecting the price level. This is illustrated in Figure 3 for the short run, and in Figure 4 for the long run. In Figure 3, an increase in nominal aggregate demand shifts the demand curve for the product of the representative firm from *d* to *d'*, becoming more price-elastic at *B* than at *A*. This is possible as the change from *A* to *B* involves a change in real output, which makes a different price elasticity possible.[5] In contrast, for the Monetarist case illustrated in Figure 2 above, the price elasticity of demand at *B* remains unchanged, being equal to that at *A*. This is because the change from *A* to *B* in that case involves no real changes, only a nominal price change.

The long-run case in Figure 4 involves a larger number of firms as nominal aggregate demand increases. There is then an additional reason for the price elasticity of demand to be higher at the new equilibrium point *B*. This is because the entry of new firms increases the degree of competition. The resulting higher price elasticity of demand allows the marginal cost of the representative firm to be higher due to the original *MC* curve being possibly upward-sloping or the whole *MC* curve shifting upward with aggregate output *Y*.[6]

4 Recall that under imperfect competition, the *MR* curve lies below the demand curve because placing an extra unit of the product on sale drives down the price slightly, so that the net revenue gained equals the extra revenue from that unit less the loss that occurs on all previous units due to the lower price.

5 The case of no change in this price elasticity is also possible for the Keynesian case but requires the *MC* curve to be non-upward-sloping and/or the whole *MC* curve not to shift upward with aggregate output *Y*; or with the two opposite effects offsetting each other.

6 The downward-sloping case is also possible and as noted in the previous footnote, even more favourable for the prevalence of the Keynesian case.

Figure 3
Money may be Non-neutral under Non-perfect Competition in the Short Run

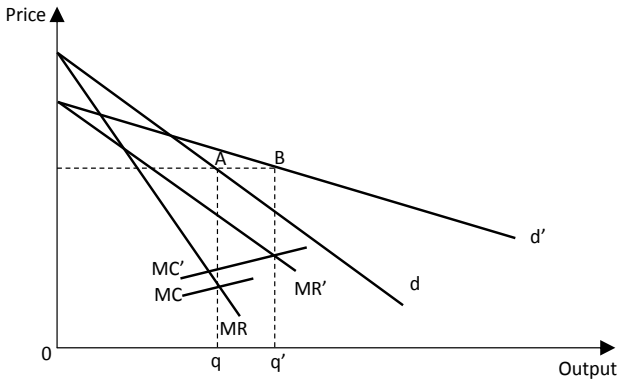
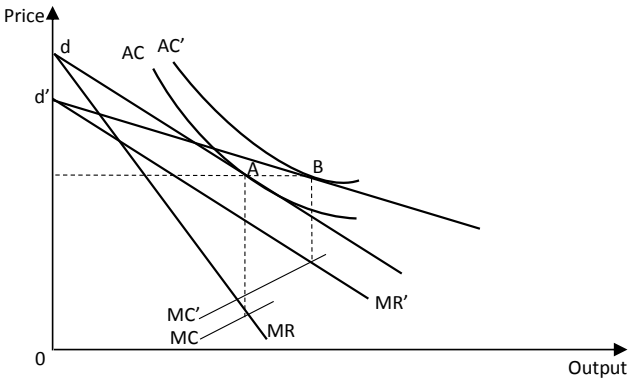


Figure 4
Non-neutrality of Money even in the Long Run



It may be suggested that we have just cherry-picked and drawn various demand and cost curves to make up the above cases, and that this might be inconsistent with economic analysis. However, all cases illustrated are consistent with the orthodox economic analysis of consumer utility maximisation (including the resulting homogeneity of degree zero in the demand functions) and the firm's profit maximisation, including the required shifts in their cost curves in response to aggregate variables (output and the price level), as shown in the full mathematical models for both the short and the long runs in Ng (1986, 2014). This fuller mathematical analysis shows that, apart from the contrasting cases of perfect versus non-perfect competition, other factors important in affecting whether the Monetarist or the Keynesian cases prevail include[7]:

- How the marginal cost of the firm responds to its own output, i.e., the slope of its *MC* curve. For small input price-taking firms, the slope of the *MC* curve depends on the relevant technology and existence of excess capacity. For larger firms, it may also depend on how input prices respond to an increase in output. An upward-sloping *MC* curve favours the Monetarist case; a horizontal or downward-sloping one favours the Keynesian case.

- How the cost curves (*MC* for the short run and *AC* for the long run) respond to the price level and aggregate output (the latter responses depend much on whether the economy is fully employed or has excess capacity). Full (proportionate) responses to prices and positive responses to output favour the Monetarist case; non-full and non-positive responses favour the Keynesian case.

[7] There are also other cases including the intermediate one, the 'expectations wonderland' where the outcome depends on expectations that will be self-fulfilling, and the cumulative expansion/contraction case, which may partly explain the Great Depression in 1929.

- Possible changes in the price elasticity of demand faced by the representative firm are also relevant, as discussed above. Elasticity is in turn exogenously determined by the demand for the product and the specific market situation. In general, an increase in the (absolute) demand elasticity as aggregate output increases favours the Keynesian case.
- Comparing the long and the short runs, costs are more likely to respond fully to prices and positively to output in the long run, and in this respect, makes the Monetarist case more likely. On the other hand, the possible entry of new firms with higher aggregate demand makes the Keynesian case more likely in the long run. Considering both factors, the net effect depends on particular cases.

The Crux Of The Difference

The reason we have the very contrasting results of money neutrality under perfect competition and possible non-neutrality under imperfect competition may be explained briefly. Under perfect competition, a firm faces a horizontal demand curve for its product. A horizontal demand curve can only shift upward or downward. It cannot shift leftward or rightward. A vertical shift in the demand curve for the representative firm implies a change in the price level which leads to corresponding vertical shifts in the cost curves in the absence of time lags, causing changes in prices only and with no output changes. On the other hand, with non-perfect competition, a downward-sloping demand curve may shift upward and downward, and it may also shift leftward and rightward, making both changes in prices only and changes in output only possible.

On the supply or cost side, a horizontal demand curve (hence also a horizontal *MR* curve) under perfect competition necessitates an upward-sloping *MC* curve for a determinate equilibrium. An upward-sloping *MC* curve means a higher marginal cost with higher output, leading to the requirement for a higher price (to be consistent with profit maximisation in the absence of other changes) and hence making the Keynesian case impossible. On the other hand, for the case of non-perfect competition, a downward-sloping demand curve usually implies an even steeper and downward-sloping *MR* curve. This makes upward/horizontal/downward-sloping *MC* curves all possible. The non-upward-sloping cases favour the Keynesian case as a higher output level need not entail a higher *MC*, unless the whole *MC* curve moves upward with the higher aggregate output. Whether the Keynesian case is possible or not depends on the combined effects of these various factors, as analysed precisely in the mathematical models, and illustrated graphically for specific cases above.

An Explanation Of The Contrasting Views Of Monetarists And Keynesians

The discussion above provides a partial explanation of the contrasting views of the Monetarists and the Keynesians on the effects of changes in nominal aggregate demand. This contrast not only applies to academic disputes but is also manifested in the very different policies adopted in the real world, including the debate over rules versus discretion in monetary policy and significant differences between some international organisations in their advice on handling financial crises.

For those who base their analysis on a well-functioning economy with perfect competition, they see that, ignoring short-run deviations due to such factors as time lags, the economy equilibrates to a unique efficient outcome largely by itself. The government only has to provide law and order, protection of property rights, essential public goods, and an announced rule in money supply. On the other hand, the Keynesians see the possibility of prolonged unemployment caused by

inadequate aggregate demand, and hence are in favour of using active fiscal and monetary policies to promote fuller employment when needed. Actual recent examples include the RMB4 trillion stimulus package China introduced in 2009 to deal with the imminent threat of collapse in aggregate demand, and the various rounds of quantitative easing by the US in the years following the 2008 financial crisis.

Our discussion above, including the first welfare theorem and the mesoeconomic perspective, suggests that both sides see some important elements in the real economy, but not all the relevant factors. Apart from the factors discussed above, there are many other factors discussed by economists, and likely many other factors that are yet to be explored. Economists are not born to lead an easy life!

References

Coase, R H (1960), "The Problem of Social Cost", *Journal of Law and Economics,* Vol. 3, pp. 1–44.

Friedman, M (1970), "A Theoretical Framework for Monetary Analysis", *Journal of Political Economy*, Vol. 78(2), pp. 193–238.

Lipsey, R G and Lancaster, K (1956), "The General Theory of Second Best", *The Review of Economic Studies,* Vol. 24(1), pp. 11–32.

Lipsey, R G (2017), "Generality versus Context Specificity: First, Second and Third Best in Theory and Policy", *Pacific Economic Review,* Vol. 22(2), pp. 167–177.

Ng, Y K (1977a), "Towards a Theory of Third Best", *Public Finance/Finances Publiques*, Vol. 32(1), pp. 1–15.

Ng, Y K (1977b), "Aggregate Demand, Business Expectation, and Economic Recovery without Aggravating Inflation", *Australian Economic Papers*, Vol. 36(1), pp. 130–140.

Ng, Y K (1980), "Macroeconomics with Non-perfect Competition", *The Economic Journal*, Vol. 90, pp. 598–610.

Ng, Y K (1982), "A Micro-macroeconomic Analysis Based on a Representative Firm", *Economica*, Vol. 49, pp. 121–139.

Ng, Y K (1984), "Quasi-Pareto Social Improvements", *American Economic Review*, Vol. 74(5), pp. 1033–1050.

Ng, Y K (1986), *Mesoeconomics: A Micro-Macro Analysis*, London: Harvester.

Ng, Y K (1992), "Business Confidence and Depression Prevention: A Mesoeconomic Perspective", *American Economic Review*, Vol. 82(2), pp. 365–371.

Ng, Y K (1998), "Non-neutrality of Money under Non-perfect Competition: Why do Economists Fail to See the Possibility?", pp. 232–252, in Arrow, K J, Ng, Y K and Yang, X (eds.), *Increasing Returns and Economic Analysis*, London: Macmillan.

Ng, Y K (2004), "Optimal Environmental Charges/Taxes: Easy to Estimate and Surplus-yielding", *Environmental and Resource Economics,* Vol. 28(4), pp. 395–408.

Ng, Y K (2007), "Eternal Coase and External Costs: A Case for Bilateral Taxation and Amenity Rights", *European Journal of Political Economy,* Vol. 23(3), pp. 641–659.

Ng, Y K (2014), "Why is Finance Important? Some Thoughts on Post-crisis Economics", *Singapore Economic Review,* Vol. 59(5), 1450037.

Ng, Y K (2015), "Welfare Economics", pp. 497–503, in Wright, J D (ed.), *International Encyclopedia of the Social & Behavioral Sciences*, 2nd Edition, Vol. 25, Oxford: Elsevier.

Ng, Y K (2017), "Theory of Third Best: How to Interpret and Apply?", *Pacific Economic Review,* Vol. 22(2), pp. 178–188.

Statistical Appendix

TABLE 1: REAL GDP GROWTH by Sector

Period	Total	Manu-facturing	Finance & Insur-ance	Business Services	Const-ruction	Wholesale & Retail Trade	Accomm & Food Services	Transpor-tation & Storage	Info & Comms	Total	Manu-facturing	Finance & Insur-ance	Business Services	Const-ruction	Wholesale & Retail Trade	Accomm & Food Services	Transpor-tation & Storage	Info & Comms
	Year-on-Year % Change									Seasonally-adjusted Quarter-on-Quarter Annualised % Change								
2016	2.4	3.7	1.6	-0.3	1.9	1.0	3.8	1.3	3.6									
2017	3.6	10.1	4.8	0.6	-8.4	2.3	1.2	4.8	3.3									
2017 Q1	2.5	8.5	0.6	1.3	-6.9	0.5	-0.3	4.7	1.6	-1.5	1.3	-6.0	2.5	3.1	-11.8	-1.7	4.9	4.1
Q2	2.8	8.4	5.0	0.4	-12.2	2.2	1.0	3.9	0.8	2.8	3.8	7.9	-1.8	-18.5	9.5	5.0	3.0	3.5
Q3	5.5	19.1	7.1	0.5	-9.3	3.3	1.3	5.2	5.1	11.2	34.9	11.7	0.0	-2.4	9.0	6.2	5.2	11.7
Q4	3.6	4.8	6.3	0.4	-5.0	3.0	2.9	5.3	6.0	2.1	-14.8	12.6	1.0	-0.2	6.5	2.2	7.2	4.8
2018 Q1	4.5	10.8	9.2	2.6	-5.2	2.5	2.0	2.7	5.4	2.2	26.2	4.8	11.4	0.8	-12.9	-4.7	-4.2	2.0
Q2	3.9	10.2	6.7	2.1	-4.6	1.5	4.0	1.3	5.2	0.6	1.8	-1.8	-3.2	-15.4	5.4	13.3	-2.7	3.0

Source: Singapore Department of Statistics

TABLE 2: REAL GDP GROWTH by Expenditure

Year-on-Year % Change

Period	Total Demand	Domestic Demand							Exports of Goods & Services	Imports of Goods & Services
		Total	Consumption			Gross Fixed Capital Formation				
			Total	Private	Public	Total	Private	Public		
2016	1.6	3.1	2.1	1.7	3.5	-0.6	-3.0	10.0	1.1	0.1
2017	4.4	5.4	3.3	3.1	4.1	-1.8	-1.6	-2.6	4.1	5.2
2017 Q1	3.7	-0.6	0.3	-0.9	4.0	-3.2	-5.6	5.4	5.4	4.8
Q2	3.7	7.3	3.2	2.7	5.3	-3.5	-1.0	-13.4	2.5	4.5
Q3	5.5	8.5	5.7	5.3	7.1	-2.7	-2.1	-4.8	4.4	5.8
Q4	4.9	6.6	4.4	5.5	0.5	2.2	2.1	3.0	4.2	5.7
2018 Q1	3.5	3.6	4.8	3.4	8.7	-0.9	-0.4	-2.4	3.5	2.7
Q2	3.4	3.0	3.0	3.2	2.2	3.3	5.6	-6.7	3.6	3.0

Source: Singapore Department of Statistics

TABLE 3: LABOUR MARKET (I)

Year-on-Year % Change

Period	Average Monthly Earnings	Value Added Per Worker[1]									Unit Labour Cost	
		Total[2]	Manufacturing	Construction	Wholesale & Retail Trade	Accomm & Food Services	Transportation & Storage	Information & Communications	Finance & Insurance	Business Services	Overall Economy	Manufacturing
2016	3.7	1.4	7.0	1.4	1.3	1.5	-0.4	0.8	-1.2	-1.8	2.0	-5.0
2017	3.0	3.8	13.7	-1.8	2.7	-0.7	3.3	1.3	1.0	-0.9	-0.3	-8.0
2017 Q1	1.9	2.5	12.1	-2.7	0.9	-2.3	3.4	-0.4	-2.7	0.4	-0.1	-10.1
Q2	3.1	3.1	12.3	-5.8	2.6	-0.8	2.7	-0.3	1.0	-1.2	0.2	-6.8
Q3	3.2	5.9	23.2	-1.5	3.7	-0.9	4.0	2.9	2.5	-1.3	-2.0	-14.6
Q4	4.0	3.8	7.6	3.2	3.2	1.4	2.9	3.2	3.1	-1.6	0.9	-0.5
2018 Q1	4.0	4.4	13.2	1.8	2.5	1.0	-0.3	2.2	6.1	0.4	-0.8	-5.4
Q2	3.6	3.4	12.2	0.5	1.4	3.3	-2.2	0.9	4.0	-0.1	-0.2	-7.4

[1] Based on Gross Value Added At 2010 Basic Prices

[2] Based on GDP At 2010 Market Prices

Note: The industries are classified according to SSIC 2015.

Source: Central Provident Fund Board/Singapore Department of Statistics/Ministry of Manpower

TABLE 4: LABOUR MARKET (II)

Thousand

Period	Changes in Employment										
	Total	Manufacturing	Construction	Wholesale & Retail Trade	Accomm & Food Services	Transportation & Storage	Information & Communications	Finance & Insurance	Business Services	Other Services	Others
2016	16.8	-14.4	-11.3	1.3	5.3	3.4	2.2	5.7	3.8	21.1	-0.3
2017	-3.6	-10.9	-38.3	-1.7	3.5	7.1	4.0	4.5	11.2	17.6	-0.6
2017 Q1	-6.8	-2.9	-12.7	-4.9	-0.3	1.4	1.0	1.6	2.0	7.8	0.2
Q2	-7.3	-3.6	-10.4	-1.7	-0.4	2.0	1.1	1.5	2.4	2.0	-0.2
Q3	-2.3	-3.2	-9.6	-0.1	1.2	0.5	1.0	2.1	1.9	3.7	0.2
Q4	12.7	-1.3	-5.6	4.9	2.9	3.3	0.9	-0.6	4.8	4.1	-0.7
2018 Q1	3.7	-3.8	-5.7	-1.8	-1.1	2.0	1.2	2.2	3.2	7.4	0.1
Q2	6.5	-0.1	-0.7	-1.7	-1.6	2.6	2.4	1.7	1.8	2.1	0.0

Note: The industries are classified according to SSIC 2015.

Source: Ministry of Manpower

TABLE 5: EXTERNAL TRADE

Year-on-Year % Change

Period	Total Trade	Exports	Domestic Exports					Re-exports	Imports	Exports	Domestic Exports			Re-exports	Imports
			Total	Oil	Non-oil						Total	Oil	Non-oil		
					Total	Electronics	Non-electronics								
	At Current Prices									At 2012 Prices					
2016	-4.9	-5.1	-5.8	-12.6	-2.8	-4.0	-2.3	-4.4	-4.7	0.5	3.5	7.4	0.5	-2.8	0.0
2017	11.1	10.3	15.8	33.4	8.8	8.0	9.2	5.2	12.1	5.7	8.0	6.5	9.2	3.0	6.1
2017 Q1	16.3	16.9	29.1	72.0	15.0	9.0	17.6	6.5	15.5	9.1	14.4	14.4	14.5	3.2	4.6
Q2	9.5	8.3	9.6	26.9	3.0	13.7	-0.9	7.0	11.0	3.3	3.5	5.1	2.2	3.0	4.7
Q3	11.6	10.1	11.0	19.3	7.6	8.9	7.0	9.3	13.4	5.1	3.4	-1.2	7.3	7.2	8.0
Q4	7.8	6.6	15.3	26.1	10.4	1.2	14.4	-1.3	9.1	5.4	11.3	8.4	13.7	-1.2	7.2
2018 Q1	2.5	2.3	3.5	8.6	1.1	-7.9	4.6	0.9	2.8	1.9	1.5	-1.5	4.0	2.2	1.0
Q2	10.2	9.3	12.9	20.4	9.3	-7.8	16.5	5.7	11.1	4.1	2.0	-7.8	10.2	6.7	3.7
Q3	14.7	12.7	14.5	28.9	8.0	-2.9	12.6	11.1	17.0	4.7	0.6	-5.9	5.6	9.4	5.9

Source: Enterprise Singapore

TABLE 6: NON-OIL DOMESTIC EXPORTS by Selected Countries

Period	All Countries	ASEAN				NEA-3				China	EU	Japan	US
		Total	of which			Total	Hong Kong	Korea	Taiwan				
			Indonesia	Malaysia	Thailand								
	Year-on-Year % Change												
2016	-2.8	-8.4	-11.1	-5.0	-7.4	9.6	19.8	-2.3	4.8	-6.7	-2.2	-8.3	-2.7
2017	8.8	9.2	8.1	12.9	8.0	12.4	-1.0	43.5	12.2	31.1	0.1	17.1	3.8
2017 Q1	15.0	6.8	12.8	7.6	7.9	31.7	15.4	36.8	52.7	48.6	-0.4	8.2	1.2
Q2	3.0	5.8	7.7	9.6	3.9	16.6	-7.3	62.7	22.8	33.8	-11.4	15.5	-2.5
Q3	7.6	13.1	7.3	18.2	16.9	13.4	11.2	36.9	1.7	23.4	-6.2	20.0	1.2
Q4	10.4	10.9	5.1	16.4	3.4	-5.2	-17.7	38.5	-12.2	22.5	18.6	25.5	16.4
2018 Q1	1.1	0.9	11.1	1.9	-9.6	-4.9	-7.4	8.9	-10.8	-11.5	3.3	20.6	45.8
Q2	9.3	6.3	14.1	-5.3	-1.0	-8.2	4.3	-23.2	-9.7	-0.1	47.9	8.0	41.1
Q3	8.0	17.8	28.1	6.1	7.1	-9.8	-12.3	-26.9	8.6	-13.2	18.4	16.2	34.6
	% Share of All Countries												
2016	100.0	22.4	5.2	7.8	4.4	19.4	9.0	3.9	6.5	15.1	11.8	5.2	9.3
2017	100.0	22.4	5.1	8.1	4.3	20.0	8.2	5.1	6.7	18.2	10.8	5.6	8.9

Source: Enterprise Singapore

TABLE 7: CONSUMER PRICE INDEX

Period	All Items	Food	Clothing & Footwear	Housing & Utilities	Household Durables & Services	Health Care	Transport	Communication	Recreation & Culture	Education	Miscellaneous Goods & Services
	2014 = 100										
2016	98.9	104.0	100.3	92.5	101.2	101.0	96.2	99.9	101.2	106.6	100.1
2017	99.5	105.5	100.9	90.2	102.2	103.5	98.7	100.5	101.6	109.8	100.3
2017 Q1	99.5	105.1	100.8	91.4	101.8	102.6	98.5	100.3	101.1	109.1	100.2
Q2	99.4	105.3	101.6	90.2	102.0	103.3	98.6	100.4	101.3	109.4	100.5
Q3	99.4	105.5	100.3	90.0	102.6	103.9	98.2	100.6	101.4	110.4	100.4
Q4	99.6	105.9	100.9	89.1	102.5	104.1	99.4	100.8	102.4	110.4	99.9
2018 Q1	99.8	106.5	101.8	89.0	102.7	105.0	98.8	100.2	102.1	112.2	100.8
Q2	99.8	106.8	102.6	88.4	102.8	105.6	98.5	99.7	102.4	112.6	101.4
Q3	100.1	107.2	102.5	89.3	103.3	106.0	98.0	99.6	102.9	113.2	101.5

Source: Singapore Department of Statistics

TABLE 8: MAS CORE INFLATION

Index (2014=100)

Period	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2005	82.0	82.1	82.2	82.2	82.2	82.0	82.4	82.7	82.7	83.2	83.4	83.4
2006	83.9	83.7	83.7	83.7	83.6	83.4	83.8	84.0	84.0	84.3	84.6	84.8
2007	84.8	84.9	84.8	84.7	84.8	84.8	85.9	86.1	86.3	86.8	87.3	88.5
2008	89.1	89.4	89.5	90.1	90.2	90.3	90.8	91.1	91.1	92.1	92.1	92.2
2009	91.5	91.1	91.2	90.3	90.1	90.0	90.3	90.4	90.3	90.8	90.8	90.9
2010	91.0	91.5	91.6	91.8	91.7	91.6	92.1	92.5	92.5	92.6	92.8	92.8
2011	92.8	93.1	93.2	93.8	93.7	93.7	94.1	94.5	94.4	94.7	95.0	95.2
2012	96.1	95.9	96.0	96.3	96.2	96.2	96.4	96.6	96.7	96.9	96.9	97.0
2013	97.2	97.7	97.6	97.6	97.8	97.8	97.9	98.3	98.4	98.6	98.9	99.0
2014	99.4	99.4	99.6	99.9	100.0	99.8	100.1	100.3	100.1	100.3	100.3	100.5
2015	100.4	100.7	100.6	100.3	100.1	100.0	100.4	100.5	100.7	100.6	100.5	100.8
2016	100.8	101.2	101.2	101.2	101.1	101.1	101.4	101.5	101.6	101.7	101.8	102.0
2017	102.3	102.3	102.4	102.9	102.7	102.7	103.0	103.0	103.1	103.2	103.3	103.4
2018	103.7	104.1	103.9	104.2	104.2	104.4	104.9	104.9	105.0			

Note: MAS Core Inflation is the CPI less the costs of accommodation and private road transport.

Source: Monetary Authority of Singapore

TABLE 9: BALANCE OF PAYMENTS – Current Account

	Current Account Balance		Goods Account			Services Account Balance							Primary Income Balance	Secondary Income Balance
	$ Million	% of GDP	Exports	Imports	Balance	Total	Maintenance & Repairs	Transport	Travel	Financial	Intellectual Property	Others		
			$ Million											
2016	81,297	19.0	501,563	383,471	118,092	-6,281	8,266	-1,127	-6,759	24,014	-15,348	-15,326	-22,102	-8,412
2017	84,221	18.8	547,934	430,968	116,966	-8,445	9,141	-2,040	-6,679	25,285	-15,953	-18,200	-15,907	-8,394
2017 Q1	21,034	19.2	132,834	104,042	28,792	-2,503	2,095	-1,223	-1,197	5,756	-3,951	-3,982	-3,275	-1,981
Q2	20,381	18.7	135,002	105,931	29,071	-1,776	2,185	-339	-1,693	6,354	-3,823	-4,460	-4,741	-2,172
Q3	25,054	22.5	137,150	105,672	31,478	-1,782	2,353	-174	-1,174	6,461	-4,223	-5,024	-2,505	-2,137
Q4	17,752	15.1	142,948	115,323	27,625	-2,384	2,508	-304	-2,613	6,715	-3,956	-4,734	-5,386	-2,103
2018 Q1	21,036	18.4	137,358	108,035	29,323	-1,667	2,272	-434	-1,264	6,405	-3,833	-4,813	-4,614	-2,006
Q2	22,832	20.0	146,829	116,605	30,224	-847	2,121	312	-1,657	6,609	-3,404	-4,828	-4,285	-2,260

Source: Singapore Department of Statistics

TABLE 10: BALANCE OF PAYMENTS – Capital & Financial Accounts

$ Million

Period	Capital and Financial Account Balance					Net Errors & Omissions	Overall Balance	Official Foreign Reserves (End of Period)
	Total	Direct Investment	Portfolio Investment	Financial Derivatives	Other Investment			
2016	83,694	-64,008	37,428	18,565	91,709	-58	-2,455	356,254
2017	46,500	-53,790	47,356	-18,693	71,626	120	37,841	373,994
2017 Q1	5,201	-22,118	1,543	502	25,273	781	16,614	362,802
Q2	17,066	-9,291	18,558	-8,775	16,573	1,128	4,443	366,634
Q3	13,398	-9,483	11,145	-11,758	23,494	-455	11,201	373,996
Q4	10,835	-12,898	16,111	1,337	6,286	-1,333	5,584	373,994
2018 Q1	15,317	-8,500	4,472	-7,271	26,616	1,113	6,833	376,529
Q2	14,096	-13,696	10,319	-936	18,409	-956	7,780	392,758

Source: Singapore Department of Statistics/Monetary Authority of Singapore

TABLE 11: EXCHANGE RATES

End of Period	Singapore Dollar Per									
	US Dollar	Pound Sterling	Euro	100 Swiss Franc	100 Japanese Yen	Malaysian Ringgit	Hong Kong Dollar	100 New Taiwan Dollar	100 Korean Won	Australian Dollar
2016	1.4463	1.7768	1.5230	141.66	1.2394	0.3224	0.1865	4.4863	0.1199	1.0460
2017	1.3366	1.7987	1.5962	136.56	1.1851	0.3290	0.1709	4.5033	0.1251	1.0416
2017 Q1	1.3978	1.7452	1.4923	139.60	1.2470	0.3158	0.1799	4.5998	0.1248	1.0683
Q2	1.3773	1.7930	1.5758	143.97	1.2316	0.3207	0.1764	4.5337	0.1204	1.0603
Q3	1.3584	1.8224	1.6007	139.88	1.2062	0.3213	0.1739	4.4713	0.1186	1.0662
Q4	1.3366	1.7987	1.5962	136.56	1.1851	0.3290	0.1709	4.5033	0.1251	1.0416
2018 Q1	1.3117	1.8470	1.6169	137.18	1.2308	0.3391	0.1671	4.5004	0.1230	1.0041
Q2	1.3650	1.7902	1.5885	137.23	1.2332	0.3380	0.1739	4.4743	0.1222	1.0078
Q3	1.3671	1.7879	1.5923	139.97	1.2044	0.3302	0.1747	4.4843	0.1233	0.9864

Source: Monetary Authority of Singapore

TABLE 12: SINGAPORE DOLLAR NOMINAL EFFECTIVE EXCHANGE RATE INDEX

Index (3–7 Apr 2017 Average=100)

Average for Week Ending	S$ NEER	Average for Week Ending	S$ NEER	Average for Week Ending	S$ NEER	Average for Week Ending	S$ NEER	Average for Week Ending	S$ NEER	Average for Week Ending	S$ NEER
2017 Apr 7	100.00	2017 Jul 7	99.95	2017 Oct 6	100.11	2018 Jan 5	100.63	2018 Apr 6	100.33	2018 Jul 6	100.19
13	99.90	14	99.99	13	100.18	12	100.40	13	100.43	13	100.53
21	99.79	21	100.21	20	100.25	19	100.31	20	100.47	20	100.59
28	99.77	28	100.38	27	100.15	26	100.36	27	100.26	27	100.79
May 5	99.57	Aug 4	100.22	Nov 3	100.32	Feb 2	100.11	May 4	100.34	Aug 3	100.85
12	99.19	11	99.94	10	100.28	9	99.69	11	100.15	10	100.88
19	99.52	18	99.94	17	100.29	15	99.88	18	100.28	17	100.86
26	99.71	25	99.93	24	100.36	23	99.93	25	100.38	24	100.89
Jun 2	99.70	31	99.94	Dec 1	100.41	Mar 2	99.95	Jun 1	100.54	31	100.87
9	99.59	Sep 8	99.95	8	100.37	9	100.12	8	100.67	Sep 7	100.64
16	99.70	15	100.10	15	100.34	16	100.39	14	100.78	14	100.75
23	99.62	22	100.21	22	100.43	23	100.26	22	100.07	21	100.93
30	99.76	29	100.25	29	100.51	29	100.40	29	100.02	28	101.22
										Oct 5	100.96

Source: Monetary Authority of Singapore

TABLE 13: DOMESTIC LIQUIDITY INDICATOR

Change from 3 Months Ago

Period	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2011	0.410	0.315	0.358	0.361	0.420	0.474	0.517	0.432	-0.211	-0.933	-1.152	-0.579
2012	0.136	0.585	0.679	0.623	0.322	0.111	0.273	0.451	0.690	0.374	0.299	0.204
2013	0.003	-0.086	-0.186	0.081	-0.052	-0.033	-0.074	0.092	0.406	0.433	0.538	0.217
2014	-0.053	-0.130	-0.240	0.139	0.133	0.355	0.189	0.093	0.037	0.002	-0.026	0.022
2015	0.010	-0.069	-0.125	0.343	0.677	0.725	0.161	-0.199	-0.114	0.004	0.258	0.244
2016	-0.068	-0.003	0.177	0.411	0.170	0.222	0.285	0.273	-0.212	-0.488	-0.393	-0.239
2017	0.062	0.175	0.333	0.309	0.090	-0.087	0.068	0.162	0.185	0.009	0.100	0.125
2018	0.099	-0.145	0.042	0.131	0.269	0.041	0.065	0.236	0.251			

Note: The DLI is a measure of overall monetary conditions, reflecting changes in the S$NEER and 3-month S$ SIBOR rate.
A positive (negative) number indicates a tightening (easing) monetary policy stance from the previous quarter.
Please refer to the June 2001 issue of the MAS ED *Quarterly Bulletin* for more information.

Source: Monetary Authority of Singapore

TABLE 14: MONETARY

End of Period	Money Supply								Interest Rates				
												Banks' Rates	
	Narrow Money M1	Broad Money M2	Broad Money M3	Reserve Money	Narrow Money M1	Broad Money M2	Broad Money M3	Reserve Money	Prime Lending Rate	3-month S$ SIBOR	3-month US$ LIBOR	Savings Deposits	12-month Fixed Deposits
	$ Billion				Year-on-Year % Change				% Per Annum				
2016	172.8	562.1	573.9	64.6	7.7	8.0	7.7	6.4	5.35	0.97	1.00	0.14	0.35
2017	183.7	580.1	592.2	68.2	6.3	3.2	3.2	5.4	5.28	1.50	1.69	0.16	0.33
2017 Q1	174.0	573.0	584.7	64.6	8.9	7.5	7.2	4.9	5.28	0.95	1.15	0.16	0.33
Q2	178.2	573.7	585.4	64.5	10.8	7.3	7.0	9.3	5.28	1.00	1.30	0.16	0.33
Q3	182.0	577.9	589.9	66.4	9.2	5.4	5.3	4.5	5.28	1.12	1.33	0.16	0.33
Q4	183.7	580.1	592.2	68.2	6.3	3.2	3.2	5.4	5.28	1.50	1.69	0.16	0.33
2018 Q1	188.2	588.6	601.1	70.6	8.2	2.7	2.8	9.3	5.33	1.45	2.31	0.16	0.34
Q2	186.1	588.6	601.4	70.2	4.4	2.6	2.7	8.9	5.33	1.52	2.34	0.16	0.37

Source: Monetary Authority of Singapore/ABS Benchmarks Administration Co Pte Ltd/ICE Benchmark Administration Ltd

TABLE 15: FISCAL

Period	Operating Revenue							Expenditure			Primary Surplus (+)/ Deficit (–)	Less: Special Transfers	Add: Net Investment Returns Contribution	Overall Budget Surplus (+)/ Deficit (–)
	Total	Tax Revenue					Non-tax Revenue	Total	Operating	Development				
		Total	of which											
			Income Tax	Assets Taxes	Stamp Duty	GST								
	$ Million													
FY2015	64,823	55,647	24,890	4,455	2,769	10,345	9,176	67,447	48,090	19,357	-2,624	10,369	8,943	-4,050
FY2016	68,965	58,699	26,378	4,360	3,278	11,078	10,266	71,045	52,129	18,916	-2,080	6,372	14,577	6,125
FY2017 (Revised)	75,154	65,512	31,264	4,392	4,732	10,770	9,642	73,918	56,098	17,820	1,236	6,234	14,607	9,608
FY2018 (Budgeted)	72,677	63,281	28,346	4,445	3,763	11,364	9,396	80,019	57,667	22,351	-7,342	9,114	15,850	-605
	% of Nominal GDP													
FY2015	15.5	13.3	5.9	1.1	0.7	2.5	2.2	16.1	11.5	4.6	-0.6	2.5	2.1	-1.0
FY2016	15.9	13.5	6.1	1.0	0.8	2.6	2.4	16.4	12.0	4.4	-0.5	1.5	3.4	1.4
FY2017 (Revised)	16.6	14.5	6.9	1.0	1.0	2.4	2.1	16.3	12.4	3.9	0.3	1.4	3.2	2.1
FY2018 (Budgeted)	15.5	13.5	6.0	0.9	0.8	2.4	2.0	17.1	12.3	4.8	-1.6	1.9	3.4	-0.1

Source: Ministry of Finance