



Monetary Authority of Singapore

macroeconomic●

review

A wide, horizontal photograph of a city skyline at night, likely Singapore, with numerous illuminated skyscrapers and buildings reflected in the water. The image is used as a background for the word 'review'.

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LIST OF ABBREVIATIONS

ACU	Asian Currency Unit
ASEAN	Association of Southeast Asian Nations
COE	Certificate of Entitlement
CPF	Central Provident Fund
CPI	consumer price index
DBU	Domestic Banking Unit
EIA	Energy Information Administration
EPG	Economic Policy Group
FAI	Fixed Asset Investment
GFC	Global Financial Crisis
GST	Goods and Services Tax
HDB	Housing Development Board
ICT	information and communications technology
IT	information technology
LIBOR	London interbank offered rate
m-o-m	month-on-month
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
PPP	purchasing power parity
q-o-q	quarter-on-quarter
REER	real effective exchange rate
SA	seasonally adjusted
SAAR	seasonally adjusted annualised rate
SIBOR	Singapore interbank offered rate
SME	small and medium enterprise
ULC	unit labour cost
UN	United Nations
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 collaborate with the ASEAN+3 Macroeconomic Research Office (AMRO) in producing Special Feature A on “The Promise of Digital Transformation in ASEAN”. The Feature highlights the region’s ongoing digital transformation and the potential for it to drive future economic growth. Special Feature B was contributed by Professor Ross Levine from the University of California, Berkeley, and we are grateful to him for providing a comprehensive survey of the multidimensional relationship between financial systems and economic dynamism. In addition, our thanks go to Alexander Clark and Samuel Hanes of the Behavioural Insights Team and Dr Aurobindo Ghosh from the Singapore Management University (SMU) for their study of inflation expectations in Special Feature C. This Feature examines how behavioural biases could possibly affect reported inflation expectations in the Singapore Index of Inflation Expectations (SInDEx) compiled by SMU, and outlines recommendations to improve the survey questionnaire. Finally, we would like to thank Associate Professor Peter Wilson for editing the *Review*.

This *Macroeconomic Review* is produced by EPG, MAS. The team comprises: Abby Ang, Alvin Jason s/o John, Betty Chong, Brian Lee, Celine Sia, 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, Lam San Ling, Li Tiansheng, Liew Yin Sze, Linda Ng, Marcus Fum, Michael Ng, Mohamed Ramli, Ng Yi Ping, Priscilla Ng, Seah Wee Ting, Shem Ng, Soh Wai Mei, Soo Cheng Ghee, Stella Ng, Tan Boon Heng, Tan Choon Leng, Tan Yanxi, Tan Yin Ying, Thum Jie Liang, Tu Suh Ping, Wu Jingyu, Xiong Wei and Yuko Toshimitsu.

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.



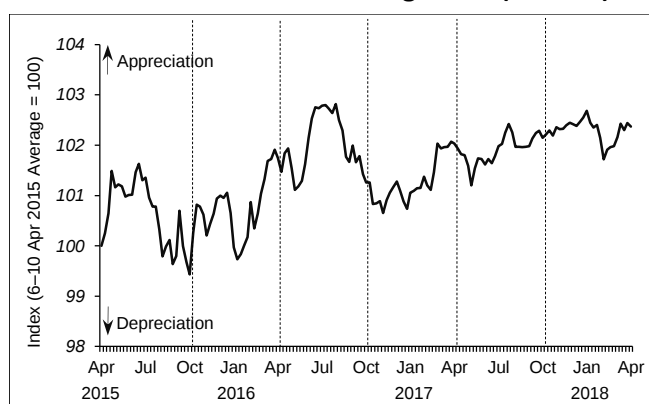
13 April 2018

Monetary Policy Statement

INTRODUCTION

1. In the October 2017 Monetary Policy Statement, MAS kept the slope of the Singapore dollar nominal effective exchange rate (S\$NEER) policy band at zero percent, with 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 the broadly stable outlook for GDP growth and MAS Core Inflation.

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



----- indicates release of Monetary Policy Statement

2. Since October 2017, the S\$NEER has appreciated in the upper half of the policy band, apart from a brief period of decline in early 2018. This development reflected, in part, broad-based US dollar weakness and depreciation in a number of regional currencies against the S\$. The three-month S\$ SIBOR rose from 1.1% as at end-October 2017 to 1.5% at the end of the year, before falling in January 2018. It subsequently resumed its upward trend to reach 1.4% as at end-March.

OUTLOOK

3. The Singapore economy has evolved as envisaged since the October 2017 policy review, and should continue on a steady expansion path in 2018. However, an escalation of the US-China trade dispute remains possible, and if it occurs, will have significant consequences for global trade. MAS Core Inflation is likely to rise gradually over the course of 2018 and into 2019.

Growth

4. According to the *Advance Estimates* released by the Ministry of Trade and Industry today, the Singapore economy grew by 1.4% on a quarter-on-quarter seasonally-adjusted annualised basis in Q1 2018, a moderation from the 2.1% recorded in Q4 last year. In comparison, year-on-year, GDP rose by an estimated 4.3% in Q1 2018, following growth of 3.6% for 2017 as a whole.

5. The sectoral composition of growth has been uneven. Within manufacturing, the semiconductor segment has continued to expand at a strong pace, but the marine and offshore engineering industry remains subdued. In services, retail and food services saw some pullback in activity after the pickup in Q4 last year, while business services posted further growth. The financial services sector also recorded varying outturns across its segments, with both domestic and offshore lending outperforming.

6. Global final demand is projected to stay firm in 2018, but the pace of expansion could slow slightly as the cyclical upturn matures. Positive business sentiment and improving labour markets continue to underpin the ongoing recovery in private consumption and investment in the external economies. However, rising trade tensions between the major economies pose a downside risk to the growth outlook.

7. Barring a setback in global trade, growth in the Singapore economy should continue at a broadly steady pace in the quarters ahead. The expansion will still be driven by the trade-related industries, although their contribution should ease from last year. The financial and business services sectors should continue to benefit from the broader pickup in income growth, including in the region. At the same time, the weaker segments of the economy, including construction and domestic-oriented services, are expected to show some improvement, with the latter supported by the upturn in private consumption.

8. On the whole, GDP growth in 2018 should come in slightly above the middle of the forecast range of 1.5–3.5%. Productivity will continue to contribute to growth this year, even as total employment is projected to expand following a marginal contraction in 2017.

Inflation

9. MAS Core Inflation, which excludes the costs of private road transport and accommodation, edged up to average 1.6% year-on-year in January–February 2018, from 1.4% in Q4 2017. This was largely due to stronger price increases in services and retail items, which more than offset lower food price inflation. In comparison, CPI-All Items inflation eased to 0.2% from 0.5% over the same period. This is because of the decline in the cost of private road transport, as COE premiums fell and the impact of the upward revision in parking fees in December 2016 faded. The disbursement of additional rebates for Service & Conservancy Charges in January 2018 also temporarily dampened headline inflation.

10. In the quarters ahead, imported inflation is likely to rise mildly, as global demand strengthens amid ample supply conditions in key commodity markets. Although global oil prices had experienced sporadic spikes in Q1 2018, they should ease as supply remains responsive. For the full year, oil prices should increase moderately compared to 2017. Food commodity prices are also projected to rise slightly.

11. Domestic sources of inflation are expected to rise gradually in 2018, with prices of consumer services increasing as domestic demand picks up. Further improvements in resident employment should support a faster pace of wage growth in 2018 compared to 2017. However, the extent of consumer price increases will remain moderate, because of relatively subdued retail rents and constraints on firms' pricing power due to market competition.

12. Private road transport inflation should decline in 2018, as the inflationary effects from previous administrative measures dissipate.¹ However, accommodation costs will fall by a lesser extent than in 2017. Overall, CPI-All Items inflation should increase in the quarters ahead, and is projected to be in the upper half of the 0–1% forecast range for 2018 as a whole.

13. Should economic conditions evolve as expected, MAS Core Inflation will rise gradually over the course of this year. For 2018, core inflation should come in within the upper half of the 1–2% forecast range.

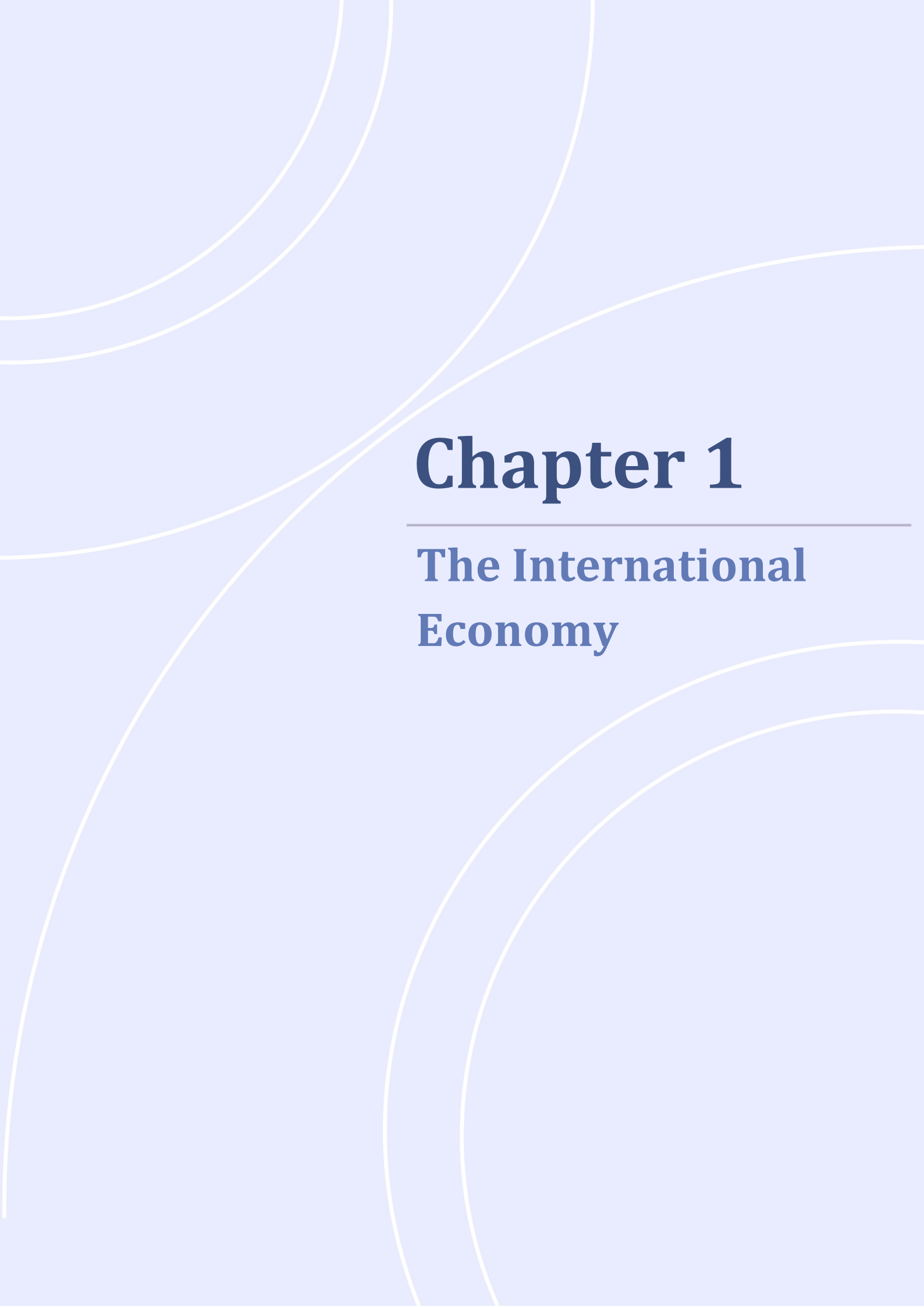
MONETARY POLICY

14. The Singapore economy is likely to remain on its steady expansion path in 2018. Upward pressures on MAS Core Inflation are expected to persist over the course of this year and beyond, underpinned by an improving labour market.

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

16. The measured adjustment to the policy stance takes into account the uncertainty in macroeconomic outcomes presented by ongoing trade tensions. MAS will continue to closely monitor economic developments.

¹ The administrative measures are the expiry of the one-year road tax rebates and the upward revision in parking fees in August and December 2016, respectively.



Chapter 1

The International Economy

1 The International Economy

The Global Economic Cycle Matures

Global growth pulled back in Q4 2017, following two quarters of robust expansion. The G3 economies grew at a slightly slower pace, due mainly to weaker net exports. Nonetheless, the underlying growth momentum remained intact on the back of buoyant domestic demand and strengthening labour markets, as well as expansionary fiscal policies in some economies. In Asia ex-Japan, growth in Q4 2017 was also a tad softer than the previous quarter. For 2017 as a whole, the external economy turned in its best performance since 2011, with average GDP growth in Singapore's major trading partners rising to 4.5%, from 3.9% in 2016. In tandem with the synchronised global upturn, world trade rose at its fastest pace since the GFC.

Conditions appear in place to sustain global growth into 2018, even as the business cycle matures. Tightening labour markets will continue to shore up household incomes and consumption spending, while investment continues to benefit from generally upbeat business sentiment and higher profitability. However, growth in Asia ex-Japan is projected to slow mildly in 2018 as the global tech cycle enters into a late expansion phase. The impact of the tariffs announced thus far by the US and China is likely to be contained, although a further escalation of global trade frictions could pose a significant downside risk to growth, and possibly an upside risk to inflation as well. Against this backdrop, global growth is projected at 4.5% in 2018 and 4.3% in 2019. (Table 1.1)

Table 1.1
Global GDP Growth

	Q3 2017	Q4 2017	2017	2018F	2019F
	q-o-q SAAR		y-o-y		
Total*	5.0	4.1	4.5	4.5	4.3
G3*	2.8	2.5	2.2	2.3	2.0
US	3.2	2.9	2.3	2.8	2.6
Japan	2.4	1.6	1.7	1.4	1.1
Eurozone	2.8	2.7	2.4	2.4	1.9
	y-o-y				
Asia ex-Japan*	5.5	5.4	5.4	5.2	5.1
NEA-3*	3.6	3.2	3.4	3.0	2.7
Hong Kong	3.7	3.4	3.8	3.2	2.7
Korea	3.8	2.8	3.1	2.9	2.8
Taiwan	3.2	3.3	2.9	2.7	2.5
ASEAN-4*	5.6	5.4	5.3	5.2	5.1
Indonesia	5.1	5.2	5.1	5.3	5.4
Malaysia	6.2	5.9	5.9	5.4	5.2
Philippines	7.2	6.5	6.7	6.6	6.5
Thailand	4.3	4.0	3.9	4.0	3.7
China	6.8	6.8	6.9	6.6	6.4
India**	6.5	7.2	6.6	7.4	7.6

Source: CEIC, Consensus Economics, April 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

Steady Growth Amid Rising Uncertainty

Economic growth in the G3 slowed in Q4 2017 to 2.5% q-o-q SAAR from 2.8% in Q3. While robust domestic demand continued to support the expansion, a pullback in Japan's economy due to lower net exports and reduced inventory accumulation dragged down G3 growth. Nevertheless, cyclical conditions remain favourable, supported by strong employment gains and low inflation.

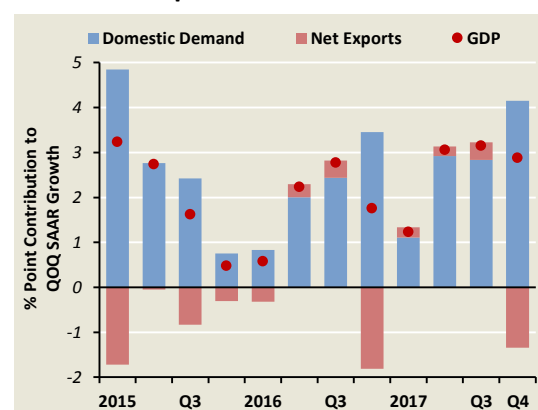
The US economy is expected to receive a fiscal stimulus from the recent tax cuts and increase in government spending in the short term. Growth in the Eurozone will likely continue to be above potential, thus enabling the region to make further progress in reducing slack in key factor markets. Meanwhile, Japan's growth will ease as the support from exports last year wanes. All in, the economic outlook for the G3 remains relatively sanguine, although an escalation of protectionism presents a material downside risk. In particular, the imposition of threatened tariffs would dampen sentiment and growth, even if their effects take time to work through the economy. Barring such an eventuality, GDP growth in the G3 should pick up slightly to 2.3% in 2018 before moderating to 2.0% in 2019.

Domestic demand supported US growth in Q4 2017.

GDP growth in the US eased to 2.9% q-o-q SAAR in Q4 2017 from 3.2% in Q3, as businesses drew down inventories and net exports fell. Nevertheless, the economy continued to expand at an above-trend rate, on the back of robust domestic demand. Final sales to domestic purchasers increased by 4.5% q-o-q SAAR in Q4—the strongest pace of expansion since Q2 2010. Overall, domestic demand contributed 4.1% points to GDP growth in Q4, compared to 2.8% points in Q3. (Chart 1.1)

Household spending, which accounts for about two-thirds of GDP, expanded by 4.0% q-o-q SAAR in Q4, the most rapid pace in three years. Notably, there was a sharp rise in purchases of durable goods such as motor vehicles and parts. Fixed investment increased by 8.2% q-o-q SAAR in Q4, compared to 2.4% in Q3, with significant contributions from both non-residential and residential investment. In terms of the type of spending, equipment investment registered double-digit growth for the second consecutive quarter. Meanwhile, government spending also rose by 3.0%, largely on account of higher federal defence spending. Full-year growth for 2017 was a creditable 2.3%, well above the 1.5% recorded in 2016.

Chart 1.1
Contribution of Domestic Demand and Net Exports to US GDP Growth



Source: CEIC and EPG, MAS estimates

US fiscal policy will be expansionary over the next two years.

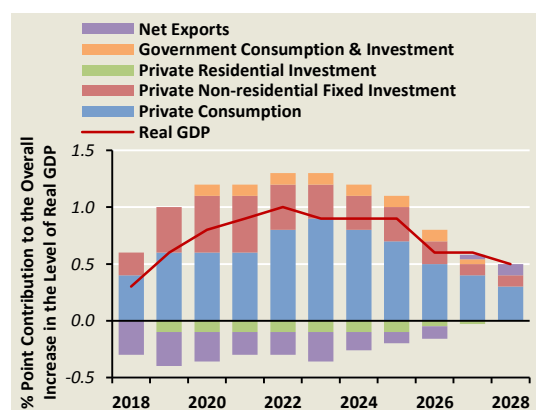
The strength in the labour market will remain a cornerstone of sustained growth in the US economy, setting in motion a virtuous cycle of rising employment, household incomes and consumption spending. Non-farm payrolls recorded a healthy increase of 202,000 per month on average in Q1 2018, which is above the 182,000 recorded in 2017. The unemployment rate stood at 4.1% in March, below the Federal Reserve's NAIRU estimate of 4.5%.

The tax reforms passed by Congress in late 2017 and the increase in federal spending limits enacted earlier this year should be viewed in the context of an economy that is already operating at close to full employment. The individual and corporate tax cuts, amounting to US\$1.5 trillion over ten years, is expected to give a fillip to growth in the next few years. The Congressional Budget Office has estimated that the Tax Cuts and Jobs Act will increase the level of real GDP by an average of 0.7% per annum over the period 2018–28.¹ This will occur mostly through increased consumer spending, which is projected to contribute, on average, 0.6% to the overall increase in the level of real GDP, although the net effect will be smaller due to import leakages. Private non-residential fixed investment will contribute a more modest 0.3% on average to the increase. (Chart 1.2)

Furthermore, the US\$300 billion hike in the federal spending limit, spread over two years, should add to aggregate demand. Some analysts have estimated that the tax reform package and increases in federal spending will boost real GDP growth by 0.5–0.7% point in each of the next two years. (Chart 1.3) Accordingly, the US growth projections have been revised upward since the last *Review*, to 2.8% in 2018 and 2.6% in 2019.

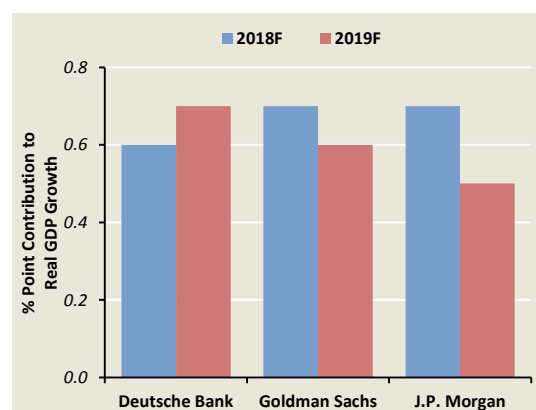
A notable economic risk on the horizon is the prospect of an escalation in US-China trade disputes. Overall, the economic effects of the tariffs already in force are estimated to be limited—washing machines, solar panels, steel and aluminium account for only a small portion (less than 3%) of total US imports. Downstream spillovers from increases in the prices of intermediate inputs, leading to higher costs for other businesses such as fabricated metals and automobiles, should also be manageable. However, should there be a rise in trade

Chart 1.2
Economic Effects of the US
Tax Cuts and Jobs Act



Source: Congressional Budget Office

Chart 1.3
Impact of the Fiscal Stimulus Package on
US Real GDP Growth



Source: Deutsche Bank, Goldman Sachs and J.P. Morgan

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

frictions among the major economies, the impact on US growth and inflation would be more discernible.

Eurozone activity remained firm in Q4 ...

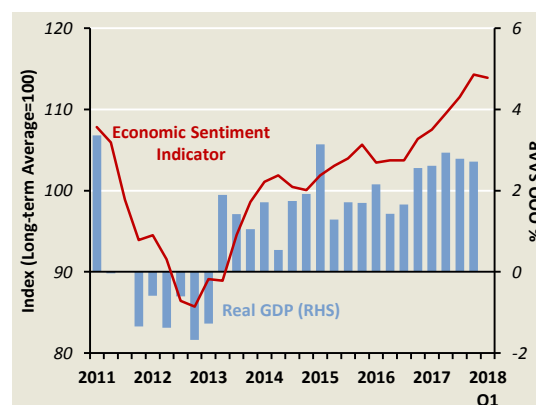
Following two quarters of robust outturns averaging 2.9% q-o-q SAAR, GDP growth in the Eurozone economy eased to a still firm 2.7% in Q4 2017. (Chart 1.4) This was underpinned by increases in all the spending components of GDP, including government expenditure, with only a drawdown in inventories subtracting from growth. However, in contrast to H1 2017 when economic activity was supported by household spending, the main engine of growth in the second half of the year was net exports, which contributed 1.8% points on average in Q3 and Q4 2017, and benefitted the core economies. Nonetheless, the cyclical upturn in economic activity was evident across all the members of the monetary union, with the peripheral economies also performing creditably. Spain and Portugal, for example, recorded healthy growth rates, underpinned by firm household spending and net exports.

... and the cyclical upswing is set to continue into 2018.

The broad-based growth momentum in the Eurozone is expected to continue into 2018, albeit at a more tempered pace. Domestic demand should be supported by improving labour markets and income growth, with full-time employment picking up strongly in 2017. (Chart 1.5) The unemployment rate also fell to 8.5% in February 2018, the lowest since December 2008. At the same time, consumer and business confidence remained buoyant, with the Economic Sentiment Indicator staying close to its recent peak in Q1 2018. (Chart 1.4)

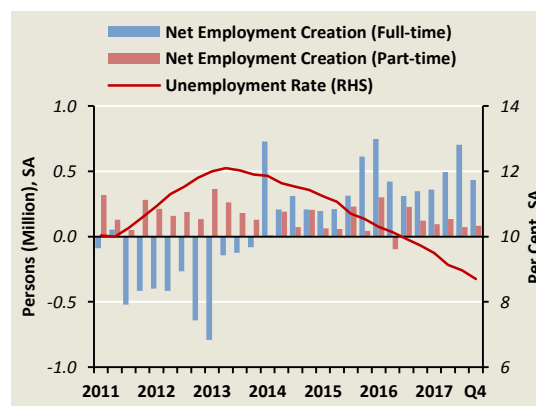
An acceleration in private investment will also help shore up the economy in the coming quarters. First, survey indicators continue to signal robust construction activity, with the construction PMI remaining at a high level in Q1 2018 and firms reporting a strong backlog of orders. Second, private capital expenditure is expected to strengthen further on account of sustained final demand and favourable financing conditions. In particular, capacity utilisation rates in the manufacturing sector have risen to well above their long-term historical averages across the Eurozone. (Chart 1.6) In contrast, net exports are projected to contribute less to growth in 2018, after registering strong gains last year, partly due

Chart 1.4
Eurozone GDP Growth and
Economic Sentiment Indicator



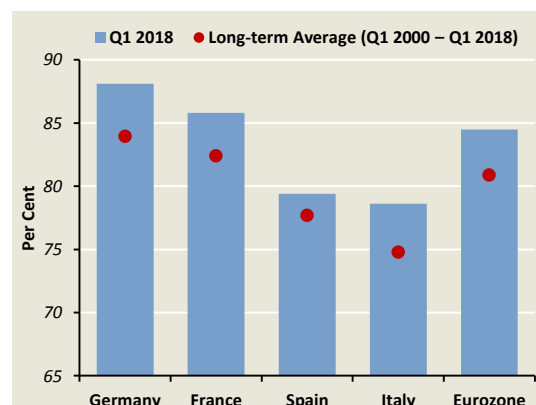
Source: Haver Analytics and EPG, MAS estimates

Chart 1.5
Eurozone Labour Market



Source: Haver Analytics and EPG, MAS estimates

Chart 1.6
Eurozone Capacity Utilisation Rates



Source: Eurostat, Haver Analytics and EPG, MAS estimates

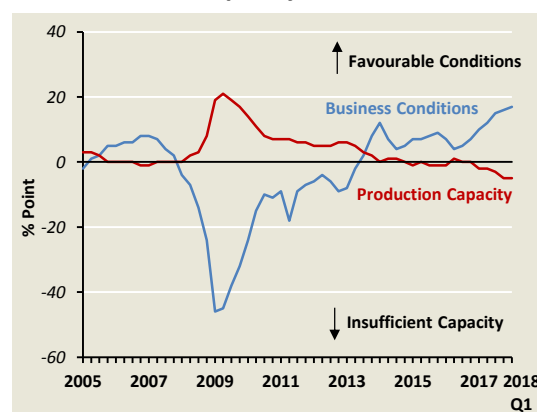
to the recent appreciation of the euro. However, downside risks to growth remain, particularly from the threat of rising trade protectionism. The recent US tariff measures on steel and aluminium have not impacted the EU due to the temporary exemption granted. In any event, these products account for only 2.1% of total EU-28 exports. Of the EU's steel and aluminium exports, the US accounts for a small share of 1.6%. Still, any escalation in trade tensions between the two major trading partners could pose a measurable drag on the region's growth.

Japan's economy will return to a more modest growth path in 2018.

Japan's GDP grew by 1.6% q-o-q SAAR in Q4 2017, a moderation from the robust rate of about 2.4% in the previous two quarters. The economy had earlier benefitted from a fiscal stimulus package, although its effects had dissipated towards end-2017. In Q4, private consumption recovered to grow by 2.1% q-o-q SAAR, after an unusually sharp 2.6% contraction in Q3 due mainly to inclement weather conditions. Business fixed investment also rose by 4.2% q-o-q SAAR in Q4—its fifth consecutive quarter of expansion. On the trade front, exports increased by 10.1% q-o-q SAAR, driven by firm demand for electronics-related products in Asia, while imports jumped by 12.0%, reflecting the underlying strength in domestic demand. The resultant decline in net exports shaved 0.1% point from GDP growth in Q4.

Although the economic momentum will carry through into 2018, growth is likely to moderate from the 1.7% outturn in 2017. Consumer spending is anticipated to increase only modestly on the back of continued sluggishness in nominal wage growth. Despite the tight labour market, this year's annual wage negotiations will result in only slightly higher wage increases compared to last year. Nonetheless, private fixed investment is projected to rise further, given upbeat business sentiment and increasingly tight production capacity. (Chart 1.7) Meanwhile, export growth has started to moderate, in line with the attenuation of the global tech cycle. The appreciation of the yen could further hold back Japan's exports in the quarters ahead. On balance, Japan's GDP growth is expected to come in at 1.4% in 2018, before moderating to 1.1% in 2019.

Chart 1.7
Japan's Business Conditions and
Production Capacity Diffusion Indices



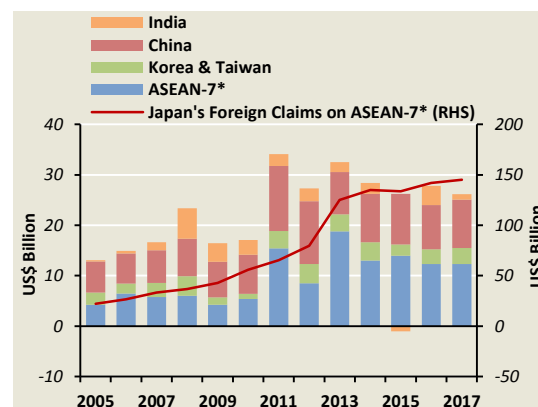
Source: Haver Analytics

Japan has strengthened its economic and financial linkages with the ASEAN economies.

Since the GFC, lacklustre domestic growth and the appreciation of the yen have prompted businesses in Japan to expand their overseas operations in search of both new markets and production bases. Notably, Japan's outward foreign direct investment and cross-border bank lending have risen steadily and in tandem over recent years. As the Bank for International Settlements has argued, these phenomena are linked: real and financial globalisation are symbiotic, as investment and trade linkages will generate the financial transactions needed to facilitate credit supply and manage balance sheet positions.² Post-GFC, Japanese firms have increasingly focused on investing in emerging ASEAN countries, attracted by fast-growing markets and cost advantages such as relatively low wages compared to China. (Chart 1.8) Concurrently, and in line with the nature of financial globalisation, Japanese banks have also expanded their cross-border financing to the ASEAN region.

This phenomenon is also the result of other push and pull factors. Shrinking net interest margins on domestic loans have been a key inducement, compelling Japanese banks to seek higher returns from overseas loans. At the same time, ASEAN's increased financing needs amid sustained economic growth has provided an important pull factor. Further, the deleveraging of European banks since 2010 has created a void, allowing Japanese banks to gain market share in the region. These trends are likely to continue given the favourable medium-term outlook. As a result, the economic and financial ties between Japan and ASEAN are likely to deepen, with Japanese corporates and banks playing a key role in the region's development.

Chart 1.8
Japan's Outward Foreign Direct Investment to Emerging Asia and Foreign Claims on ASEAN



Source: Haver Analytics and EPG, MAS estimates

Note: 2017 foreign claims data is as of Q3 2017.

* The ASEAN-7 countries are Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Thailand and Vietnam.

² Bank for International Settlements (2017), "Understanding globalisation", 87th Annual Report, Chapter 6, June.

1.2 Asia

Domestic Demand Will Underpin Growth

Asia ex-Japan put up a sterling performance in 2017 due to the sustained upturn in exports induced by the synchronised recovery in the advanced economies. Additionally, the continuing upswing in the global tech cycle lifted electronics shipments from China, Korea, Malaysia, and Taiwan—countries that are highly integrated into regional supply chains. In turn, the pickup in exports has generated positive spillover effects on domestic demand, as firms stepped up investment, particularly in the NEA-3.

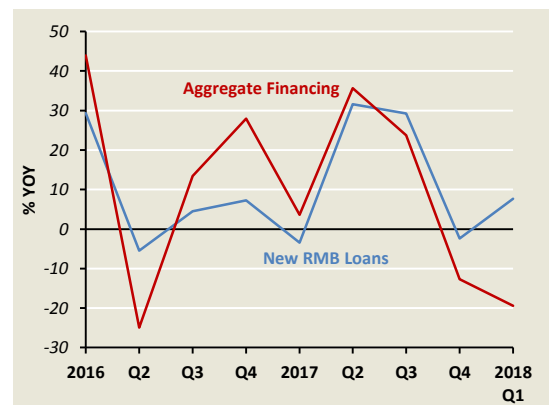
While export momentum is anticipated to moderate in 2018, stronger employment and incomes will underpin household spending across Asia. In China, growth will be supported by a new consuming class in the lower-tier cities and the rapid expansion of online services. In the NEA-3, growth will be bolstered by accommodative fiscal measures even as trade activity eases with the maturing of the global tech cycle. In the ASEAN-4, the economic expansion should be supported by a resurgence in investment and improving terms of trade for commodities. On balance, growth in Asia ex-Japan is expected to edge down to 5.2% in 2018 and 5.1% in 2019, although a sharper deceleration could occur should there be a further escalation of trade disputes.

External demand bolstered China's economy in Q4 2017, while domestic investment cooled.

China's GDP growth was maintained at 6.8% y-o-y in Q4 2017, on par with the previous quarter, as buoyant net exports offset muted domestic investment. Over the course of 2017, the policy focus has evolved from supporting growth to addressing vulnerabilities, such as excess capacity and high indebtedness. As the Chinese authorities continued to rein in financial risks, credit conditions tightened for entities that had relied on shadow funding channels, such as real estate companies. Indeed, the growth of aggregate financing to the real economy fell by more than 6% points from 2016 to 9.2% last year, even though formal bank lending declined by less. (Chart 1.9) As a result, the growth of fixed asset investment in manufacturing, real estate and infrastructure eased in Q4 2017. Meanwhile, China's goods and services exports rallied by 13.5% y-o-y in the same quarter while imports moderated, resulting in net exports contributing 2.0% points to headline growth.

The external sector provided less support to growth in Q1 this year, as a rebound in goods imports outstripped faster growth in goods exports. Nevertheless, the Chinese economy continued to perform robustly in Q1, growing by a steady 6.8% y-o-y, alongside a larger contribution from consumption.

Chart 1.9
Growth in China's New Bank Loans and Aggregate Financing



Source: CEIC and EPG, MAS estimates

China has sufficient policy buffers to counter the risks from trade restrictions.

Economic growth in China is expected to ease in the coming quarters as export growth softens. However, domestic demand should provide a strong buffer. Improved industrial capacity utilisation following the weeding out of excess capacity in heavy industries, as well as dwindling inventories of unsold real estate, should put a floor on investment demand. (Charts 1.10 and 1.11) Meanwhile, a tight labour market will provide support for private consumption. In addition, aggregate household spending will be increasingly driven by China's lower-tier cities, where disposable incomes are converging with those in the top-tier cities. The authorities have committed to forging a medium-term development strategy that spreads the benefits of economic growth more equitably across regions, and produces a more balanced mix between consumption and investment. Policymakers have also been placing greater emphasis on mitigating environmental externalities and managing financial risks, paving the way for higher-quality growth.

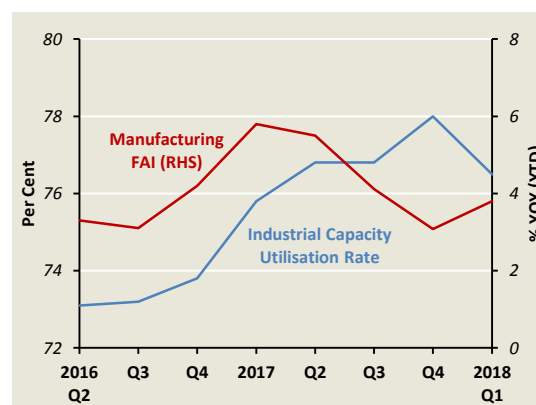
On the external front, the impact of US trade actions on China has so far been limited. For tariffs that are already in force, the affected manufactures account for only a small part (4.5% in 2016) of China's total goods exports, with US-bound shipments of these goods also constituting a minor share (7%) of the country's global exports. Should trade frictions intensify, the Chinese authorities have sufficient policy levers to buffer growth, including through fiscal pump-priming. Thus, the Chinese economy is expected to expand by around 6.6% in 2018, before growth eases to 6.4% in 2019.

Economic growth in India is poised to accelerate as policy uncertainty dissipates.

Growth in India recovered in the second half of last year as the country adjusted to the demonetisation exercise and the implementation of the Goods and Services Tax (GST) in H1 2017. In particular, growth rose to 7.2% y-o-y in Q4 2017, from an average of 5.9% in the first half of the year.

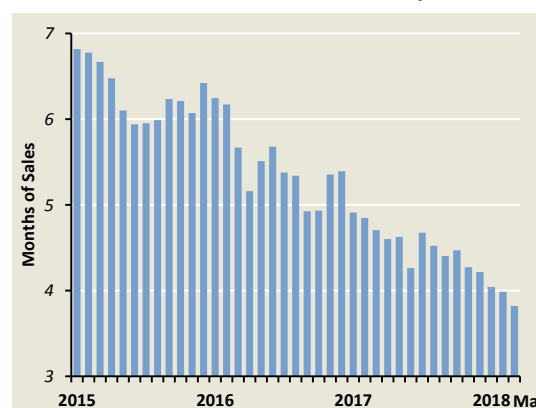
The recovery was underpinned by a broad-based turnaround in the manufacturing and services sectors. Aggressive inventory restocking by businesses alongside a normalisation of industrial activity post-GST saw growth in manufacturing rebound from -1.8% y-o-y in Q2 2017 to 6.9% and 8.1% in Q3 and Q4, respectively.

Chart 1.10
China's Industrial Capacity Utilisation Rate and Growth in Manufacturing FAI



Source: Wind

Chart 1.11
Unsold Commodity Real Estate Floor Space in China as a Ratio of Monthly Sales



Source: CEIC and EPG, MAS estimates

Note: Commodity real estate refers to property that is sold by real estate developers.

In addition, the upturn in the cash-intensive services industries continued to gain momentum in H2, following a steep decline in activity in Q1 caused by the demonetisation exercise. (Chart 1.12) Meanwhile, growth in public administration services moderated from the first half of 2017 as the authorities reined in public spending to adhere to fiscal targets.

Looking ahead, household consumption is expected to be boosted by renewed government efforts to support rural and lower-income communities. The implementation of a two-year US\$32 billion bank recapitalisation package should help to clean up public banks' balance sheets, boost credit supply, and set the stage for a gradual investment revival. (Chart 1.13) All in, growth in the Indian economy is projected to come in at 7.4% in FY2018, before rising to 7.6% in FY2019.

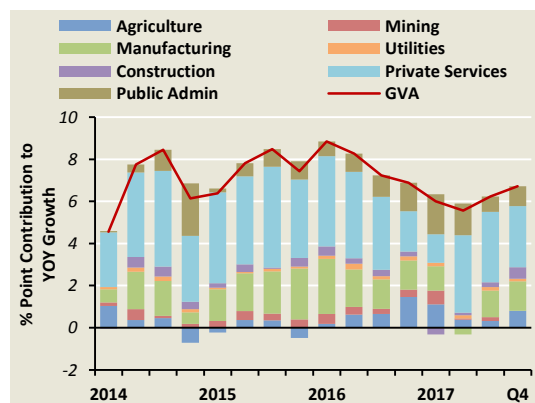
Growth momentum in the NEA-3 will moderate alongside the maturing tech cycle.

GDP growth in the NEA-3 economies eased to 3.2% y-o-y in Q4 2017, from 3.6% a quarter ago. (Chart 1.14) In Q4, firming domestic demand underpinned growth, ameliorating the impact of a slowdown in exports. The slippage in exports from a spike in Q3 was, in turn, due to an unusual confluence of calendar and moving holiday effects, rather than a retraction in external demand.

Private consumption improved as a cumulative result of the positive spillovers from the sustained export upturn over the past two years. Supported by rising employment and wages, household spending strengthened across the region over the past few quarters. However, investment activity pulled back in Korea and Taiwan in Q4, as growth in machinery and equipment investment slackened alongside easing supply shortages in the DRAM market and declining NAND flash prices.

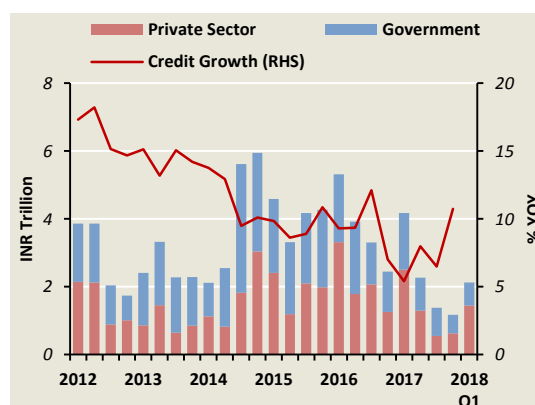
The near-term outlook for the NEA-3 economies remains favourable, despite a slowing of external demand and the maturing of the global electronics cycle. GDP growth will be held up by household spending, bolstered by fiscal and social measures such as a salary hike for public servants and reduction in the maximum income tax rate in Taiwan, as well as one-off income tax relief and cash handouts in Hong Kong. Taking into consideration these factors, the NEA-3 region is forecast to grow by 3.0% in 2018 and 2.7% in 2019. These projected outcomes represent a moderation from

Chart 1.12
Contribution to India's Real Gross Value Added (GVA) by Sector



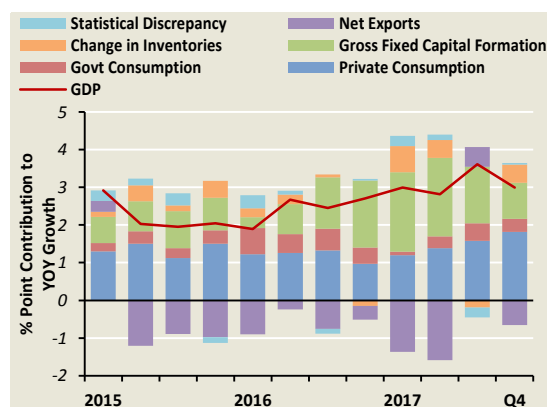
Source: CEIC and EPG, MAS estimates

Chart 1.13
India's New Investment by Ownership and Credit Growth



Source: CMIE, CEIC and EPG, MAS estimates

Chart 1.14
Contribution to NEA-3 GDP Growth



Source: CEIC, Haver Analytics and EPG, MAS estimates

the strong 3.4% recorded in 2017, but is nevertheless higher than the five-year average of 2.4% posted in 2012–16.

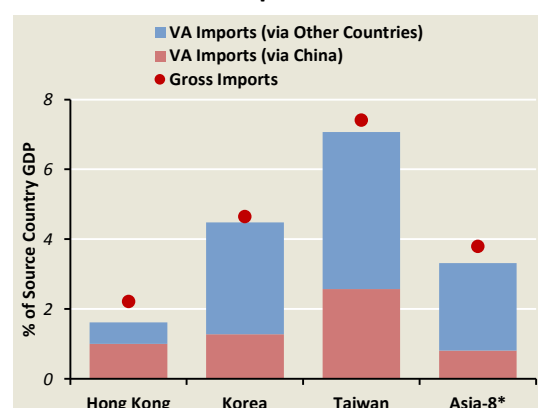
The threat of increased protectionism poses a tangible risk to the trade-oriented NEA economies. Heightened tensions between the US and China will have an outsized impact on the region. Given their close manufacturing linkages with China, Taiwan and, to a lesser extent, Korea, could be adversely affected if trade conflicts escalate. (Chart 1.15) Hong Kong, as an entrepôt port and a key gateway for China, will also see some impact if higher import tariffs imposed by either side were to curtail trade flows.

ASEAN-4 economies turned in a creditable growth performance in 2017.

GDP growth in the ASEAN-4 was sustained at 5.4% y-o-y in Q4 2017, marginally lower than the 5.6% in Q3. Demand for ASEAN electronics exports showed little sign of abating, and private domestic spending further propped up growth across the region. (Chart 1.16) Indonesia also experienced a long-awaited revival in investment demand, while the Philippines saw private consumption accelerate on the back of strong overseas remittances and rising employment. Government spending firmed in Malaysia and the Philippines but contracted in Thailand, as changes in procurement regulations held back budget disbursements.

The ASEAN-4 economies as a whole are projected to expand by 5.2% in 2018 and 5.1% in 2019. Barring an escalation of trade skirmishes, external demand from the G3 economies and China should sustain export growth. The major primary goods exporters, Malaysia and Indonesia, will also benefit from firmer commodity prices and hence improving terms of trade. In addition, the sustained momentum in trade activity should generate knock-on effects buttressing domestic consumption and investment throughout the region. However, the fiscal stimulus in the ASEAN-4 is likely to ease somewhat in the coming quarters, as the authorities refocus on raising revenue to finance long-term spending plans.

Chart 1.15
US Merchandise Imports from Asia in 2017

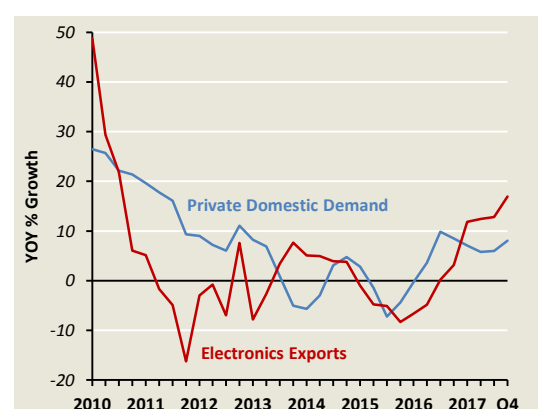


Source: OECD, Haver Analytics and EPG, MAS estimates

Note: Gross imports are the value of shipments imported by the US directly from the source country, while VA imports are the value added embodied in US imports originating from the source country. The 2017 figures for VA imports are estimated by applying the 2011 (latest available) ratios of VA imports from the source country to US total imports, to 2017 US gross import figures.

* The Asia-8 countries are Hong Kong, India, Indonesia, Korea, Malaysia, the Philippines, Taiwan and Thailand.

Chart 1.16
ASEAN-4 Electronics Exports and Private Domestic Demand



Source: CEIC, Haver Analytics and EPG, MAS estimates

ASEAN's emerging middle class provides significant growth potential.

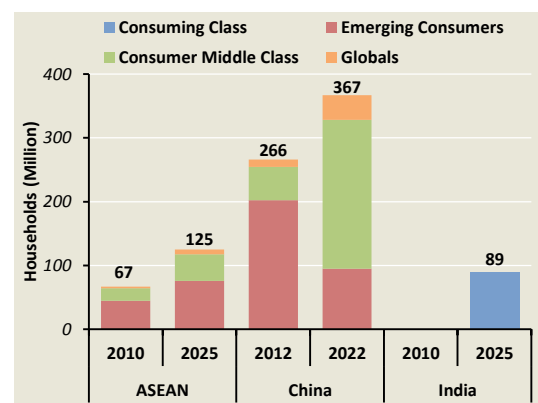
In the coming years, consumption is set to play a larger role in driving ASEAN's growth, even as the cyclical forces currently underpinning domestic demand fade. The outlook for household spending in the region will be bolstered by the burgeoning ranks of middle-class consumers. According to estimates by McKinsey, the number of households with annual incomes exceeding US\$7,500 in 2005 PPP terms will rise from 67 million in 2010 to 125 million by 2025.³ (Chart 1.17) In terms of mean wealth per adult, middle-income ASEAN countries (Indonesia, Malaysia, Thailand and the Philippines) are ahead of Asian heavyweight India, and not far behind China. (Chart 1.18)

With steadily rising incomes, the increasingly affluent ASEAN region represents a sizeable consumer market with substantial growth potential. The ASEAN consumer market overshadows that of India and Central and Eastern Europe, given its higher per capita consumption relative to the former and larger population relative to the latter. (Chart 1.19) The Peterson Institute for International Economics estimates that East Asia and the Pacific, which includes ASEAN, will witness the third-fastest rate of consumption growth in the world between 2013 and 2035, behind only India and Africa, which are still in the early stages of consumption take-off.⁴

This rapid expansion in ASEAN's middle class will underpin growing demand for a wide range of mass consumer products. In the initial phases of consumption take-off, demand for mass consumer products such as chocolates, beer and detergent will be first to rise. As per capita income increases further, consumers will progressively spend a larger proportion of their income on consumer durables, such as cars and washing machines, and finally on services, such as recreation and international travel.

The lower middle-income ASEAN economies are at the inflection point where demand for basic consumer goods will accelerate, while the richer economies of Malaysia and Thailand should witness stronger demand for premium consumer products. (Chart 1.20) The emergence of a growing group of high-income

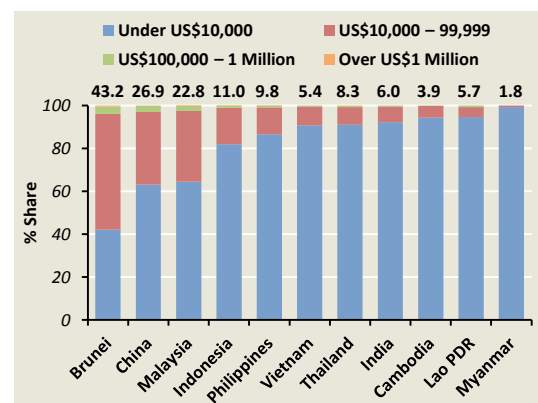
Chart 1.17
Projections of Middle- and High-income Populations for Asia



Source: McKinsey and EPG, MAS estimates

Note: The middle- and high-income population in this chart follows the definition of a consuming class by McKinsey. For ASEAN, the consuming class consists of: (i) emerging consumers (annual income of US\$7,500–19,999); (ii) consuming middle class (US\$20,000–70,000); and (iii) globals (>US\$70,000) in 2005 PPP terms. For China, the categories are: (i) emerging consumers/mass middle class (US\$9,000–15,999); (ii) upper middle class/consuming middle class (US\$16,000–34,000); (iii) globals/affluent (>US\$34,000) in 2010 real terms. For India, McKinsey includes all households with an annual disposable income of more than US\$31,000 in 2012 prices.

Chart 1.18
Distribution of Wealth in Asia (US\$)



Source: Credit Suisse

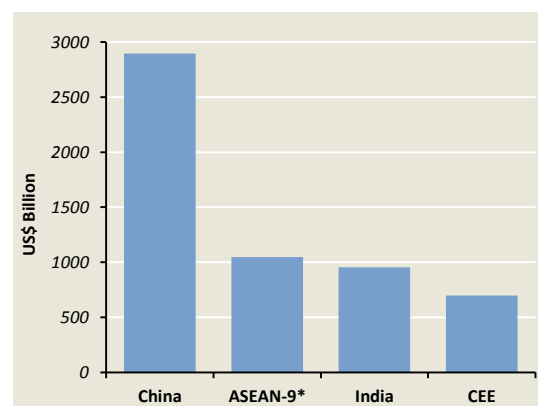
Note: The figures above the columns represent mean wealth per adult in each country in US\$ thousands.

³ McKinsey Global Institute (2016), "Understanding ASEAN: Seven Things You Need To Know", May.

⁴ Hellebrandt, T and Mauro, P (2015), "World on the Move: The Changing Global Income Distribution and Its Implications for Consumption Patterns and Public Policies", Peterson Institute for International Economics Policy Brief, November.

consumers will also drive demand for luxury goods and services. McKinsey projects that the group of high-income households with incomes above US\$70,000 will swell from 2.7 million households in 2010 to 7.2 million by 2025. ASEAN countries are also poised to become heavier consumers of ICT-related products and services, as the region makes further advances in its digitalisation journey. (Please refer to Special Feature A, which examines the prospects for digital transformation in the ASEAN economies)

Chart 1.19
Aggregate Private Consumption by Region in 2016

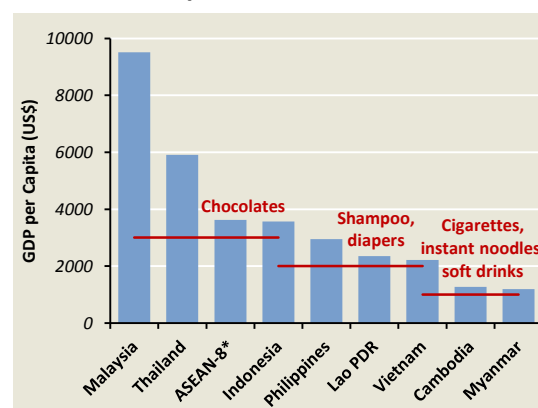


Source: Haver Analytics and EPG, MAS estimates

Note: CEE refers to Central and Eastern Europe.

* The ASEAN-9 countries are Brunei, Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam.

Chart 1.20
GDP per Capita and Income Thresholds for Consumption Take-off in ASEAN



Source: The Nielsen Company

Note: The horizontal red lines indicate the estimated inflection point beyond which consumer demand accelerates for the named products.

* The ASEAN-8 countries are Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Thailand and Vietnam.

1.3 Global Inflation

Nascent Signs Of A Pick-up In Inflation

Even with the global cyclical upswing firmly underway, cost and price pressures have so far been muted. While underlying inflationary pressures in the advanced economies have been largely absent thus far, the recent period of sustained GDP growth should tighten labour market conditions and lead to a pickup in wages and inflation. To date, there are only nascent signs of faster wage increases in the G3 economies. In Asia ex-Japan, countervailing fluctuations in food and commodity prices have led to mixed inflation outcomes. All in, global CPI inflation is anticipated to rise to 2.2% in 2018 and 2.1% in 2019, from 1.9% in 2017.

G3 headline inflation edged higher, even as core inflation remained subdued.

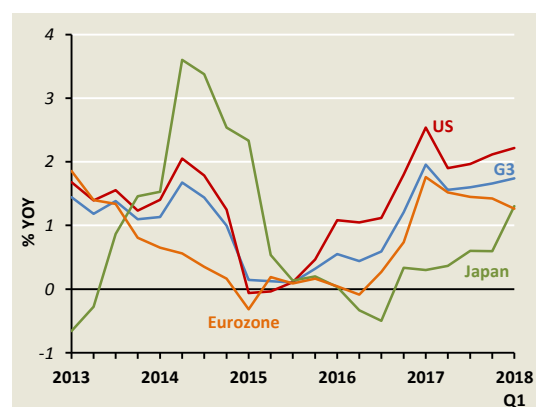
Thus far, both inflation and wage growth in the US and other G3 economies have surprised on the downside, despite the growing tightness in the labour market. (Chart 1.21) Overall, G3 inflation is projected to pick up to 1.9% in 2018 before easing to 1.7% in 2019.

In the US, headline CPI inflation inched up to an average of 2.2% y-o-y in Q1 2018, from 2.1% in the preceding quarter, due in part to an increase in energy prices. Core inflation also rose to 1.9% in the first quarter, from 1.8% in Q4 2017. Average hourly earnings picked up to 2.7% y-o-y in Q1 2018, slightly ahead of the norm over the past three years. As the US economy grows strongly in the next two years amid diminishing slack in the labour market, wage growth and CPI inflation should pick up. Indeed, the 10-year break-even inflation rate has risen significantly since the beginning of this year, pointing to a rise in long-term inflation expectations. (Chart 1.22)

In the Eurozone, headline CPI inflation dipped to 1.3% in Q1 2018 from 1.4% in the previous quarter. This was mainly due to lower unprocessed food price inflation. Nevertheless, core inflation also remained subdued and is expected to rise only gradually, as stronger GDP growth slowly absorbs the remaining slack in the economy.

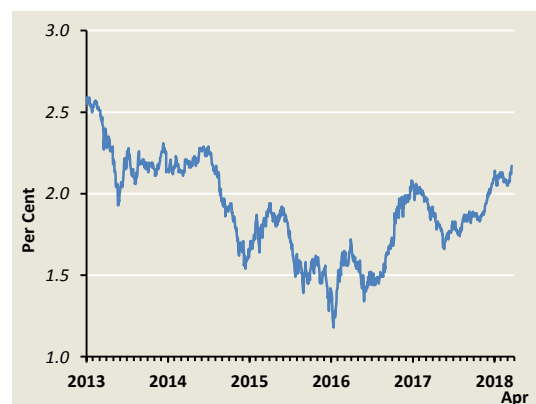
In Japan, headline CPI inflation jumped to 1.3% y-o-y in Q1 2018 from 0.6% in the previous quarter, largely due to a weather-related rise in fresh food prices. Meanwhile, core inflation inched up but remained low at 0.3% y-o-y in Q1. Going forward, core inflation is likely to remain muted throughout 2018, on the back of weak inflation expectations and subdued wage growth.

Chart 1.21
G3 CPI Inflation



Source: Haver Analytics and EPG, MAS estimates

Chart 1.22
US 10-year Break-even Inflation Rate



Source: Federal Reserve Bank of St. Louis

Note: The break-even inflation rate is a measure of what market participants expect inflation to be in the next 10 years, on average. The rate is the difference in yields between the nominal and inflation-linked 10-year Treasury bonds.

Inflation in Asia ex-Japan is expected to tick up, partly because of cost-push pressures.

In Asia ex-Japan, CPI inflation picked up to 2.6% y-o-y in Q1 2018 from 2.4% in Q4 2017. (Chart 1.23) For the year as a whole, it is projected to rise to 2.8% from 2.1% in 2017, and stabilise at that level next year.

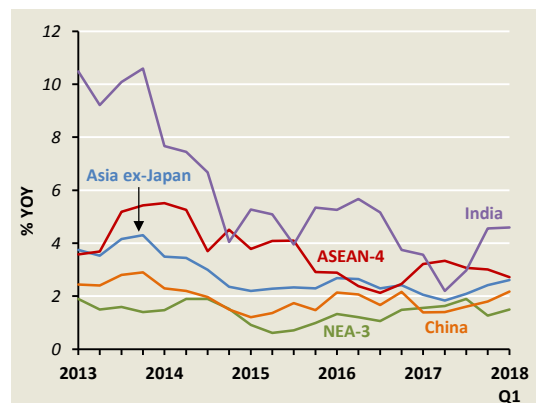
In China, headline inflation in Q1 2018 rose to 2.2% y-o-y, up from 1.8% in Q4 last year, as food price inflation turned positive for the first time in five quarters. However, underlying cost pressures remained contained, with China's core inflation slipping to 2.1% in Q1, from 2.3% in the previous quarter, as housing, healthcare and transport cost increases ebbed. Meanwhile, PPI inflation retreated from the nine-year peak of 6.3% in 2017 to 3.7%.

Looking ahead, headline and PPI inflation in China could face some upside risks resulting from the retaliatory tariffs against US imports. The potential impact on domestic inflation will depend on the willingness of Chinese importers to pass on cost increases as well as the availability of substitutes. For now, the headline CPI inflation rate is expected to come in at 2.3% for the whole of this year.

In India, headline CPI inflation was unchanged at 4.6% y-o-y in Q1 2018 compared to the previous quarter, as a decline in food inflation was offset by stronger price increases in the education, recreation and personal care categories. In the coming quarters, inflation is expected to pick up alongside rising energy prices and the implementation of higher minimum support prices for common summer crops such as paddy and maize. Accordingly, CPI inflation is projected to average 4.8% in FY2018, up from 2.4% in FY2017.

CPI inflation in the NEA-3 economies rose to 1.5% y-o-y in Q1, from 1.3% a quarter ago, due to higher inflation in Hong Kong and Taiwan. In Hong Kong, demand-pull pressures increased alongside strengthening domestic demand while in Taiwan, a step-up in food and tobacco prices drove up CPI inflation. In the quarters ahead, factors such as a minimum wage hike in Korea and an expansionary budget in Hong Kong should exert further upward pressure on inflation. Overall, NEA-3 inflation is projected to rise gradually in the quarters ahead and average 1.7% in 2018, compared with 1.6% last year.

Chart 1.23
Asia ex-Japan CPI Inflation



Source: Haver Analytics and EPG, MAS estimates

Inflation in the ASEAN-4 economies eased to 2.7% y-o-y in Q1 2018, from 3.0% in the previous quarter. Inflation was contained due to subdued food prices in Indonesia and Thailand, as well as stabilising fuel prices in Malaysia. However, inflation in the Philippines picked up to 3.9% in Q1 2018 from 3.0% in the preceding quarter, due in part to higher excise taxes on a wide range of consumer goods. Overall, headline inflation across the ASEAN-4 is forecast to come in at 3.2% this year, unchanged from the 2017 outcome.

Chapter 2

The Singapore Economy

2 The Singapore Economy

On A Steady Course

Alongside the maturing of the global economic cycle, growth momentum in the Singapore economy slowed over the last two quarters, compared with the previous six months. Nevertheless, the economy remained firmly on an expansion path, albeit with some sectoral unevenness. While the trade-related and modern services clusters gained from the global cyclical uplift, the positive spillovers have yet to fully feed through to the domestic-oriented cluster, where some slack is still evident.

For 2018, Singapore's economic outlook remains positive. The trade-related sectors will anchor growth as they continue to leverage on sustained demand in the global electronics industry, especially from regional production nodes. Meanwhile, digital transformation is set to play an increasingly important role in modern services. As firms undertake investment to digitalise, they impart positive spillovers to industries providing supporting services, which will boost both productivity and economic growth. In the domestic-oriented cluster, consumer spending is expected to pick up alongside the improving labour market. Moreover, there has been a discernible increase in the share of consumer spending on non-tradable services where the value-added multiplier is higher, which augurs well for the cluster's outlook, especially over the longer term.

However, the recent escalation of rhetoric from both the US and China has stoked fears of a protracted period of trade tensions between the world's two largest economies. While the direct impact from tariff actions announced thus far should be limited, the curtailment of business investment and consumer spending arising from a loss of confidence could quickly dampen global economic growth and pose some downside risk to Singapore's economic growth outlook. Nonetheless, barring a significant escalation of trade and other geopolitical tensions, domestic GDP growth is expected to continue on a steady expansion path for the rest of the year.

2.1 Recent Economic Developments

Beyond The Cyclical Uplift

The Singapore economy registered creditable, albeit uneven, growth over the last two quarters. The bulk of the increase came from the trade-related sectors, underpinned by the continued resilience of the global tech cycle. The modern services cluster also performed well, benefiting from ongoing digitalisation initiatives. In contrast, the performance of the domestic-oriented cluster was lacklustre, with weakness still evident in the consumer-facing industries.

Economic growth remained firm and was largely driven by the trade-related and modern services clusters.

The Singapore economy remained firmly on an expansion path over the last two quarters. On a q-o-q SAAR basis, Singapore's GDP grew, on average, by 1.8% over Q4 2017 to Q1 2018, extending the strong 7.0% growth of the previous six months. (Chart 2.1)

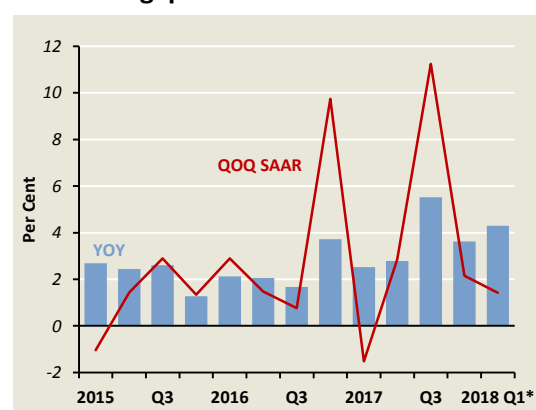
This was corroborated by EPG's Economic Activity Index (EAI), which rose to 107.9 in Q4 2017 and 108.7 in Jan–Feb 2018, compared to an average of 105.7 over Q2–Q3 2017. (Chart 2.2) Concomitantly, the value added-weighted share of indicators in the EAI that recorded positive growth was well above the 50 per cent mark over the last two quarters. (Chart 2.3)

From a sectoral perspective, growth was led by the trade-related sectors and modern services, while the domestic-oriented industries were stagnant over the last two quarters.

The trade-related sectors were further boosted by the global tech expansion.

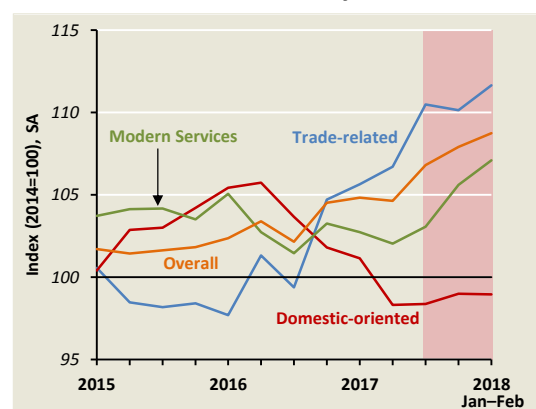
The trade-related sectors continued to expand alongside the enduring upturn in the global IT cycle. In particular, production in the electronics sector remained at elevated levels. (Chart 2.4) Notably, the semiconductors segment was the largest source of growth, expanding by 3.2% q-o-q SA, on average, in the last two quarters, even though growth moderated from a high of 9.4% in the preceding half year. The strong showing in IT-related activities was also consistent with the favourable performance of Asian electronics exporters as regional supply chains continued to benefit from the global tech expansion. (Chart 2.5)

Chart 2.1
Singapore's Real GDP Growth



* Advance Estimates.

Chart 2.2
Economic Activity Index



Source: EPG, MAS estimates

Meanwhile, the rest of the trade-related sectors turned in more subdued performances. The marine & offshore engineering (M&OE) segment continued to weaken in Q1 2018, although the pace of contraction eased alongside some recovery in crude oil prices. The transportation & storage sector was also impacted by a pullback in sea and air cargo handled in the first quarter of 2018, after firm expansions in H2 2017.

Activity in the modern services cluster was buoyant, but a ‘digital divide’ has emerged.

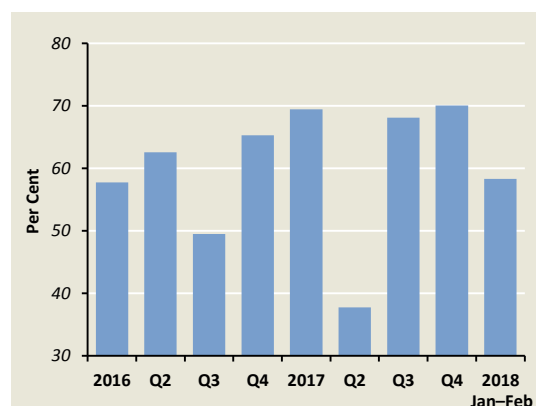
Modern services contributed steadily to growth in the last two quarters. This was largely anchored by a pickup in pockets of activity within financial services, as well as ongoing digitalisation, which have, in turn, led to positive spillovers to other services such as information & communications technology (ICT).

In the finance & insurance sector, the synchronised global recovery has supported stronger credit demand in most regions. In particular, ACU non-bank lending to East Asia grew by 7.5% sequentially in Q4 2017 and a further 5.8% in Jan–Feb 2018, after growing by 6.0% on average in the first three quarters of 2017. Meanwhile, some sentiment-sensitive segments benefited from heightened volatility in global financial markets, which, in turn, largely stemmed from investor concern over policy tightening in advanced economies. For example, the daily average of forex trading volumes in Jan–Feb and the trading value of securities in Q1 2018 surged sequentially by 20% and 29%, respectively.

Outcomes within the ICT sector were uneven. The drivers of growth were largely a result of capacity-building investments for the digital economy, which boosted the IT & information services segment. In comparison, the telecommunications and “others”¹ segments have been facing structural headwinds from technological disruption, which weighed on their performances in the last two quarters.

In fact, this apparent ‘digital divide’ had emerged as early as 2012. On average, the IT & information services segment expanded by 11.4% p.a. in nominal terms since 2012, outpacing the 3.6% and 0.4% growth recorded by the telecommunications and “others” segments, respectively. (Chart 2.6) A survey of local publicly-listed telecommunications and media companies also showed

Chart 2.3
Proportion of Expanding Components in the EAI



Source: EPG, MAS estimates

Chart 2.4
Industrial Production

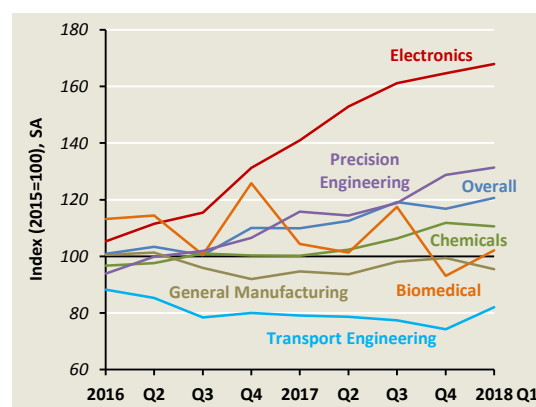
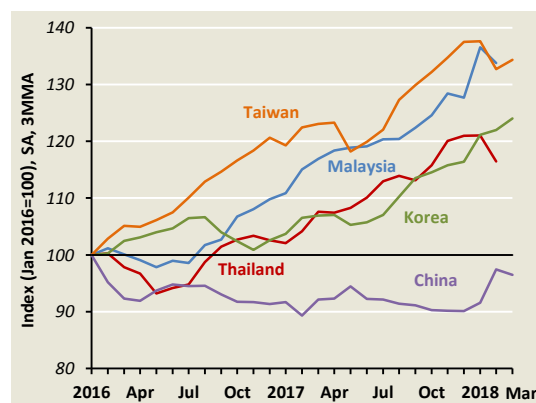


Chart 2.5
Regional Electronics Exports



Source: Haver Analytics, CEIC and EPG, MAS estimates

¹ The “others” segment in the ICT sector includes publishing as well as the production and broadcasting of television and radio programmes.

that their revenues and operating profits have seen declining growth for several years. (Chart 2.7)

Some slack remains in the domestic-oriented cluster, but recovery is underway.

Meanwhile, some domestic-oriented activities weakened marginally at the start of 2018. This was especially evident in the consumer-facing segments such as retail and food services, although it could be partly due to the moving Chinese New Year holiday effect. Retail sales volumes (excluding motor vehicles) registered low, albeit still-positive, growth of 0.3% q-o-q SA in Q4 2017, but saw a small decline of 0.6% in Jan–Feb 2018. Likewise, food & beverage (F&B) spending fell by 0.7% q-o-q SA in Q4 2017 and slipped further by a similar magnitude in Jan–Feb 2018.

Surveys conducted by MasterCard and Nielsen in late 2017 pointed to a gradual turnaround in consumer sentiment. However, the translation to actual retail and F&B sales has not been strong. This could be due to a confluence of factors, including seasonal effects as well as structural shifts in consumption behaviour. Notably, rising e-commerce penetration and an increasing preference for affordable casual mid-tier dining could have limited the extent of the cyclical uplift in retail sales and restaurant meals. As a result, there could still be some slack in these industries despite the consolidation of such firms in the preceding years.

EPG constructed a factor utilisation indicator to assess the extent of slack in the retail and F&B services segments by aggregating information from five series: the net employment changes and net firm formation in each industry and the retail occupancy rate.² As shown in Chart 2.8, factor utilisation in these segments started to decline in 2015, largely as a result of the closure of firms and fall in hiring, especially in the retail industry. While weakness has persisted, there have been signs of easing since late 2016. Even as occupancy rates of retail space remained mildly depressed, there has been a rise in net firm formation in both the restaurant and retail industries. (Chart 2.9)

In the construction sector, certified progress payments staged a notable turnaround, growing by 1.5% q-o-q SA in Q4 2017 and a further 1.2% in Jan–Feb 2018, after six consecutive quarters of contraction. Civil engineering

Chart 2.6
Nominal VA Growth in the ICT Sector

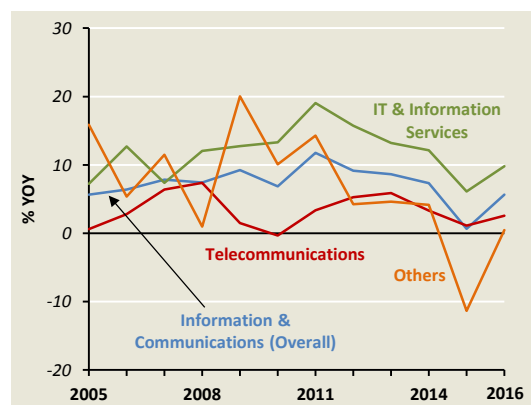
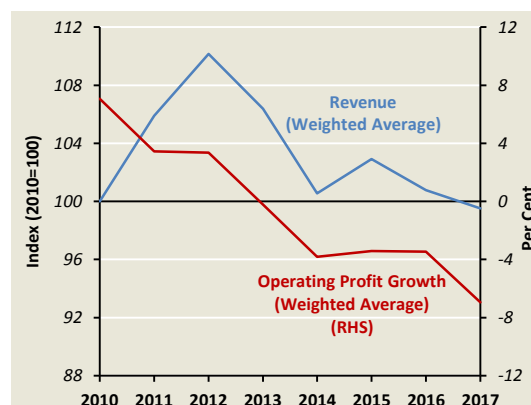
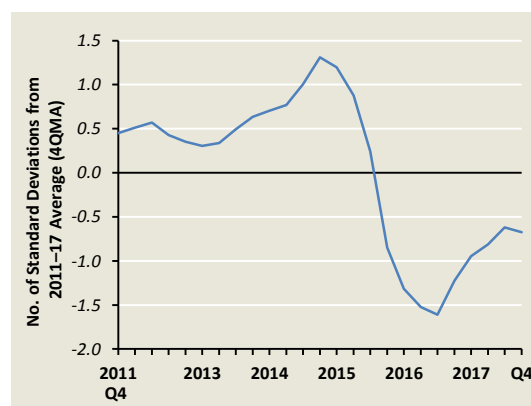


Chart 2.7
Revenue and Operating Profit Growth in Listed Telecommunications and Media Companies



Source: Bloomberg and EPG, MAS estimates

Chart 2.8
Factor Utilisation in Retail and F&B



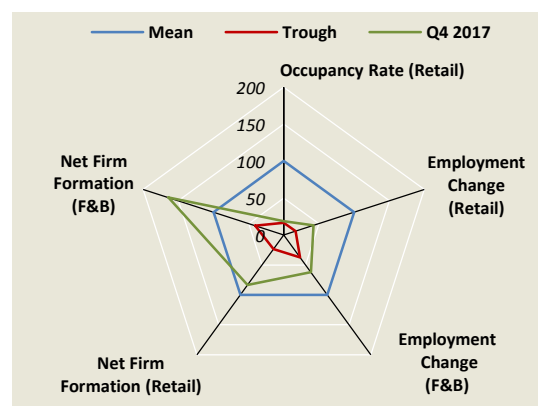
Source: EPG, MAS estimates

² Principal components analysis was used to summarise the information set, with the estimated first principal component explaining about 53% of the data variance. The number of standard deviations of the first principal component from its average 2011–17 level was used as a gauge of industry activity or resource utilisation.

led the recovery in line with ongoing projects such as the Deep Tunnel Sewerage System and the power supply upgrading for the rail network. Conversely, building construction works remained sluggish.

A similar factor utilisation analysis was applied on a slightly different set of indicators in the construction sector: net firm formation, employment change, and imports of construction machinery. The results suggest that while the degree of slack has not widened since mid-2016, it will take more time for existing capacity to be fully utilised. (Chart 2.10) Indeed, the industry has continued to scale down on machinery and equipment investment, and reduced the labour employed. (Chart 2.11) As such, productivity turned around in the second half of 2017, averaging 1.6% q-o-q in Q3–Q4 2017, compared to –0.9% over Q1 2016 – Q2 2017.

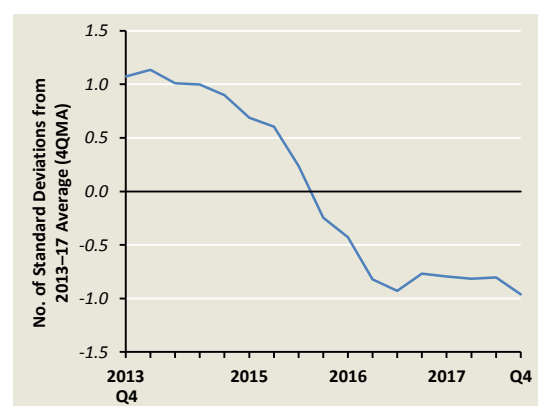
Chart 2.9
Factor Utilisation Indicators for Retail and F&B



Source: EPG, MAS estimates

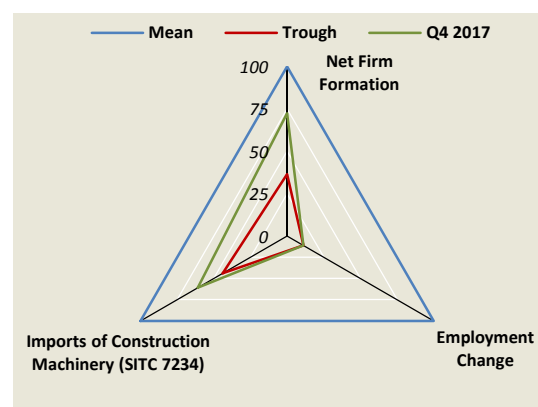
Note: The data have been statistically normalised with mean 100, and plotted on a four-quarter moving average basis.

Chart 2.10
Factor Utilisation in the Construction Sector



Source: EPG, MAS estimates

Chart 2.11
Factor Utilisation Indicators for the Construction Sector



Source: EPG, MAS estimates

2.2 Economic Outlook

Cautious Optimism

Global final demand is projected to stay firm in 2018 and rising household incomes should translate into positive consumer and business sentiment. Concomitantly, the global tech expansion is expected to continue, albeit at a more restrained pace. Against this backdrop, the trade-related sectors should witness further expansion in the quarters ahead. Meanwhile, digital activities have emerged as an important growth engine in modern services as firms invest in more technological enhancements. The ICT and professional services industries will also benefit from the derived demand for IT and other supporting services, respectively. In turn, the strength of the trade-related sectors and modern services should impart further positive spillovers to the domestic-oriented cluster. While the recent escalation of global trade frictions has posed some downside risks to the Singapore economy, the direct impact of the announced tariffs is likely to be contained. On balance, GDP growth in 2018 should come in slightly above the middle of the forecast range of 1.5–3.5%.

The Singapore economy is set to continue on a steady expansion path in 2018.

The global economy has largely evolved according to expectations since the last *Review*. In 2017, it turned in its best performance since 2011, in tandem with the synchronised global upturn and solid growth in world trade. While the global economic cycle has entered a more mature phase in 2018, growth momentum is expected to remain firm on the back of improving labour markets and increased consumption spending, which should generate positive spillovers for Singapore. However, risk factors have emerged which could have a bearing on the performance of the domestic economy. Specifically, the imposition of tariff increases by both the US and China, and the threat of further action on a broad range of products, present downside risks to Singapore's GDP growth. Barring a setback in global trade, growth in the Singapore economy should continue at a broadly steady pace in the quarters ahead.

Notwithstanding this risk, growth in Singapore will largely be supported by the trade-related cluster (although its contribution will be lower compared to 2017) and modern services. These clusters will, in turn, impart positive spillovers to the domestic-oriented cluster towards the end of the year. While the latter was a drag on growth last year, it is expected to contribute positively, albeit not substantially, this year.

Global IT continues to grow, but signs of moderation are emerging.

The outlook for the global IT industry remains largely unchanged from the last *Review*, with the industry continuing to grow in the coming quarters, but at a slower pace. Industry analysts expect global chip sales to increase by a still-firm 7.4–9.5% in 2018 but this is nonetheless a step-down from the approximately 22% surge in 2017. (Table 2.1) In fact, signs of moderation had already emerged since late 2017, with a rise in the weighted electronics inventory-to-shipment ratio in Korea, Taiwan and the US, indicating an accumulation of inventory in these economies. (Chart 2.12) Concomitantly, chip prices have stabilised or fallen slightly during the same period. (Chart 2.13)

There was also a tapering of demand for final electronic products. For instance, on a year-ago basis, growth of global smartphone sales turned negative towards end-2017. (Chart 2.14) On the corporate front, the capital expenditure and technology spending diffusion indices in the Federal Reserve Bank of New York's *Empire State Manufacturing Survey*, which capture the net proportion of firms expecting to increase company spending six months ahead, began to ease in January 2018. (Chart 2.15)

Nevertheless, pockets of the electronics industry could see strong growth this year.

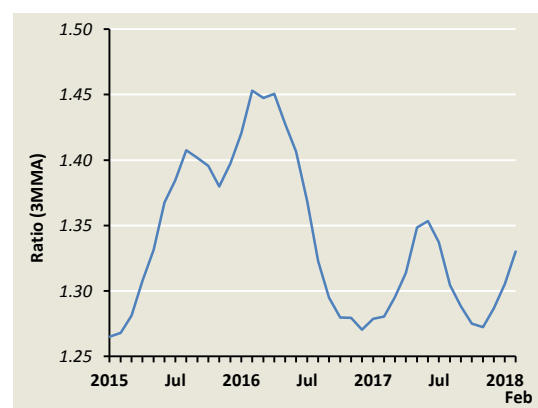
Notwithstanding the softening in global demand growth, some memory chip-makers in the semiconductors segment have continued to do well and have added to capacity recently. Micron, a major semiconductors manufacturer, recently broke ground to begin construction of new cleanroom space to meet future demand for its 3D NAND flash memory products. This is in line with the strong medium-term demand anticipated for domestically-produced electronics.

Further downstream, Singapore-based firms have benefited from being tapped into the Chinese smartphone manufacturing space which has rapidly gained worldwide market share over the past two years, with global sales far outpacing other manufacturers. (Chart 2.14) The Chinese market is currently the largest export destination for Singapore-based chip makers—in 2017, China alone accounted for slightly more than one-third of domestic export growth and a fifth of re-export growth in semiconductors. Continued strong performances by these Chinese smartphone

Table 2.1
Forecasts for Global Semiconductor Revenue Growth

Analyst	As of	2018F (%)
IHS Markit	January 2018	7.4
Gartner	January 2018	7.5
WSTS	February 2018	9.5

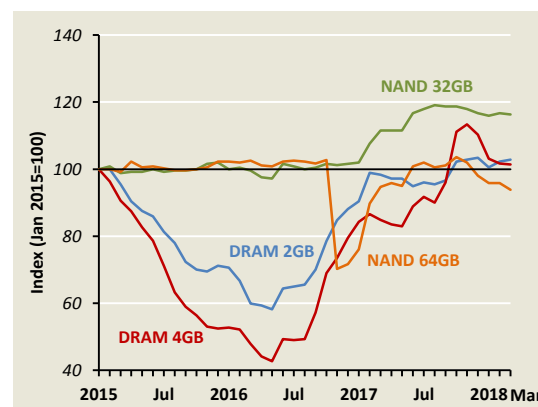
Chart 2.12
Weighted Electronics Inventory-to-Shipment Ratio



Source: Haver Analytics and EPG, MAS estimates

Note: Weighted by Korea, Taiwan and the US shares of electronics exports.

Chart 2.13
Global Chip Prices



Source: Bloomberg

manufacturers will generate positive spillovers to intermediate component suppliers based in Singapore.

Container shipping will gain from the expansion in global trade.

In late 2017, container throughput at Singapore's ports recovered to pre-2015 levels due, in part, to an upturn in global trade. This should continue to lend support to domestic port activities in the absence of extended trade frictions. (Chart 2.16) In the medium term, Singapore remains an attractive regional base for global shipping liners. Industry analysts cite advanced technology and automation, and reduced port fees, as some of Singapore's strong suits. The expected opening of the Tuas Megaport in 2021, which will have technology- and automation-heavy features, should also bolster Singapore's market share in global maritime trade.

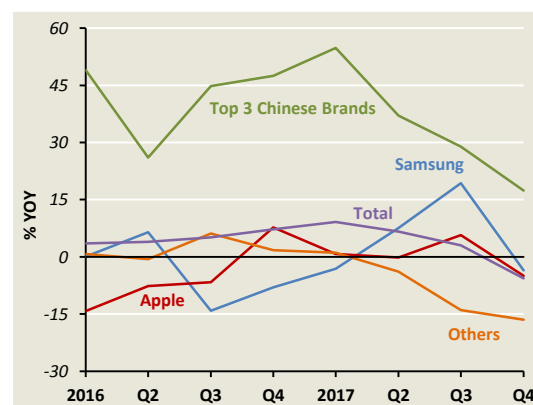
Growth in modern services will be digitally driven ...

The 'digital divide' in the information & communications and business services sectors will determine their growth prospects going forward. The recent launches of the Industry Transformation Maps for the Infocomm Media and Professional Services sectors focused heavily on digitalisation and the adoption of technology in firms' business models and processes. As such, demand for ICT services should remain robust, anchored by the public sector's Smart Nation initiatives and the private sector's digital transformation efforts. In particular, the step-up in demand for ICT services should be broad-based. Indeed, the logistics and retail industries embarked on their "Industry Digital Plan" (IDP) at the end of 2017, and more IDPs will be launched in 2018 to help companies in other industries tap into opportunities available in the digital realm.

More broadly, academic studies over the last two decades have established the role of ICT investment as a growth enabler. For instance, a study by Jorgenson *et al.* (2011) suggests that the mass adoption of established technologies, through large investments in IT hardware and software, explains by far the largest proportion of US economic growth over the last few decades.³

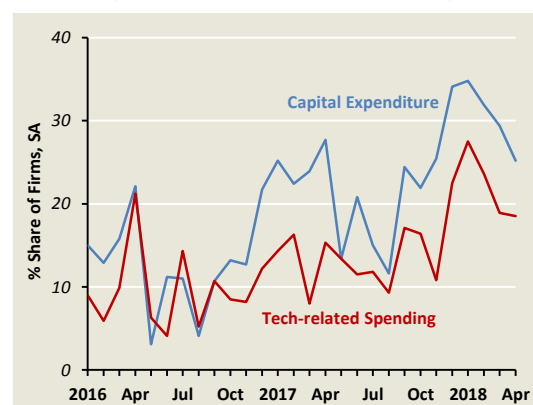
Closer to home, the World Economic Forum's *The Global Information Technology Report 2016* found that

Chart 2.14
Growth of Global Smartphone Sales



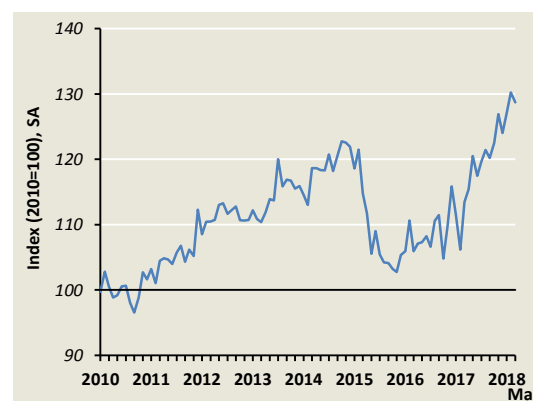
Source: Gartner

Chart 2.15
Empire State Manufacturing Survey
Diffusion Indices
(Six-months Ahead Outlook)



Source: Federal Reserve Bank of New York

Chart 2.16
Container Throughput in Singapore



Source: EPG, MAS estimates

³ Jorgenson, D, Ho, M and Samuels, J (2011), "Information Technology and U.S. Productivity Growth: Evidence from a Prototype Industry Production Account", *Journal of Productivity Analysis*, Vol. 36(2), pp. 159–175.

Singapore was among the top countries leading the world in generating economic benefits from investments in ICT, and that businesses in Singapore had very high levels of ICT adoption. However, according to IMDA's *Annual Survey on Infocomm Usage by Enterprises for 2016*, the adoption rate for ICT was uneven across companies as well as industries. For example, SMEs tend to have more limited web presence than large enterprises, with less than half of small enterprises having one. In addition, firms in the accommodation & food services industry tend to utilise computers and the internet to a smaller extent than other industries, even though they could benefit by doing so, for instance in creating greater consumer awareness of their products. (Charts 2.17 and 2.18) Thus, it seems there is scope for SMEs and domestic-oriented industries to increase their ICT adoption rates.

As companies embark on digital transformation, there will be positive spillovers to the business services sector, in particular, increasing demand for their specialised services such as consulting and project management. At the same time, the professional services segments in the business services sector will also benefit from the adoption of digital infrastructure and skills, such as data science and analytics, and artificial intelligence.

By contrast, traditional media, publishing and telecommunications will continue to face more intense competition, including the entry of a fourth telco in 2018, in an already saturated market. Changes in consumer preferences in the consumption of media would also likely dampen the demand for their services.

Moderate growth is expected in the financial services sector in the coming quarters as the upturn in the global interest rate cycle raises bank margins from loan re-pricing, although increased borrowing costs could partially dampen credit demand. The positive outlook for emerging Asian economies is also expected to boost demand for financial products, including insurance. Additionally, the setting up of a large global reinsurer's Asia-Pacific headquarters in Singapore will create positive spillovers in the insurance segment.

As one of the leading FinTech hubs in the world, Singapore would be well-positioned to benefit from technological and digital developments in the financial industry. For example, initiatives in technology for supervision (SupTech) and regulation (RegTech) aim for machine-to-machine data collection and reporting,

Chart 2.17
ICT Adoption Rate by Employment Size

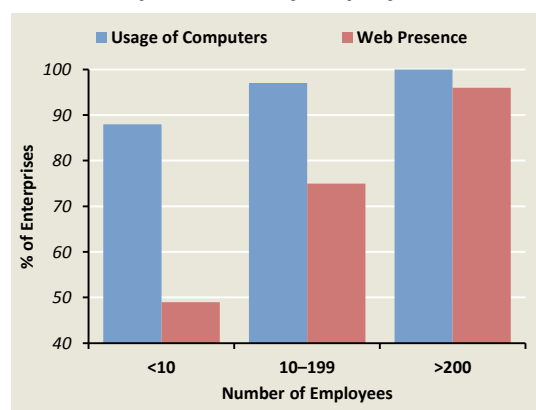
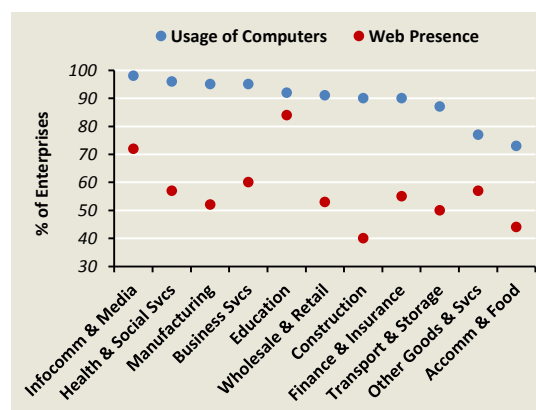


Chart 2.18
ICT Adoption Rate by Industry



which should lead to an improvement in the efficiency of firms in meeting regulatory requirements.

... while increasing modern services demand will have positive spillovers on domestic jobs and growth.

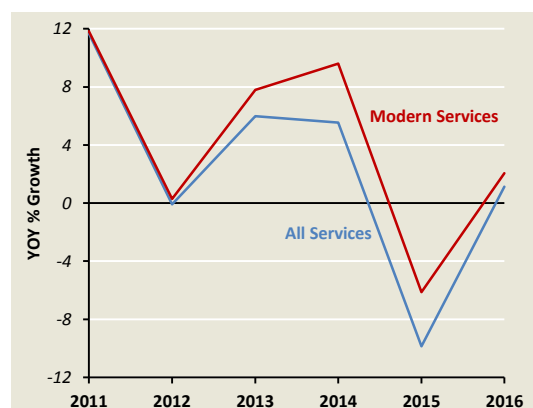
Modern services sectors not only play a critical supporting role to the other sectors, but are themselves major contributors to Singapore's GDP growth and a key pillar of Singapore's status as a regional hub. In recent years, global demand for such services has been robust, with imports growing at 4.2% p.a. over 2011–16 in a sample of 19 advanced economies, faster than the 2.4% recorded for their overall services imports. (Chart 2.19) Singapore is well-positioned to take advantage of this trend, as a comparison with regional competitors indicates a favourable revealed comparative advantage of around 1.5.⁴

In particular, exports of telecom, computer & information services, intellectual property-related services and other business services grew rapidly over 2011–17. (Chart 2.20) Singapore's modern services exports as a whole grew at 12.7% p.a. over this period, relative to the 7.5% for overall services exports and 1.2% for merchandise exports. With modern services' value-added share rising from 26.8% of real GDP in 2010 to 29.6% in 2017, job creation has also been significant, averaging 3.9% p.a., compared to 2.4% for the overall economy over 2011–17.

The consumption channel should play a larger role in the growth of the domestic-oriented cluster.

After a period of weakness in 2016, growth in private consumption expenditure (PCE) picked up in H2 2017. (Chart 2.21) A decomposition of PCE growth suggests that part of the turnaround was cyclical in nature—likely tied to the swift recovery in consumer sentiment as a swathe of macroeconomic data increasingly pointed to an entrenched and broad-based recovery, both globally and domestically. For the rest of 2018, sustained growth in the trade-related industries and firm labour market outcomes should continue to impart a positive impulse to private consumption, which will in turn provide support to the consumer-facing sectors, such as retail and food services.

Chart 2.19
Global Imports of Services



Source: IMF and Haver Analytics

Chart 2.20
Singapore's Exports of Services

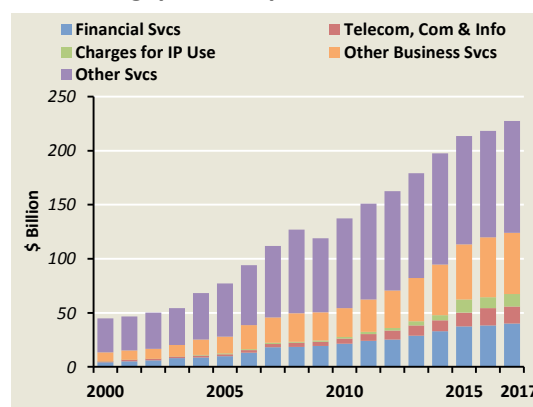
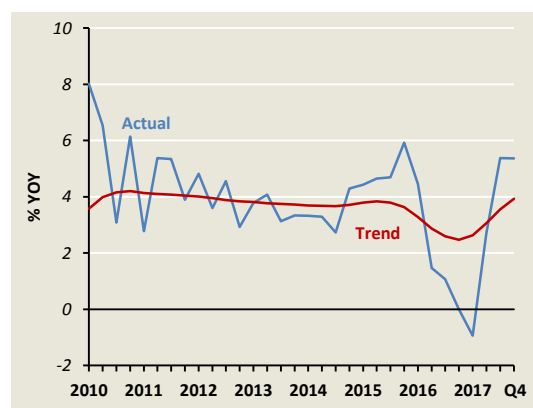


Chart 2.21
Trend Decomposition of PCE Growth



Source: EPG, MAS estimates

Note: The trend was estimated using the average of the Friedman Variable Span Smoother and the HP filter.

⁴ Revealed Comparative Advantage (RCA) was computed by dividing the share of a country's exports of a specific good or service by the equivalent share for a reference set of countries: China, Hong Kong, Malaysia, Singapore, South Korea, Taiwan, and Thailand. An economy has a comparative advantage compared to its trading partners if its RCA is greater than unity.

Cyclical uplift aside, there are also structural factors that are favourable to medium-term private consumption growth. As highlighted in the previous *Review*, the consumption channel has become more important in transmitting economic shocks, underpinned by an increased demand for intermediate inputs from the services sectors (see the earlier discussion about ICT and business services) which have a higher labour income share, and shifts in the consumption basket towards non-tradable services where the value-added multiplier is higher. Indeed, there has been a discernible increase in the consumption of non-tradable services, such as healthcare, education and food services, since 2003. (Chart 2.22)

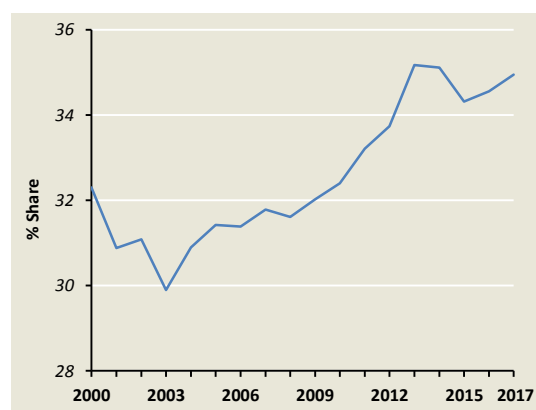
In 2018, the oil-related segments could recover, while construction is likely to remain lacklustre.

The laggards of 2017, namely M&OE and construction, could see more positive outcomes in 2018. M&OE should benefit from higher crude oil prices—which was on the rise since late 2017—and indeed, a number of major local companies have recorded some improvement in their net order books. The latest EDB *Business Expectations of the Manufacturing Sector Survey* also indicates that M&OE manufacturers' general business outlook for the next six months has been positive since Q3 2017. (Chart 2.23)

Nevertheless, the medium-term outlook for the M&OE segment is more muted as recent developments in the global oil market appear to be driven by supply to a greater extent—despite an expected increase in demand—as crude oil prices were propped up by joint action from oil producers to restrict output. In addition, structural trends, such as the rise of US shale production and growing demand for alternative energy sources, will continue to weigh on the oil industry.

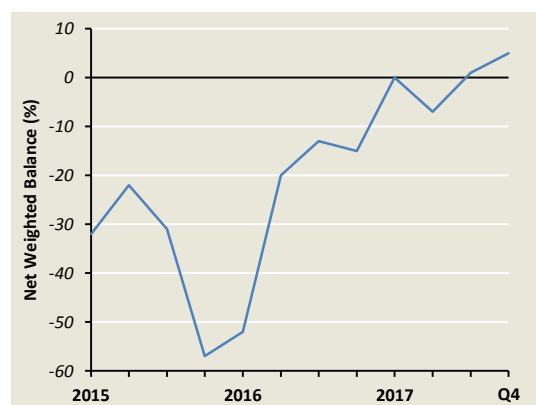
The lacklustre performance in the construction sector is expected to continue in the immediate future before recovering in H2 this year. While private sector building activities will likely remain weak, public sector projects should help to buttress overall demand. Public sector projects that will come on-stream this year include the 21.5 km North-South Corridor and Phase 2 of the Deep Tunnel Sewerage System. As detailed in the October 2017 *Review*, there has been a shift in payment time-frames following the award of a contract—project developers are spreading out payments across a longer period of time. Therefore, even after major public infrastructure projects come on-stream this year, they

Chart 2.22
Share of Non-tradable Services in PCE



Source: EPG, MAS estimates

Chart 2.23
M&OE Business Outlook



Note: The chart shows the net weighted balance of firms expecting a more favourable six-month ahead outlook, compared to the latest quarterly outcome.

are not expected to boost certified progress payments significantly, although they will aid in the turnaround of value added in H2 2018.

The rise of trade protectionism presents a downside risk to Singapore's GDP growth outlook.

The Trump administration signed an executive order on 8 March 2018 that will lead to levies of 25% and 10% on US imports of steel and aluminium, respectively. In response to the steel tariffs, other countries have threatened to impose retaliatory measures. The subsequent announcement of potential US tariffs on a list of 1,333 products imported from China, valued at US\$50 billion, as well as the subsequent retaliatory tariffs announced by China, have raised further concern that the strong recovery in global trade seen since the beginning of last year could be threatened.

Singapore's exposure to products that are impacted by tariffs can be systematically traced using the OECD Input-Output tables. Taking the example of the steel industry, there are two ways in which the Singapore economy is exposed to a US tariff on steel. First, the direct exposure: an increase in the tariff could lead to a decline in US imports of steel from Singapore. Second, the indirect exposure: as US import demand declines, steel exporters from third countries will be affected, and this will in turn impact Singapore-based industries which are exposed to these third countries. For instance, the increase in tariff could lead to a fall in export orders for Chinese steel manufacturers. In this instance, Singapore-based banks which provide financial intermediation services to Chinese steel exporters could be hit as well.

Due to the strong industrial linkages between Singapore and China, the imposition of US tariffs on Chinese products would have a relatively greater impact on Singapore's GDP amongst all tariff actions announced thus far. Nevertheless, the overall impact is assessed to be contained, barring an intensification of trade disputes that have spillovers to the Singapore economy.

Chapter 3

Labour Market and Inflation

3 Labour Market and Inflation

Inflation Is On A Mild Ascent

MAS Core Inflation rose to 1.5% y-o-y in Q1 2018 from 1.4% in Q4 last year, reflecting stronger price increases for retail items. In comparison, CPI-All Items inflation eased from 0.5% to 0.2% over the same period due to a slower increase in the cost of private road transport.

In the quarters ahead, external price pressures are expected to be relatively contained. Broadly accommodative supply in global oil and food markets will cap price increases despite an expected increase in demand. Notwithstanding the sporadic spikes in Q1 2018, oil prices are expected to ease in the quarters ahead to average around US\$66 for the whole of this year, compared to US\$54 in 2017. While imported food prices have stayed relatively subdued in recent months, domestic food inflation is likely to have troughed in Q1, and should pick up over the course of this year.

Domestic sources of inflation are expected to rise gradually in 2018 as the labour market continues with its recovery. Overall employment expanded in H2 2017, as job losses in the construction and transport equipment manufacturing industries moderated, while healthy job gains were recorded in the services sector, particularly for residents. A broad range of indicators—including reduced retrenchments and falling unemployment rates—suggests that labour market conditions are improving.

Barring a significant intensification of global trade frictions, overall labour demand is expected to expand in 2018, supported by hiring in external-oriented and community, social & personal services, even as job losses in construction and transport engineering continue to moderate. The slack that had previously accumulated in the labour market will be further absorbed, and wages should rise at a faster pace this year, compared to 2017.

Amid the continued recovery in the domestic labour market, there are indications that inflation is on a mild ascent. Econometric analysis show that core inflation, particularly the discretionary services component, is sensitive to the degree of tightness or slack in the domestic labour market. The projected reduction of labour market slack is estimated to add 0.2% point to core inflation in 2018, all else equal. Nevertheless, the extent of consumer price increases will be capped by relatively subdued retail rents and market competition constraining firms' pricing power.

Accordingly, MAS Core Inflation is expected to rise gradually over the course of this year to reach slightly below 2% by Q4. For 2018 as a whole, it is expected to come in at the upper half of the 1–2% range, with price increases likely across the food, services and retail components. Similarly, CPI-All Items inflation is expected to average in the upper half of the 0–1% forecast range. Accommodation cost is projected to weigh less on headline inflation in 2018 compared to 2017, while the positive contribution from private road transport cost last year stemming from administrative measures should dissipate.

3.1 Labour Market

Labour Market Slack Is Being Absorbed

Overall employment expanded by 10,400 in H2 2017, a turnaround from the contraction in H1 2017. For the whole of 2017, total net employment fell by 3,600. However, excluding the underperforming construction and transport equipment industries, overall employment growth was stronger than in 2016. Moreover, the contraction in overall employment in 2017 was mainly borne by work permit holders. A range of indicators suggests that the labour market has continued to improve in the second half of 2017. In 2018, employment gains are likely to be driven by the services sector. Employment growth will likely be firm in sectors such as financial & insurance and information & communication services. At the same time, headcount gains in services will likely be shored up by the community, social & personal services sector, while improving consumer sentiment may also provide some support to hiring in industries such as retail trade and food & beverage services. Barring a significant intensification of global trade frictions, the remaining slack in the domestic labour market will likely be gradually absorbed over the course of this year, underpinning a slight pickup in wage growth.

The labour market improved in H2 2017.

Total net employment increased by 10,400 in H2 2017, reversing the declines in H1 (–14,100) and H2 2016 (–400). This improvement was broad-based, reflecting a moderation of job losses in the construction and transport equipment manufacturing industries, as well as robust employment growth in the services sector. (Chart 3.1)

While construction continued to reduce headcount, the rate of decline in H2 (–15,200) was slower than in H1 (–23,100). The sector had experienced job losses for six consecutive quarters, amounting to a cumulative reduction of around 10% of its workforce since Q3 2016. Weighed down by the prolonged weakness in the marine & offshore engineering (M&OE) cluster, the transport equipment industry also continued to shed jobs in H2 2017 (–5,600), albeit at a slower pace than in the first half of the year (–8,100).

On the back of stellar output growth, the electronics manufacturing industry recorded a 4,700 increase in headcount in H2, extending the 3,000 expansion in H1. Nevertheless, due to the capital-intensive nature of the industry, output growth was still largely driven by productivity rather than employment gains.

Employment in the services sector registered strong sequential growth of 29,400 in H2 2017. While this was partially a result of year-end festivities, the gains were larger than the same period a year ago. Compared to H2 2016, net job additions increased in external-oriented

Chart 3.1
Employment Change by Sector

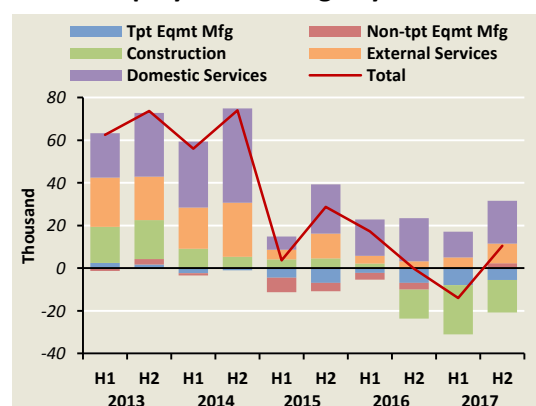
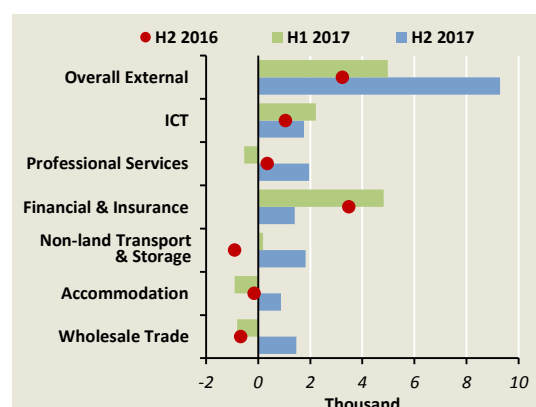


Chart 3.2
Employment Change:
External-oriented Services



services, but was stable in domestic-oriented services. (Charts 3.2 and 3.3) Non-land transport & storage added 1,800 headcount in H2 2017, reversing a decline of 900 in the second half of the preceding year, mainly due to increased hiring in air transport. Reflecting the improvement in trade-related activity, employment in wholesale trade also turned around in H2.

Within domestic-oriented services, employment gains increased mildly in administrative & support, real estate, land transport as well as community, personal & social (CSP) services compared to a year ago. However, these were offset by a more moderate pace of headcount increases in retail trade and food & beverage services, which could have reflected in part the spare capacity accumulated when employment outstripped real output growth previously.

For the whole of 2017, total net employment fell by 3,600. However, excluding the construction and transport equipment industries, employment expanded by 48,300, higher than the 37,500 gains in 2016. The contraction in overall employment in 2017 was also entirely borne by foreigners (–24,900), particularly work permit holders in construction and transport equipment manufacturing. (Chart 3.4) Employment pass holders also decreased, largely in the professional services and ICT industries. Meanwhile, resident employment grew by 21,300, nearly double that in 2016, with the increase coming entirely from the services sector as headcount shrank in manufacturing and construction.

Labour market indicators suggest that slack has decreased.

Improvements were seen in a number of key labour market indicators in the last two quarters of 2017. First, the seasonally-adjusted resident unemployment rate fell by 0.1% point q-o-q to 3.0% in Q4 2017, with the number of unemployed residents declining to 68,500 in Q4 from 70,800 in Q3.¹ Second, retrenchments in Q4 fell in all three major sectors of the economy (manufacturing, construction and services) by roughly one-third from a year ago. Third, there was an increase in labour turnover, with the seasonally-adjusted recruitment rate rising to 2.3% in Q4 from 2.1% in the preceding quarter, and the resignation rate edging up to 1.9% from 1.8%.

Chart 3.3
Employment Change:
Domestic-oriented Services

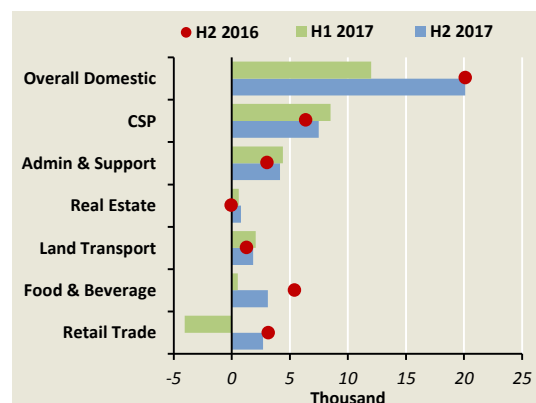
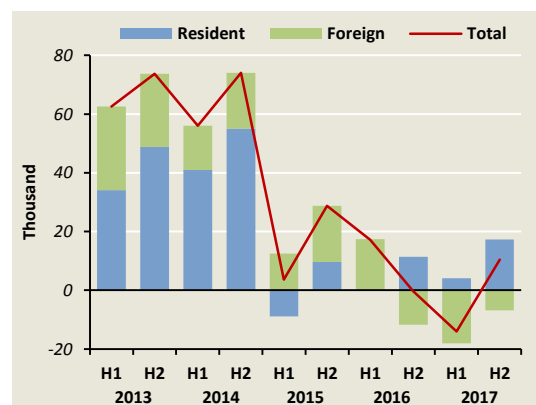


Chart 3.4
Resident and Foreign Employment Change



¹ Quarterly statistics on unemployment rates and unemployed persons pertain to the last month of the quarter.

While the seasonally-adjusted overall vacancy rate stayed at 2.4% in Q4 2017, the ratio of job vacancies to unemployed persons improved to 0.92 from 0.89 in the previous quarter. (Chart 3.5) However, the ratio remained below one, pointing to some residual slack in the labour market. Overall, EPG's Labour Market Pressure Indicator (LMPI)—a summary statistic which captures the extent of labour market tightness using 31 indicators—turned less negative in the second half of 2017, suggesting that slack in the labour market has continued to decrease. (Chart 3.6)

Employment prospects for long-term unemployed residents and PMETs are improving.

The seasonally-adjusted long-term unemployment rate for residents has crept up since Q2 2015, and remained at 0.8% since Q3 2016, save for a temporary dip in Q2 2017. However, the long-term unemployment rate declined from Q3 to Q4 last year for all age groups above 30, suggesting that older unemployed workers have seen improved job prospects recently.

While PMETs have accounted for a larger share of retrenched residents, the number of PMET vacancies has also recently increased, alongside strengthening labour demand. There were 2,500 more PMET vacancies in Q4 2017 compared to a year ago (Chart 3.7), reflecting a combination of improving labour market conditions and a higher PMET share in the relatively well-performing financial & insurance and information & communications services industries. This augurs well for the employment outlook for retrenched PMETs who have the requisite skills to take on such new roles.

To help jobseekers reskill and take on new jobs, MOM has a wide range of programmes under the “Adapt and Grow” initiative. In particular, the Professional Conversion Programmes and Career Support Programme provide training and wage support to help PMETs bridge skills or wage expectation mismatches. These supply-side initiatives should help smooth transitions and improve the employment prospects of unemployed residents.

Chart 3.5
Ratio of Vacancies to Unemployed Persons

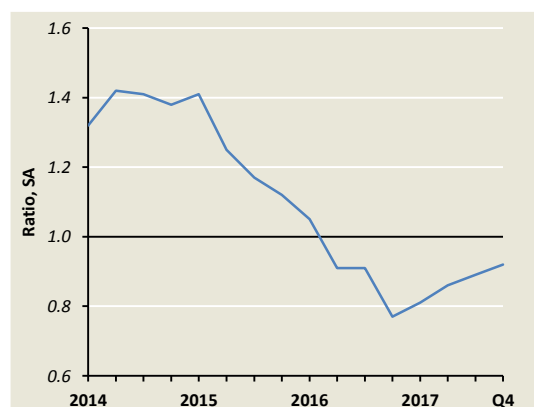
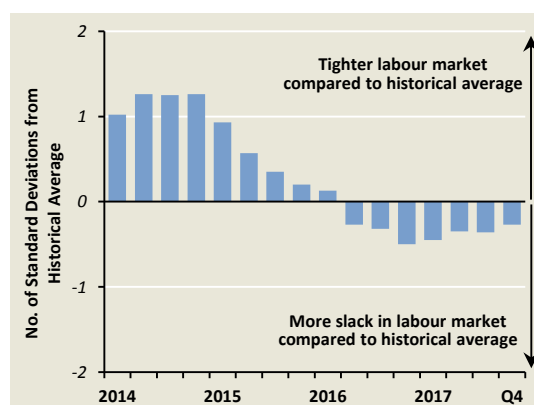
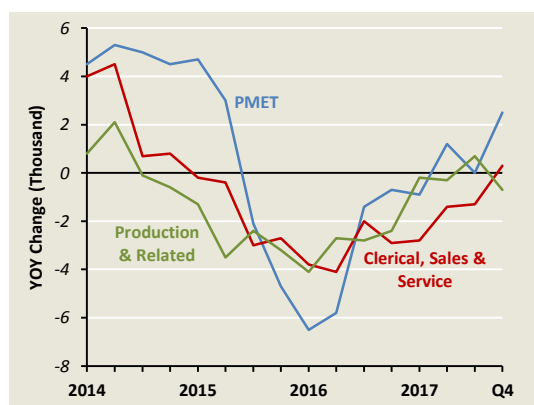


Chart 3.6
Labour Market Pressure Indicator



Source: EPG, MAS estimates

Chart 3.7
Change in Vacancies by Occupation



Note: Data pertain to private sector establishments (each with at least 25 employees) and the public sector.

Resident wage growth was close to its historical average, but uneven across industries.

Resident wage growth rose to 3.6% y-o-y in H2 2017, close to its 10-year historical average of 3.7%, although it remained uneven across industries. (Chart 3.8) For the whole year, wage growth was generally higher in CSP, administrative & support, and real estate services, and lower in retail and transport & storage services. A shift towards higher-skilled and more productive workers could have also boosted wage growth in the construction sector.

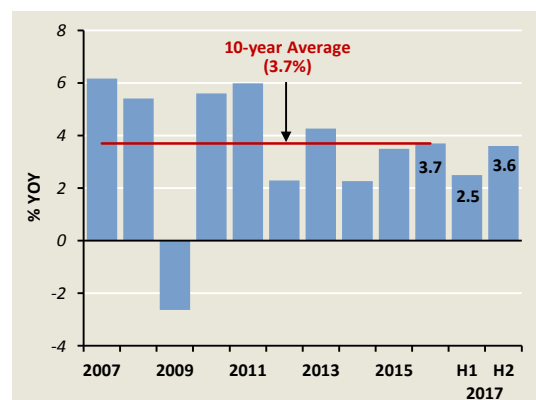
The labour market should continue to recover on the back of sustained GDP growth.

Box A summarises EPG's empirical work on the relationship between GDP growth and unemployment in Singapore, known as Okun's Law, and finds that there is indeed a significant relationship between these variables. Chart 3.9 plots the historical relationship between total employment growth and real GDP growth lagged two quarters. With real GDP growth projected to stay firm in 2018, total employment growth is likely to pick up, as predicted by Okun's Law. Further, as the driver of growth shifts from the capital-intensive manufacturing sector to the relatively more labour-intensive services sector, labour demand should improve. Barring a significant escalation of global trade frictions disrupting output growth, the remaining slack in the labour market is likely to be gradually absorbed over the course of this year.

In the construction sector, job losses are expected to moderate in 2018. Certified progress payments increased on a q-o-q basis in Q4 2017, led by the civil engineering segment with ongoing projects such as the Deep Tunnel Sewerage System and power supply upgrading for the rail network. However, building construction works remain sluggish and may continue to pose a drag on headcount recovery in the sector.

Similarly, the companies in the M&OE-related transport equipment industry continue to be cautious about their near-term hiring prospects. In addition, the medium-term outlook for the industry will likely be affected by structural trends, such as US shale oil production and the push for alternative energy sources. Consolidation within the industry may lead to job losses even as value-added growth recovers.

Chart 3.8
Resident Wage Growth



Note: Based on average (mean) monthly earnings.

Chart 3.9
Real GDP and Employment Growth



The services sector will likely underpin employment gains ...

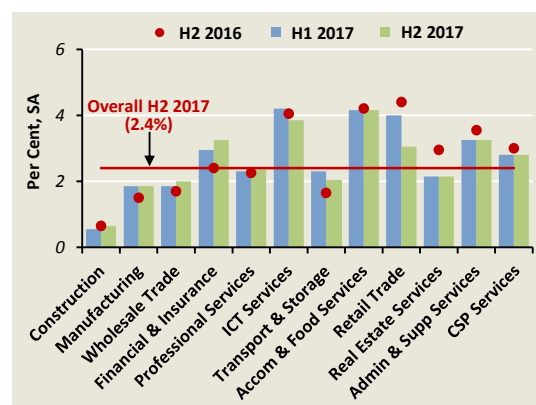
Within the services sector, trends in job vacancy rates suggest that the external-oriented services will likely provide support to employment growth in 2018, even as employment in the domestic-oriented services continues to increase. (Chart 3.10) For example, firms' hiring intentions have strengthened in financial & insurance and wholesale trade. According to the Q1 2018 *Business Expectations Survey of Services Sector*, the net weighted balance² of companies' quarterly employment forecasts for financial & insurance services came in at a strong +15%, underpinned by fund management, insurance, as well as banks and finance companies. Employment in the insurance sector will also be boosted by the establishment of a new regional headquarters in Singapore by a major re-insurer. In view of the favourable external environment, employment prospects in non-land transport should also remain resilient.

... with the domestic-oriented industries supported by CSP services.

On the domestic front, the job vacancy rate in retail trade fell significantly from 4.4% in H2 2016 to 3.1% in H2 2017. (Chart 3.10) The continued shift towards e-commerce retail platforms may pose headwinds to the sector, although rising consumer confidence could provide some support in the near term.

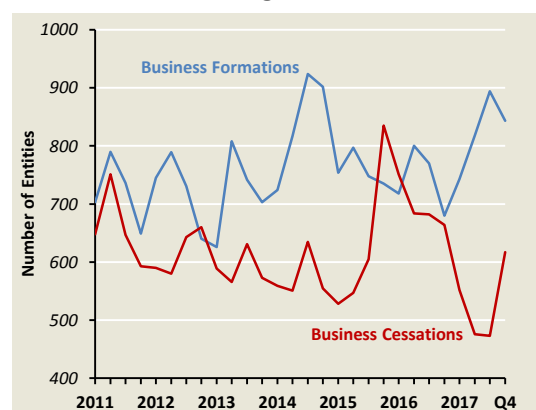
Although the job vacancy rate for the accommodation and food services sector remained stable, headcount gains are likely to slow in 2018. Since Q2 2016, the formation of food services establishments has exceeded cessations, but the gap has recently begun to narrow. (Chart 3.11) The reduction in net business formation in the industry is likely to lower gains in food services employment.

Chart 3.10
Vacancy Rates by Industry



Note: The job vacancy rate for a quarter is defined as the number of job vacancies divided by the sum of the number of employees and job vacancies at the end of the quarter. Semi-annual figures are the simple averages of the quarterly figures.

Chart 3.11
Formation and Cessation of Food & Beverage Establishments



Source: Accounting and Corporate Regulatory Authority

² "Net weighted balance" is the difference between the weighted percentages of "ups" and "downs". A positive sign indicates a net upward trend, while a negative sign implies a net downward trend.

In H2 2017, the job vacancy rate also fell slightly for administrative & support services (Chart 3.10), suggesting that employment growth in this sector could moderate from a high in 2017. Meanwhile, employment growth in land transport will likely ease in view of more modest rail network additions this year. Nevertheless, hiring in the CSP sector is likely to be resilient, with the opening of new hospitals lifting employment in the health & social services segment.

Wage growth is expected to pick up in 2018 as remaining slack in the labour market is absorbed.

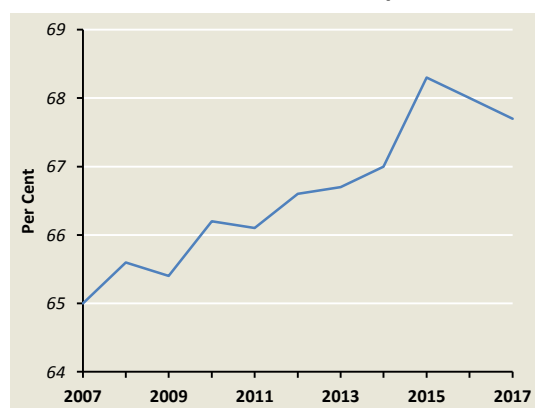
In June 2017, the labour force participation rate (LFPR) of residents aged 15 and over declined by 0.3% point to 67.7% from the year before. (Chart 3.12) The female LFPR fell by 0.6% point, possibly due to marginally attached workers leaving the labour force and youths opting to pursue further studies and postpone full-time entry into the labour market. These may be reversed in 2018 as more job vacancies become available. A cyclical recovery of the resident LFPR will alleviate short-term labour supply constraints, and resident and overall unemployment are not expected to be significantly different from current rates.

Overall, with increased turnover and the continued absorption of the remaining slack in the labour market, wages are likely to rise at a faster pace this year compared to 2017. Overall resident wage growth (based on average monthly earnings) for 2018 is likely to pick up to around 3.5%, slightly below its 10-year historical average of 3.7%.

Labour productivity growth will moderate from its cyclical high, but stay relatively strong this year.

Overall labour productivity growth, as measured by output per worker, reached a cyclical high of 3.8% in 2017. A shift-share decomposition³ of this growth into the within effect (contribution of each sector's productivity growth), the static effect (contribution of changes in the share of workers employed in sectors with different productivity levels) and the dynamic effect (contribution of changes in the share of workers employed in sectors with different productivity growth rates) indicates that the within effect accounted for most of the growth in productivity. (Chart 3.13) While the static shift effect had been negative in previous

Chart 3.12
Resident Labour Force Participation Rate



Note: Resident labour force participation rate figures are as at June of each year.

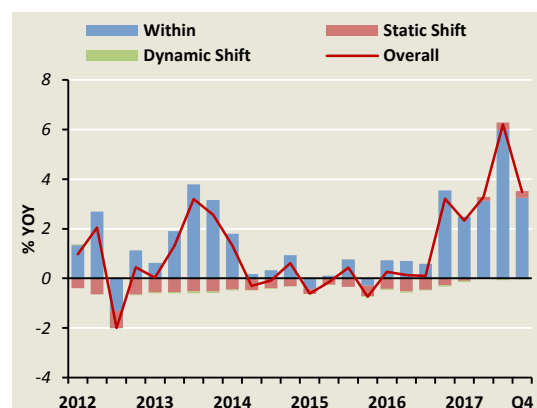
³ The methodology is described in Annex B of Box Article 2.1 in the *Economic Survey of Singapore 2017* published by the Ministry of Trade and Industry.

years, it turned marginally positive in 2017 due to the reduction in the employment share of the low-productivity construction sector.

Chart 3.14 shows a further decomposition of the within effect into broad sectors of the economy. While the high productivity growth in 2017 was largely manufacturing-driven, there was also a rising contribution from external-oriented services towards the end of the year.

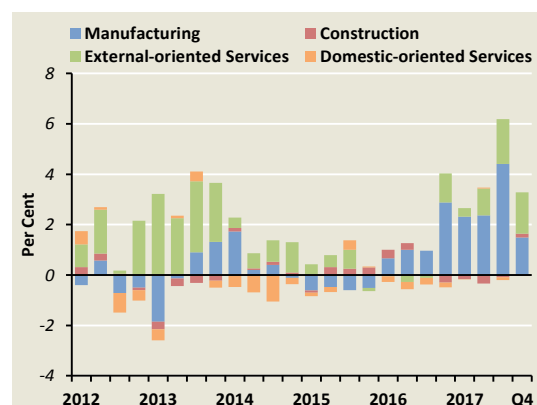
Overall productivity growth in 2018 is expected to remain supported even as the contribution from cyclical gains in the manufacturing sector taper off. There is also scope for productivity-led, rather than employment-driven, growth in the domestic-oriented services sector. With higher wage growth and moderating productivity growth, ULC is likely to increase modestly in 2018, compared to the 0.2% decline in 2017.

Chart 3.13
Shift-share Decomposition of Productivity Growth



Source: EPG, MAS estimates

Chart 3.14
Within Effect Contribution by Sector



Source: EPG, MAS estimates

3.2 Consumer Price Developments

Inflation Should Rise Gradually Over 2018

MAS Core Inflation rose in Q1 2018, due to stronger increases in the prices of retail items. Meanwhile, CPI-All Items inflation fell amid a slower increase in the cost of private road transport. External sources of inflation are expected to stay relatively benign as supply remains broadly accommodative in global commodity markets, notwithstanding the recent increase in oil prices. Core inflation is expected to rise gradually for the rest of the year, underpinned by the improvement in labour market conditions, with the projected reduction of labour market slack adding about 0.2% point to core inflation. In 2018, MAS Core Inflation and CPI-All Items inflation are expected to come in at the upper half of their forecast ranges of 1–2% and 0–1%, respectively.

Core inflation picked up in Q1 2018, while CPI-All Items inflation eased.

Core and headline inflation diverged in the first quarter of 2018. MAS Core Inflation was 1.5% y-o-y in Q1 2018, compared to 1.4% in Q4 2017, as higher retail inflation more than offset the smaller increase in food prices. Meanwhile, CPI-All Items inflation moderated from 0.5% to 0.2% over the same period, as a result of a slower rise in the cost of private road transport. This was, in turn, driven by lower car prices, while the impact of the upward revision in parking fees in December 2016 dissipated. (Charts 3.15 and 3.16)

External price pressures have moderated recently.

On the external front, Singapore's overall import price index (IPI) fell by 0.1% y-o-y in Jan–Feb 2018, a reversal of the 2.3% increase recorded in Q4 last year, largely on account of the smaller rise in the cost of mineral fuels. Non-oil import prices also fell over this period due to a steeper decline in the prices of machinery & transport equipment. The fall in IPI inflation in recent quarters partly reflected the appreciation of the S\$ against the currencies of Singapore's major trading partners. (Chart 3.17)

Global oil prices are expected to ease as non-OPEC supply ramps up.

Global oil prices, as measured by the Brent oil benchmark, surged past US\$70 per barrel on several occasions in recent months. While oil demand has strengthened on the back of a global economic recovery, the rally in oil prices was largely driven by transitory supply-side factors, including the risk of disruption to oil supplies following a host of geopolitical events in the

Chart 3.15
CPI-All Items and MAS Core Inflation

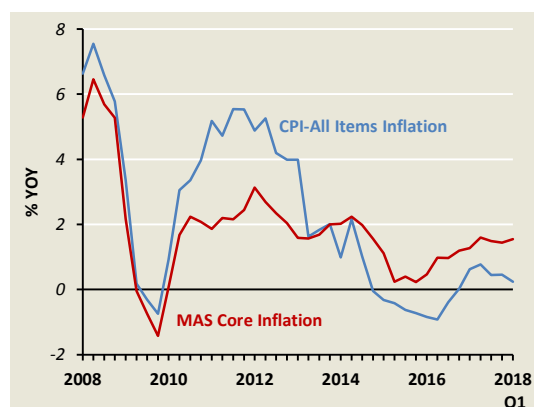
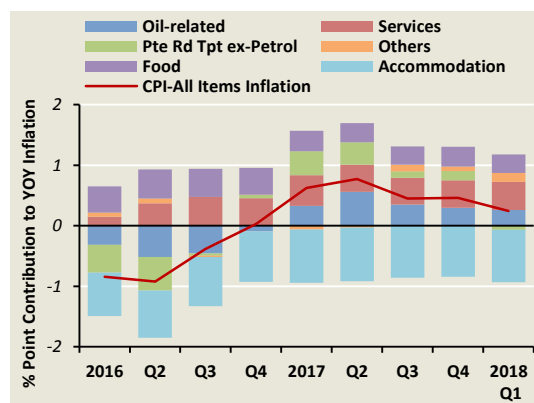


Chart 3.16
Contribution to CPI-All Items Inflation



Middle East, unanticipated production outages in other key oil-producing countries, as well as the extension of OPEC-led production cuts to the end of 2018. Recent missile attacks by Yemeni rebels on Saudi Arabia's oil storage facilities and the escalation of tensions in Syria have also threatened global supplies, causing prices to reach a high of around US\$75.

Some modest accumulation of global inventories is expected towards the end of 2018 as growth in non-OPEC supply outpaces demand. (Chart 3.18) Higher oil prices have spurred US shale oil production, as evidenced by the increased rig count and higher output since the start of 2018. (Chart 3.19) Based on current oil prices, shale production should rise further and cap the extent of gains.

Against this backdrop, oil prices are expected to ease slightly in the latter half of 2018 and average around US\$66 for the whole year, compared to US\$54 in 2017. Geopolitical risks—including the possibility that the US would no longer waive oil export and financing sanctions on Iran, a further decline in Venezuelan oil production, and escalation of the Saudi-Yemen conflict—could contribute to price volatility in the coming months. Growing trade tensions could also negatively impact oil demand if they result in disruption to global trade flows.

Global food commodity prices have declined.

Global food commodity prices fell on a year-ago basis in Q1 2018. This was broadly transmitted to the prices of Singapore's non-cooked food imports, which registered a steeper decline of 1.8% on a year-ago basis in Jan–Feb 2018, compared to 0.4% in Q4 2017. (Charts 3.20 and 3.21) In particular, inflation for imported meat and dairy products decelerated markedly in Q4 and early 2018, respectively, after rising over Q1–Q3 2017.

The decline in meat import prices was likely driven by the fall in Brazilian meat export prices, given the significant share of Singapore's meat imports from that country. The more recent fall in imported dairy inflation reflected the delayed pass-through from global prices of dairy products to import prices. Global prices for dairy products fell steeply in Nov–Dec 2017 amid concerns over weakening demand, but subsequently rebounded in March as dry weather crimped dairy output in key-producing regions.

Chart 3.17
S\$NEER, Overall and Non-oil Import Price Indices

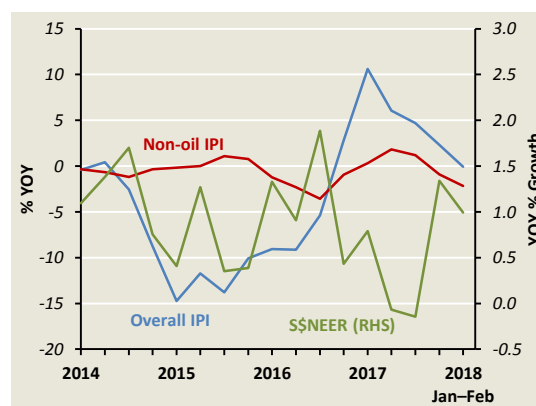
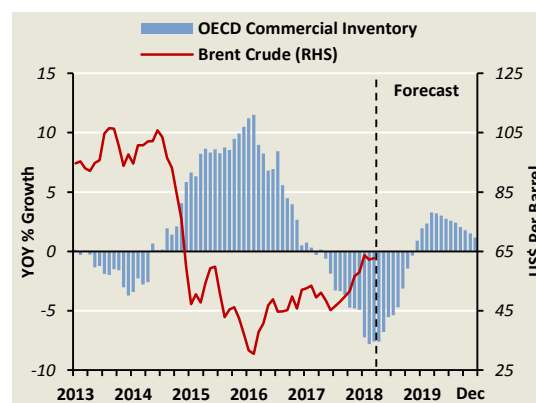
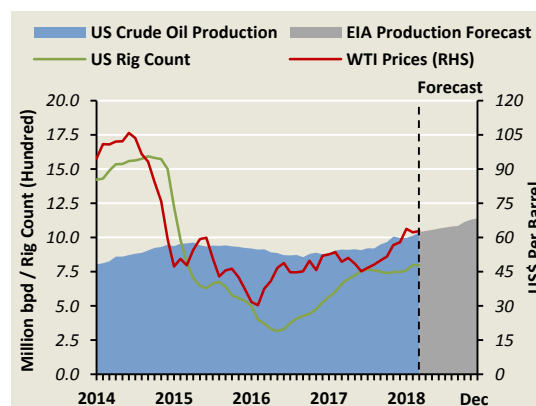


Chart 3.18
OECD Commercial Inventory and Brent Crude Oil Prices



Source: EIA and Haver Analytics

Chart 3.19
US Crude Oil Production, Rig Count and West Texas Intermediate (WTI) Crude Prices



Source: Baker Hughes and EIA

However, pockets of price pressure have emerged elsewhere. According to data from the World Bank, average wholesale prices of Thai rice surged by 8.2% y-o-y in Q4 2017 due to depleted stockpiles and high export demand, after falling by an average of 2.3% over the preceding three quarters. Singapore's import price index for rice rose in tandem by 8.3% y-o-y, but the pass-through to domestic rice prices has been muted so far. Wet weather and flooding in Malaysia also reduced the supply of local fresh vegetables in recent months, resulting in a relatively large 3.7% increase in vegetable & fruit import prices in Jan–Feb. However, the rate of increase in vegetable prices is expected to moderate in the months ahead as supplies normalise.

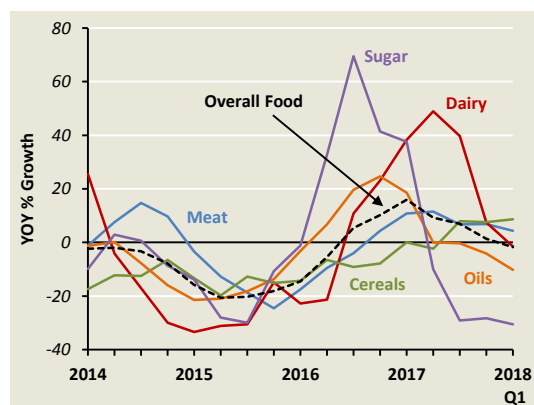
International food monitoring agencies currently forecast slightly higher food prices in 2018. For example, the World Bank is projecting a modest 1% increase in its composite food index this year, given that markets for most food commodities remain adequately supplied. The outlook for global food prices continues to be benign on the whole, with stockpiles expected to remain ample even as demand increases on the back of rising income and population growth.

Food inflation has been contained, but could increase in the quarters ahead.

On the domestic front, food inflation has been relatively contained. Inflation for non-cooked food items was lower at 1.2% y-o-y in Q1 2018, compared to 1.5% in Q4 and 1.3% for 2017 as a whole. Meanwhile, prices of prepared meals rose by 1.4% in Q1 2018, similar to Q4 2017, as the larger increase in the prices of sentiment-sensitive restaurant meals offset the dip in hawker and fast food inflation. (Chart 3.22)

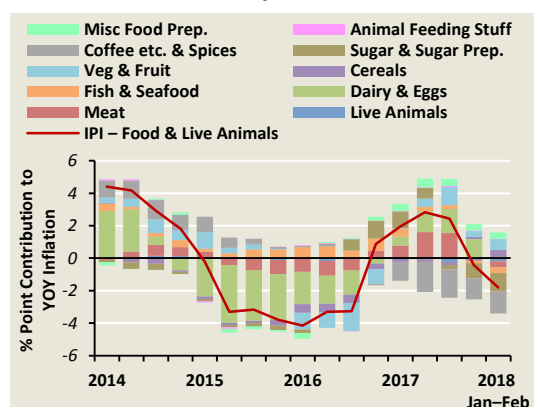
In view of the softer outturns in recent months and generally benign outlook for global food prices, overall food inflation is forecast to rise gradually in the coming quarters to average around 1.6% this year, slightly higher than the 1.4% recorded in 2017.

Chart 3.20
Global Food Commodity Prices



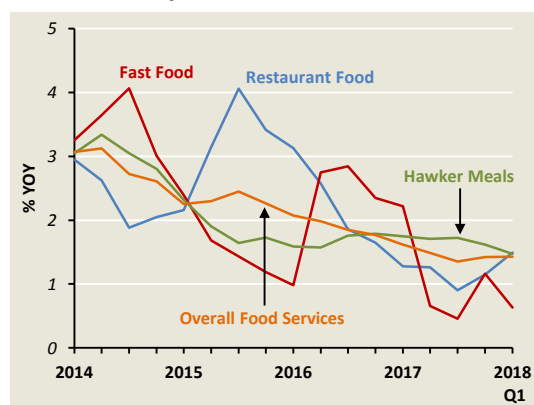
Source: UN Food and Agriculture Organization

Chart 3.21
Contribution to Imported Food Inflation



Source: EPG, MAS estimates

Chart 3.22
Prepared Meals Inflation



Retail inflation has picked up recently amid a broader recovery in consumer spending.

Retail goods prices rose by 0.5% y-o-y in Q1 2018, reversing a decline of 0.2% in Q4 2017.⁴ (Chart 3.23) Abstracting from the impact of the hike in tobacco excise duties in February⁵, this was characterised by broad-based price increases across a range of product categories alongside a recovery in private consumption expenditure and retail sales volumes, which were, in turn, supported by an increase in real wages. (Chart 3.24)

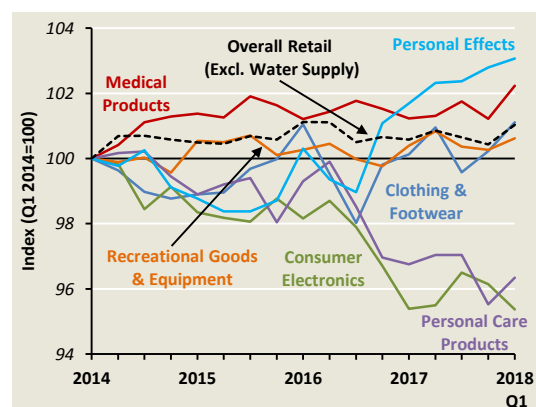
However, stronger retail inflation in Q1 2018 also partly reflected the low base as a result of weaker retail inflation outturns in H1 last year. Inflation for imported goods moderated over the course of 2017, while growth in unit labour costs in the wholesale & retail trade sector and retail rentals has been modest, suggesting that input cost pressures are unlikely to be a significant driver of inflation in the near term. (Chart 3.25) Other structural factors, such as price competition from e-commerce, should also cap further increases in retail inflation.

For 2018, retail goods inflation is projected to rise mildly on the back of some improvement in consumer sentiment. Concomitantly, the hike in tobacco excise duties is estimated to add around 0.05% point to core inflation this year.

Services inflation is likely to rise in 2018, but stay below its historical average.

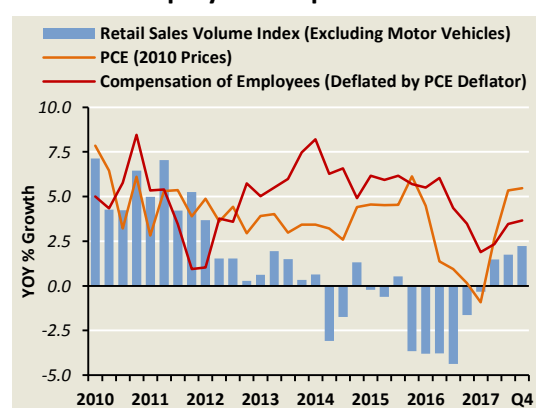
The overall cost of services registered an increase of 1.5% y-o-y in Q1 2018, unchanged from the preceding quarter, as the rise in essential services inflation offset the decline in discretionary services inflation. (Chart 3.26) For essential services, there was a larger year-ago increase in education fees due to the hike in school fees by pre-school operators. However, this was offset by the decline in telecommunication services fees, which forms part of the discretionary services basket.

Chart 3.23
Selected Components of Retail Inflation



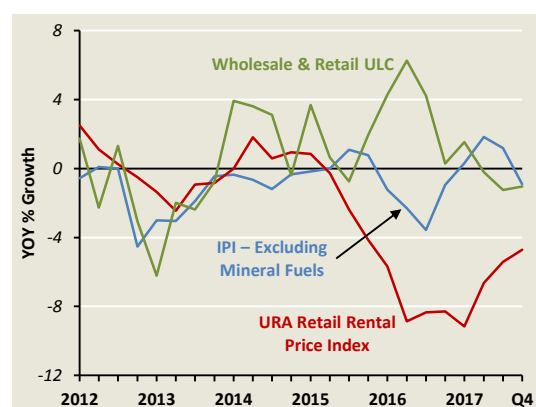
Source: EPG, MAS estimates

Chart 3.24
Private Consumption Expenditure (PCE),
Retail Sales Volume Index and
Employee Compensation



Source: EPG, MAS estimates

Chart 3.25
Cost Indicators for the Retail Sector



⁴ Components related to water supply (including water tariffs for domestic use and other fees) are classified under the "Others" category, which includes retail goods. Figures for retail goods inflation reported here exclude these components to remove the direct impact of the water price increase in July 2017.

⁵ Excise duties were raised by 10% across all tobacco products with effect from 19 February 2018.

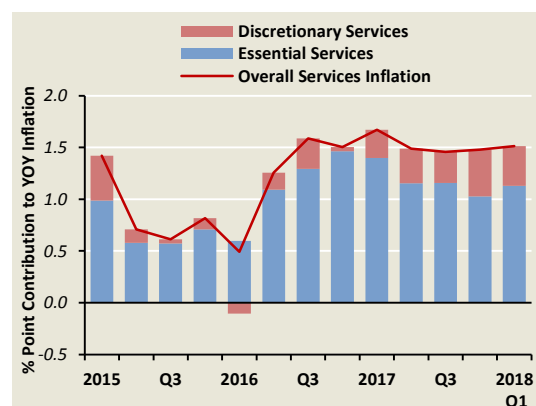
In general, inflationary pressures have been uneven across the different components of discretionary services. (Chart 3.27) For example, in Q1 2018, increases in the cost of personal care services eased further from the low 0.3% recorded in Q4 2017, while charges for recreation & entertainment rose from 1.0% to 1.3% over the same period. In the quarters ahead, services inflation is expected to pick up on the back of an improving labour market and stronger demand. For 2018 as a whole, services inflation should rise, but remain below its 10-year historical average of 1.8%.

Accommodation cost will continue to weigh on headline inflation in 2018, albeit to a lesser extent than last year.

The cost of accommodation remained on a downtrend, falling by 4.1% y-o-y in Q1 2018, slightly faster than the 4.0% in previous quarter. While the decline in actual and imputed rentals eased in Q1, this was more than offset by the dampening effect from the disbursement of additional Service & Conservancy Charges (S&CC) rebates in January 2018.⁶ Notably, the drag on the accommodation CPI from the decline in housing rentals has levelled off in recent months. (Chart 3.28) The vacancy rate for private residential property fell to 7.8% in Q4 2017 from 8.4% in the previous quarter as growth in the stock of vacant units tapered off, but continued to stay above its historical average.

In terms of rental demand, despite the expected cyclical increase this year in foreign employment (excluding foreign domestic workers and construction), structurally lower foreign worker inflows and changes to HDB sub-letting and tenancy rules for foreign work pass holders are likely to dampen any increase in imputed rentals.⁷ In 2018, the cost of accommodation is expected to continue to decline, albeit at a more moderate pace, and subtract a smaller 0.5% point from headline inflation, compared to 0.9% point in 2017.

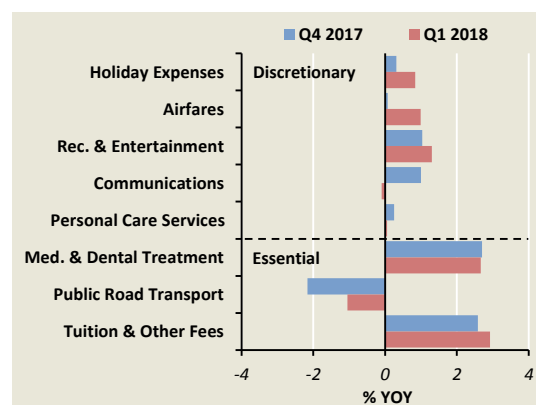
Chart 3.26
Contribution of Essential and Discretionary Services to Overall Services Inflation



Source: EPG, MAS estimates

Note: 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.

Chart 3.27
Price Changes of Selected Services CPI Components



Note: "Recreation & Entertainment" and "Communications" comprise mainly recreation & culture and telecommunications services, respectively, although they also include some retail goods items.

⁶ As announced in Budget 2017, the quantum of S&CC rebates was increased in FY2017, with an additional 0.5 month of rebates disbursed to most HDB households in January 2018. S&CC rebates, which lower the housing maintenance & repair cost component of accommodation CPI, were disbursed in April, July and October last year, but not in January. This resulted in a negative contribution to y-o-y inflation in Q1 2018.

⁷ These broadly include restrictions on the eligibility of non-Malaysian work permit holders in the construction, manufacturing, marine and process sectors to rent whole HDB flats or rooms.

Private road transport inflation is expected to fall in 2018.

Car prices have fallen in tandem with the recent slide in average COE premiums from \$47,620 in Q4 2017 to \$39,768 in Q1 2018, before slipping further to \$37,611 in April. This partly followed from a lull in bidding during the Chinese New Year festive period, as well as the front-loading of vehicle purchases towards the end of 2017 in the run-up to the introduction of the Vehicular Emissions Scheme in January this year.

Car COE premiums are projected to rise gradually from a low in Q1 as bidding activity normalises. Improving consumer sentiment and labour market outcomes could also support car demand this year. Notably, motor loan volumes have turned around in recent quarters after declining over 2012–16. (Chart 3.29) However, fleet-building activity by private-hire car operators has ceased to be a major driver of demand, which should temper upward pressure on premiums.

For 2018 as a whole, car prices are projected to be lower compared to last year. At the same time, the inflationary impact of administrative measures, including the expiry of the one-year road tax rebates in August 2016, and the upward revision in parking fees in December 2016, will have dissipated. Accordingly, the positive contribution of private road transport cost (excluding petrol) to headline inflation in 2017 is expected to fade this year.

The projected reduction of labour market slack will underpin the rise in inflation.

To examine the relationship between domestic labour market conditions and inflationary pressures, core inflation and its major components were regressed on EPG's Labour Market Pressure Indicator (LMPI) over the period Q1 2008 to Q4 2017. Other control variables, such as imported food and fuel prices, were added to the regressions. The results show that the impact of cyclical labour market conditions on core inflation, particularly the discretionary services component, is statistically significant. Based on the estimated regression coefficient, an increase in the LMPI by one standard deviation from its historical average would raise q-o-q SAAR core inflation by 0.7% point, *ceteris paribus*. The estimated impact of the degree of labour market tightness or slack (as proxied by the LMPI) on core inflation is shown by the red bars in Chart 3.30.

Chart 3.28
URA Rental Price Index and Accommodation CPI

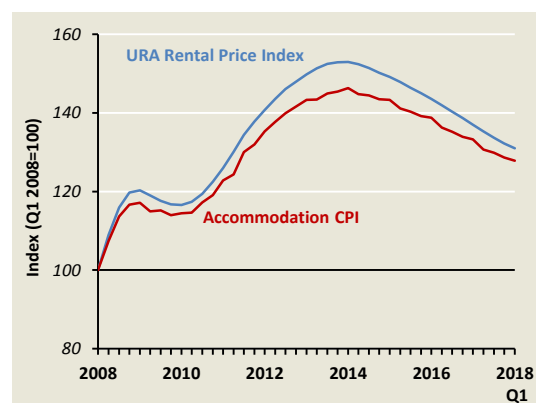


Chart 3.29
Motor Loan Volumes and Retail Sales Volume Index for Vehicles

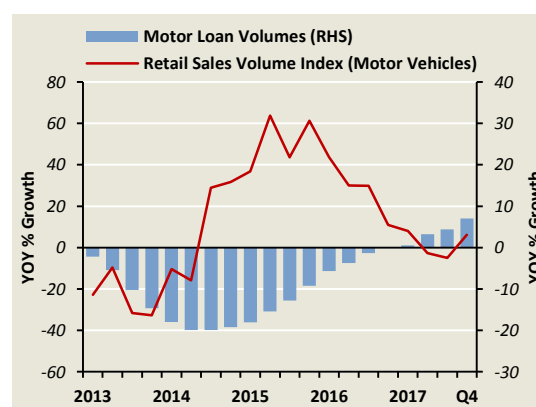
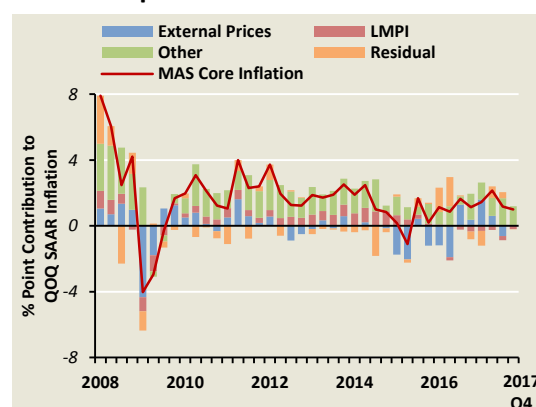


Chart 3.30
Decomposition of MAS Core Inflation



Source: EPG, MAS estimates

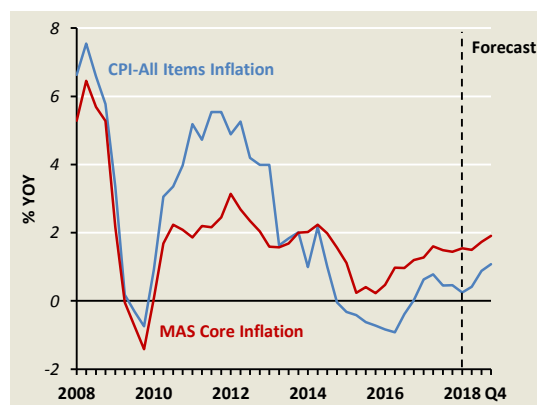
Note: The "Other" component includes the constant term, control variables and lagged q-o-q SAAR MAS Core Inflation. "External Prices" comprise the estimated contribution of food and mineral fuel import prices to q-o-q SAAR core inflation.

Overall, the results suggest that the bulk of the variation in core inflation over the past few years has been driven by fluctuations in external prices, particularly the sharp decline in oil prices in late 2014 to 2015 and its subsequent recovery in 2017. As at Q4 2017, slack in the labour market—as represented by an LMPI level of -0.27 standard deviations from its historical average—had subtracted almost 0.2% point from q-o-q SAAR core inflation of 1.0% during the quarter. The projected improvement in the LMPI towards its historical average in 2018 is, therefore, estimated to add around 0.2% point to core inflation this year, other things being equal.

In sum, external price pressures are expected to be relatively contained in 2018, given broadly accommodative supply in the global oil and food markets. Instead, the projected rise in core inflation this year is likely to be underpinned by the absorption of remaining slack in the labour market. (Chart 3.31) MAS Core Inflation is expected to trend up gradually to average slightly below 2% by Q4 this year. Price increases are expected in food, services and retail items, while the water price hikes in 2017/18 and increase in tobacco excise duties will contribute around 0.1–0.2% point to the rise in core inflation this year. Meanwhile, the non-core CPI items of accommodation and private road transport should largely offset each other in 2018.

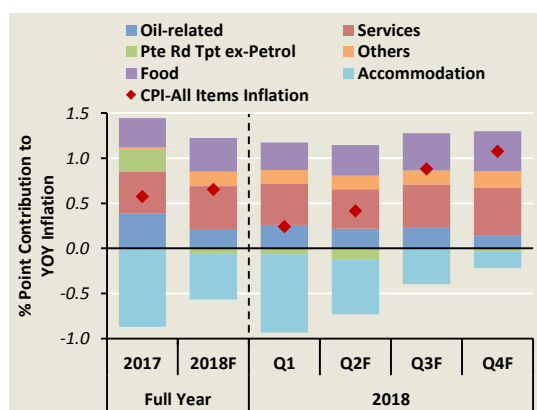
Accordingly, MAS Core Inflation and CPI-All Items inflation are projected to come in at the upper half of their forecast ranges of 1–2% and 0–1% in 2018, respectively. (Chart 3.32)

Chart 3.31
CPI-All Items and MAS Core Inflation



Source: EPG, MAS estimates

Chart 3.32
Contribution to CPI-All Items Inflation



Source: EPG, MAS estimates

Box A

An Empirical Analysis of Okun's Law in Singapore

Introduction

Okun's Law is one of the best known empirical regularities in macroeconomics, linking cyclical fluctuations in output to changes in the unemployment rate. In Arthur Okun's (1963) original formulation, a 1% point increase in US real GNP growth above its potential lowers the unemployment rate by 0.33% point. This relationship appears to have stood the test of time, although the subdued labour market performance in advanced economies during the recovery from the Global Financial Crisis (GFC) led some economists to question its validity in the face of what appeared to be a "jobless recovery".

Apart from providing an empirical link between economic activity and the labour market, estimates of Okun's Law are also pertinent to macroeconomic policy considerations, as it is often assumed that counter-cyclical policies to offset negative shocks to output would concurrently improve the employment situation. If this does not hold, other policy measures, such as reducing the degree of skills mismatch, may be more effective in reducing unemployment.

This Box investigates the continued relevance of Okun's Law in Singapore, where the economic recovery from the GFC has been relatively rapid and strong. It builds on existing work in the literature, in particular, by using more robust time series econometric methods to estimate the relationship and assess its stability over time.

Empirical Methodology

The methodology used is based on Ball *et al.* (2017), who postulate that there exist equilibrium levels of output, employment and unemployment that represent a sustainable utilisation of available resources, at which expectations are fulfilled. These equilibrium levels are often referred to as "potential output" and the "natural rate" of unemployment.

The authors assume that shifts in aggregate demand cause output fluctuations around its potential level. An increase in output, in turn, causes firms to hire more workers, which lowers the unemployment rate. These relationships can be expressed in the following equations:

$$E_t - E_t^* = \gamma(Y_t - Y_t^*) + \eta_t, \quad \gamma > 0 \quad (1)$$

$$U_t - U_t^* = \delta(E_t - E_t^*) + \mu_t, \quad \delta < 0 \quad (2)$$

where E_t is the log of employment, Y_t is the log of real output, U_t is the unemployment rate and asterisks indicate the equilibrium levels of the variables. If the labour force is assumed to be fixed, the coefficient δ will be approximately -1 . However, a tight labour market and high wages may induce more individuals to enter the labour force, thus reducing the magnitude of δ .

Okun's Law is derived by substituting the first equation into the second:

$$U_t - U_t^* = \beta(Y_t - Y_t^*) + \varepsilon_t, \quad \beta < 0 \quad (3)$$

where $\beta = \gamma\delta$ and $\varepsilon_t = \mu_t + \delta\eta_t$. One approach to estimating equation (3) is to first difference the equation. The differencing eliminates the need to specify the unobservable variables Y_t^* and U_t^* and yields the following equation:

$$\Delta U_t = \alpha + \beta \Delta Y_t + w_t \quad (4)$$

It can be shown that $\alpha = -\beta g$, where g is the mean value of ΔY_t^* or the average real potential GDP growth rate. Note that the value of β (the Okun coefficient) depends on both γ (the sensitivity of employment changes to output growth) and δ (the response of the unemployment rate to employment changes).

Hoon (2005) estimates Okun's Law for Singapore using the specification in (4) with annual data from 1967 to 2002, and obtained an estimate of -0.12 for β . This finding suggests that historically, a 1% point shortfall of the real GDP growth rate below the potential rate in any given year results in a rise in the overall unemployment rate of 0.12% point over the previous year. However, if the error term w_t in (4) is correlated with real GDP growth, the estimate of β obtained from ordinary least squares will be biased and inconsistent. This could occur if supply-side changes that affect the unemployment rate, such as a decrease in the growth rate of the labour force or labour productivity, also reduce potential and real GDP growth.

An alternative approach is to estimate equation (3) as it stands but augmented with some lags of the independent variable, using pre-determined values of U_t^* and Y_t^* . In addition to avoiding the endogeneity bias, this "gap" version of Okun's Law has the advantage of taking into account the state of the economy compared to its trend or equilibrium position.¹ In the literature, empirical estimates of U_t^* and Y_t^* are typically obtained from the Hodrick-Prescott (HP) filter, which generates smooth paths for potential output and the natural unemployment rate. This methodology will be referred to as the "level" specification.

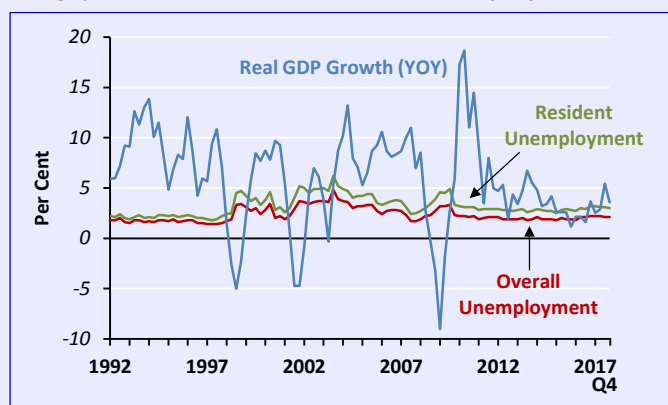
In addition, equation (3) can also be estimated parsimoniously using the autoregressive distributed lag model (ARDL), which include lags of the dependent variable in addition to lags of the independent variables. Both specifications will be used here to ensure robust estimates and inferences.

Stylised Facts of Growth and Unemployment in Singapore

Chart A1 plots y-o-y real GDP growth on a quarterly basis against the overall and resident unemployment rates, both seasonally adjusted. Several interesting observations can be made from visual inspection of the graph.

First, real GDP growth is volatile, as can be expected of a small open economy such as Singapore that is exposed to the vagaries of global trade and financial market conditions. In contrast, unemployment rates have been relatively stable, although they also exhibit some cyclical fluctuations. From a purely econometric perspective, the combination of highly-variable GDP growth and less volatile unemployment is expected to lead to a small coefficient estimate for Okun's Law.

Chart A1
Singapore's Real GDP Growth and Unemployment Rates



^{1/} The "gap" and "difference" versions of the law are identical if it is assumed that potential growth and the natural unemployment rate are constant.

Second, the movements of the overall unemployment rate are similar to those of the resident unemployment rate, although the latter tends to be higher as foreign workers would generally need to be employed to stay in Singapore.

Third, there appears to be a time lag between changes in real GDP growth and the (inverse) movements in the unemployment rate. This lagging relationship has been observed in many countries and can be attributed to the time and costs it takes to hire new workers. Moreover, firms may temporarily hoard labour, especially if they believe fluctuations in demand are temporary.

Results

Following Ball *et al.* (2017), two different smoothing parameters were experimented with when applying the HP filter to the output and unemployment data ($\lambda = 1,600$ and $16,000$). The choices did not result in dissimilar estimates of the Okun coefficient, though the latter produced a better model fit. The Bayesian information criterion (BIC) was used to decide on the optimal lag length in both the level and ARDL specifications. For the level specification, the implied Okun coefficient is given by the sum of the contemporaneous and lagged coefficients on the output gap. In the ARDL regression, the implied coefficient is the sum of the coefficients on the output gap divided by one minus the coefficient on the lagged dependent variable.

Table A1
Estimation Results for Quarterly Data (Q1 1992 – Q4 2017)

Regressor	Specification			
	(1) Overall, Level	(2) Overall, ARDL	(3) Resident, Level	(4) Resident, ARDL
Dependent variable ($t-1$)	-	0.31** (0.08)	-	0.28** (0.08)
Output gap (t)	-0.02 (0.02)	-0.02 (0.02)	-0.03 (0.02)	-0.03 (0.02)
Output gap ($t-1$)	-0.07** (0.02)	-0.06* (0.02)	-0.09** (0.03)	-0.08* (0.03)
Output gap ($t-2$)	-0.03** (0.01)	-	-0.03* (0.01)	-
Implied coefficient	-0.11** (0.01)	-0.12 (0.10)	-0.15** (0.01)	-0.15 (0.17)
Diagnostic Statistics				
Adjusted R^2	0.65	0.69	0.66	0.68

Note: Newey-West standard errors in parentheses.

* Statistically significant at the 5% level.

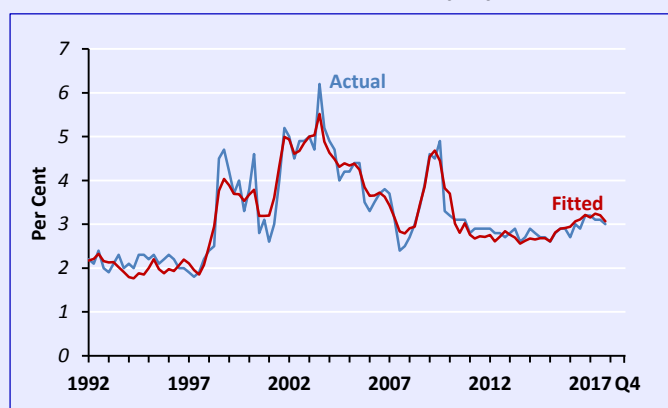
** Statistically significant at the 1% level.

Standard errors for the implied coefficients in the ARDL specifications are derived via the delta method.

Table A1 reports the empirical results. The Okun coefficients for both the level and ARDL specifications are similar, although measures of fit such as the adjusted R^2 suggest that the ARDL models fit marginally better. In addition, the ARDL models also pass diagnostic tests for serial autocorrelation up to four lags while the levels specifications did not. The responsiveness of the unemployment rate to output changes is around -0.15 for resident unemployment and -0.12 for overall unemployment, close to Hoon's (2005) estimate. Similar estimates were also obtained using annual data (-0.14 and -0.12 respectively).

Chart A2 plots the actual and fitted resident unemployment rates over the sample period Q1 1992 – Q4 2017 using the ARDL specification. Putting aside short-term fluctuations, the in-sample fit of the equation is good, although there are some periods of persistent errors of the same sign (Q3 1993 – Q3 1996 and Q4 2010 – Q4 2014). One possible reason for this could be that the underlying Okun coefficient has shifted over time. Indeed, Andrew's (1993) test for an unknown structural break indicates that a break might have occurred in Q4 2009, at the height of the GFC.

Chart A2
Actual and Fitted Resident Unemployment Rates



In order to examine the possibility that the response of unemployment to output gap movements may have changed over time, the sample was split into two time periods: Q1 1992 – Q3 2009 and Q4 2009 – Q4 2017, corresponding broadly to the pre- and post-GFC periods. Table A2 presents the results of the separate regressions for the two sub-periods based on the ARDL specification, which suggests that the Okun coefficient for both the overall and resident unemployment rates has declined after the GFC.

Table A2
Subsample Estimation Results for Quarterly Data

Regressor	Specification			
	Overall, Pre	Overall, Post	Resident, Pre	Resident, Post
<i>Dependent variable (t-1)</i>	0.29** (0.10)	-0.08 (0.24)	0.27** (0.10)	-0.16 (0.18)
<i>Output gap (t)</i>	-0.02 (0.02)	-0.04* (0.02)	-0.03 (0.03)	-0.06** (0.02)
<i>Output gap (t-1)</i>	-0.07* (0.03)	-0.02 (0.02)	-0.09* (0.04)	-0.03 (0.02)
<i>Implied coefficient</i>	-0.13 (0.22)	-0.06 (2.47)	-0.17 (0.26)	-0.08 (0.60)
Diagnostic Statistics				
<i>Adjusted R²</i>	0.73	0.49	0.72	0.60

Note: Newey-West standard errors in parentheses.

* Statistically significant at the 5% level.

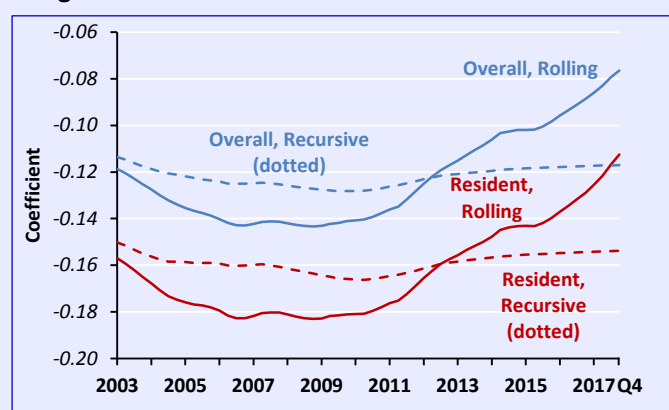
** Statistically significant at the 1% level.

Standard errors for implied coefficients are derived via the delta method.

To obtain a better idea of how the Okun coefficient has evolved in Singapore, the results from rolling-window and recursive estimation procedures using the ARDL specifications are shown in Chart A3.² They suggest that the estimated coefficients for both the overall and resident unemployment rates peaked in magnitude around the time of the GFC, and declined thereafter—consistent with the evidence from the structural break test and sub-sample estimation. In comparison, Ball *et al.* (2017) found that the Okun coefficient for the US increased in later sample periods.

^{2/} A 32-quarter window was used and the rolling coefficients were smoothed with a 12-quarter moving average. As a result, the rolling estimates only begin in 2003.

Chart A3
Rolling Window and Recursive Estimates for Okun Coefficient



Note: The solid lines show the estimated coefficients from rolling window regressions (32-quarter window), which have been smoothed with a 12-quarter moving average. The dotted lines show the results from a recursive regression, starting with a 32-quarter window, and smoothed with a 12-quarter moving average.

There are a number of reasons why the relationship between unemployment and output would not be constant over time. Most notably, it would be reasonable to expect structural economic changes—including changes in the capital intensity of domestic production—to affect labour market and productivity trends across industries. In Singapore's context, another possible explanation is that, while smaller shocks to GDP can be absorbed by firms, for example by accepting temporary fluctuations in profits or by varying hours worked, this might not be the case when the economy is buffeted by large shocks.³ This hypothesis is partially supported by the rolling-window findings which show that the estimated coefficient is relatively large during the GFC. However, the coefficient remained relatively small during the 2003 SARS shock.

The reduced value for the Okun coefficient is also likely due in part to the further evolution of Singapore's industrial structure, coupled with targeted government policies to support unemployed jobseekers and at-risk individuals, such as the Jobs Credit Scheme introduced during the GFC, the Ministry of Manpower's Adapt and Grow initiative as well as its precursors such as the Professional Conversion Programme. Such policies would have had a positive impact on the resident unemployment rate and employment, providing a partial insulation from output fluctuations.

A smaller Okun coefficient has implications for employment generation across the economic cycle. The reduced responsiveness of employment to output changes is taking place in the context of the increased capital and technology intensity of production, which would support a higher level of productivity, profitability and eventually real wages. Moreover, the recursive regressions in Chart A3 suggest that changes in the underlying parameters could be more slow-moving and possibly less persistent than suggested by the larger changes in the rolling estimates.

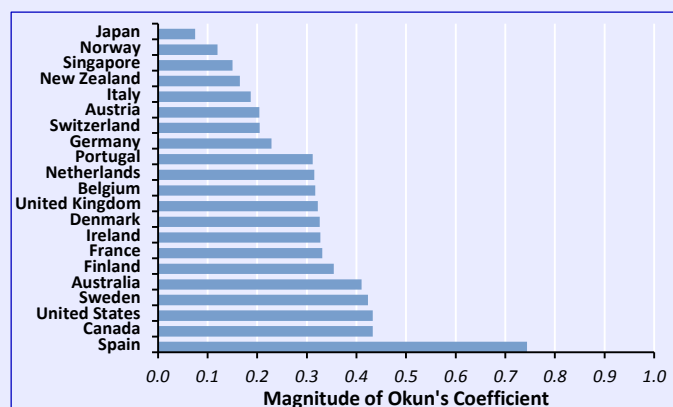
International Comparisons

Chart A4 presents a cross-country comparison of Singapore's Okun coefficient with estimates for other countries extracted from Ball *et al.* (2017). Singapore's coefficient is smaller than most countries in the sample, but still higher than those of Norway and Japan. In contrast, Spain, Canada and the United States have significantly larger coefficients.

^{3/} If firms vary hours worked, productivity measured on a per worker basis will decline when a negative shock hits GDP, which is consistent with the stylised fact of pro-cyclical productivity movements.

The size of Singapore's Okun coefficient may be partly due to its foreign workforce being a buffer for cyclical labour demand changes, where adjustments in employment may be partially borne by the foreign workforce, thereby keeping the unemployment rate relatively stable. Further, the contrast between the US and Japan suggests that the willingness of employers to hold on to workers during a downturn contributes to the magnitude of the coefficient. In this regard, the Jobs Credit Scheme in Singapore instituted in the aftermath of the GFC could have helped to mitigate labour costs and thus made employers more likely to retain workers.

Chart A4
International Comparison of Okun Coefficient



Note: Estimates for Singapore are drawn from this box. The estimation period is from Q1 1980 to Q4 2013 for countries other than Singapore.

Conclusion

Okun's Law fits the Singapore experience well and may be used to forecast the unemployment rate and guide the formulation of macroeconomic policies. The estimates of Okun's Law documented in this Box are robust across annual and quarterly data, as well as alternative time series methods. Compared to other countries, the Okun coefficient is smaller in Singapore, reflecting the inherent ability of the economy to absorb shocks through the buffer provided by foreign workers. In addition, a low average unemployment rate, coupled with policy measures to support unemployed jobseekers and at-risk individuals in the wake of GFC and relatively flexible wage adjustments, are likely to have attenuated the estimated value of the Okun coefficient.

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Chapter 4

Macroeconomic Policy

4 Macroeconomic Policy

Calibrated Macroeconomic Policy Mix

In April 2018, MAS increased the slope of the S\$NEER policy band slightly from zero percent as the economy was envisaged to expand steadily under the baseline, while MAS Core Inflation was projected to rise gradually into 2019 amid improving labour market conditions. Against this backdrop, MAS assessed that it was appropriate to withdraw some degree of monetary policy accommodation, taking into account the uncertainty surrounding the global trade outlook, so as to secure both near- and medium-term price stability.

Budget 2018 largely focused on investing in the Singapore economy's future capacity through targeted measures that help position firms and individuals to benefit from globalisation and technological advancement. At the same time, it took steps to ensure that Singapore could meet its longer-term spending needs in a fiscally sustainable manner. The overall fiscal policy stance is estimated to be expansionary for CY2018, reflecting supply-side investments that are aimed at supporting the potential growth trajectory of the economy.

Overall, the macroeconomic policy mix has been calibrated to be consistent with steady economic growth in line with potential.

4.1 Monetary Policy

A Slight Adjustment To The Slope Of The Policy Band

Singapore's growth and inflation outturns have broadly evolved as expected since the October 2017 policy review. Although the risk of further trade frictions has arisen, barring a major setback to global trade, the Singapore economy should continue on its steady expansion path in the quarters ahead, with growth supported by a more even mix of external and domestic demand. Meanwhile, given the ongoing improvement in the domestic labour market, MAS Core Inflation is projected to rise gradually over 2018 and average in the upper half of the 1–2% forecast range for the year as a whole. Accordingly, MAS decided to increase slightly the slope of the S\$NEER band in April 2018, after maintaining a neutral policy stance for eight consecutive quarters. This measured adjustment took into account the expected gradual normalisation of inflation as well as the uncertainty presented by current global trade tensions.

In October 2017, MAS kept to a neutral policy stance.

At the time of the October 2017 policy review, the Singapore economy had performed slightly better than envisaged on the back of a sustained upturn in the electronics sector. There were also signs that growth was broadening to more sectors of the economy as the recovery gained traction and consumer and business confidence rose. Against the backdrop of a synchronised global expansion, Singapore's GDP growth was forecast to be firm in 2018, even as it would ease slightly from the cyclical high in 2017. Growth outturns across sectors were also projected to converge as the performance of the trade-related sectors tapered off and that of the domestic-oriented sectors improved.

On the inflation front, domestic sources of price pressures were projected to remain contained in the near term. While the labour market had troughed, and further recovery would be supported by sustained GDP growth, previously-accumulated slack across this and other factor markets would take some time to be absorbed. Moreover, imported inflation was projected to rise only mildly given ample supply in global commodity markets. Therefore, MAS Core Inflation was forecast to come in at around 1.5% in 2017 and remain broadly stable in 2018.

In light of these factors, MAS maintained the slope of the S\$NEER policy band at 0% in October 2017, with no change to its width or the level at which it

was centred. This policy stance was assessed to be appropriate for the expected economic outlook and consistent with the guidance provided in October 2016 that a neutral policy stance would be kept in place for an extended period.

In view of a projected rise in core inflation, MAS increased the slope of the policy band slightly in April 2018.

Headline growth and inflation outturns in the Singapore economy have broadly evolved as envisaged since the October 2017 policy review. According to the *Advance Estimates*, GDP growth came in at 1.4% q-o-q SAAR in Q1 2018, compared to 2.1% in Q4 2017. On a year-ago basis, the Singapore economy expanded by 4.3% in Q1 2018, following the 3.6% rise in 2017 as a whole, indicating that the overall level of activity in the economy remained high. Nevertheless, the performance across sectors remained uneven as growth was still largely driven by the external-facing segments such as semiconductor production and offshore lending. In comparison, the domestic-oriented clusters, including retail trade and food services, saw some pullback after picking up in Q4 2017, even as the construction sector showed some signs of improvement.

Domestic labour market conditions continued to improve in Q4 2017 as anticipated in the last policy review. The seasonally-adjusted resident unemployment rate edged down to 3.0% in Q4 amid a decline in retrenchments and a pickup in job vacancies on a year-ago basis. Wage growth also

increased to 4.0% y-o-y in Q4 2017, although it remained uneven across sectors. Meanwhile, MAS Core Inflation rose to 1.5% y-o-y in Q1 2018 from 1.4% in Q4 2017, as stronger price increases in retail items more than offset lower food inflation. In comparison, CPI-All Items inflation eased to 0.2% from 0.5% over the same period as COE premiums fell and the impact of the previous hike in parking fees faded.

In the forecast period ahead, downside risks to growth have risen compared to the October 2017 policy review. Trade tensions between the major economies have emerged and could escalate further, notwithstanding a recent cooling in rhetoric. Should significant trade frictions arise, the increase in economic uncertainty could lead to a setback in the global investment upturn. The ongoing recovery in global trade would also be derailed while the accompanying financial market volatility would weigh on sentiment and thus global demand. In the longer term, the reduction in trade from a less open global economy would also weigh on income growth.

At this juncture, however, the likelihood is that a significant escalation in trade frictions will be avoided. For the rest of 2018, the Singapore economy is expected to expand at a steady pace, driven by a more balanced mix of activity in the external- and domestic-oriented sectors. Worldwide final demand should remain firm and drive growth in Singapore's externally-oriented sectors, including manufacturing and transport, as well as financial and business services. Business and consumer sentiment should also remain positive and support the strengthening of domestic demand. The consumer-facing sectors of the economy—where a considerable share of workers are employed—will also benefit from rising incomes in the region and domestically. Overall, GDP growth in 2018 should come in slightly above the middle of the 1.5–3.5% forecast range.

Against this backdrop, domestic labour demand should continue to improve, with total employment projected to expand in 2018 following the marginal contraction last year. This is expected to further reduce the remaining slack in the labour

market and set the ground for a faster pace of wage growth than the 3.0% registered in 2017. Productivity growth will also likely remain firm, despite moderating from its cyclical high.

The improving labour market and growing private consumption should bolster domestic sources of inflation, with prices of discretionary and other services expected to rise gradually. However, these demand-pull price pressures will be partly mitigated by heightened market competition, which will have some restraining effect on price increases in a range of consumer facing segments. For example, the entry of the fourth telco should cap consumer price increases in the telecommunications industry in the near term, while new technology-based firms have also reduced search and transportation costs for consumers, who are now able to choose from a wider range of goods and services providers than before.

Global food and oil prices are projected to increase moderately in 2018 amid firmer global demand and broadly accommodative supply. Accordingly, imported inflation will likely rise in 2018, albeit at a fairly modest pace. On the whole, MAS Core Inflation is set to rise gradually over the course of 2018 and into 2019, and should average in the upper half of the 1–2% forecast range this year, up slightly from the 1.5% in 2017. Given an upturn in core inflation components, CPI-All Items inflation should also average in the upper half of the 0–1% forecast range this year.

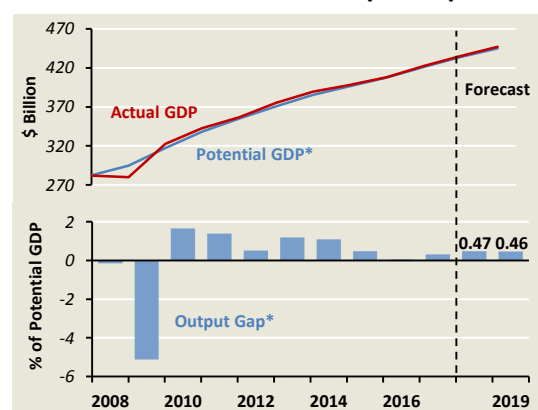
Barring an escalation of trade frictions, the Singapore economy should see steady and more balanced growth over 2018. This will underpin a continued reduction in slack in domestic factor markets, which, together with mild increases in imported inflation, will cause MAS Core Inflation to rise gradually over the forecast period. Accordingly, MAS decided to increase slightly the slope of the S\$NEER policy band in April 2018 from zero percent. There was no change to the width of the policy band or the level at which it was centred. Indeed, sufficient evidence has accumulated after eight consecutive quarters of a neutral policy stance to suggest that a broad range of nominal

variables in the economy have begun to normalise. It was therefore appropriate that MAS withdrew some degree of monetary policy accommodation in this review, even as core inflation rises only gradually this year and into 2019.

In this policy review, it was assessed that the risk of an acceleration in cost and price pressures in the short term was low, because of the less factor-intensive nature of this recovery. For example, at the aggregate level, there is evidence of a decline in the responsiveness of resident unemployment to GDP growth. (See Box A in Chapter 3) At the micro level, the rise of fabless production in the electronics industry has reduced the domestic factor intensity of production and has also resulted in a decoupling of direct exports from production which, in turn, may have reduced spillovers on other sectors in the economy, such as transport and storage. These factors could have acted together to weaken demand-pull inflation, making a measured adjustment to the policy stance appropriate.

Over the forecast period, the monetary policy stance adopted in April 2018 is consistent with a modest and gradual appreciation path of the S\$NEER policy band that will keep the economy close to potential and ensure 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 in the Singapore economy.

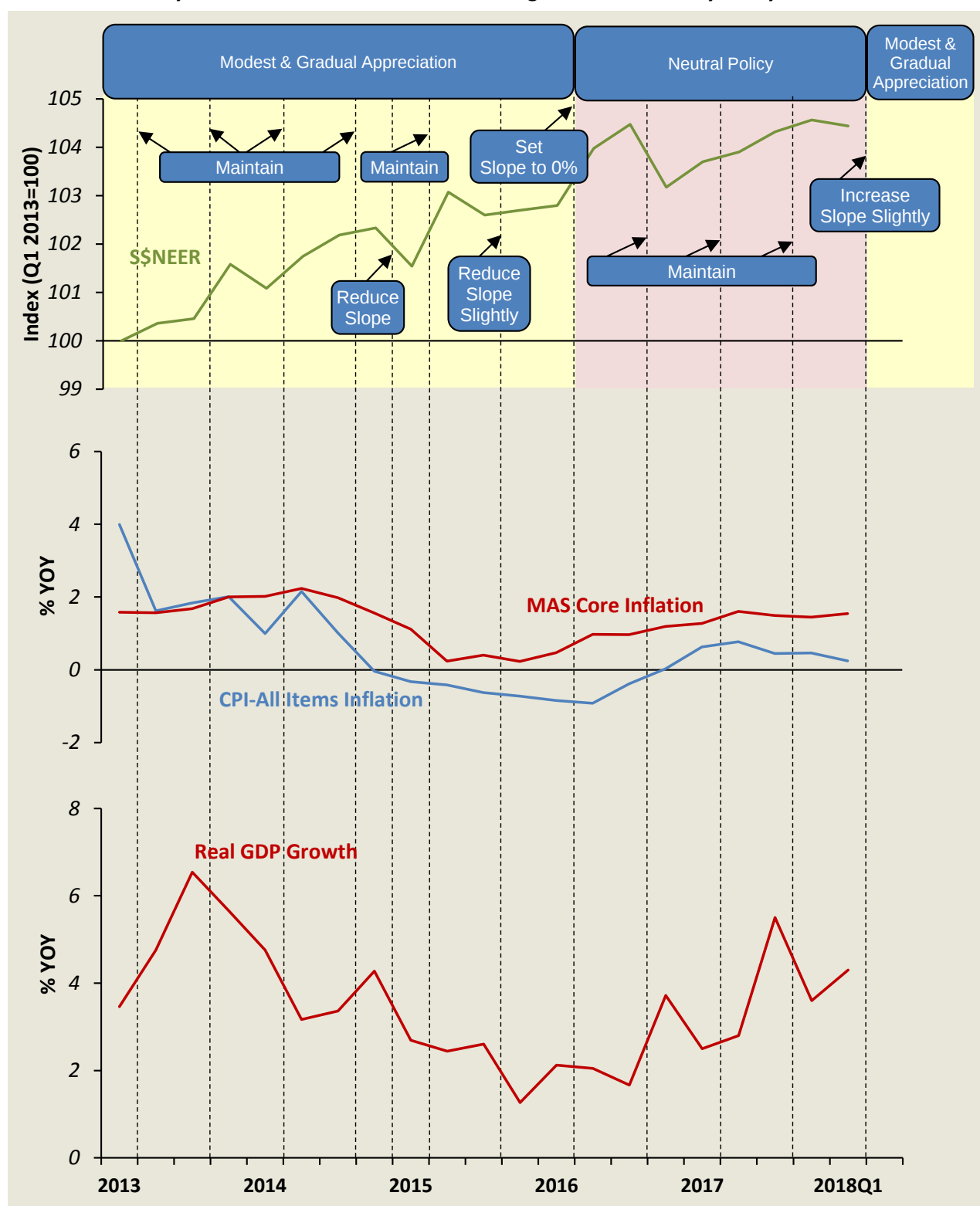
Chart 4.1
Real GDP and the Output Gap



* 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 simple univariate Hodrick-Prescott filter. The forecasts for 2018 and 2019 take into account the policy stance adopted in April 2018.

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



---- indicates release of Monetary Policy Statements

The S\$NEER has risen slightly since the October 2017 Monetary Policy Statement.

The S\$NEER was, for the most part, on a gentle strengthening trend within the policy band between the October 2017 Monetary Policy Statement (MPS) and end-March 2018. However, there was a brief bout of depreciation from January to mid-February, as financial market concerns that the US Federal Reserve would tighten monetary policy faster than previously expected prompted a global equity market correction. However, after these concerns abated, the trade-weighted index gradually appreciated again. (Chart 4.3)

Since the October 2017 MPS, the S\$ has fluctuated against the major reserve and regional currencies. Between the week ending 13 October 2017 and the week ending 6 April 2018, the S\$ rose by 3–5% against the Australian dollar, Indonesian rupiah, and US dollar. (Chart 4.4) However, the S\$ also weakened against the Malaysian ringgit, and to a lesser extent, the pound sterling, Japanese yen, Chinese renminbi and Euro.

Overall, the S\$NEER has inched up by 0.2% since the October 2017 MPS, having fluctuated within the upper half of the flat policy band.

The CPI-based S\$REER has gradually declined.

Using the CPI as the measure of price level, the S\$ real effective exchange rate¹ (S\$REER) edged down over H2 2017. As at Q4 2017, it had fallen by a cumulative 4.4% from its peak in Q4 2013. (Chart 4.5) This was entirely driven by the 6.6% fall in relative prices over this period, as domestic CPI-All Items inflation was slightly negative while consumer prices in Singapore's major trading partners rose. In comparison, the S\$NEER appreciated by 2.4% over the past four years.

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

The three-month S\$ SIBOR rose from 1.13% in October 2017 to a high of 1.5% in December, before falling back to 1.13% in January 2018. (Chart 4.6) It then picked up to 1.45% by March. In comparison, the three-month US\$ LIBOR increased steadily to 2.31% in March 2018 from 1.38% in October 2017. Consequently, the S\$ SIBOR discount to the US\$ LIBOR widened from

Chart 4.3
S\$NEER

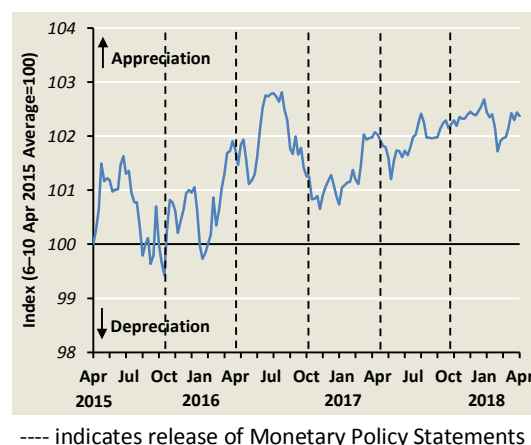


Chart 4.4
Singapore's Bilateral Exchange Rates

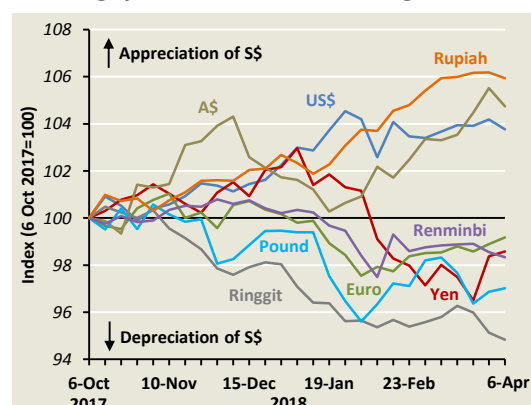
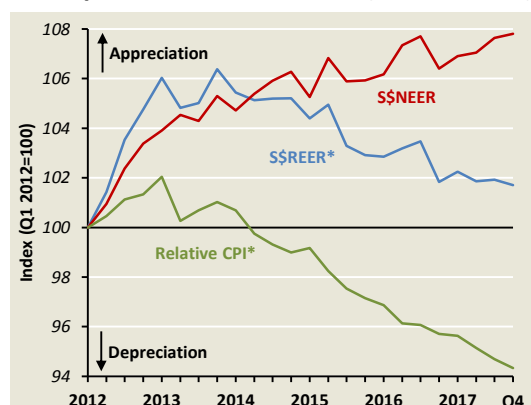


Chart 4.5
Components of the S\$REER (CPI-deflated)



* 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.

around 25 bps in Oct–Dec 2017 to 86 bps by March. Meanwhile, the three-month S\$ Swap Offer Rate rose to 1.48% in March from 1.01% in October 2017, broadly tracking movements in the three-month S\$ SIBOR.

Despite the increases in domestic interbank rates, the saving deposit rate has remained stable at 0.16% since March 2017, while the 12-month fixed deposit rate has edged up by 1 bps to 0.34%, since January 2018.

Overall domestic liquidity has tightened in recent months.

In the past six months, overall liquidity in the domestic economy, as measured by changes in the Domestic Liquidity Indicator (DLI)², has tightened, largely due to increases in the S\$ SIBOR. Although the S\$NEER initially strengthened and contributed to tighter liquidity conditions between October 2017 to January 2018, its sharp depreciation in February caused liquidity conditions to ease temporarily. (Chart 4.7) Thereafter, increases in domestic interest rates caused liquidity to tighten once more.

DBU non-bank loan growth slowed in late 2017 and into early 2018.

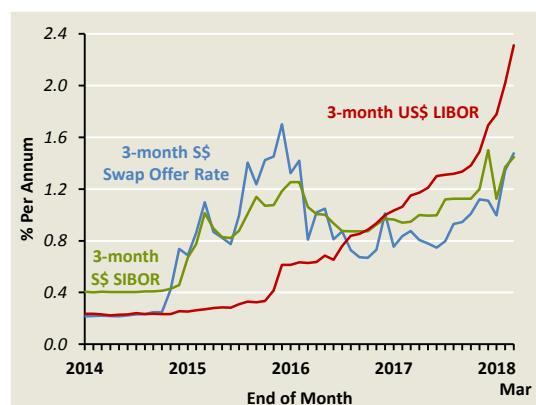
Growth in the stock of DBU non-bank loans increased from 5.1% y-o-y in August 2017 to 7.1% in November, as business loans expanded at a faster rate alongside the growing economy. (Chart 4.8) Meanwhile, consumer loan growth was fairly stable at around 4%.

However, total loan growth subsequently decelerated to 3.7% in February 2018. Business loan growth eased sharply, reflecting slower credit expansion for building and construction, financial institutions, and manufacturing. In comparison, credit to consumers increased more rapidly, buoyed by higher borrowing on credit cards and for car purchases.

Money supply growth has edged up in recent months from a low in December 2017.

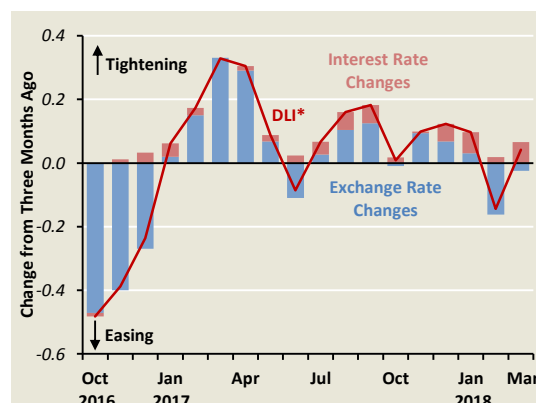
The y-o-y growth in M1 peaked in July 2017 and moderated over the rest of the year as the expansion of demand deposits and currency in active circulation slowed. (Charts 4.9 and 4.10) Over the same period, M2 and M3 growth also slowed as the stock of savings and other deposits increased at a slower pace, while the

Chart 4.6
Interbank Rates and Swap Offer Rate



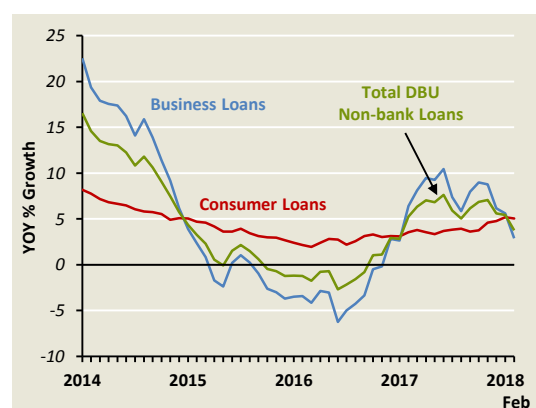
Source: ABS Benchmarks Administration Co Pte Ltd and ICE Benchmark Administration Ltd

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.

stock of fixed deposits contracted. Overall, money supply growth, as measured by M1, M2 and M3, eased over the second half of 2017.

After hitting a trough in December 2017, growth across the monetary aggregates picked up in the first two months of 2018. This was driven by a surge in currency in active circulation and a rise in demand deposits, while the decline in the stock of fixed deposits also eased.

Chart 4.9
Money Supply

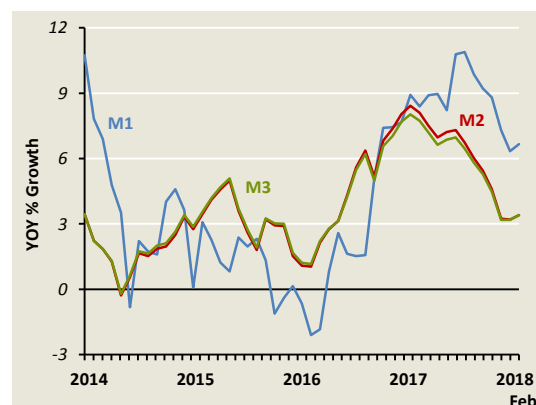
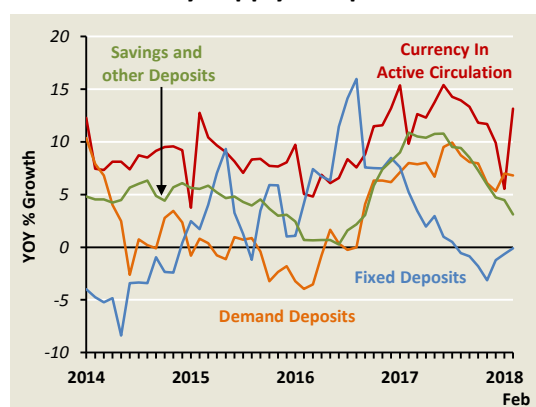


Chart 4.10
Money Supply Components



4.2 Fiscal Policy

A Sustainable Approach To Promote Medium-Term Growth

Budget 2018 recognised that globalisation and technological advancements would bring about permanent changes to the overall structure of the Singapore economy, and that the impact on businesses and workers could vary significantly. Therefore, the Budget introduced new measures to help industries, firms and individuals benefit from these global structural shifts and refined a number of existing programmes on restructuring and upskilling. In addition, to foster a cohesive and inclusive society, Budget 2018 strengthened social safety nets to facilitate social mobility, and ensure that tax policies remain progressive. There were also concrete measures to ensure fiscal sustainability over the longer term in the face of growing spending needs going forward. Overall, the fiscal policy stance for CY2018 is estimated to be mildly expansionary.

Budget 2018 focused on building Singapore's medium-term capabilities, while providing targeted near-term relief.

Budget 2018 was delivered after confirmation of the Singapore economy's stronger-than-expected performance in 2017. As the economy had emerged from an extended period of modest growth with pockets of lingering weakness, there was a withdrawal of broad-based financial support in this Budget, although some of the more targeted assistance to specific vulnerable sectors and households were retained.

Globalisation and technological advancements have caused permanent changes to the structure of the economy, impacting businesses and households to varying degrees. It is timely that the central theme of this year's budget was on positioning industries, firms and individuals to reap the benefits from global structural shifts. In particular, it recognised that there were limitations to a broad-brush sectoral approach to restructuring, and more refined measures would be needed to ensure that GDP growth in Singapore would be sustainable and driven by innovation. The Budget also expanded and improved on existing measures that had been formulated with a multi-year time frame in mind and which would take time to work through the economy.

In addition, the Budget detailed the Government's initiatives to ensure long-term fiscal sustainability in the face of growing spending needs, especially in the areas of healthcare, infrastructure, security and other social needs. The key measures are summarised in Table 4.1.

The Budget offered near-term, targeted relief measures for firms and households ...

Recognising that firms still faced near-term cost pressures, Budget 2018 enhanced the Corporate Income Tax (CIT) rebate for YA2018 to 40% of tax payable, capped at \$15,000. The CIT rebate was also extended to YA2019 at a rate of 20% of tax payable, capped at \$10,000. This would benefit all tax-paying companies, but smaller ones in particular. The Wage Credit Scheme was also extended till 2020. Furthermore, the previously-announced hike in foreign worker levy rates for the Marine Shipyard and Process sectors was deferred for another year.

Budget 2018 also included measures to support households and individuals. For example, eligible households would receive an increase in the quantum of "Goods and Services Tax Voucher (GSTV) – U-Save" from 2019–2021 to soften the impact of the carbon tax³ on households' average electricity and gas expenses, while rebates on Service & Conservancy Charges (S&CC) would be

³ Budget 2018 provided details of the implementation of the carbon tax announced in Budget 2017. The tax will be levied on all facilities that produce 25,000 tonnes or more of greenhouse gas emissions a year at a rate of \$5 per tonne of emissions from 2019 to 2023. The tax aims to correct negative environmental externalities inflicted by pollution. Its impact on households will be small, at about 1% of total electricity and gas expenses, on average.

extended to FY2018. Part of the one-off increase in the government surplus in FY2017⁴ was also shared with Singaporeans through the SG Bonus.

... but focused on helping to position firms and individuals to benefit from global structural shifts.

Sustainable growth in an innovation-driven economy requires a dynamic private sector investing in new industries, activities and markets, supported by a skilled and competent workforce. Previous Budgets had introduced broad-based measures to facilitate economic restructuring and upskilling but these need to be adjusted at the more advanced stage of economic restructuring. Accordingly, the Budget sought to fine-tune measures to facilitate the necessary changes that industries, firms and workers would need to undertake to ensure that they are better positioned to reap the benefits of structural changes in the global economy. At the same time, the Budget announced that key agencies and schemes will be consolidated to strengthen the Government's capacity to provide streamlined and integrated support to businesses that are looking to innovate.

First, the Budget unveiled focused productivity solutions as well as measures targeted at industries or processes. For instance, the proposed e-invoicing framework will provide a common infrastructure that should improve efficiency in payments and enhance business productivity. At the same time, the existing National Robotics Programme was extended to the construction sector to transform work processes and improve labour productivity, while the Aviation and Maritime Transformation Programmes were introduced to boost the adoption of new technologies in these industries.

Second, to position Singapore to gain from digital technologies, the Government will embark on several strategic national projects. These include the National Digital Identity Framework, which aims to allow Singaporeans and businesses to

transact digitally in a convenient and secure manner; and Smart Urban Mobility, which leverages on data and technologies, such as artificial intelligence and autonomous vehicles, for enhanced public transportation. Through these initiatives, the Government will provide a "public good" in the form of the underlying infrastructure necessary for more pervasive adoption of digital and smart technologies.

Third, measures to support innovation were enhanced, while some were calibrated to be more targeted at SMEs. To foster pervasive innovation throughout the economy, the tax deduction on qualifying expenses incurred on research and development done in Singapore was raised from 150% to 250% for YA2019 to YA2025. To support businesses, but SMEs in particular, in their efforts to build and protect their own innovations, the Budget raised the tax deduction on intellectual property registration fees from 100% to 200% for YA2019 to YA2025, capped at \$100,000 of registration fees per year.

Fourth, the Budget built on existing schemes for workers and introduced new programmes to support Singaporeans in their efforts to acquire deep skills and competencies. The "Adapt and Grow" initiative first launched in 2016 was enhanced with higher funding support for workers to try out new careers. The Tech Skills Accelerator was also expanded to develop workers' skills in new sectors and emerging areas, such as cybersecurity and data analytics. Meanwhile, the newly-announced Capability Transfer Programme would plug skill gaps in important fields by facilitating skills transfer from foreign specialists to Singaporean trainers and trainees.

Fifth, to reduce duplication and ensure a streamlined and coordinated approach to helping firms, SPRING and IE Singapore were merged into Enterprise Singapore, as of 2 Apr 2018, to provide integrated support to companies looking to internationalise and develop capabilities. Existing grants to encourage partnerships were also consolidated under a single Partnerships for

⁴ This was due to an exceptional statutory board contribution from the Monetary Authority of Singapore, as global equity and bond markets performed better than envisaged in the latter half of FY2016, as well as increased stamp duty collections due to the recent property market pick-up.

Capability Transformation scheme, which provides up to 70% funding support for collaboration and partnerships between firms. This integrated approach will allow for resource-sharing and more effective outcomes.

Measures were taken to ensure more socially equitable outcomes ...

Budget 2018 committed to fostering inclusiveness by improving social service delivery, facilitating social mobility, and ensuring that tax and transfer policies remained progressive when taken as a whole. For example, the Budget announced the consolidation of social- and health-related services for seniors under the Ministry of Health, and the nationwide expansion of the Community Network for Seniors. In addition, it strengthened existing measures to help students from low-income families by increasing Edusave contributions and enhancing financial assistance schemes for eligible students. To encourage philanthropy, Budget 2018 also extended tax deductions for corporates and individuals making donations to Institutions of a Public Character. To enhance the progressivity of Singapore's tax system, the top marginal Buyer's Stamp Duty for residential property was raised from 3% to 4%.

At the same time, the Budget assured Singaporeans that the future Goods and Services Tax (GST) increase will be implemented in a progressive manner: the Government will continue to absorb GST on publicly-subsidised education and healthcare services, enhance the permanent GST Voucher Scheme to provide more help to lower-income households and seniors, and introduce an offset package for a period to help lower and middle-income Singaporeans adjust to the GST rate increase. (See below for details on the increase)

... and address Singapore's long-term challenges in a fiscally sustainable manner.

Budget 2018 was cognisant of the importance of securing fiscal sustainability over the longer term, as spending needs would increase across all sectors, especially in healthcare, infrastructure and security, while revenue growth could slow in a

more competitive global environment. To achieve this, the Budget introduced several measures.

First, it was announced that the GST rate will be raised from 7% to 9% sometime in the period from 2021 to 2025, to support expected increases in recurrent healthcare, security and other social spending needs.

Second, the bulk of the larger-than-expected, one-off revenue gains in FY2017 will be injected into the new Rail Infrastructure Fund for developing future rail lines. Funding was also set aside for premium subsidies and other forms of support for Singaporeans in anticipation of the completion of the ElderShield review.

Third, statutory boards and government-owned companies that build infrastructure will look into borrowing to spread the cost of investments over more years. At the same time, the Government will consider providing guarantees to statutory boards and government-owned companies for some of the long-term borrowings related to critical national infrastructure. This would keep borrowing costs manageable while ensuring a more equitable sharing of the funding burden across generations, since the benefits will accrue to future generations as well.

Fourth, to further entrench prudent spending in the public sector, the rate at which Ministries' block budgets were allowed to grow was reduced as a share of GDP growth. This followed the downward adjustment to the Budget caps announced last year.

In sum, Budget 2018 conveyed the Government's commitment towards addressing Singapore's long-term challenges in a fiscally sustainable way. The Budget focused on positioning industries, firms and workers to benefit from global structural changes through strategic and targeted measures, while allowing previous policies on restructuring and upskilling to continue to percolate through the economy. At the same time, the Budget continued to build on measures to ensure a more equitable society.

Table 4.1
Key Budget Initiatives in FY2018

A. For Businesses	
General Measures	
(A1) Enhancement of the Corporate Income Tax Rebate (additional \$475 million over YA2018 and YA2019)	- Enhanced to 40% of tax payable, with cap of \$15,000 (from 20% of tax payable, capped at \$10,000) for YA2018. - Extended to YA2019, capped at \$10,000, 20% of tax payable.
(A2) Extension of Wage Credit Scheme (WCS) (\$1.8 billion over the next three years)	Extension of WCS till FY2020 to provide co-funding of 20%, 15% and 10% for 2018, 2019 and 2020 respectively.
(A3) Fostering Pervasive Innovation through Enhancements to Tax Deductions	- Tax deductions for qualifying R&D expenses incurred in Singapore raised from 150% to 250%. - Tax deductions raised from 100% to 200% on licensing payments for commercial use of Intellectual Property (IP) and registration fees for IP, with each capped at \$100,000 of payments per year. The enhancements apply for YA2019 to YA2025.
Providing Matching Platform	Pilot of Open Innovation Platform, a crowd-sourcing platform to match companies requiring digital solutions for specific challenges with ICT firms and research institutes to co-develop solutions.
(A4) New Investment Venture to support IP Commercialisation (\$50 million from Government)	To co-launch with Temasek the NRF-Temasek IP Commercialisation vehicle to invest in start-ups with commercially-viable business models that are underpinned by cutting-edge science and technology generated from publicly-funded research in Singapore.
(A5) Productivity Solutions Grant	To provide up to 70% funding for the adoption of pre-scoped, off-the-shelf solutions to improve productivity.
(A6) Enhancing Support for Internationalisation	- Merging of SPRING and IE Singapore into Enterprise Singapore to provide integrated support to companies for internationalisation and development of capabilities to enhance competitiveness. - Enterprise Development Grant to provide up to 70% co-funding for companies to build capabilities including innovation and talent development. - To raise the amount of expenses that qualify for Double Tax Deduction for Internationalisation without prior approval from \$100,000 to \$150,000 per YA from YA2019.
(A7) Adjustments to Broad-Based Tax Schemes	- To restrict tax exemptions under Start-up Tax Exemption (SUTE) and Partial Tax Exemption Schemes to the first \$200,000 of normal chargeable income. - To exempt 75% instead of 100% of the first \$100,000 of normal chargeable income under SUTE.
(A8) Supporting Partnerships	To consolidate existing grant schemes that support various partnerships between firms into the Partnerships for Capability Transformation scheme, which provides up to 70% funding support for collaborations and partnerships between firms.
(A9) Anchoring Singapore as a Global-Asia Node of Technology, Innovation and Enterprise	To develop an ASEAN Innovation Network to strengthen linkages between innovation ecosystems in the region and to spark new collaborations and solutions.
(A10) Establishment of Infrastructure Office	Infrastructure Office to connect infrastructure demand in Asia to infrastructure financing, services and expertise.
(A11) Implementation of Carbon Tax from 2019	- To be levied on all facilities producing greenhouse gas emissions of 25,000 tonnes or more per annum at an initial rate of \$5 per tonne of emissions from 2019 to 2023. - Carbon tax rate will be reviewed by 2023, with the intention of raising the rate to between \$10 and \$15 per tonne of emissions by 2030. - Starting from 2019, more grants and support will be set aside for companies with worthwhile projects on improving energy efficiency.
(A12) Encouraging Corporates to Support Employees' Contributions	- Extension of SHARE as One, which provides dollar-for-dollar matching grant, to 2021. - Extension of Business and IPC Partnership Scheme to 2021.
Industry-specific Measures	
(A13) Aviation Transformation Programme and Maritime Transformation Programme (up to \$500 million)	Strengthen local aviation and maritime-related Research and Development capabilities and enhance Singapore's competitiveness as an aviation and maritime hub.

• Provide a platform for companies to develop, test and use new technologies for airport and seaport operations.
(A14) Expand National Robotics Programme (NRP) • Expanding NRP to the built environment and construction sectors to transform work processes and create better job opportunities.
(A15) Deferring Foreign Worker Levy (FWL) Increases • Defer FWL increase in the Marine Shipyard and Process sectors for one more year to help employers in these sectors that still face weakness.
B. For Households and Individuals
Workers and Job Seekers
(B1) Enhancing “Adapt and Grow” Initiative • Upgrade Work Trial scheme into a Career Trial scheme to provide higher funding support for workers to try out new careers.
(B2) Scaling up of Tech Skills Accelerator (TeSA) (additional \$145 million over next three years) • To expand TeSA into new sectors and emerging skill areas such as data analytics, artificial intelligence, and cyber-security.
(B3) ASEAN Leadership Programme • A programme under the existing SkillsFuture Leadership Development Initiative to help business leaders to build networks and develop business expansion plans in Southeast Asian markets.
(B4) Capability Transfer Programme • Pilot programme to support skills transfer from foreign specialists to Singaporean trainers and trainees.
Households, Families and Community
(B5) Additional GST Voucher — U-Save (\$54 million over three years) • To soften the impact of the carbon tax on households’ average electricity and gas expenses, eligible HDB households will receive an additional \$20 of U-Save per year, from 2019 to 2021.
(B6) Extension of Service & Conservancy Charges (S&CC) Rebate (\$126 million) • Extend S&CC rebates to FY2018.
(B7) One-off SG Bonus — Cash Special Payment (\$700 million) • Up to \$300 to be given to eligible recipients.
(B8) Increase in Edusave Contributions • Edusave contribution will be increased from Jan 2019, from \$200 to \$230 for each primary-level student and from \$240 to \$290 for each secondary-level student.
(B9) Enhancements to MOE Financial Assistance Scheme (FAS) • Increase in annual bursary quantum for pre-university students from \$750 to \$900. • More meals for secondary school students under the School Meals Programme. • Update income eligibility criteria for MOE FAS, as well as for Edusave Merit Bursary and the Independent School Bursary, to benefit more students.
(B10) Support for Financial Planning • New Financial Education curriculum at Polytechnics and Institute of Technical Education. • Enhance existing services at HDB and CPF Board to enable individuals to make better-informed decisions.
(B11) Enhancements to Proximity Housing Grant (PHG) (additional \$80 million per year) • Increase in PHG (from \$20,000 to \$30,000) for families buying a resale flat to live with their parents or adult children. • Increase in PHG (from \$10,000 to \$15,000) for singles buying a resale flat to live with their parents. • Introduce PHG of \$10,000 for singles buying a resale flat to live near their parents. • Simplify criteria of “near” to within 4km.
(B12) Foreign Domestic Worker (FDW) Levy • Raise qualifying age for the monthly concessionary FDW levy for care of aged persons from 65 to 67 years. • Raise monthly FDW levy for first and second FDW employed without levy concession from \$265 to \$300 and \$450 respectively. • The changes will take effect from 1 April 2019.
(B13) Integrated Health and Social Support for Seniors • Consolidation of health- and social-related services for seniors under Ministry of Health. • Agency for Integrated Care (AIC) to be designated as the central implementation agency for coordination of services to seniors and caregivers. • Nationwide expansion of Community Network for Seniors. • Pioneer Generation Office renamed as Silver Generation Office and merged with AIC.
(B14) Top-ups to Funds and Subsidies • Community Silver Trust (\$300 million).

- Seniors' Mobility and Enabling Fund (\$100 million). - Empowering for Life Fund (\$190 million per year). - ElderShield premiums subsidies (\$2 billion).
(B15) Encouraging Singaporeans to Give Back - Extension of 250% tax deductions for donations made to Institutions of a Public Character to 2021. - Enhancements to Giving.sg portal. - Raise government annual matching grant cap for Community Development Councils from \$24 million to \$40 million from FY2018.
(B16) Increase in Buyer's Stamp Duty (BSD) Raise top marginal rate of BSD for residential properties from 3% to 4%.
(B17) Extension of GST to Imported Services Introduce GST on imported services with effect from 1 January 2020.
(B18) Increase in Tobacco Excise Duty Implement 10% increase in tobacco excise duty across all tobacco products.
C. Strategic Nationwide Initiatives and Infrastructure Investments
(C1) Building a Smart Nation Embark on strategic national projects such as Smart Nation Sensor Platform, National Digital Identity System, e-Payments, Smart Urban Mobility and Moments of Life.
(C2) Energy Grid 2.0 Develop next-generation grid architectures which can respond quickly and reliably to changes in energy demand and supply.
(C3) Rail Infrastructure Fund (injection of \$5 billion in FY2018) - Set up the Rail Infrastructure Fund to save ahead for future development of major rail lines. - To be topped up in future years when the fiscal position allows.
D. Fiscal Sustainability
(D1) Increase in GST rate - To raise GST rate from 7% to 9% sometime in the period from 2021 to 2025 to support increase in recurrent needs in healthcare, security and other social spending. - Will be complemented with the continued absorption of GST on publicly-subsidised education and healthcare, an enhanced permanent GST Vouchers (GSTV) scheme and an offset package for a period of time to help Singaporeans adjust to the GST increase. - To top up the GST Voucher Fund in advance by \$2 billion in FY2018.
(D2) Borrowing for Infrastructure - Statutory Boards and Government-owned companies that build infrastructure to enter into borrowing arrangements to spread out investment costs over more years. - Government will consider providing guarantees for long-term borrowings for critical national infrastructure to enhance confidence of creditors.
(D3) Prudent and Effective Public Spending Ministries' block budgets to grow by 0.3 times GDP growth, adjusted down from 0.4 times.

Source: MOF

A small overall budget deficit is projected for FY2018.

The overall budget balance is projected to be a small deficit of \$0.6 billion or 0.1% of GDP for FY2018, compared with a surplus of \$9.6 billion or 2.1% of GDP in FY2017. (Chart 4.11 and Table 4.2)

The primary balance is expected to record a deficit of \$7.3 billion this FY compared to a small surplus in FY2017, due to lower operating revenues and higher total expenditures, primarily in transport infrastructure projects. Special transfers, including top-ups to endowment and trust funds, are also expected to increase, mainly due to the injection of \$5.0 billion into a newly set up Rail Infrastructure Fund to support the development of future MRT infrastructure projects. Meanwhile, Net Investment Returns Contribution is estimated to increase by \$1.2 billion to \$15.9 billion in FY2018.

Chart 4.11
Components of the Budget

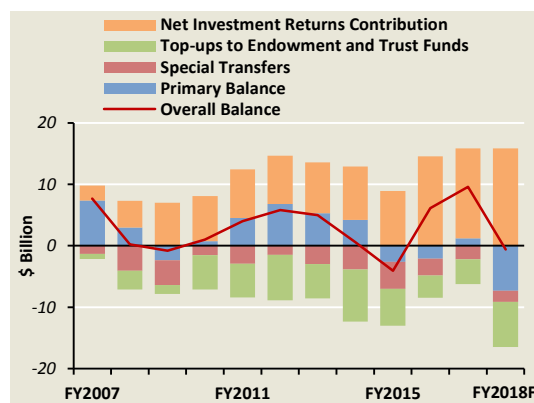


Table 4.2
Budget Summary

	FY2017 Revised		FY2018 Budgeted	
	\$ Billion	% of GDP	\$ Billion	% of GDP
Operating Revenue	75.2	16.6	72.7	15.5
Total Expenditure	73.9	16.3	80.0	17.1
Operating Expenditure	56.1	12.4	57.7	12.3
Development Expenditure	17.8	3.9	22.4	4.8
Primary Surplus/Deficit (–)	1.2	0.3	(7.3)	(1.6)
Less: Special Transfers (excluding top-ups to endowment/trust funds)	2.2	0.5	1.8	0.4
Basic Surplus/Deficit (–)	(1.0)	(0.2)	(9.2)	(2.0)
Less: Special Transfers (top-ups to endowment/trust funds)	4.0	0.9	7.3	1.6
Add: Net Investment Returns Contribution	14.6	3.2	15.9	3.4
Budget Surplus/Deficit (–)	9.6	2.1	(0.6)	(0.1)

Source: MOF

The fiscal policy stance will be mildly expansionary in 2018.

The fiscal impulse (FI) in CY2018 is estimated to be moderately positive at around 1.0% of GDP (Chart 4.12), indicating an expansionary fiscal stance compared to last year. The fiscal stance remains appropriate for an economy that is undergoing restructuring, with the higher spending representing continued supply-side investments to address longer-term challenges brought about by demographic and technology shifts.

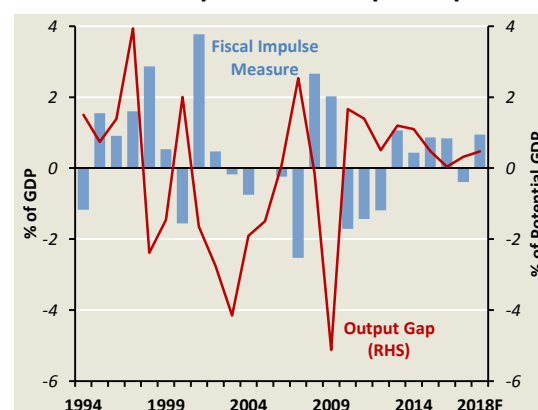
Using the Monetary Model of Singapore (MMS), EPG simulated the key household and business-related initiatives announced in Budget 2018 to assess their impact on the Singapore economy. The largest component of household-related spending was a one-off SG Bonus of \$700 million, introduced to share a part of the government's windfall surplus in FY2017 with Singaporeans. Together with community-related measures such as enhancements to Financial Assistance Schemes in schools and Proximity Housing Grants, this will raise disposable incomes and boost private consumption in 2018.

The business-related measures in Budget 2018 cover a range of transfers to firms, grants and direct expenditure by the government to help businesses—especially SMEs—acquire new capabilities and seize opportunities. Some of these measures will manifest as cost savings for firms, while others, such as the Enterprise Development Grant, should help to boost investment spending.

Overall, the results show that the Budget will have a modest positive impact on GDP growth in 2018, raising it by 0.26% point. CPI-All Items inflation is expected to be lowered by 0.1% point in 2018. (Table 4.3) This benign outcome can be attributed to the substantial business cost savings and the dampening effect of the S&CC rebates for households on inflation. The effects of stronger private consumption and investment on CPI inflation will appear with a lag in 2019.

There will also be considerable fiscal support through the increase in government development expenditures. New infrastructure projects were announced as part of Budget 2018, along with an affirmation of the government's commitment to national infrastructure development in the medium term, including the expansion of the rail network, the construction of the KL-Singapore High Speed Rail and new hospitals. EPG simulated the macroeconomic impact of upcoming government development spending. The results suggest that such public non-residential investment is expected to contribute about 0.4% point to overall GDP growth in 2018.

Chart 4.12
Fiscal Impulse and Output Gap



Source: EPG, MAS estimates

Table 4.3
**Impact of Selected Budget 2018 Measures
on Real GDP and CPI-All Items Inflation**

	2018	2019
Real GDP (% deviation)	0.26	0.13
CPI-All Items Inflation (% point deviation)	-0.10	0.30

Note: The total values of the measures simulated are \$1,956 million in 2018 and \$1,596 million in 2019. The simulations include the deferment of foreign worker levies in the Marine Shipyard and Process sectors, as well as the changes to the foreign domestic worker levy and tobacco excise duty.

Review Of Government's CY2017 Basic Balance

Government operating revenue increased in line with GDP growth in 2017.

This section compares the government's budgetary outturn in CY2017 with CY2016.

In 2017, operating revenue increased by \$2.3 billion to \$70.2 billion (15.7% of GDP), mainly from corporate and personal income taxes and stamp duties. (Chart 4.13) Revenues from personal income tax (PIT) and corporate income tax (CIT) receipts rose in 2017 alongside firm growth. PIT increased by \$0.5 billion, and CIT grew by \$1.2 billion. Meanwhile, stamp duty collections rose to \$4.5 billion from \$3.1 billion in 2016, due to an increase in property transactions in 2017 as a whole. (Chart 4.14)

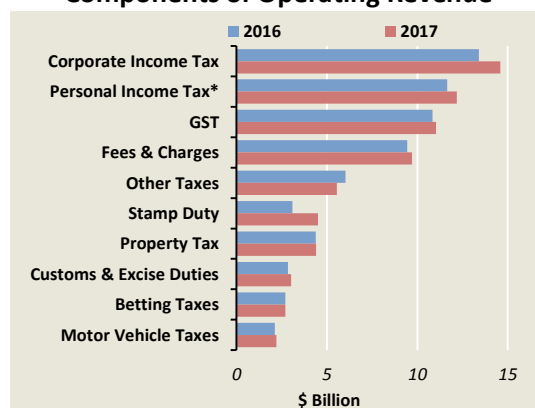
The fall in development expenditure more than offset the increase in operating expenditure.

Total government expenditure fell by \$1.3 billion to \$71.6 billion (16.0% of GDP) in 2017 as lower development expenditure more than offset increased operating expenditure. (Chart 4.15) In terms of sectors, the decrease in total expenditure can be attributed to lower spending on economic development⁵, which in turn reflected the lumpiness in transport-related spending. (Chart 4.16)

Operating expenditure, which includes expenses on manpower, operating grants and subventions to statutory boards and other organisations, rose by \$3.8 billion to \$54.9 billion (12.3% of GDP) in 2017. The Ministry of Education recorded higher spending on initiatives to improve the quality of education as well as provision for SkillsFuture Singapore Agency, which was established in October 2016. At the same time, operating expenditure by the Ministry of National Development increased by \$1.0 billion due to higher outlay on public housing. The Ministry of Transport also saw an increase in operating expenditure due to the funding of public bus services contracts.

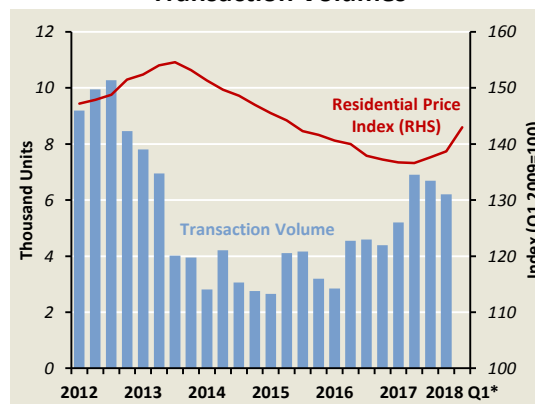
Development expenditure, which comprises longer-term investment in capitalisable assets, such as roads and buildings, declined by \$5.1 billion to \$16.8 billion (3.7% of GDP) in 2017 as the reduction in spending on transport infrastructure more than outweighed the

Chart 4.13
Components of Operating Revenue



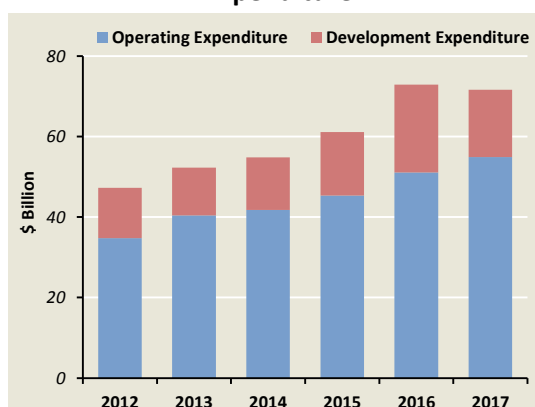
* Includes withholding tax.

Chart 4.14
Residential Price Index and Property Transaction Volumes



* Flash estimate.

Chart 4.15
Government Operating and Development Expenditure



⁵ The economic development category comprises Transport, Trade and Industry, Manpower (excluding Financial Security) and Info-Communications and Media Development.

higher expenditure on the environment and water resources. The lower development outlay by the Ministry of Transport last year was mainly due to the completion of the Downtown MRT Line 3 and the progress of the Thomson East-Coast Line project into a lower-expenditure phase. In addition, development spending on transportation also normalised in 2017 following the one-off ramp-up in 2016 with the purchase of SMRT's assets under the Rail Financing Transition Framework. In comparison, the Ministry of the Environment and Water Resources incurred higher development expenditure due to the construction of an Integrated Waste Management Facility as well as redevelopment of Mandai.

The primary and basic balance deficits narrowed in CY2017.

Reflecting higher operating revenue and lower total expenditure, the government recorded a smaller primary deficit of \$1.4 billion (0.3% of GDP) in CY2017, compared to \$4.9 billion in CY2016. Taking into account lower special transfers due to smaller disbursements from the Wage Credit and the Productivity and Innovation Credit Schemes, the Government's basic deficit narrowed to \$3.6 billion (0.8% of GDP), from \$9.1 billion in the preceding year. (Chart 4.17)

Chart 4.16
Components of Total Expenditure

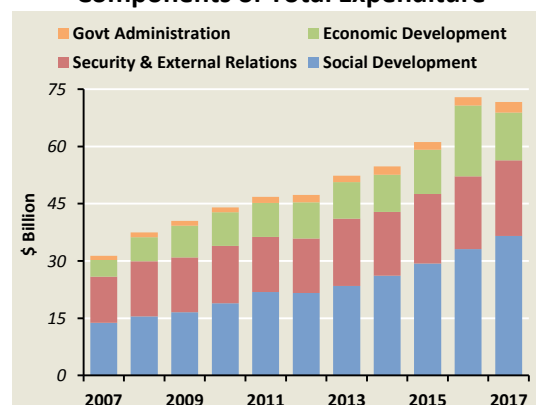
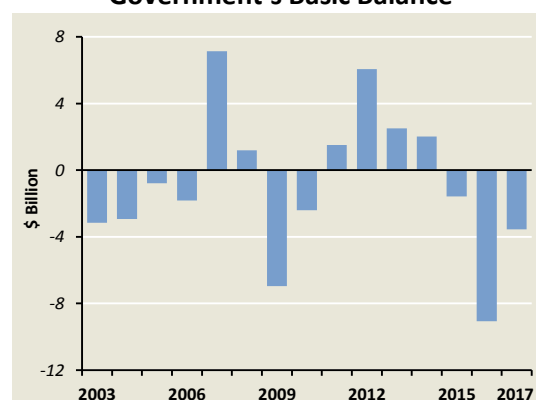


Chart 4.17
Government's Basic Balance





Special Features

Special Feature A

The Promise Of Digital Transformation In ASEAN¹

Introduction

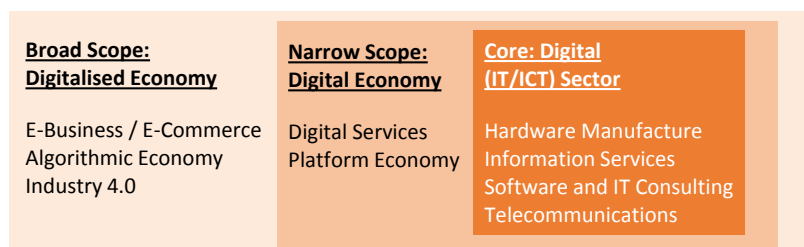
Since the 1990s, information and communications technologies (ICT) have been exerting an increasingly important impact on the way people live and work around the world. With the proliferation of mobile technology and the advent of the Internet of Things (IoT), ICT holds the promise of offering seamless and intelligent interconnectivity between people, firms and governments globally. By improving connectivity and facilitating access to information and services, the 'digital economy' is upending current ways of organising activities and transforming how firms reach out to consumers.

Given its great potential, the digital economy can play a key role in fostering economic development in the ASEAN² region, and more fundamentally, serve as a driver of productivity growth. The digital transformation is already leading to important sectoral shifts in GDP and employment patterns. The biggest winners of

these changes include the ICT-producing sectors, such as electronics and communications, as well as major ICT-using sectors, such as e-commerce and transport. However, digital technologies have also allowed new and more nimble firms to enter other contestable markets, such as the domestic services industries, in the process disrupting existing business practices, exposing incumbents to competition and benefiting consumers.

This Special Feature begins with an overview of notable developments in the digital economy in the ASEAN region and an assessment of its quantitative importance. It then proceeds to discuss the benefits of digital transformation, with an emphasis on the potential efficiency, productivity and welfare gains that can accrue from digitalisation. Finally, it highlights the challenges arising from the greater adoption of digital technologies in the ASEAN region.

Figure 1
A Representation of the Digital Economy



Source: Bukht and Heeks (2017)

¹ This feature is a collaborative project between EPG, MAS and the ASEAN+3 Macroeconomic Research Office (AMRO). The views expressed in this paper do not necessarily represent those of AMRO, its Executive Board, AMRO management, or the MAS.

² The focus of this study is the following ASEAN member countries: Indonesia, Malaysia, the Philippines, Singapore, Thailand and Vietnam (ASEAN-6). Where available, data on Brunei, Cambodia, Lao PDR and Myanmar are included.

Measuring The Digital Economy

Although there are various definitions of the digital economy, it fundamentally refers to economic processes, transactions, interactions and activities that are based on digital technologies. The core IT/ICT digital sector itself (ICT-producing activities) and a wider range of digital applications (ICT-using activities) fall within the scope of activities considered. (Figure 1) In addition, the digital economy subsumes the production and application of novel technologies such as artificial intelligence, robotics, cloud computing, 3D-printing and big data analytics.

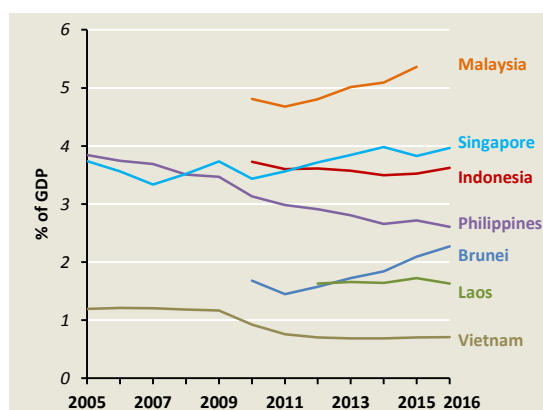
In recent years, the expansion of the digital economy has provided an important source of economic growth for the ASEAN economies. Major global players in the digital economy such as Facebook, Apple, Microsoft, Google and Amazon have established a presence in the region. Similarly, their Asian counterparts such as Baidu, Alibaba and Tencent in China, Softbank and Rakuten in Japan, Naver in Korea, and Grab, Go-Jek, Traveloka and Lazada in ASEAN are transforming the region into a digitally-connected economic powerhouse.

Recognising the critical importance of digital adoption for revenue growth, firms in ASEAN have been relatively quick to adopt ICT, and have

done so at a faster pace than the global average, although there are inter-country variations, as discussed later. The World Economic Forum's *Executive Opinion Survey* conducted in 2016–17 shows that firms in the region have made commendable efforts to adopt new technologies, which can be partly attributed to their strong participation in global value chains (World Economic Forum, 2016). These regional production networks greatly facilitate access to the latest manufacturing technologies, thus helping firms to effect the digital transformation (Chen, 2017). Nevertheless, there remains considerable scope for digital technologies to diffuse more broadly and penetrate more deeply into the operations of a wide range of firms in other non-manufacturing and services industries.

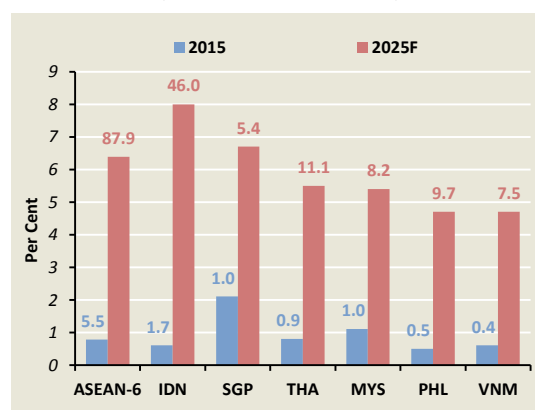
While reliably measuring the size of the digital economy is a challenging task, it is undoubtedly growing rapidly in importance. For example, Huawei and Oxford Economics (2017) have estimated its size at US\$11.5 trillion globally (or 15.5% of global GDP). Moreover, it is reckoned to have expanded two-and-a-half times faster than global GDP over the past 15 years. According to UNCTAD, which employs a narrower definition that does not account for digital spillovers, the production of ICT goods and services currently

Chart 1
ASEAN ICT Value Added
as a Share of GDP



Source: National Authorities

Chart 2
Size of the ASEAN E-Commerce Retail Market
(% of Retail Market)



Source: Google-Temasek (2017), McKinsey

Note: Figures are in US\$ billions.

accounts for a smaller 6.5% of GDP globally, with the services sub-sector alone employing some 100 million people (UNCTAD, 2017).

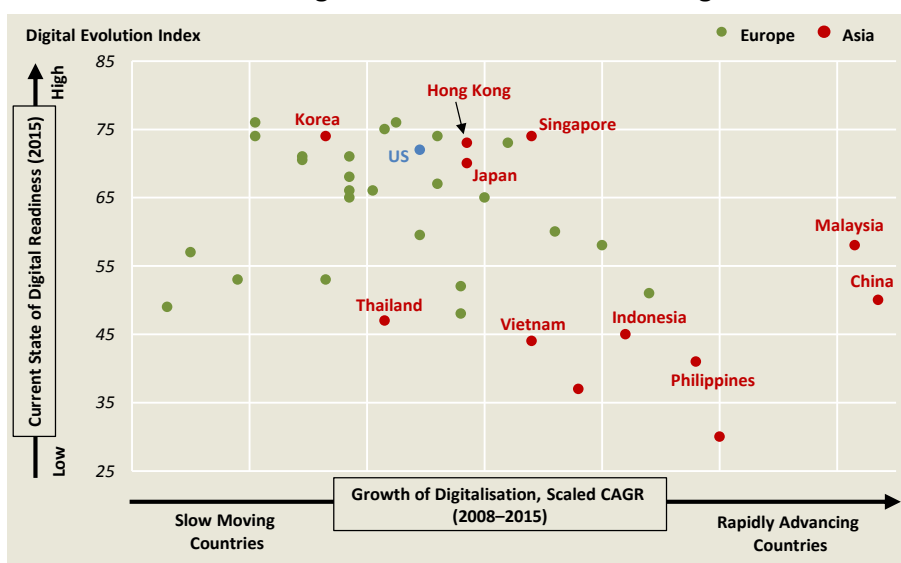
In the ASEAN economies, the ICT sector is also growing fast, albeit from a lower base—it is estimated to account for about 3% of total value added in the region currently. However, there is considerable variation between countries, with ICT value-added shares ranging from 0.7% to 5.4%. (Chart 1) The increasing heft of the ICT sector is most discernible in major ASEAN economies such as Indonesia, Malaysia and Singapore. At the same time, ICT investment in ASEAN, which amounted to more than US\$100 billion in 2014, is now growing by more than 15% annually (AT Kearney and Axiata, 2015).

At the industry level, economic activities that utilise ICT have also grown progressively over the past several years. For instance, new industries such as e-commerce have sprouted. The e-commerce market in the ASEAN-6 was valued at more than US\$5 billion in 2015. (Chart 2) By 2025, it is estimated that the overall size of the regional market will increase to approximately US\$90 billion, with Indonesia poised to be the largest

sub-market (US\$46 billion), while Vietnam, Malaysia, the Philippines, Thailand and Singapore will also see e-commerce accounting for a significant share of retail transactions.

The Digital Evolution Index compiled by Chakravorti and Chaturvedi (2017) is a summary measure that gauges how much progress economies have made in terms of digitalisation. Chart 3 shows the current state of digital readiness of countries around the world (vertical axis) against the growth of digitalisation (horizontal axis). A negative relationship is discernible among the Asian economies, with the economies at a relatively advanced state of digital readiness (such as Korea) experiencing slower growth in digitalisation than those at an earlier stage of digital development (such as Indonesia and the Philippines). Malaysia and China are notable outliers—despite having a higher level of digital readiness compared to most of the ASEAN region, both countries outperformed in terms of digitalisation growth. This could reflect early successes in their efforts to accelerate the digital transformation and catch up with countries at the forefront of digital readiness.

Chart 3
Current State of Digitalisation versus Growth of Digitalisation



Source: Chakravorti and Chaturvedi (2017)

The Promise Of Digital Transformation

Efficiency and Welfare Gains

ICT can be considered to be a general purpose technology. Similar to how the steam engine and electricity generated positive productivity spillovers across multiple industries and thereby reshaped economies in the 18th and 19th centuries, the proliferation of ICT promises to dramatically reconfigure the current economic landscape (Brynjolfsson and McAfee, 2016).

First, ICT can greatly reduce the cost of acquiring information and increase its availability at the same time, thus engendering transactions that were not possible before and fostering economic growth. The ability of digital technologies to transcend information and transport barriers may be especially impactful in previously remote regions with poor infrastructure and limited access to services. By creating new markets and rendering existing ones more efficient, ICT can play a central role in broadening access to goods and services in under-served regions. For example, mobile payments have allowed farmers in the region to reliably send and receive payments at affordable rates, allowing them to overcome the ‘tyranny of distance’. In Indonesia, portable ultrasound devices operated by trained midwives (rather than radiologists) have helped increase access to pre-natal care (McKinsey Global Institute, 2014).

Second, digital technologies can help manufacturers lower costs and increase profitability. For instance, the use of big data analytics can aid firms in better forecasting demand, while enabling them to manage their inventories more efficiently. On the production front, a network of sensors embedded in factory floors would help firms to identify bottlenecks, reduce wastage and optimise production. As supply chains are highly fragmented across the region, there are outsized benefits to deploying sensors across the entire length of the supply chain to track shipments on a real-time basis.

Third, by infusing ICT into the manufacturing sector, countries that embrace digital technologies can quickly move up the value chain,

and even leap-frog forerunners, which followed a conventional export-led strategy as suggested by the ‘flying geese’ model of development (Akamatsu, 1962). With the proliferation of cross-border production networks in the region since the 1990s, ASEAN, with its relatively low labour costs, is well-placed to serve as a base for ICT producers to manufacture tech products such as smartphones. Multinational firms such as Intel and Panasonic are major players in Malaysia’s electrical and electronics industry, having established extensive operations there. More recently, Samsung has set up production facilities in Vietnam to take advantage of its educated workforce and relatively lower factor costs.

Fourth, the non-rivalrous nature of ICT has brought broader welfare gains to societies, by allowing a single provider to reap enormous internal economies of scale and expand its product offerings to new users at negligible marginal cost. The lower cost of provision is often passed on to consumers through reduced prices, thus enhancing consumer welfare. Another more indirect way in which ICT can enhance welfare is through facilitating market entry and promoting competition. Internet businesses are often labour- and capital-light, with low barriers to entry. Many online firms in e-commerce, telecommunications, media and FinTech compete directly with offline ones, reducing corporate pricing power and rents. The dampening impact of technology-related supply-side developments on prices is popularly known as the ‘Amazon effect’, after the prominent online retailer.

Fifth, the digital economy can play a critical role in enhancing ASEAN economic integration, as well as promoting financial inclusion. For this reason, policymakers are making a concerted effort to position ASEAN for digital transformation under the ASEAN Economic Community (AEC) Blueprint 2025 (ASEAN, 2015). In February 2018, ASEAN leaders underlined their support for a Smart Cities Network across the region. This would help to further connect and integrate regional supply chains, and foster digital trade in products and services. There is also great potential in bringing previously unconnected SMEs ‘online’ into the

regional marketplace, hence stimulating intra-regional consumption and investment. On the financial front, innovations in mobile banking, e-payments and remittances services will help promote financial inclusion and benefit the ‘unbanked’ population in ASEAN.

Impact on Productivity

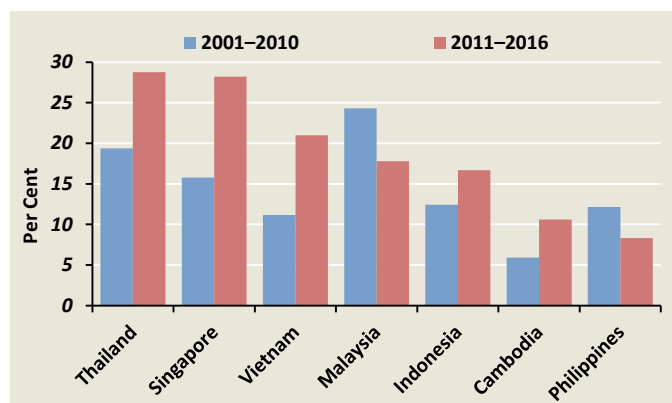
From the supply-side perspective, ICT raises GDP growth, productivity and real wages through three main channels: (i) the ICT-producing sector itself is a source of growth; (ii) ICT investments add to the capital stock that is available to workers and thus raise labour productivity; and (iii) ICT enables firms to combine labour and capital inputs more efficiently, enhancing total factor productivity (TFP).

To assess the impact of ICT on economic growth and productivity in recent years, a growth decomposition framework pioneered by Jorgenson *et al.* (2003) is applied to seven major

ASEAN economies. The supply-side analysis conducted here draws on data from the Total Economy Database (TED) provided by The Conference Board, which decomposed the aggregate GDP growth rate of each economy into ICT and non-ICT capital inputs, labour input and TFP (The Conference Board, 2017). Jorgenson *et al.* (2008) have shown ICT to be quantitatively important for output and productivity growth in the US, accounting for one-third of GDP growth over 2000–05.

As seen in Chart 4, the contribution of ICT capital to GDP growth has increased significantly in Thailand, Singapore, Vietnam and Indonesia from 2011 onwards, compared to the preceding decade. This reflects the growing importance of ICT capital deepening in driving economic growth across the region. It should be noted that these findings are likely to represent a lower bound for the aggregate contribution of ICT to GDP growth, since the salutary effects of ICT on TFP are difficult to measure directly.

Chart 4
Contribution of ICT Capital to GDP Growth in ASEAN



Source: The Conference Board

Looking ahead, there is considerable scope for boosting productivity growth in the ASEAN region through increasing ICT capital inputs and accelerating the diffusion of ICT into the broader economy. This is especially true for services industries, such as wholesale trade & retail and food & accommodation, where productivity levels have remained low. Further, digitalisation offers a novel solution to the ‘cost disease’ in the provision of education and healthcare services.

Digital transformation can be disruptive, and both individuals and firms need to stay on top of rapidly shifting digital trends (Dahlman *et al.*, 2016). According to a market survey by IMD and Cisco (2015), the four industries most susceptible to disruption or displacement are: (1) technology products and services (since this sector represents the foundation for digital disruptions); (2) media and entertainment; (3) retail; and (4) financial services. To address the impact of disruption,

firms in these sectors will have to obtain new digital capabilities, by investing more heavily in R&D and by acquiring technology companies. If they can reinvent their business models to exploit

emerging technological trends, they can create new market opportunities and find success in the new digital economy.

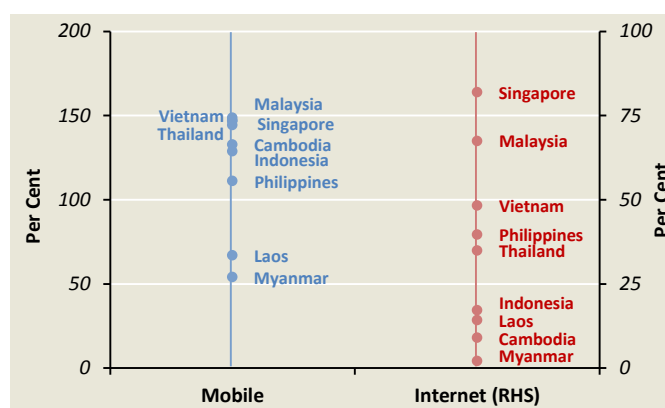
Challenges To Greater Adoption Of Digital Technologies

Emerging and developing economies are at very different phases of their digitalisation journey, partly as access to ICT infrastructure is a basic prerequisite for participation in the digital economy. ICT infrastructure encompasses the physical hardware necessary for digital activities to be carried out, such as fibre optic cables, computers, routers and servers.

According to the *World Bank World Development Report 2016*, eight in ten individuals in the

developing world own a mobile phone, but only three in ten have internet access. Similarly, internet penetration is lagging mobile penetration across ASEAN. (Chart 5) With the exception of Singapore and Malaysia, a majority of the population in ASEAN countries does not yet have internet access. Ensuring that access to digital technologies becomes more widespread will ensure that their benefits are shared more widely and equitably.

Chart 5
ASEAN Mobile and Broadband Penetration



Source: World Development Indicators, World Bank

Besides the ‘hardware’ of ICT infrastructure, ASEAN needs to pay attention to developing ‘software’, namely to nurture a skilled and educated populace to fully harness the benefits of digital transformation. Technology can only make workers more productive if they are trained and equipped to fully exploit the possibilities that digital technologies bring. Indeed, automation is already rendering many jobs in low- and mid-skilled routine occupations obsolete, generating significant job losses in some sectors (Acemoglu and Restrepo, 2017). Education and training systems need to be reconfigured to imbue people with the skills required in the digital economy. In ASEAN, the main priority should be to create a strong pipeline of ICT talent

to meet the needs of the fast-growing ICT sector, while promoting digital literacy among the general population.

For firms to maximise the benefits of digital adoption, investment in IT needs to be accompanied by the adoption of complementary organisational practices at the firm level (Brynjolfsson and Hitt, 2003). Not surprisingly, recent studies have found positive causal effects between firms’ technology adoption and employment and earnings, but these effects are only seen when business processes and organisational structures are revamped to take advantage of IT investments (Gaggl and Wright, 2014). Therefore, it is essential to raise awareness

and boost implementation capacity especially among smaller firms, so that they too can reap the benefits of new digital tools. A survey conducted by IDC Asia/Pacific on behalf of Microsoft (2018) has shown that firms with fully-developed digital transformation strategies will gain the lion's share of economic opportunities, at the expense of other firms.

On the regulatory front, policymakers in ASEAN economies will need to adopt policies that are supportive of the fast-growing ICT sector, while facilitating the digital transformation process. ASEAN's regulatory policies would need to serve as an enabler—promoting a level playing field, maintaining legal and security safeguards, while at the same time not stifling innovation. Given that the digital economy is effectively borderless, closer collaboration and exchange of experiences

amongst ASEAN member states is key. For example, Singapore has launched the National Trade Platform (NTP), a national trade information management platform that forms the backbone of Singapore's trade and logistics ecosystem, while Malaysia has developed a National E-Commerce Strategic Roadmap, aimed at promoting easy access to cross-border information, including information on Harmonized System Codes, export requirements and product certifications. Such supportive policies help to expedite cargo clearance, harmonise export processes and safeguard consumers' interests. In Singapore, the SMEs Go Digital Programme aims to help SMEs exploit digital technologies and take a more structured and inclusive approach to building strong digital capabilities.

Conclusion

Much of ASEAN is still in the early stages of digital transformation. This implies greater opportunities for ICT-driven growth in the region, compared to more developed economies. As long as the right complementary factors and policies are in place, alongside a supportive regulatory environment, emerging ASEAN has the potential to leap-frog its forerunners and converge faster to the global technology frontier.

Despite the real progress made by the ASEAN economies in embracing the digital economy, challenges remain. If the region can collectively foster the development of ICT infrastructure, promote ICT skills, drive greater adoption of ICT in firms and adopt forward-looking regulations and policies, it will be able to harness technology to reap substantial productivity gains and realise the promise of digital transformation.

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Special Feature B

Finance, Growth And Economic Prosperity

by Ross Levine¹

The Questions

Do financial institutions and markets contribute to economic growth and prosperity, or are they simply casinos where the rich come to place their bets? While there is little doubt that finance is a cornerstone of capitalism, there is considerable debate among political leaders and the public about the social productivity of the financial

system. In this article, I take stock of a large body of research examining the role of financial systems in shaping economic growth, income inequality, poverty and the degree to which an individual's economic horizons are shaped by the wealth of the person's family or by the person's talent, energy and initiative.

The Overarching Answers

The evidence provides a clear message: Well-functioning banks and securities markets foster economic prosperity. By well-functioning, I refer to financial systems that effectively mobilise savings, screen borrowers and allocate those savings, monitor and govern the use of those savings by firms and individuals, provide mechanisms for individuals and firms to manage risk, and facilitate transactions. When financial systems perform these functions well, they promote growth and expand economic opportunities as described in Levine (1997, 2005). For example, when banks screen borrowers effectively and identify firms with the most promising prospects, this is a first step in boosting productivity growth. When they mobilise savings from disparate households to invest in these promising projects, this represents a second crucial step in fostering growth. Furthermore, when banks monitor the use of investments and scrutinise managerial performance, this is an additional ingredient in boosting the operational efficiency of corporations and reducing waste, fraud, and private rents earned by corporate insiders. But, that is not all. When securities

markets ease the diversification of risk, this encourages investment in higher-return projects that might be shunned without effective risk management vehicles. And, when capital markets lower transactions costs, this facilitates trade and specialisation, which are fundamental inputs into technological innovation and economic growth.

However, when financial systems are underdeveloped and perform these functions poorly, they hinder economic growth and curtail economic opportunities. For example, if banks simply collect funds with one hand and pass them along to cronies with the other hand, this produces a less efficient allocation of resources that slows economic growth and limits the economic horizons of many people. If capital markets fail to exert sound corporate governance, this makes it easier for managers to pursue projects that benefit themselves rather than the firm and the overall economy. Thus, poorly functioning financial systems can become an effective tool for restricting credit—and hence opportunity—to the already rich and

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powerful rather than a mechanism for financing the best projects and entrepreneurial ideas. And, when securities markets create new, complex financial instruments and trick unsophisticated savers into buying them, this can boost the bonuses of financial engineers and executives while distorting credit allocation and attracting talented individuals into these socially unproductive activities.

Finance and Growth

Evidence shows that better functioning financial systems accelerate long-run economic growth. King and Levine (1993a, 1993b), Jayaratne and Strahan (1996), Demirgüç-Kunt and Maksimovic (1998), Levine and Zervos (1998), and Rajan and Zingales (1998) were early contributors to this research. Since then, investigators using many different research methodologies continue to find that countries with better-developed banks and stock markets enjoy much faster rates of long-run economic growth than economies with malfunctioning financial systems. This result does not reflect a ‘chicken-and-egg’ problem. It is not just that rich countries develop better banking systems. The evidence indicates that better financial systems accelerate economic growth.²

The evidence also explains that finance spurs growth by improving the allocation of resources, not by increasing the savings rate (e.g., King and Levine, 1993a; Beck *et al.*, 2000; Wurgler, 2000; Midrigan and Xu, 2014). While better financial systems more ably mobilise savings from individuals, the evidence indicates that banks and markets do not primarily boost economic growth by raising the savings rate; rather, they exert a first-order impact on the economy by getting resources to the most productive entrepreneurs and ensuring that those entrepreneurs use those resources efficiently.

Income Distribution and Poverty

Economic prosperity involves more than increasing the size of the economic pie. Part of evaluating the impact of finance on economic

prosperity involves understanding how it shapes the sizes of the slices of the economic pie. Do better-developed banks and markets increase the overall size of the economy only by boosting the incomes of the rich? Do better functioning financial systems materially boost the living standards of lower-income households? Moreover, part of evaluating the impact of banks on economic prosperity involves focusing on economic opportunities. Do better-developed financial systems influence the degree to which the contours of an individual’s economic possibilities are shaped by the individual’s abilities versus the degree to which those opportunities are predetermined by the wealth and connections of the individual’s family?

The evidence will surprise many: better-developed banks disproportionately help lower-income families and expand the economic opportunities available to economically disadvantaged individuals and groups, as shown in Beck *et al.* (2007) and Beck *et al.* (2010). To see how this works, again consider how finance shapes long-run growth. Better functioning financial systems boost growth by funnelling capital to the most promising entrepreneurs.³ This does not mean that they funnel credit to those endeavours run by the wealthiest families. Rather, it means that better-developed financial systems boost growth by funnelling credit to those entrepreneurs with projects that have greater risk-adjusted expected returns. By reducing the connection between wealth and access to credit, better financial systems can expand the economic opportunities for low-wealth people, improve the efficiency of resource allocation, and spur growth. ***It is not growth versus expanding economic opportunities; it is growth by expanding economic opportunities.***

Crucially, research also uncovers the channels through which better-developed financial systems reduce income inequality. First, they do not reduce inequality by lowering the incomes of high-earners. Rather, better banking systems reduce income inequality by boosting the

² See, for example Haber (1991), Beck *et al.* (2000), Brown *et al.* (2009), and the literature reviews by Levine (1997, 2005) and Popov (2018).

³ For the theory underlying this argument, see for example Greenwood and Jovanovic (1990) and Galor and Zeira (1993).

incomes of lower-income families by more than they boost the incomes of higher-income families (e.g., Beck *et al.*, 2007; Beck *et al.*, 2010).

Second, research shows that better-functioning financial systems lower inequality by spurring entrepreneurship and improving labour market conditions. This occurs as follows. As shown by Kerr and Nanda (2009), better banking systems lower the barriers to becoming an entrepreneur. This facilitates the entry of promising new firms, forcing the exit of unsuccessful incumbents and making the product market more competitive. The resultant intensification of product market competition means that workers—who account for the vast majority of people—look for work in a more dynamic competitive environment. A few large firms can no longer dictate terms to labour, and labour unions can no longer protect inefficient workers at the expense of more efficient ones.

Better banks create more competitive product markets, which in turn enhance competition for workers, boosting wages and lowering unemployment. As shown by Beck *et al.* (2010), it is through this labour market channel that better-functioning banking systems boost the incomes of lower-income families and narrow income inequality. Thus, banking systems shape the economic lives of almost everyone—***even those who never receive a loan, start a business, or purchase a security***—because almost everyone needs a job and that job search is materially shaped by the financial system.

It is worth emphasising that finance is special. While many other policy areas deserve attention, such as inflation, fiscal expenditures, taxes, international trade, cross-border capital flows, and the regulation of non-financial industries, finance exerts an especially robust impact on growth. In particular, King and Levine (1993a) show that the level of banking system development in 1960 predicted economic performance over the next half-century; but they also show that none of the other policy areas mentioned above has such predictive power.

From cross-country comparisons, individual country studies, time series studies, and microeconomic studies, research confirms and reconfirms the impact of financial systems on economic prosperity. People do not enjoy substantial and enduring improvements in living standards over decades in the absence of well-functioning financial systems.

Financial Innovation, Growth, and Prosperity

What about financial innovation? Paul Volcker, the former chairman of the Board of Governors of the Federal Reserve System sceptically stated in 2009, “I wish someone would give me one shred of neutral evidence that financial innovation has led to economic growth—one shred of evidence.” There are good reasons to believe that his scepticism about financial innovation is wrong. As described by Adam Smith, enhancing the wealth of nations requires increased specialisation and the development of novel technologies. The resulting increase in complexity makes it more difficult to screen borrowers, identify the most promising entrepreneurs and funnel credit effectively. As technological innovations cause the financial system to become less effective at selecting and financing firms, the efficiency of resource allocation declines and growth slows. Thus, to maintain the same rate of economic progress, financial systems must adapt to changing conditions and enhance the quality of their screening and other services to avoid becoming increasingly ineffective and ultimately obsolete.⁴

Historical examples and new econometric evidence show that: (i) better-functioning financial systems spur technological improvements; and (ii) continual innovations within capital markets are necessary for sustaining technological innovation. Just to mention a few examples, the creation of tradable debt contracts 6,000 years ago in Samaria made it easier to lend and less costly to borrow, which boosted specialisation and productivity. Ancient Rome developed a stock

⁴ Laeven *et al.* (2015) develop a theoretical model that formalises this argument.

market to ease the mobilisation of savings for enormous mining projects. To finance oceanic explorations in the 16th to 18th centuries, banks and other financial market participants invented the joint stock company to facilitate risk diversification. And, financial innovations were necessary ingredients for the funding of the Industrial Revolution.

More recently, financial innovations fostered the rapid scientific and commercial advances in information, telecommunications and biotechnologies. During the second half of the 20th century, new, high-technology firms found it increasingly difficult to obtain financing. Commercial banks were reluctant to lend without a secure cash flow to repay the loan. It was difficult to issue securities in public markets because the technology was complex and difficult to evaluate. Venture capital firms arose to screen entrepreneurs and provide technical, managerial and financial advice to new high-technology firms.

In this way, financial innovation, i.e., the creation of venture capital firms, spurred technological innovation. The financing of biotechnology offers

a still more recent example. As the frontiers of biotechnology advanced, the venture capitalist model did not work well because it did not have the requisite assembly of biologists, chemists, roboticists, engineers, and lawyers with expertise in the regulation of drugs to screen, monitor and guide new biotechnology endeavours. So, venture capitalists innovated by teaming with large pharmaceuticals companies that had the requisite expertise. In this way, financial innovation has facilitated technological innovation.

In terms of econometric evidence, research by Laeven *et al.* (2015) and many others, as reviewed in Aghion *et al.* (2018), indicate that financial innovation spurs technological change and economic growth. There is a symbiotic connection between technological innovation, finance, and financial innovation. Given all of the evidence, it is perhaps more appropriate to turn Volcker's sceptical query around and ask, "I wish somebody would give me a shred of evidence that the long-run link between financial innovation and growth has recently stopped."

Policies

The study of finance, growth, and prosperity offers a few important policy lessons, as stressed by Barth *et al.* (2004). In terms of the big general lesson, financial regulation is not just about preventing crises; it is also about cultivating financial systems that effectively mobilise savings, screen entrepreneurs, allocate savings to the most promising ones, monitor those businesses and induce them to use those savings efficiently, and provide first-rate risk management and transactions services. Financial regulation is about creating an environment that allows the financial system to innovate continuously to improve the quality of these financial services.

Research also provides three more specific lessons. First, competition among financial institutions and markets tends to improve the quality of the services provided by the financial

system to the rest of the economy with positive effects on economic growth, the incomes of the poor and the availability of economic opportunities to people throughout society. Considerable evidence shows that when bank regulators remove impediments to competition, bank lending rates fall, deposit rates rise, bank profits fall, the proportion of past due loans falls, bank transparency increases, the efficiency of credit allocation soars, economic growth accelerates, new firms enter at a faster rate, old firms exit at a faster rate, inequality falls, poverty drops and income inequality shrinks (e.g., Beck *et al.*, 2010).⁵

Second, granting greater power to official supervisory and regulatory agencies often *damages* the operation of financial systems unless there are effective institutional

⁵ For evidence on the impact of bank competition on transparency and fragility, see Jiang *et al.* (2016, 2017).

mechanisms for compelling these agencies to use their powers in the best interests of the public. As shown by Barth *et al.* (2004), bank regulatory and supervisory systems often use their powers to promote the interests of narrow political groups or wealthy individuals and too infrequently promote the interests of the public at large. Too often, there is ineffective governance of bank regulatory and supervisory agencies and these agencies are captured by narrow interests and fail to advance the public interest (e.g., Barth *et al.*, 2008). From the most developed economies to the least developed ones, and across centuries of experience, research shows us that it is often the regulatory agencies that discourage banks from effectively screening borrowers and allocating capital. It is often the regulatory agencies that compel banks to make loans that are politically appealing but that harm economic prosperity. Thus, too often it is the regulatory and supervisory agencies themselves that limit the ability of the most promising entrepreneurs to flourish. The evidence raises a cautionary flag about financial regulatory approaches that rely on the guiding hand of government officials.

Third, the evidence does favour a regulatory approach that forces banks to disclose more information, that ensures that bank owners and creditors have financial incentives to monitor and govern effectively, and that provides bank owners and creditors with the legal tools necessary

to oversee bank executives. As emphasised by Barth *et al.* (2004, 2008), such a regulatory approach will not just involve forcing banks to disclose information in a timely, comparable and transparent manner. Such a regulatory approach will focus on enhancing private sector governance of banks, so that small shareholders and debtors have the incentives, information, legal backing and legal means to exert corporate control over banks.

In sum, a large and growing body of evidence demonstrates that finance exerts a powerful influence on living standards. They influence who can start a business and who cannot, who can expand a business and who cannot. They shape who can borrow to buy a house in a neighbourhood that is conducive to the cognitive and non-cognitive development of their children and who can and who cannot borrow to send their children to better schools. The financial system influences whether people look for work in a dynamic, competitive and growing economy, or whether people search for jobs in more stagnant economies in which a few, protected firms dominate labour markets. Although financial systems will never eliminate the advantages of being rich, better-developed financial systems reduce the advantages of wealth by expanding economic opportunities and boosting the dynamism of economies.

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Special Feature C

Inflation Expectations In Singapore: A Behavioural Approach

by Alexander Clark, Aurobindo Ghosh and Samuel Hanes¹

Introduction²

The expectations of economic agents have significant impact on their decisions and are key determinants of macroeconomic outcomes such as inflation, economic growth and unemployment. For example, if a worker believes that consumer prices will rise sharply next year, she would demand a wage increase. Similarly, a homeowner with a fixed interest mortgage might make an early repayment if she expects price levels to fall, knowing that the real value of her mortgage debt will increase. In these cases, expectations about inflation could lead to changes in behaviour and in the aggregate, influence prices and become self-fulfilling.

It is no surprise, then, that policymakers are concerned with inflation expectations. Understanding inflation expectations can help policymakers improve their own forecasts and also better communicate the intent of, and strengthen the effectiveness of monetary policy (Barro and Gordon, 1983).

Indeed, effective communication of the central bank's outlook for inflation is one of the maxims of good monetary policy. Such communication

will help to ensure stability of prices and provide the correct "... anchoring of inflation expectations ...", despite shocks to aggregate demand (Bernanke, 2007).

Many central banks publish surveys of professional forecasters (see for example, MAS, 2018) and others also survey consumers on their expectations of future price changes. Some central banks like the US Federal Reserve Board or the Bank of England rely on a combination of past data, activity- and survey-based measures to gauge inflation expectations. However, survey-based estimates are plagued with different measurement and cognitive biases which in turn can affect the decision-making of different market participants, and adversely impact the prospects for the real economy. One of the major issues identified by survey designers is that *"... relatively little is known about how respondents interpret the survey questions, how their interpretation affects their responses, and how much their expectations influence their behaviour and beliefs about the economy ..."* (Bruine de Bruin et al., 2010).

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² This project is a collaboration between BIT and SMU, and supported by the Economic Policy Group (EPG) at MAS. It is based on the Singapore Index of Inflation Expectations (SInDEX) that was initially developed at the Sim Kee Boon Institute of Financial Economics (SKBI) under the supervision of Dr Ghosh. Dr Ghosh would like to acknowledge the support of and numerous helpful discussions about this project with several colleagues at different institutions including Jun Yu, Ekkehart Boehmer, Roberto Mariano, Peter Philips, Anil Bera, Shurojit Chatterjee, Jeremy Goh, Melvyn Teo, Anthony Tay, John Sequeira, EPG, and seminar participants at SMU and The Conference Board. Dr Ghosh would like to acknowledge the funding from LKCSB, SMU through a research grant (grant approval number C207MSS14B004) from the Ministry of Education Academic Research Fund Tier 1. Dr Ghosh also acknowledges the funding for the data provided by SKBI in collaboration with MasterCard International, Agility Research and Strategy, besides able research assistance from Gin Nguyen.

Notwithstanding this, the number of inflation expectations surveys has increased around the world. The more notable surveys include the *Livingston Survey* of professional economists (conducted by the Federal Reserve Bank of Philadelphia), *Thomson Reuters/University of Michigan Surveys of Consumers* (the ‘Michigan Survey’), the Federal Reserve Bank of New York’s (FRBNY) *Household Inflation Expectations Project* (HIEP), the online FRBNY *Survey of Consumer Expectations* (SCE), the *Bank of England/GfK NOP Inflation Attitudes Survey*, and the European Commission’s *Business and Consumer Survey*. Most of these used questionnaires that include demographic, wage and price-related questions, and were sent to a wide cross-section of experts, individuals or households. We cannot understate the importance of the accuracy of such surveys. In the US context, it has been succinctly observed that:

“... The Federal Reserve needs reliable measures of expected inflation to formulate and gauge the thrust of monetary policy. In fact, inflation expectations have become more important to the Fed given the diminished stability of the link between the monetary aggregates and GDP expenditures since the early 1980s, and the greater role that has been thrust upon expected real short-term interest rates in the implementation of Federal Reserve policy.” (Thomas, 1999)

In Singapore, the Singapore Index of Inflation Expectations or SInDEx compiled by SMU (see for example, Ghosh and Yu, 2011) asks questions such as the following:

Based on your own opinions and what you have seen and heard, which of the following ranges best describe the 12-month ahead yearly overall inflation rate in Singapore?

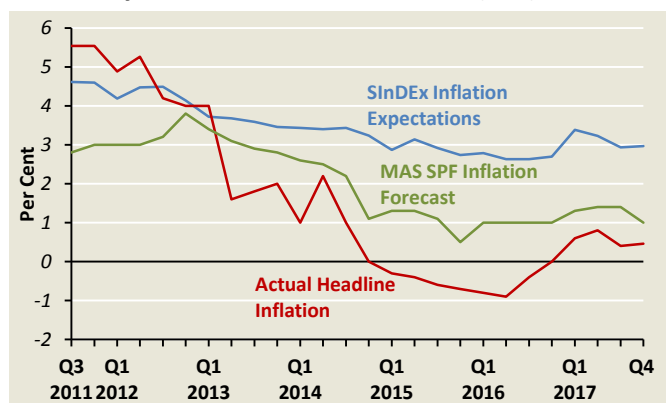
But there are reasons for caution in interpreting survey-based measures of inflation expectations. In both the US and Singapore, the median consumer inflation expectation is consistently higher than those from experts or macroeconomic models (Detmeister *et al.*, 2016). In the case of the SInDEx, for instance, there has been a non-trivial number of responses that could be characterised as ‘wild’, expecting inflation of more than 10% in a disinflationary period. When the data are examined subsequently, such predictions are typically not vindicated. (Chart 1)

There are two possible explanations for this phenomenon. Either consumers have predictable biases to their ‘true’ inflation expectations, or they do not give ‘true’ answers to inflation expectation questions. There have been a number of attempts to address this challenge. Some compare expectations to consumers’ estimates of past inflation. Others examine ‘turning points’ in consumer expectations, e.g., whether people predict that inflation is accelerating.

Our central hypothesis is that even if people behave as if they have sensible inflation expectations, the response they give when asked about inflation may not reflect this behaviour. Evidence from behavioural science also suggests that changing the questions used can create substantial differences in responses.

To understand the influence of cognitive biases on responses to the SInDEx with the aim of enhancing the survey, a collaborative project was undertaken by BIT and SMU, with support from EPG. This Feature describes two randomised experiments undertaken as part of the project, which assess whether asking people to estimate future prices leads to different answers compared to asking them about ‘inflation rates’.

Chart 1
Headline Inflation: Actual, SInDEx One-Year Ahead Expectations
and MAS Survey of Professional Forecasters (SPF) Median Forecast



Source: SInDEx

Note: For SInDEx and MAS SPF series, the horizontal axis corresponds to the period during which the survey was conducted.

Difficulties In Assessing Inflation Expectations

The first challenge with asking survey respondents about inflation is that many of them may not understand the term.

Suppose over the next 10 years the prices of the things you buy double. If your income also doubles, will you be able to buy less than you can buy today, the same as you can buy today, or more than you can buy today? [Answer options: less; the same; more; don't know; refuse to answer]

A global study found that only 50% of respondents could answer this question correctly (Klapper *et al.*, 2015). If half of the people who respond to inflation expectations surveys do not understand the question, then there is reason to doubt the reliability of their answers and to believe that the results are biased.

The second challenge is that question *framing* matters, as evidenced from a number of other contexts. A classic example is that of medical students being asked to make a hypothetical choice between radiation therapy and surgery. They were first presented with statistics on the effectiveness of each procedure. Researchers found that the students were much more likely to prefer radiation therapy when the statistics were framed as the percentage chance of immediate

death, as compared to the same statistics presented as percentage survival rate (McNeil *et al.*, 1982). Equally, survey respondents queried on how they spent a 2001 tax rebate in the US that was referred to as “withheld income” had dramatically different recollections of their expenditure than when the same rebate was referred to as “bonus income” (Epley *et al.*, 2006).

Similarly, when people make a numerical estimate, they are influenced by other numbers in their environment. This is known as *anchoring*. Sometimes anchors are relevant to the estimate—for example, when asked to make a donation to charity at their doorstep, people gave nearly three times more than when the request was accompanied by a suggested amount of \$20 (Fraser *et al.*, 1988). In other cases, they are not relevant at all. In one study, experimenters spun a wheel of fortune, which could land on 65 or 10. Participants were then asked to guess the percentage of African countries in the United Nations. Of course, none believed the two things were related, but when the wheel landed on 65, the average guess was 45%; when it landed on 10, it was 25% (Tversky and Kahneman, 1974).

Anchoring works because we begin with the presented figure, and then adjust—but we often adjust insufficiently (Epley and Gilovich, 2006). In

the question above, participants who started at 10 adjusted their estimate up, and those who started at 65 adjusted down, but both were ‘anchored’ to the initial figure. There is also evidence suggesting that these effects are more pronounced when the participant is more uncertain about the true figure (Mussweiler and Strack, 2000). Given that across the world, an average of only 50% of persons correctly answer a question about what inflation is, it is reasonable to assume that uncertainty on this topic is high.

In the case of a typical inflation question, much like the one used by the SInDEx above, providing

answers as multiple choices could anchor responses—suggesting to the uncertain respondent that the middle choice is a ‘sensible’ answer (Benartzi and Lehrer, 2015).

If inflation expectations are subject to the influences above, we should be careful in the construction of our surveys as we may unwittingly influence respondents towards a certain response. This necessitates exploration of how different questions influence survey respondents’ stated inflation expectations—the intention of the joint study between BIT, SMU and EPG.

Experiment 1

Experiment 1 was a pilot survey run in October 2017, outside of the normal SInDEx schedule. Participants were recruited and remunerated in the same way as the previous SInDEx runs. This was used to test some initial theories and explore possible question formats.

Method

We ran a randomised experiment to compare the effects of differing question formats on stated inflation expectations. We randomised our sample of 400 participants into two groups. The control group was asked the usual questions relating to inflation in the normal SInDEx survey.

Our first hypothesis was that increasing the magnitude of the multiple choice answer set will lead to higher stated inflation expectations. To test this, we gave different sets of answer options to the control and treatment groups for the following question:

Based on your own opinions and what you have seen and heard, which of the following ranges best describe the 12-month ahead yearly overall inflation rate in Singapore?

For the control group, the answer options were:

- *Less than 0%*
- *0% to less than 2%*
- *2% to less than 4%*
- *4% to less than 6%*
- *6% to less than 8%*
- *8% to less than 10%*
- *10% or more*
- *No idea*

For the treatment group, the answer options were:

- *Less than 0%*
- *0% to less than 6%*
- *6% to less than 12%*
- *12% to less than 18%*
- *18% to less than 24%*
- *24% to less than 30%*
- *30% or more*
- *No idea*

Our intention was to investigate whether people would be influenced to give higher inflation expectations when presented with options spanning a wider range. We compared the proportion of respondents expecting inflation of 6% or greater, which is taken to be the proportion of ‘wild’ responses given that Singapore has not experienced an inflation rate of 6% or more since the Global Financial Crisis.

Our second hypothesis was that respondents will give different answers if asked to forecast future prices in dollar terms, rather than in percentage rates of change.

The SInDEx normally asks for 1-year ahead and 5-year ahead expectations, for the following inflation measures:

- Headline;
- Singapore core, which excludes accommodation and private transport costs;
- International core, which excludes food and energy costs

Whilst the SInDEx asks for the two core measures directly, we wanted to explore a different approach where we presented free-text questions to the respondents in the treatment group asking for their forecasts for major CPI items in terms of absolute prices. We then carried out the necessary calculations to derive the forecasts for headline and core inflation. The hypothesis here is that people are better at answering questions about prices (in dollars) than price changes (in percentages).

Below we have listed what the average household in Singapore spent monthly on various items in 2016 and 2017. We want to know what you think buying the same items will cost in 12 months' time, November 2018.

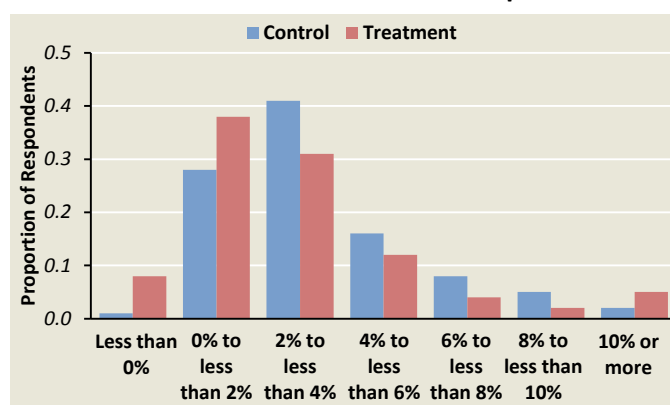
Item	2016	2017	2018
<i>e.g., Food</i>	\$1275.50	\$1291.10	?

We wanted to test if question formats that relied on absolute figures rather than percentage changes might change the distribution of answers. For example, past research has indicated that people may find absolute figures easier to process (Slovic *et al.*, 2000). This alternate question format was used to solicit both 1-year and 5-year ahead expectations.

Results

The results are consistent with our first hypothesis—respondents in the treatment group who were given the alternative multiple choice question format (with wider ranges of answers of up to 30% or more) were more than twice as likely to ‘expect’ inflation of above 6% (21% of respondents compared to 10% in the control group, $p < 0.05$). Our second hypothesis was also confirmed. Asking respondents to estimate actual future prices of goods in the CPI basket led to a different distribution of expected inflation rates compared to the direct results from the SInDEx questions in the control group ($p < 0.01$). (Chart 2)

Chart 2
Households' Core Inflation Expectations in Treatment and Control Groups



Experiment 2

Following the pilot survey, we ran an experimental survey alongside the SInDEx in December 2017. SInDEx usually recruits around 500 participants for each run, so we recruited an additional 500 for the experiment. As in Experiment 1, participants were recruited and remunerated in the same way as previous SInDEx surveys.

Method

The 1,000 participants were randomly allocated between a control group, doing the usual SInDEx survey, and a treatment group who were given a survey with a number of revisions and alterations.

Both groups were asked for their 1-year and 5-year ahead inflation expectations with multiple choices provided in percentage rates. However, as with Experiment 1, the revised survey for the treatment group also asked respondents to forecast actual prices of items in the CPI basket. Following the results from Experiment 1, we expected that the redesigned questions (asking in dollar terms and providing historical data as an ‘anchor’) should reduce the proportion of people with inflation expectations greater than 6%.

We also expected that if the same respondent is asked for inflation expectations in different ways, their responses could potentially be inconsistent.

In addition, we asked both groups to make hypothetical decisions that might be influenced by inflation—for example, whether to make an early repayment on a mortgage. This was intended as a consistency check on the responses, as accurately elicited inflation expectations should correlate with inflation hedging choices.

Finally, we asked the treatment group a set of standard financial literacy questions. We hypothesised that those who passed would be less likely to state inflation expectations of 6% or more.

Results

There was no statistically significant difference in the proportion of responses revealing inflation expectations that were greater than 6% between the treatment and control groups for the 1-year ahead forecasts ($p > 0.05$). However, we do see a difference in the 5-year ahead headline inflation forecasts ($p < 0.05$). (Chart 3)

We think the large difference between the treatment and control groups in the 5-year ahead expectations is explained by the unusually poor performance of the control survey results. Some participants could have misunderstood the question and answered what the total or cumulative (as opposed to annual) inflation rate will be over five years. That is, participants might have selected 6% or above to signify that prices in five years’ time would be 106% or more of current prices. Equally, the lower forecasts in the treatment survey could be because we averaged the stated 2022 dollar prices over the five intervening years at a constant rate, which might have artificially lowered the calculated responses.

When a respondent was asked about core inflation across the two different formats in the treatment survey with respect to absolute prices versus percentage price increases, their responses followed different distributions ($p < 0.05$, using a Kolmogorov-Smirnov test). This suggests that question format influences inflation expectation responses.

We did not detect a significant relationship between responses to our questions about inflation hedging behaviour and inflation expectations in either survey.

Finally, respondents who failed the financial literacy test were much more likely to give inflation expectations above 6% ($p < 0.05$). (Chart 4)

Chart 3
Proportion of Respondents who Responded
“More than 6%” in Treatment and Control Groups

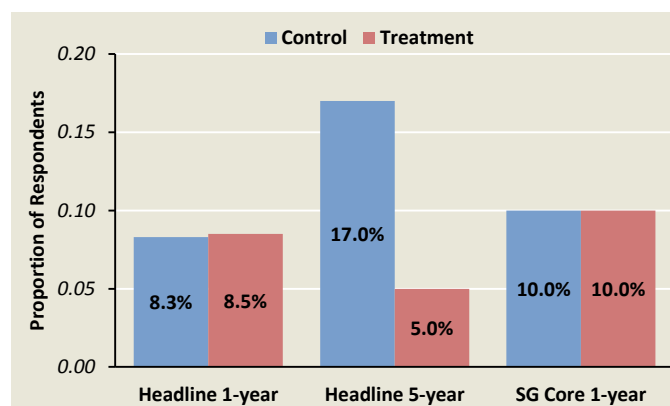
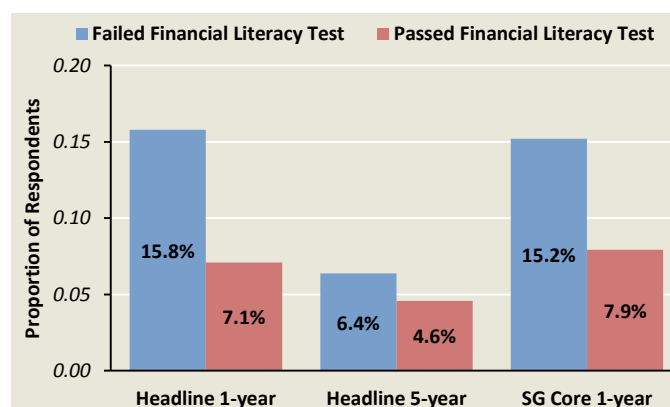


Chart 4
Proportion of Respondents who Responded “More than 6%”
based on their Performance in the Financial Literacy Test



Implications

Inflation expectations are challenging to measure—we cannot easily determine whether a response is ‘true’ or is the product of misunderstanding of the question or concept. This joint study has tried to apply a relatively new area of behavioural economics to an existing survey which has been refined over the years. Our results certainly demonstrate that changing question formats can lead to significantly different answers.

When we look at the median forecasts produced (using the standard SInDEX methodology), we do see pronounced differences. The 1-year ahead forecasts from the treatment surveys in both experiments were far lower than those of the control survey. However, we should be cautious

about drawing conclusions from this. The fact that these forecasts are closer to professional forecasts is not necessarily a sign of an improved question format—it could simply be that this format anchors respondents to lower forecasts overall.

As for the 5-year forecasts, our considered opinion is that the comparatively low median forecasts from the treatment survey in Experiment 2 is simply a combination of anchoring effects and the way we spread 5-year forecasts across all intervening years to estimate the respondent’s expectation. The 5-year forecasts for CPI is perhaps not a suitable question in surveys, particularly if we are interested to gauge the ‘animal spirits’ of

respondents, which might be better elicited through a simpler question about the perceived health of the economy.

It is very clear from the findings described above that the key bias influencing the formation of inflation expectations is anchoring, whereby consumers are influenced by immediately available information. The inclusion of financial literacy questions appears to effectively identify

those who are less able to answer questions on inflation, although whether this merits exclusion or reweighting of their responses requires further discussion.

Overall, our results support the hypothesis that stated inflation expectations are strongly influenced by question format, although they fail to indicate the most effective way to elicit expectations.

Recommendations

This Feature has highlighted and attempted to address the key issues on survey-based methods for measuring households' inflation expectations. We have attempted to mitigate the perceived biases in reported inflation expectations in the SInDEx survey by running experiments on the format and design of the questionnaire. In this concluding section, we highlight some recommendations for potential adoption in future surveys.

We first address the issues raised with regard to the questionnaire design. First, the respondents to the surveys may not be as well-informed as professional forecasters, whose expectations are routinely used by central banks. Hence, even with the same economic shocks and the absence of uncertainty in probability distributions, there would still be a certain degree of 'noise' in responses. Second, as an outcome of a fairly well-documented cognitive bias, providing only radio button-based numerical responses (as in many inflation surveys) may lead to a behavioural bias in responses. These issues can possibly be addressed by providing respondents with current information on inflation and other relevant macroeconomic variables, possibly presented in the form of charts, in conjunction with a free-text numerical response. This will help anchor responses and also evaluate the bias, if any, from these alternate formats. Lastly, we also need to address the questions posed regarding the behaviour/cognitive ability and, to a lesser extent, the professionalism of the respondents. This will help us to extract the 'signal' in the responses rather than the 'noise'.

In response to the findings of the report, we propose three main pathways to incorporate changes in the questions.

First, we need to evaluate the financial literacy or awareness of the respondents with respect to informed decision-making so as to shed some light on hedging behaviour, given future expected inflation. There was no definitive evidence that the inflation hedging questions used in this study were effective in eliciting further information over the financial literacy-type questions. However, to further investigate this, we propose to combine the inflation hedging questions with the financial literacy questions.

Second, there is always an element of speculation in how individuals form decisions. Do respondents look at the aggregate first before looking at components or vice versa? This is particularly important in reconciling certain aspects of the differences in the treatment and control groups in Experiment 2. We propose to look at individual component responses of (potentially) more 'accurate' respondents to investigate any persistent differences. This could be considered together with the finding that the treatment group had lower aggregate responses for overall inflation compared to the control group.

Finally, long-term inflation expectations were significantly lower in the treatment survey. While this could just be an anomaly, it can also be due to aggregating responses which were not well-informed or overly influenced by factors like

media attention. To address this last issue, we intend to provide more guidance through actual data, such as yields from CPF and/or Singapore Savings Bonds. This will serve the twin purpose of anchoring using a better benchmark, and providing respondents with the relevant information.

In summary, this is a study that was grounded in current research. However, as it is possibly also the first study of its kind straddling the disciplines of economics, finance and behavioural sciences, it should be viewed as a first and ongoing effort towards solving the nagging and hitherto open and challenging problem of measuring inflation expectations through public perception.

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Statistical Appendix

Table 1: Real GDP Growth by Sector

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TABLE 1: REAL GDP GROWTH by Sector

Period	Total	Manu- facturing	Finance & Insur- ance	Business Services	Const- ruction	Wholesale & Retail Trade	Accom & Food Services	Transpor- tation & Storage	Info & Comms	Total	Manu- facturing	Finance & Insur- ance	Business Services	Const- ruction	Wholesale & Retail Trade	Accom & 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									
2016 Q1	2.1	-0.4	2.7	0.5	9.2	0.1	3.6	-0.5	4.7	2.9	14.9	0.3	-7.7	4.3	-2.5	8.7	2.1	6.0
Q2	2.0	1.6	0.7	0.7	6.7	-0.7	4.5	1.8	4.7	1.5	3.3	-8.9	0.8	2.2	3.2	-0.7	5.8	6.7
Q3	1.7	1.8	0.7	-0.9	0.0	0.6	4.9	-0.2	2.9	0.8	-6.3	3.4	0.3	-14.4	5.4	6.5	-0.5	-5.0
Q4	3.7	11.8	2.3	-1.4	-7.2	3.6	2.3	4.1	2.1	9.7	41.1	16.0	1.2	-17.4	7.7	-4.7	8.5	1.2
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

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
2016 Q1	1.1	11.8	4.7	4.5	5.4	2.8	-0.1	14.8	-2.6	-0.1
Q2	1.6	-3.8	2.6	1.4	7.8	2.5	-1.0	18.5	3.6	0.4
Q3	0.3	-3.4	0.0	0.9	-3.2	-3.1	-6.8	15.0	1.7	-2.6
Q4	3.4	8.5	1.1	0.2	4.5	-4.1	-3.6	-6.1	1.6	2.8
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

Source: Singapore Department of Statistics

TABLE 3: LABOUR MARKET (I)

Period	Average Monthly Earnings	Value Added Per Worker ¹									Year-on-Year % Change	
											Unit Labour Cost	
		Total ²	Manufacturing	Construction	Wholesale & Retail Trade	Accom & Food Services	Transportation & Storage	Information & Communications	Finance & Insurance	Business Services	Overall Economy	Manufacturing
2016	3.7	1.4	7.2	1.3	1.3	1.2	-0.3	0.6	0.1	-2.5	2.0	-5.0
2017	3.0	3.8	13.4	-2.0	3.3	-1.3	2.8	0.4	1.7	-0.1	-0.3	-8.0
2016 Q1	4.3	0.9	3.4	6.6	1.5	1.0	-1.9	0.7	-0.1	-2.4	2.7	-2.5
Q2	3.9	0.7	5.1	4.9	-0.5	1.5	0.2	1.3	-0.6	-1.8	2.9	-3.2
Q3	3.4	0.7	5.0	-0.2	0.3	2.1	-2.1	0.3	0.2	-2.8	2.5	-3.0
Q4	3.3	3.2	15.3	-5.4	3.5	0.0	2.4	0.3	1.1	-3.0	-0.3	-10.8
2017 Q1	1.9	2.5	12.1	-2.9	1.5	-3.2	2.9	-1.0	-0.7	0.7	-0.1	-10.1
Q2	3.1	3.1	12.1	-6.0	3.3	-1.3	2.2	-2.0	1.4	-0.1	0.2	-6.8
Q3	3.2	5.9	22.9	-1.7	4.5	-1.4	3.6	2.1	2.7	-0.3	-2.0	-14.6
Q4	4.0	3.8	7.3	3.0	3.8	0.8	2.5	2.5	3.4	-0.5	0.9	-0.5

¹ Based on Gross Value Added At 2010 Basic Prices

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

² Based on GDP At 2010 Market Prices

Note: The industries are classified according to SSIC 2010.

TABLE 4: LABOUR MARKET (II)

Period	Changes in Employment											Thousand
	Total	Manufacturing	Construction	Wholesale & Retail Trade	Accom & Food Services	Transportation & Storage	Information & Communications	Finance & Insurance	Business Services	Other Services	Others	
2016	16.8	-15.5	-11.5	0.8	6.0	4.1	2.2	2.8	8.1	20.2	-0.4	
2017	-3.6	-11.3	-38.3	-0.7	3.6	5.9	4.0	6.2	11.4	16.0	-0.4	
2016 Q1	13.0	-1.9	1.9	-0.7	0.0	1.8	0.9	1.9	0.8	8.6	-0.3	
Q2	4.2	-3.4	0.2	-1.1	0.6	1.7	0.2	-2.6	3.6	5.1	-0.1	
Q3	-2.7	-3.6	-5.3	-0.9	0.7	0.7	1.0	0.4	1.7	2.8	-0.2	
Q4	2.3	-6.5	-8.3	3.6	4.7	-0.1	0.0	3.1	2.0	3.7	0.1	
2017 Q1	-6.8	-4.4	-12.5	-3.4	0.1	0.5	1.2	3.2	1.7	6.7	0.1	
Q2	-7.3	-3.6	-10.5	-1.5	-0.5	1.7	1.0	1.6	2.8	1.8	-0.1	
Q3	-2.3	-2.1	-9.5	-0.5	1.2	0.3	0.9	1.8	2.0	3.5	0.1	
Q4	12.7	-1.3	-5.7	4.7	2.7	3.4	0.8	-0.4	5.0	4.0	-0.5	

Note: The industries are classified according to SSIC 2010.

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
2016 Q1	-11.0	-13.1	-16.9	-33.3	-9.6	-3.4	-12.0	-9.5	-8.5	-5.5	-3.7	1.7	-7.7	-7.5	1.0
Q2	-6.0	-4.8	-5.0	-18.0	1.2	-5.1	3.6	-4.6	-7.4	4.2	8.9	14.4	4.9	-1.3	2.3
Q3	-6.6	-4.5	-8.0	-13.7	-5.4	-8.6	-4.1	-1.0	-9.1	1.8	2.1	4.1	0.5	1.5	-5.4
Q4	4.0	2.1	7.6	20.2	2.7	1.0	3.5	-2.4	6.1	1.5	6.5	9.4	4.2	-3.6	2.5
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	2.6	2.4	3.6	8.6	1.2	-7.7	4.7	1.0	2.9	1.9	1.6	-1.5	4.1	2.4	1.1

Source: International 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	
2016 Q1	-9.6	-12.9	-12.9	-8.1	-11.5	-7.1	9.1	-16.8	-18.5	-19.6	-7.6	2.7	-3.0	
Q2	1.2	-4.7	-16.0	0.1	-4.7	6.2	22.3	-15.6	3.0	-9.8	0.6	-6.9	2.4	
Q3	-5.4	-11.8	-16.8	-9.6	-10.6	5.4	8.7	7.7	-0.2	-6.1	-0.9	-9.0	-4.2	
Q4	2.7	-4.1	1.6	-2.3	-2.1	34.1	39.0	20.2	36.1	8.4	-0.2	-18.5	-6.0	
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	1.2	0.9	11.1	1.9	-9.6	-4.3	-7.4	8.9	-9.1	-11.4	3.3	20.9	45.7	
	% 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: International 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
2016 Q1	98.9	103.5	101.7	94.4	100.0	100.0	94.9	100.0	100.7	105.3	100.3
Q2	98.7	103.9	100.2	92.2	101.4	100.7	95.3	100.0	101.3	106.0	100.4
Q3	99.0	104.2	98.7	92.1	101.6	101.2	96.8	100.0	101.2	107.5	100.0
Q4	99.1	104.4	100.5	91.3	101.6	102.0	97.8	99.8	101.8	107.7	99.8
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

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									

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
2016 Q1	15,863	15.3	116,275	89,221	27,054	-3,066	1,777	-639	-2,050	5,525	-4,129	-3,551	-6,123	-2,003
Q2	22,465	21.4	125,595	93,901	31,694	-1,567	2,258	-319	-1,693	5,573	-3,669	-3,717	-5,453	-2,209
Q3	24,476	23.0	125,296	94,209	31,088	-342	1,980	69	-658	5,772	-3,748	-3,756	-4,192	-2,078
Q4	18,493	16.4	134,397	106,141	28,256	-1,307	2,250	-237	-2,359	7,144	-3,803	-4,302	-6,334	-2,123
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

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
2016 Q1	23,813	-13,720	-4,658	9,772	32,420	-770	-8,720	331,526
Q2	18,187	-21,341	19,319	5,788	14,421	480	4,757	334,876
Q3	19,912	-14,143	7,895	-2,641	28,802	870	5,434	345,533
Q4	21,781	-14,804	14,873	5,645	16,067	-638	-3,927	356,254
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

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
2016 Q1	1.3511	1.9372	1.5290	139.82	1.2020	0.3445	0.1742	4.1935	0.1181	1.0339
Q2	1.3490	1.8083	1.4977	137.57	1.3126	0.3354	0.1739	4.1826	0.1170	1.0031
Q3	1.3656	1.7710	1.5318	141.32	1.3468	0.3294	0.1761	4.3602	0.1238	1.0418
Q4	1.4463	1.7768	1.5230	141.66	1.2394	0.3224	0.1865	4.4863	0.1199	1.0460
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

Source: Monetary Authority of Singapore

TABLE 12: SINGAPORE DOLLAR NOMINAL EFFECTIVE EXCHANGE RATE INDEX

Index (3–7 Oct 2016 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
2016 Oct 7	100.00	2017 Jan 6	99.80	2017 Apr 7	100.76	2017 Jul 7	100.71	2017 Oct 6	100.88	2018 Jan 5	101.40
14	100.00	13	99.84	13	100.66	14	100.76	13	100.95	12	101.17
21	99.58	20	99.88	21	100.55	21	100.98	20	101.02	19	101.08
28	99.59	27	99.90	28	100.53	28	101.15	27	100.92	26	101.13
Nov 4	99.64	Feb 3	100.12	May 5	100.33	Aug 4	100.98	Nov 3	101.09	Feb 2	100.88
11	99.40	10	99.94	12	99.94	11	100.70	10	101.05	9	100.46
18	99.66	17	99.86	19	100.28	18	100.70	17	101.05	15	100.64
25	99.80	24	100.20	26	100.47	25	100.69	24	101.12	23	100.69
Dec 2	99.91	Mar 3	100.76	Jun 2	100.46	31	100.70	Dec 1	101.18	Mar 2	100.71
9	100.02	10	100.67	9	100.35	Sep 8	100.71	8	101.14	9	100.89
16	99.84	17	100.70	16	100.46	15	100.87	15	101.11	16	101.16
23	99.63	24	100.70	23	100.38	22	100.97	22	101.19	23	101.03
30	99.48	31	100.80	30	100.52	29	101.02	29	101.27	29	101.17
										Apr 6	101.10

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	0.405	0.311	0.354	0.357	0.415	0.468	0.511	0.427	-0.209	-0.922	-1.138	-0.572
2012	0.134	0.578	0.671	0.615	0.318	0.110	0.270	0.446	0.682	0.369	0.295	0.202
2013	0.003	-0.085	-0.183	0.080	-0.051	-0.033	-0.073	0.091	0.401	0.428	0.532	0.214
2014	-0.052	-0.129	-0.237	0.138	0.131	0.351	0.187	0.092	0.036	0.002	-0.026	0.022
2015	0.010	-0.069	-0.123	0.339	0.669	0.717	0.159	-0.196	-0.113	0.004	0.255	0.241
2016	-0.067	-0.003	0.175	0.406	0.168	0.220	0.281	0.270	-0.209	-0.482	-0.388	-0.236
2017	0.062	0.173	0.329	0.305	0.088	-0.086	0.067	0.160	0.183	0.009	0.099	0.123
2018	0.097	-0.143	0.042									

Note: The DLI is a measure of overall monetary conditions, reflecting changes in the S\$NEER and 3-month S\$ SIBOR rate.

Source: Monetary Authority of Singapore

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.

TABLE 14: MONETARY

End of Period	Money Supply								Interest 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	Banks' Rates	
												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
2016 Q1	159.7	533.0	545.5	61.6	-1.8	2.1	2.2	5.2	5.35	1.06	0.63	0.14	0.35
Q2	160.9	534.6	547.2	59.0	1.6	4.3	4.2	4.9	5.35	0.93	0.65	0.14	0.35
Q3	166.6	548.1	560.3	63.6	5.1	5.2	5.0	10.7	5.35	0.87	0.85	0.14	0.35
Q4	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 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

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