SINGAPORE

July 2018

2018 ARTICLE IV CONSULTATION-PRESS RELEASE; STAFF REPORT; AND STATEMENT BY THE EXECUTIVE DIRECTOR FOR SINGAPORE

Under Article IV of the IMF's Articles of Agreement, the IMF holds bilateral discussions with members, usually every year. In the context of the 2018 Article IV consultation with Singapore, the following documents have been released and are included in this package:

- A **Press Release** summarizing the views of the Executive Board as expressed during its July 20, 2018 consideration of the staff report that concluded the Article IV consultation with Singapore.

- The **Staff Report** prepared by a staff team of the IMF for the Executive Board's consideration on July 20, 2018, following discussions that ended on May 15, 2018, with the officials of Singapore on economic developments and policies. Based on information available at the time of these discussions, the staff report was completed on July 3, 2018.

- An **Informational Annex** prepared by the IMF staff.

- A **Statement by the Executive Director** for Singapore.

The IMF's transparency policy allows for the deletion of market-sensitive information and premature disclosure of the authorities' policy intentions in published staff reports and other documents.

Press Release No. 18/316
FOR IMMEDIATE RELEASE
July 27, 2018

International Monetary Fund
700 19th Street, NW
Washington, D. C. 20431 USA

IMF Executive Board Concludes 2018 Article IV Consultation with Singapore

On July 20, 2018, the Executive Board of the International Monetary Fund (IMF) concluded the Article IV consultation[1] with Singapore.

Singapore's economy strengthened markedly in 2017, benefiting from a synchronized global expansion and a surge in electronics exports, and maintained its momentum in 2018. The strength in the externally-oriented sectors has been gradually spilling over to the rest of the economy, supporting a reduction in labor market slack and a recovery in private domestic demand. Real GDP growth reached 4.4 percent in 2018Q1 compared to a year ago and the 2017 average of 3.6 percent. Headline consumer price inflation turned positive in 2017 after remaining below zero for nearly two years. In the first four months of 2018, headline inflation decelerated, but the MAS core inflation was largely unchanged at 1.5 percent. The current account surplus has remained substantial and broadly unchanged, as a share of GDP, in the past few years.

Economic growth is expected to normalize toward its potential rate of about 2¾ percent, starting in 2018, while strengthening of labor market conditions should support higher inflation going forward. Macroeconomic policies have remained accommodative and are being recalibrated in response to the strength in the economy, while also being mindful of medium-term infrastructure and aging-related needs. Risks to the near-term growth are broadly balanced and stem from external sources. Key global downside risks include intensification of trade tensions, tighter financial conditions, and a slower-than-expected growth in major trading partners. Continued strength in global electronics trade and higher-than-expected spillover from U.S. fiscal stimulus are important upside risks. Over the medium term, a successful transition to a new growth model that aims to adopt general purpose digital technologies, strive for innovation, improve workers' skills, and embrace a more inclusive society, should help rebalance the economy.

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[1] Under Article IV of the IMF's Articles of Agreement, the IMF holds bilateral discussions with members, usually every year. A staff team visits the country, collects economic and financial information, and discusses with officials the country's economic developments and policies. On return to headquarters, the staff prepares a report, which forms the basis for discussion by the Executive Board.

Executive Board Assessment[2]

Executive Directors commended the Singaporean authorities for their strong and strategic stewardship. Directors noted that growth accelerated in 2017 and the momentum is sustained in 2018, while risks stem mainly from external sources. Inflation turned positive after two years and is expected to rise modestly. Going forward, challenges remain, including from an evolving external environment, demographics and technological change. Against this backdrop, Directors recommended continued calibration of macroeconomic policies and recognized the authorities' pro-active approach to address structural transformation.

Directors considered that the commencement in April of monetary policy normalization was appropriate given the economy's cyclical strength and the labor market recovery. Further normalization should be data dependent and taken in response to clear signs of inflationary pressures.

Directors welcomed the planned fiscal impulse under the FY2018/19 budget. The boost in spending on infrastructure and aging-related healthcare services would help ease supply constraints and facilitate external rebalancing. Additional stimulus would be in order if downside risks to growth were to materialize. Fiscal policy should be the first line of defense if growth and inflation undershoot. As regards the medium-term, many Directors noted the need to maintain fiscal sustainability against higher recurrent spending needs, including from demographics. Directors urged a careful consideration across fiscal options, including a lower budget surplus and bringing on budget more of the government's asset income, a higher goods and services tax (GST) and borrowing for infrastructure spending.

Directors noted Singapore's strong external position. The current account surplus is expected to narrow gradually over the medium term as private investment recovers further and public capital spending rises. A few Directors considered that there was additional scope for the fiscal path and structural policies to reduce external surpluses. In this context, they urged a strengthening of social insurance arrangements to lower private precautionary saving, among other steps.

Directors welcomed continued monitoring of conditions in property markets and appropriate adjustment of macroprudential measures to maintain prices in line with fundamentals. The residency-based differentiation in the stamp duty (ABSD) should be eliminated and the measure phased out once systemic risks dissipate.

Directors noted that the financial sector remains healthy with adequate buffers and strong balance sheets for banks, households and corporates. However, pockets of vulnerabilities require continued monitoring. In this context, Directors welcomed the authorities' efforts to strengthen the regulatory framework in line with Basel III principles and to enhance the AML/CFT framework. They encouraged the authorities to continue to support the development of a FinTech ecosystem while

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[2] At the conclusion of the discussion, the Managing Director, as Chairman of the Board, summarizes the views of Executive Directors, and this summary is transmitted to the country's authorities. An explanation of any qualifiers used in summings up can be found here: http://www.imf.org/external/np/sec/misc/qualifiers.htm.

regulations would require adaptation to emerging risks. Directors noted that the upcoming FSAP intends to examine financial sector issues in detail.

Directors commended the authorities' plans to harness automation and digital technologies to help drive productivity growth, including targeted incentives for firms to innovate and integrate and for workers to reskill and pursue lifelong learning. Directors encouraged the authorities to further foster competition and innovation, including support for new, dynamic firms. While welcoming the authorities' broad-based and upstream approach to addressing unemployment, they also supported the adoption of broader social insurance arrangements to help workers cope with technological disruptions.

Singapore: Selected Economic and Financial Indicators, 2013–19

Nominal GDP (2017): US$324 billion
Population (June 2017): 5.61 million
GDP per capita (2017): US$57,737
Main goods exports (2017, percent of total exports): Electronic products (33 percent); mineral fuels (18 percent); and chemical products (14 percent).
Top three destinations for goods exports (2017, percent of gross goods exports): China (14 percent); Hong Kong SAR (12 percent); and Malaysia (11 percent).

	2013	2014	2015	2016	2017	Projections 2018	Projections 2019
Growth (percentage change)							
Real GDP	5.1	3.9	2.2	2.4	3.6	2.9	2.7
Total domestic demand	5.2	2.3	0.5	3.1	5.4	3.0	2.4
Final domestic demand	5.7	3.8	4.3	1.1	1.4	3.9	3.8
Consumption	5.2	2.7	5.6	2.1	3.3	3.6	3.5
Private consumption	3.6	3.4	4.9	1.7	3.1	3.4	3.5
Gross capital formation	5.3	1.8	-7.0	4.8	8.7	1.9	0.8
Gross fixed investment	6.5	5.5	2.2	-0.6	-1.8	4.4	4.3
Change in inventories (contribution to GDP growth, percentage points)	-0.2	-1.0	-2.7	1.5	2.9	-0.6	-0.9
Net exports (contribution to GDP growth, percentage points)	1.5	1.6	2.3	2.0	-0.7	0.9	1.0
Saving and investment (percent of GDP)							
Gross national saving	47.2	48.8	45.7	46.0	46.5	46.4	45.8
Gross domestic investment	30.7	30.2	27.1	27.0	27.6	28.2	27.9
Inflation and unemployment (period average, percent)							
CPI inflation	2.4	1.0	-0.5	-0.5	0.6	1.0	1.3
CPI inflation, excluding food and energy 1/	2.7	0.6	-0.7	-0.9	-0.1	0.4	1.3
MAS core inflation 1/	1.7	1.9	0.5	0.9	1.5	1.6	1.9
Unemployment rate	1.9	2.0	1.9	2.1	2.2	2.0	1.9
Central government finances (percent of GDP) 2/							
Revenue	21.6	21.2	21.4	21.9	22.6	21.9	21.8
Expenditure	14.6	15.4	17.7	18.1	18.0	18.9	20.0
Net lending/borrowing	7.0	5.8	3.6	3.8	4.6	3.0	1.9
Budget balance (government's definition)	0.2	2.4	1.5	3.3	0.7	2.4	1.0
Primary balance 3/	0.0	-0.6	-2.4	-1.8	-1.1	-2.8	-3.6
Money and credit (end of period, percent change)							
Broad money (M2)	7.9	7.6	4.0	8.4	4.1	3.9	4.0
Credit to private sector	15.5	7.0	2.5	5.5	3.6	2.9	2.7
Three-month S$ SIBOR rate (percent)	0.4	0.5	1.2	1.0	1.5	...	...
Balance of payments (US$ billions)							
Current account balance	50.3	58.2	56.5	58.8	61.0	63.6	65.7
(In percent of GDP)	16.5	18.7	18.6	19.0	18.8	18.2	18.0
Goods balance	76.1	85.0	89.8	85.5	84.7	87.3	91.9
Exports, f.o.b.	447.6	440.0	384.1	363.0	396.8	441.9	463.5
Imports, f.o.b.	-371.5	-354.9	-294.4	-277.6	-312.1	-354.6	-371.5
Financial account balance 4/	31.5	52.9	53.8	60.6	33.7	52.3	58.1
Overall balance 4/	18.2	6.8	1.1	-1.8	27.4	11.3	7.6
Gross official reserves (US$ billions)	273.1	256.9	247.7	246.6	279.9	294.0	301.9
(In months of imports) 5/	6.3	6.7	6.8	6.1	6.1	6.1	6.1
Singapore dollar/U.S. dollar exchange rate (period average)	1.25	1.27	1.37	1.38	1.38	...	...
Nominal effective exchange rate (percentage change) 6/	2.6	0.9	-0.3	0.9	0.2	...	...
Real effective exchange rate (percentage change) 6/	2.7	-0.3	-2.0	-1.0	-1.0	...	...

Sources: Data provided by the Singapore authorities; and IMF staff estimates and projections.
1/ IMF staff estimates. For MAS core inflation, staff projections from 2018.
2/ IMF staff estimates on a calendar year basis following GFSM 2014.
3/ Overall balance excluding capital receipts and net investment return contribution (NIRC).
4/ Following the BPM6 sign convention, a positive entry implies net outflows.
5/ In months of following year's imports of goods and services.
6/ Increase is an appreciation.

INTERNATIONAL MONETARY FUND

SINGAPORE

STAFF REPORT FOR THE 2018 ARTICLE IV CONSULTATION

July 3, 2018

KEY ISSUES

Outlook and risks. Singapore's economy is on a strong cyclical upswing. Economic growth has recovered to a three-year high, led by externally-oriented sectors that benefitted from the synchronized global expansion. Economic momentum is becoming more broad-based, helping to reduce the labor market slack. Growth is expected at or above the potential rate in the near term, increasingly supported by domestic demand. Inflation is subdued but expected to rise modestly. The current account surplus, as a share of GDP, has remained large. Risks to the near-term outlook are broadly balanced and come mainly from external sources. Over the medium term, the structural transformation aimed to prepare Singapore for challenges from technological changes globally and population aging at home should help support higher productivity.

Macroeconomic and financial sector policies. Macroeconomic policies are being recalibrated to reflect the cyclical strength of the economy while considering risks to the near-term outlook. Normalization of monetary policy began in April but policy remains accommodative and further tightening may be in order. Fiscal policy overperformed but a fiscal stimulus is planned under the FY2018/19 budget. The easing of fiscal policy will help to address medium-term infrastructure needs and is welcome. In response to downside risks, Singapore should use its ample fiscal space to provide a first line of defense with monetary policy playing a supportive role. The choice of medium-term fiscal options to finance infrastructure and aging-related healthcare should embody equity and efficiency considerations, both within and across generations. Financial sector and macroprudential policies have bolstered the resilience of the banking sector. Private sector leverage has stabilized but remains elevated. Property market measures should continue to focus on both demand and supply issues. Addressing financial sector risks, including from new financial technologies, requires vigilance and a strong regulatory framework.

Structural transformation. A restructuring of the economy is underway to embrace digital technologies and automation, while deepening skills and capabilities, becoming more inclusive, and further integrating with the rest of the world. Policies should facilitate the entry of new, dynamic firms; encourage training, reskilling, and lifelong learning for workers; promote an innovation ecosystem; collaborate with all stakeholders; and adopt broader social insurance arrangements.

Approved By **Odd Per Brekk (APD) and Martin Kaufman (SPR)**	This report was prepared by a staff team led by Alex Mourmouras and Yuko Kinoshita. Discussions were held in Singapore during May 3–15, 2018. The mission comprised Alex Mourmouras (Head), Yuko Kinoshita, Souvik Gupta, Jiae Yoo (all APD), Jochen Schmittmann (Resident Representative), Adrian Alter (MCM), and Tristan Walker (ILU). Juda Agung and Chengyi Ong (both OED) participated in the policy discussions. Yun He and Justin Flinner (both APD), and Adeline Yeo (Singapore office) assisted in the research and preparation of this report. Presentation of historical data and staff's macroeconomic projections are based on information available as of June 26, 2018.

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TABLES

APPENDICES

Abbreviations and Acronyms

ACIP	AML/CFT Industry Partnership
AML/CFT	Anti-money laundering/countering the financing of terrorism
ASEAN	Association of Southeast Asian Nations
CA	Current account
CFE	Committee on the Future Economy
CSIP	Council for Skills, Innovation, and Productivity
FCI	Financial Conditions Index
Fintech	Financial technology
FX	Foreign exchange
FY	Fiscal year
FSAP	Financial Stability Assessment Program
GaR	Growth-at-Risk
GDP	Gross domestic product
GFSM	Government Finance Statistics manual
GPT	General-purpose technology
GST	Goods and Services Tax
IP	Intellectual property
IPP	Intellectual property product
ITM	Industry Transformation Map
LTV	Loan to value
MAS	Monetary Authority of Singapore
ML/TF	Money laundering/terrorist financing
NEER	Nominal effective exchange rate
NIRC	Net Investment Returns Contribution
NPL	Nonperforming loan
R&D	Research and development
S$	Singapore dollar
TDSR	Total debt service ratio
US	United States, the
US$	U.S. dollar
y/y	Year-on-year

CONTEXT

1.   Singapore was one of the fastest growing advanced economies in the region in 2017. The synchronized global expansion led to a turnaround in Singapore's externally oriented sectors that is now spilling over to the broader economy, creating a welcome recovery following two years of low growth. Inflation, which stayed below zero for nearly two years until late 2016, has been picking up since early 2017 but remains low. Meanwhile, an ambitious structural transformation of the economy is underway to harness emerging digital technologies, amid population aging and tighter limits on foreign labor. Incentives are being provided to firms to automate, innovate, and integrate regionally and globally; and to workers to retrain, raise skills and pursue lifelong learning. Singapore is also preparing for a transition to a new generation of leaders ahead of the next general election that must be held by January 2021.
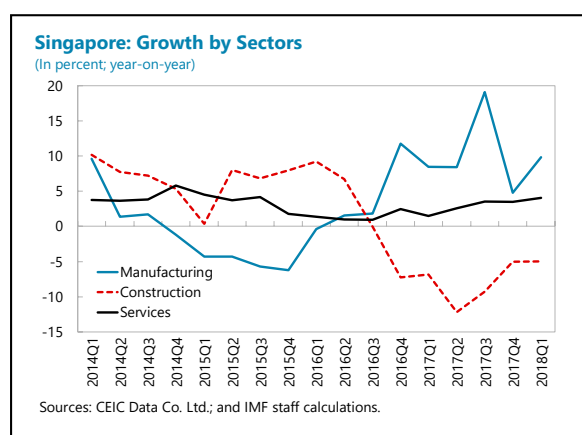
2.   In response to growing strength in the economy, policies are being recalibrated. The Monetary Authority of Singapore (MAS) adjusted its forward guidance in October 2017. This was followed by the commencement of monetary policy normalization in April 2018. As regards fiscal policy, after a higher-than-expected budget surplus in FY2017/18, the FY2018/19 Budget provides for a fiscal stimulus while addressing medium-term needs. The authorities continued to ensure stability in the financial sector and responded to property market developments with both demand- and supply-side measures.

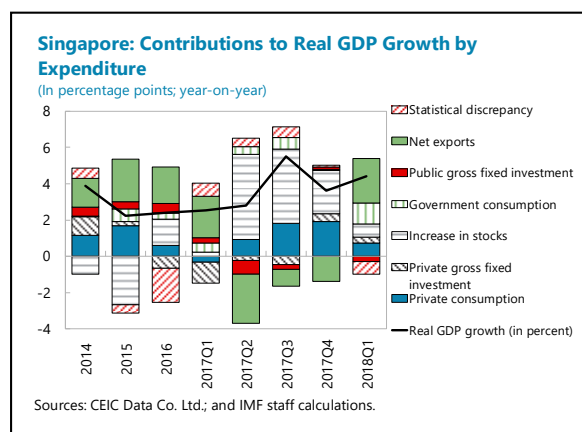# ECONOMIC DEVELOPMENTS, OUTLOOK, AND RISKS

After witnessing the fastest growth in three years in 2017, a moderation of growth momentum is expected in 2018. Private domestic demand is on the mend as the growth momentum leads to growing strength in the labor market. Inflation is expected to creep up but remain manageable. Risks to the near-term outlook are broadly balanced. Demographic headwinds and adaptation to rapid technological changes remain medium-term challenges.

3.   Growth surprised on the upside in 2017 and remained strong in 2018Q1, helping lower labor market slack.

- Real GDP grew by 3.6 percent y/y in 2017, compared to 2.4 percent in 2016, and strengthened further to 4.4 percent y/y in 2018Q1. As a result, the small negative output gaps of the past couple of years have closed and the economy is in a cyclically strong position. A turnaround in exports related to the upswing in global capital expenditure, including on information technology products, provided a direct boost to the manufacturing sector which led the growth recovery. In 2017, exports of oil also went up but those of pharmaceuticals declined.

Singapore: Growth by Sectors
(In percent; year-on-year)

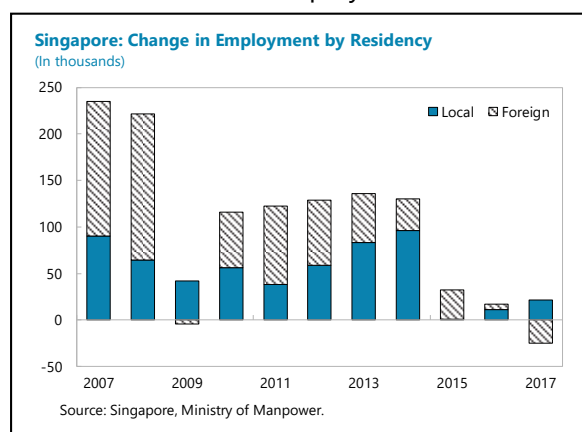Sources: CEIC Data Co. Ltd.; and IMF staff calculations.

- A gradual spillover of momentum from the externally-oriented sectors to the broader economy has helped strengthen private domestic demand and supported the services sectors. Recovery in private domestic demand also led to a faster growth in imports in the latter part of 2017, which more than offset the initial positive contribution to growth from net exports. In 2018Q1, net export's contribution to growth turned positive on slower import growth.

Singapore: Contributions to Real GDP Growth by Expenditure
(In percentage points; year-on-year)

Sources: CEIC Data Co. Ltd.; and IMF staff calculations.

- Private consumption grew by 3.1 percent in 2017 (2016: 1.7 percent), but slowed to 2 percent y/y in 2018Q1, reflecting in part a decline in motor vehicles purchases. The contribution of private fixed investment has also grown on the firming global outlook. A strong increase in inventories on higher wholesale trade and a rise in intangible capital have partly offset lower private investment in buildings, both residential and nonresidential. The positive economic outlook has contributed to a three-year high net creation of new businesses and a recovery in machinery and equipment investment in recent quarters.

- Public consumption has also contributed positively, with 2018Q1 witnessing one of the strongest contributions to growth in more than two years. But public investment fell on completion of some infrastructure projects and lower public housing investment. Lower private and public investment in buildings has contributed to negative annual growth in the construction sector for seven consecutive quarters.

- The growth recovery has helped to narrow labor market slack with employment of resident workers growing (Appendix I). The labor force declined in 2017, for the first time since 2003, reflecting a combined effect of slowing working-age population growth and ongoing restrictions on the foreign workforce. Employment of residents grew in 2017, supported mainly by the services sector, but total employment fell due to a decline in foreign work permit holders in construction and shipyards. The overall unemployment rate declined over the course of 2017 and stood at 2 percent in 2018Q1.

Singapore: Change in Employment by Residency
(In thousands)

Source: Singapore, Ministry of Manpower.

- In 2017, overall labor productivity, as measured by value added per actual hours worked, recorded a strong improvement to 4.5 percent y/y, concentrated in the externally-oriented sectors, while some domestically-oriented sectors also saw higher productivity growth. Real

income from work has risen. Income inequality among resident employed households, as measured by the Gini coefficient, is below its peak, but remains elevated.

4. **The role of intangible capital has become much more prominent in Singapore's growth.** In the last three decades, Singapore's stock of intellectual property products (IPP, i.e., research and development, and software and databases) has grown rapidly, as a share in GDP to about 25 percent as of 2016. Recent revisions in historical national accounts data from 2011 were largely supported by upward adjustments in private IPP investment. The rapid rise in the IPP capital stock should favorably position the economy to take advantage of the ongoing digitalization revolution (Box 1).
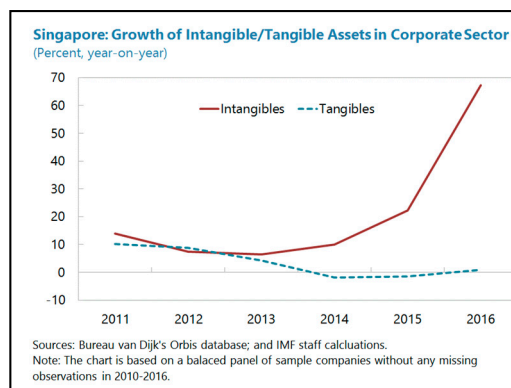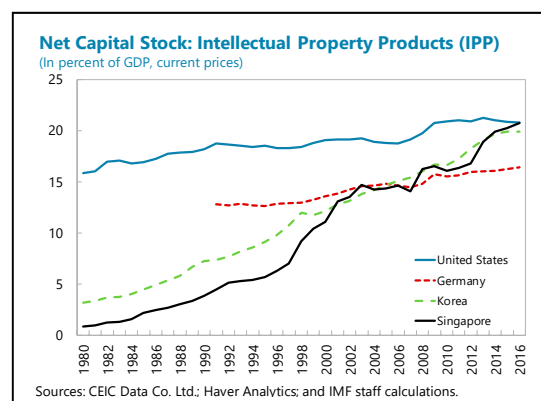

Box 1. Rising Investment in Intangible Assets

As economies become more knowledge based, investment in intangible capital is becoming an important source of growth. At the macro level, Singapore's capital stock related to Intellectual Property Products (IPP), a subset of intangible capital that mostly comprises R&D and software investment, grew by 11¾ percent annually over the past decade.[1] As a result, the size of Singapore's IPP capital stock relative to its GDP is now similar to that of the United States. Average contribution of IPP capital to real GDP growth was 0.6 percentage points per annum in the past five years, double of what was seen in the preceding one and a half decades. Private sector was the main contributor in investment in intangible capital, accounting for about 92 percent of total IPPs in 2017.

Net Capital Stock: Intellectual Property Products (IPP)
(In percent of GDP, current prices)

Sources: CEIC Data Co. Ltd.; Haver Analytics; and IMF staff calculations.

Firm-level data from Singapore confirms that corporate sector investment has shifted toward intangible capital since 2013. The definition of intangibles here covers a broader set of investments beyond IPPs, including also copyrights, trademarks, patents, design, brand equity, firm-specific organizational know-how, and networks. The firm-level dataset from *Orbis* cover about 900 companies in Singapore.[2] The growth of intangible capital stock in Singapore's corporate sector accelerated sharply at 30 percent compound annual rate between 2013 and 2016, in contrast with the sluggish growth in physical capital investment.

Singapore: Growth of Intangible/Tangible Assets in Corporate Sector
(Percent, year-on-year)

Sources: Bureau van Dijk's Orbis database; and IMF staff calcuations.
Note: The chart is based on a balaced panel of sample companies without any missing observations in 2010-2016.

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[1] The System of National Accounts, 2008, defines IPP capital stock as comprising research and development; mineral exploration and evaluation; computer software and databases; entertainment, literary and artistic originals; and other IPPs.

[2] Sample represents about 20 percent of Singapore's corporate sector in terms of their assets.

Box 1. Rising Investment in Intangible Assets (concluded)

Intangible assets are concentrated in a few industries, especially in computer and electronic product manufacturing. The share of intangible assets in fixed assets has been highest in manufacturing of computers and electronics. It increased sharply between 2014 and 2016. In 2016, this sector accounts for about a half of total intangible capital stock in the corporate sector. Information and communication (InfoComm) and wholesale trade sector also have high intangible shares. The intangible share in wholesale trade sector increased fast between 2014 and 2016, while the share remained stable in InfoComm and other sectors.

Singapore: Intangible Assets, 2014 vs. 2016
(In share of total capital stock (= sum of tangible and inangible fixed assets)

Sources: Bureau van Dijk's Orbis database; and IMF staff calculations.
Note: MF stands for manufacturing. The position of each bubble represents the average intangible share (weighted by comapnies' total capital stock) of each industry in year 2014 and 2016. The area of bubbles represents the size of total intangible assets within the respective industry relative to those of all sectors. Industry classification follows the first level of NACE (alphabet) for most industries, except for manufacturing and trade sector where a further disaggregated, second level NACE, were used. "MF" refers to manufacturing sector (followed by sub-sector names). Sectors that have intangible share above 10 percent and is rising during the period are labeled.

Investment in intangible assets can have a positive impact on firms' financial performance as well as productivity. At the macroeconomic level, it is well known that intangible capital investment contributes to productivity and growth (Corrado and others, 2016; OECD 2013). At the micro level, firms can benefit from their intangible assets in various ways, including commercialization of their intellectual properties, innovation in business processes or organization, or through better branding and distribution. It could also enhance firms' overall ability to absorb existing technologies and leverage on them. Against this background, studies found that firms' investment in intangible assets can enhance firms' productivity (Marrocu et al., 2012; Crass and Peter, 2014). Some found that intangible capital tends to be more productive in sectors that intensely use information and communication technology (Chen et al., 2016). Higher investment in intangible capital such as R&D and training could also lead to better financial performance (Li and Wang, 2014).
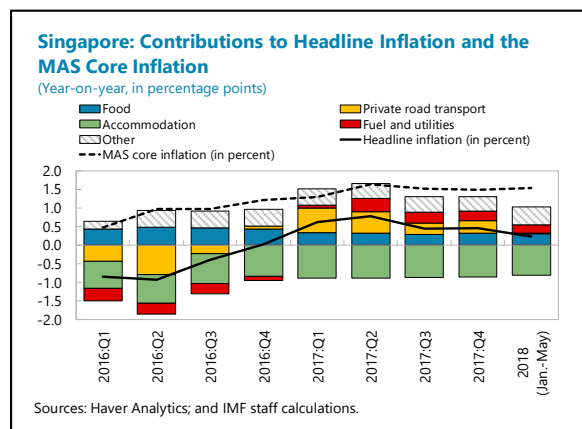
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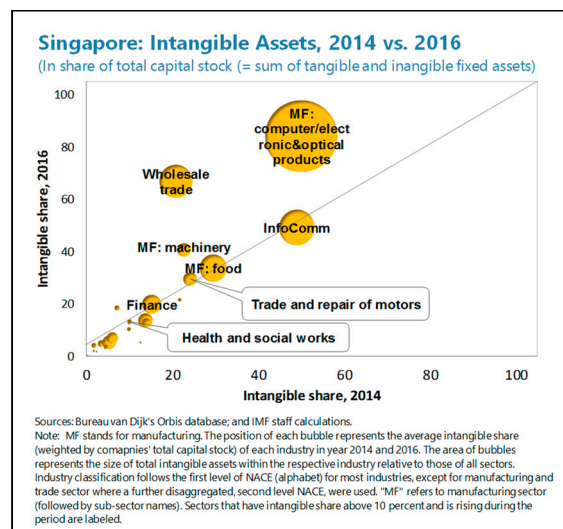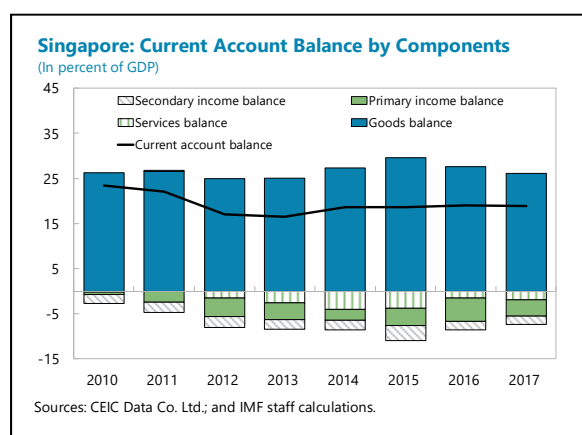
5.   Headline inflation turned positive in 2017, after two years of deflation, but remained subdued. The rise in average headline inflation in 2017 to 0.6 percent (2016: –0.5

percent) was mainly attributable to pass through from higher global oil prices. Changes in administrative prices also contributed somewhat. The official core inflation, which excludes private road transportation and accommodation costs, averaged higher at 1.5 percent (2016: 0.9 percent), in part due to increases in electricity and services prices. In the first five months of 2018, headline inflation averaged lower at 0.2 percent mostly due to lower contribution from private road transportation owing to a decline in premium paid for vehicle ownership. The MAS core inflation was relatively stable, averaging 1.5 percent.
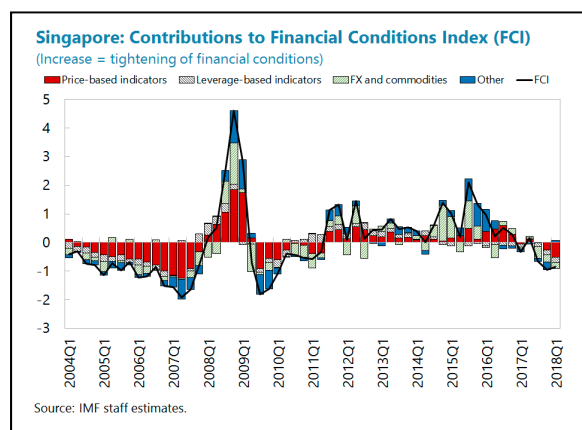
Singapore: Contributions to Headline Inflation and the MAS Core Inflation
(Year-on-year, in percentage points)
Food | Private road transport
Accommodation | Fuel and utilities
Other | Headline inflation (in percent)
MAS core inflation (in percent)

6.   The current account surplus remained unchanged at a high level, contributing to a substantially strong external position. At close to 19 percent of GDP in 2017, Singapore's

current account (CA) surplus has remained largely stable since 2014. Despite the recovery in exports, the goods and services surplus declined in 2017 as imports rose. The primary income balance improved. The CA surplus was close to 18 percent of GDP in 2018Q1. Staff assessment suggests that the 2017 CA balance was substantially higher, by 2.5–8.5 percent of GDP, than warranted by fundamentals and desired policies (Appendix II provides details). Domestic policy gaps contributed 3.4 percentage points to this CA gap, coming mostly from the fiscal surplus. Consistent with the estimated CA gap in 2017, the real exchange rate was assessed to be undervalued by 4–16 percent. The real effective exchange rate

Singapore: Current Account Balance by Components
(In percent of GDP)
Secondary income balance | Primary income balance
Services balance | Goods balance
Current account balance

Sources: CEIC Data Co. Ltd.; and IMF staff calculations.

depreciated by 1 percent in 2017 and weakened further in the first four months of 2018.

7.   Financial conditions eased in 2017, supporting the recovery, but tightened somewhat in 2018Q1, and banks' balance sheets remained strong.

- Staff estimates of a Financial Conditions Index (FCI) show an overall easing in 2017, led by compressed corporate spreads and

Singapore: Contributions to Financial Conditions Index (FCI)
(Increase = tightening of financial conditions)
Price-based indicators | Leverage-based indicators | FX and commodities | Other | FCI

Source: IMF staff estimates.

buoyant asset valuations (Box 2 and Appendix III).[1] Bank lending to businesses turned around, contributing to an improvement in private investment. Financial conditions tightened somewhat in the first three months of 2018, in tandem with rising global interest rates and heightened market volatility.

- In the housing market, prices of private residential properties staged a steady recovery in 2017, for the first time since 2013, and were up by 5.4 percent y/y in 2018Q1. The share of foreign transactions has remained stable over the past six years (close to 7 percent) but is significantly below the 2011 peak (19.5 percent). Vacancy rates have come down slightly but are still elevated. In recent quarters, supply in the pipeline (i.e., new and redevelopment

Singapore: Property Price Index by Type
(Index, 2011:Q1=100)

Sources: CEIC Data Co. Ltd.; and IMF staff calculations.

projects of private residential units with planning approvals that are expected to be on the market within a few years) has also increased after a few years of falling.

- Private sector leverage has stabilized but remains elevated. Growth in credit to the domestic private sector peaked at 20 percent y/y in late 2011 but has trended downward since and reached 3 percent y/y in 2018Q1. By end-2017, nonfinancial corporate sector debt was at 150 percent of GDP, below its recent peak of 160 percent of GDP. However, overall debt servicing capacities remain healthy. Household debt has also declined from its peak of 75 percent of GDP in 2014 and has remained stable at about 72 percent of GDP. Overall household balance sheets are strong, with net wealth reaching close to 400 percent of GDP and total holdings of cash and deposits exceeding total debt. The average loan-to-value ratio of mortgages is contained at 54 percent. However, in both these sectors, pockets of vulnerabilities remain.

- In the banking sector, capital and liquidity buffers remained strong. Banks' profitability has improved in the past year on the back of higher net interest margins and loan growth, in particular to nonresidents. Growth in loans to nonresidents was driven by trade credits to the Greater China region. Banking sector's asset quality has improved: gross nonperforming loan (NPL) ratios in local banks declined slightly in the 2018Q1 after the modest increase over the last two years. They were helped by improvements in NPLs in sectors that experienced heightened stress after the sharp decline in global oil prices in 2014-15. For example, gross NPL ratios in the transportation, storage and communication sub-sector (about 6 percent of total loans to nonbanks) peaked in 2017, as banks accelerated recognition of vulnerable exposures in marine and offshore engineering businesses. Banks' exposure to property-market related sectors remains significant at about 30 percent of total nonbank lending, though gross NPL ratios for these loans are currently low (0.8 percent for loans to building and construction sector and 0.4 percent for housing loans). Banks maintain adequate loss provisioning of above 100 percent of unsecured NPLs, as well as capital adequacy and leverage ratios well above the regulatory requirements.

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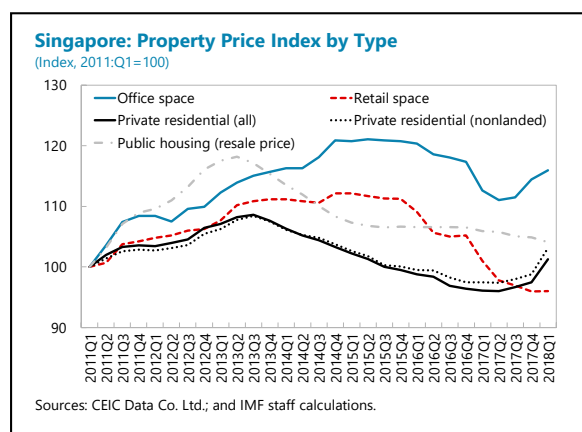
[1] The FCI measures the ease of obtaining finance. It includes information on the domestic price of risk, credit aggregates, and external conditions. It is useful in assessing economic prospects and the impact of policy.

## Box 2. Financial Conditions and Growth-at-Risk in Singapore[1]

This box applies the Growth-at-Risk (GaR) methodology to Singapore. GaR is a new approach that links current financial conditions to the distribution of future growth outcomes in an economy. The GaR concept is similar to Value-at-Risk metric in finance: GaR can be used to measure worst-case scenarios for output growth, describing, for instance, the growth rate that should be exceeded in all but the worst possible outcomes. Quantitative assessments of the distribution of Singapore's future economic growth prospects are of much interest in the highly open economy.

Singapore's one-year ahead growth distribution is well predicted by the financial conditions index (FCI), house prices, and China's output growth. Much forward-looking information about growth is embedded in asset prices, including stock market prices and corporate bond spreads. FCIs are considered a good predictor of the conditional moments of the GDP growth distribution (see also Appendix III). Generally, tighter financial conditions are associated with a decline in output growth in the near term (Figure 1.1). Relying on quantile regressions, the fitted model is tailored to Singapore's risks and vulnerabilities as presented in the Risk Assessment Matrix (Appendix IV). Based on the benchmark model, the interquartile interval of the forecasted real growth ranges from 2.1 to 6.5 percent at the end of 2018, with the median rate at 3.5 percent, and thus signaling potential upside risks to the average estimate.

GaR analysis tailored to Singapore points to reduced tail risks in 2018 compared to 2017. The left tail of the growth distribution was fatter in 2017, and the recession probability was larger compared to 2018 (Figure 1.2). The probability of recession declined from about 15 percent in 2017 to 8 percent in 2018, below its historical average. Moreover, the 5 percent GaR (the value of the fitted growth distribution forecasted to be breached once in 20 cases) shows less cause for concern, improving from -2 percent at end-2017 to -0.7 at end-2018. At the same time, the right tail points to a higher growth potential in 2018. However, a buildup of financial vulnerabilities over time typically leads to a further worsening of outcomes. Prolonged accommodative financial conditions globally may sow the seeds for a global recession down the road, with an elevated probability of recession three years ahead (IMF (2018)). These developments could be important for the Singaporean economy.

Box 2. Figure 1. Financial Conditions and Growth Forecasts in Singapore

1. FCI and Real GDP Growth Relationship
(In percent)
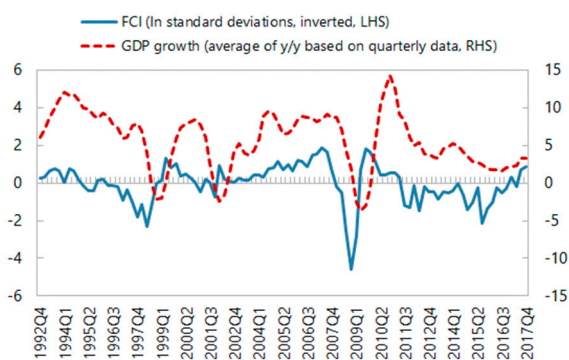
2. Growth Density (one-year ahead)
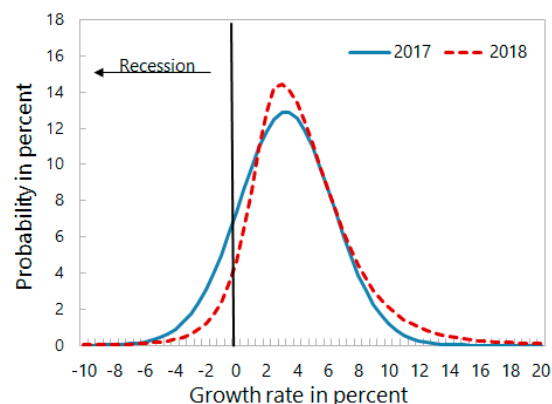
Note: In panel 2, recession is defined as negative year-on-year real GDP growth rate. The forecast horizon is four quarters ahead (i.e., h=4). The probability of recession is the area at the left of the vertical bar.

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[1] Prepared by Adrian Alter (MCM).

8.   Growth is expected to moderate in 2018 with a modest uptick in headline inflation.

- Staff projects growth to moderate to 2.9 percent in 2018 but remain above potential. Final domestic demand will be the main driver of growth. Momentum in electronics exports is expected to remain healthy, but at a more sustainable pace relative to last year. This is also expected to lead to lower inventories accumulation later in the year. Strength in the global economy, higher oil prices, and the ongoing momentum in the property market would help private investment and construction. As growth becomes more entrenched, the services sector should pick up and labor market slack should decline further, supporting private consumption. Higher contribution from public investment would also help.

- Headline inflation is forecast to average 1 percent in 2018, in response to a recovery in the labor market, a rise in housing rentals, and pass through of higher global oil prices. MAS core inflation is projected to average at 1.6 percent, reflecting a strengthening of domestic demand.

9.   Risks to the near-term growth outlook are broadly balanced. Near-term risks stem mainly from external sources (Appendix IV). A slower-than-expected normalization in global electronics trade and/or higher-than-expected spillover from U.S. fiscal stimulus would be the upside risks to growth. GDP forecasts based on staff's FCI also point to some upside surprise to the 2018 baseline. However, uncertainties over growing U.S.– China trade frictions pose a downside risk. The impact could be felt more through trade exposures to China, Singapore's single largest destination for goods exports. Over the years, Singapore's shares in value-added to China's final domestic demand and exports have increased, making it more exposed to developments in China. Short-run uncertainties about economic policies in the region may cause some financial volatility. Tighter global financial conditions against the backdrop of continued monetary policy normalization in major advanced economies and/or further deterioration in global risk appetite could lead to higher financing costs and pose some macro-financial risks: higher debt servicing and refinancing costs and a potential disruption to the ongoing adjustments in property prices could impact private domestic demand.

10.   Over the medium term, higher capital intensity and productivity are expected to support growth and headline inflation to stabilize. Staff has revised potential growth up, to about 2¾ percent from about 2½ percent, reflecting upward revisions in the capital stock. In 2017, the contribution of total factor productivity to growth turned positive after six years. Over the medium term, the capital intensity of production is expected to rise and productivity to improve, driven by higher skills that complement automation and digitalization and labor-lean but inclusive policies that provide a further boost to the wage-rental ratio. Final domestic demand is expected to remain the main driver of growth. Headline

Singapore: Contributions to Real GDP Growth
(In percentage points)
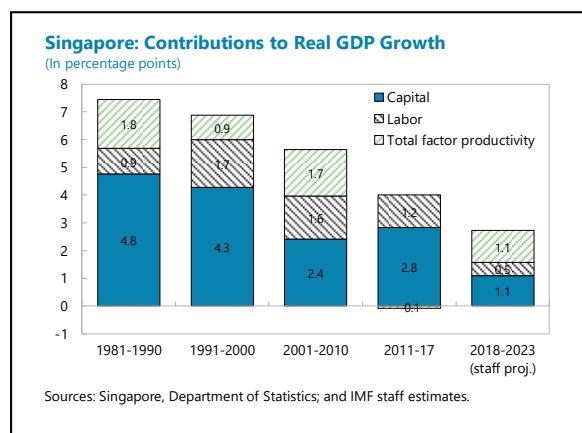
inflation will stabilize at about 1¼ percent as higher non-food, non-energy prices will offset the waning impact from global cost factors.

11.   The CA gap is expected to narrow moderately over the medium term. A further recovery in private fixed investment and lower public sector net saving, in part owing to higher investment in aging-related and other infrastructure, will help lower the CA balance. Productivity growth would support a trend appreciation in the real exchange rate. The persistently high CA surplus can be attributed to, among other things, structural factors that may boost saving, including limited social insurance and safety nets, the mandatory defined-contribution pension system, and Singapore's status as a financial center and attractive location for multinational companies. To lower private precautionary saving and ease credit constraints, more ambitious policy action than envisaged will be required to strengthen social insurance and safety net arrangements, including the introduction of unemployment insurance. Staff analysis suggests that household net saving, the largest contributor to the CA balance, will decline over the longer term as population aging accelerates.[2] Corporate saving is another channel through which private saving gets a boost in Singapore. Though the breakdown between household and corporate saving is not available, the high levels of corporate retained earnings relative to the OECD observed in Singapore could be attributed to the presence of multinational companies which tend to have higher retained earnings than local companies.[3]

12.   Risks to medium-term growth are balanced. A successful transition to an innovation-based growth model would help raise productivity and investment and exert positive spillovers for ASEAN and beyond. Meeting aging-related needs would raise domestic demand and lower the external surplus. However, risks of a global retreat from cross-border integration and/or weaker-than-expected global growth would adversely impact growth prospects. Financial sector risks stem from disorderly corrections in asset prices, which will also impact domestic demand; delays in implementation of anti-money laundering standards and reputational risks; and cyber-attacks on inter-connected financial systems.

Authorities' Views

13.   The authorities broadly agreed with staff assessments of near-term growth and risks. They noted that Singapore, along with other economies in the region, recorded a sterling performance, benefitting from their openness to trade amid a recovery in global growth, an upswing in demand for information technology products, and robust domestic demand in the region. In Singapore, GDP growth was firm but remained uneven: trade-related and modern services sectors performed much better than domestically-oriented ones. The authorities also noted that the labor market slack has declined. They expect the Singaporean economy to remain on a steady course in the near term, with growth sustained at close to 3 percent. Trade-related sectors would underpin growth, while modern services and domestically-oriented sectors will become more important sources over time. They mentioned that inflation was supported by

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[2] Mahvash S. Qureshi, 2017, What Drives Private Saving in Singapore? IMF Country Report No. 17/241, pp 27-50.

[3] This is the retained earning bias on portfolio equity investments. See Switzerland, IMF Country Report 18/173, Annex II, p. 39.

increases in prices for retail and essential services, while inflation for discretionary services was weak. However, by year end, further reduction in labor market slack should underpin a rise in headline inflation toward 1 percent and MAS core inflation toward 2 percent. The authorities considered escalation of trade frictions among Singapore's key trading partners and geopolitical risks as the main external sector risks. They reiterated Singapore's commitment to free trade.
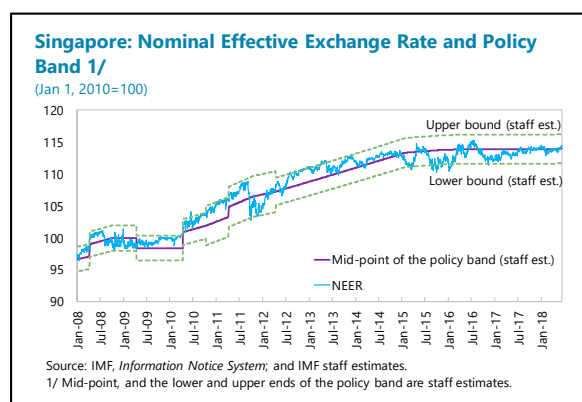
14.   On the external sector assessment, the authorities reiterated that the demographic transition would help lower the CA surplus over time. The authorities noted that household saving was the biggest contributor to the saving-investment gap and that existing mechanisms (e.g., mandatory contribution to a pension fund, various limits on banks' exposures to individuals and households) are aimed at ensuring soundness of household balance sheets. They reiterated that Singapore's large CA surplus also reflects country-specific factors, including its status as a city state with no natural resources and as a global hub for trade and finance with corporate saving that is often channeled to investment abroad. Given the large size of the foreign workforce and remittances abroad, Singapore's consumption should be assessed in relation to its gross national disposable income, rather than GDP, which shows a comparable proportion to that in the other industrialized economies. Policies are calibrated to near- and medium-term considerations, including those stemming from the economy's structural transformation. Over time, higher public spending, a recovery in private investment, and dissaving by an aging population should help lower the CA balance.

POLICY DISCUSSIONS

Given the large and persistent external and fiscal surpluses, a further recalibration of medium-term macroeconomic policies is needed. Monetary policy normalization should continue and multi-year fiscal expansion should be used to support domestic demand, improve infrastructure and broaden social insurance systems. Financial sector and macro prudential policies have ensured financial stability but elevated household and corporate sector leverage warrant continued monitoring as the property market continues to pick up. The upcoming 2019 FSAP will follow up on financial sector risks. Structural reforms should continue with a view to raising skills and productivity, boosting business innovation, and pursuing more inclusive policies for the coming digital age.

A.   Monetary Policy

15.   In its April meeting, the MAS announced a slight appreciation in the slope of its exchange rate band. The move came after two years of MAS targeting a zero slope for the central parity of its basket, band, crawl nominal effective exchange rate (NEER) framework, amid a soft economy and persistent undershooting of its medium-term price stability objective. At the current level, the monetary policy remains accommodative. The

Singapore: Nominal Effective Exchange Rate and Policy Band 1/
(Jan 1, 2010=100)

Source: IMF, *Information Notice System*; and IMF staff estimates.
1/ Mid-point, and the lower and upper ends of the policy band are staff estimates.
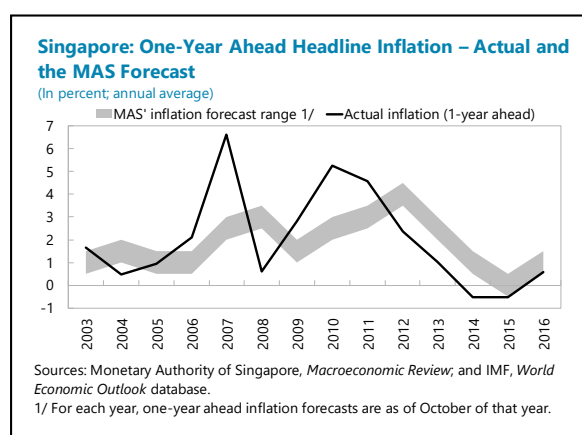
MAS now expects that steady economic expansion and improving labor market conditions in 2018–19 will put upward pressure on core inflation and reverse the undershooting.

16.   Under the baseline, further normalization of monetary policy is likely in order. Given the economy's strength, recovery in the labor market, and a positive fiscal impulse, the MAS is expected to continue normalizing its monetary policy gradually during 2018-19. A Taylor-type rule suggests a gradual appreciation of the NEER parity, rising to about 1½ percent by end-2019 (Appendix V). The timing and size of the moves should be data dependent and in response to clear signs of inflation pressure that could impact medium-term price stability. They should also be well communicated. Premature or overly ambitious tightening could impede the healthy ascent of inflation and potentially de-anchor inflation expectations.

17.   Should inflation continue to undershoot, fiscal policy should be the first line of defense. In recent years, inflation has underperformed the authorities' expectations, reflecting in part a weaker New Keynesian Phillips Curve relationship between inflation and unemployment. However, inflation expectations appear to be well anchored.[4] In the context of Singapore's monetary policy framework and its capital account openness, monetary policy easing (e.g., a lowering of the NEER slope) in response to inflation underperformance could adversely impact the ongoing recovery in private domestic demand.

Singapore: One-Year Ahead Headline Inflation – Actual and the MAS Forecast
(In percent; annual average)

Sources: Monetary Authority of Singapore, *Macroeconomic Review*; and IMF, *World Economic Outlook* database.
1/ For each year, one-year ahead inflation forecasts are as of October of that year.

Such policy would lead to a faster rise in domestic interest rates than in international rates, impacting private sector balance sheets (e.g., mortgages are typically on adjustable rates) and would also further increase the external surplus. Available fiscal space should be deployed to support domestic demand and address inflation undershooting.

Authorities' Views

18.   Monetary policy decisions are carefully calibrated to deliver medium-term price stability. The April move reflected a careful consideration of strength in the domestic economy and evolving risks to the near-term outlook. Broader growth and continued decline in labor market slack are expected to support a gradual rise in MAS core inflation, by early 2019, above the level that is consistent with medium-term price stability. Thus, a first step toward policy normalization was imperative given lags in monetary policy transmission. However, the authorities are cognizant of uncertainties surrounding the inflation path, stemming from structural shifts at home and abroad, and from policy uncertainties involving key trading partners of Singapore. Policy decisions would continue to evolve with the economy's response to existing policies and shocks.

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[4] Gupta, S., 2016, *Inflation and Unemployment Trends in Singapore*, Macroeconomic Review, Volume XV, Issue 2, The Monetary Authority of Singapore (October 2016).
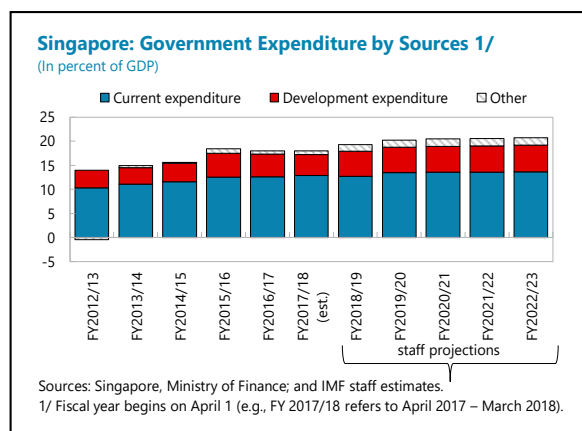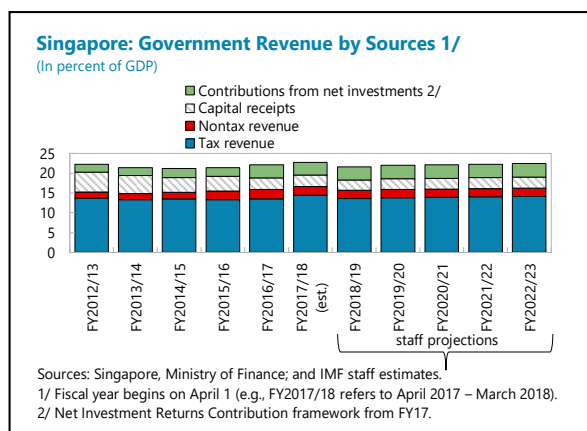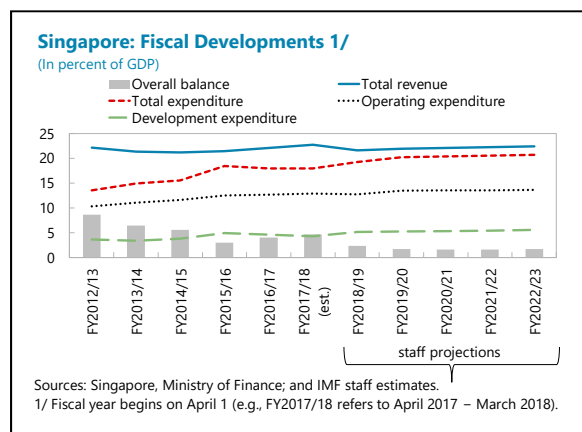
B. Fiscal Policy

Near-Term Developments

19.   The fiscal position strengthened significantly in FY2017/18, due mostly to cyclical and one-off factors. Prudent fiscal policy has resulted in the buildup of significant fiscal buffers over time. Although the share of government spending in GDP had risen by about 5 percentage points between FY2012/13 and FY2015/16, driven by higher healthcare and other aging-related spending and infrastructure spending, it has flatlined in the last two years (Table 6). The overall fiscal surplus (GFSM definition) in FY2017/18 (ending in March 2018) was at 4.7 percent of GDP, substantially higher than the budgeted

Singapore: Fiscal Developments 1/
(In percent of GDP)

Sources: Singapore, Ministry of Finance; and IMF staff estimates.
1/ Fiscal year begins on April 1 (e.g., FY2017/18 refers to April 2017 – March 2018).

1.7 percent of GDP. Higher revenues from stamp duties and a one-off increase in statutory board contributions along with cashflow delays in infrastructure projects contributed to fiscal overperformance.
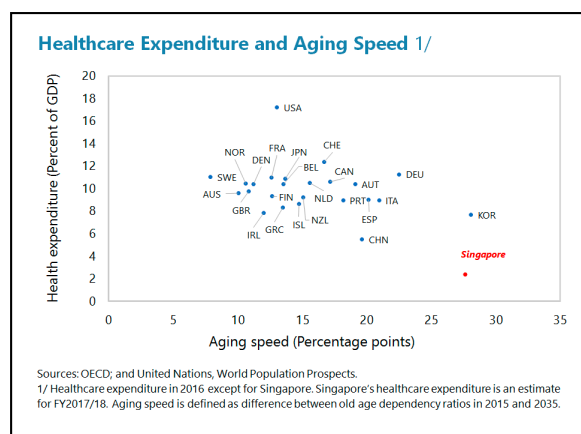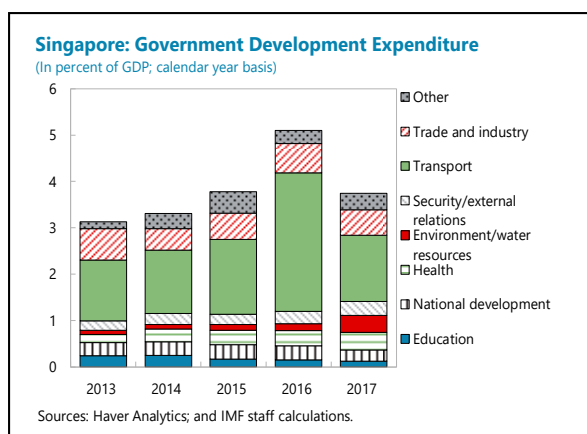
20.   The FY2018/19 budget provides fiscal stimulus with a boost to capital expenditure and a lower overall surplus than last year.

Singapore: Government Revenue by Sources 1/
(In percent of GDP)

Sources: Singapore, Ministry of Finance; and IMF staff estimates.
1/ Fiscal year begins on April 1 (e.g., FY2017/18 refers to April 2017 – March 2018).
2/ Net Investment Returns Contribution framework from FY17.

Singapore: Government Expenditure by Sources 1/
(In percent of GDP)

Sources: Singapore, Ministry of Finance; and IMF staff estimates.
1/ Fiscal year begins on April 1 (e.g., FY 2017/18 refers to April 2017 – March 2018).

The budget takes into consideration one-off revenue gains in FY2017/18 and projects increases in infrastructure and other capital outlays by 1¼ percent of GDP. As a result, the overall surplus will decline to about 2.3 percent of GDP (Table 6). Staff supports the planned fiscal impulse of about 1 percent of potential output, noting that it would help ease medium term supply-side constraints and support external rebalancing. Deviations of fiscal outturns from budget targets in recent years are caused by over-performance of revenue and project savings and cashflow delays for development expenditure. Possible over-performance again over budget plans will have implications for external adjustment and the pace of monetary policy normalization. Staff calls for more ambitious fiscal stimulus if downside risks to growth or inflation materialize.

Medium- to Longer-Term Challenges

21.   The authorities are proactively addressing future aging-related healthcare and infrastructure needs. Singapore's health care system provides quality outcomes at a fraction of the cost seen in other advanced economies.[5] Going forward, much uncertainty surrounds the rate of acceleration of healthcare costs over the medium- to long-term as the population will age at a very fast pace (faster than Japan, for instance). The authorities are currently projecting healthcare spending to rise to 3 percent of GDP in 2030, up from 2.2 percent in 2018. But this could be an underestimate: recent enhancements of government subsidies for healthcare insurance and higher spending on additional infrastructure needs for the very aged in the future could both push up government healthcare spending. On the other hand, innovative digital medical technologies and supply management could both help contain the pace of cost increases.
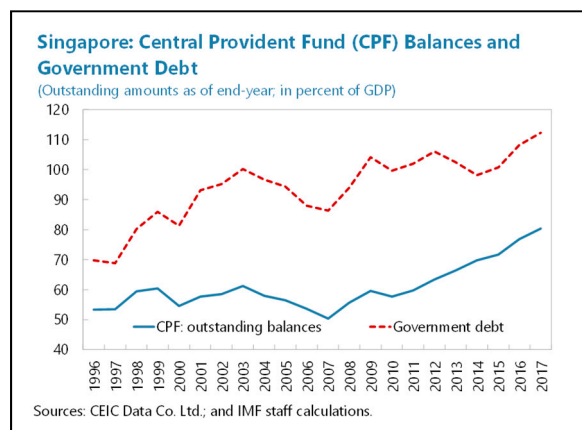

Singapore: Government Development Expenditure
(In percent of GDP; calendar year basis)

Sources: Haver Analytics; and IMF staff calculations.

Healthcare Expenditure and Aging Speed 1/

Sources: OECD; and United Nations, World Population Prospects.
1/ Healthcare expenditure in 2016 except for Singapore. Singapore's healthcare expenditure is an estimate for FY2017/18. Aging speed is defined as difference between old age dependency ratios in 2015 and 2035.

22.   A variety of options is available to finance long-term healthcare and infrastructure needs. These include higher taxes, borrowing, or bringing on budget a greater proportion of the government's investment income. Efficiency and equity considerations, both within and across generations, should determine the appropriate financing mix. Long-term infrastructure investment that will benefit future generations calls for borrowing to spread the costs across current and future generations.

23.   The 2018 budget reaffirmed that sufficient fiscal resources are available to meet spending plans until the end of the current term of government in 2020. It also argued that fiscal sustainability beyond 2020 called for higher taxes and signaled an increase in Goods and Services Tax (GST) to cover recurrent healthcare costs going forward, with appropriate offsets to reduce its regressive nature. It also indicated that major infrastructure needs can be financed by borrowing.

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[5] Haseltine, W., 2013, *Affordable Excellence: The Singapore Healthcare Story*, Brookings Institution Press.

24.   The choice of medium-term fiscal options warrants careful consideration. Singapore runs a large fiscal surplus, possesses substantial net sovereign assets whose income is only partially on budget, and has a low consumption-to GDP ratio. It also operates a fully funded pension system, so that the government's gross debt does not reflect deficit finance (see the role of the CPF in explaining Singapore's gross debt in the public sector DSA, Appendix VI), and provides quality healthcare at low cost. From a macroeconomic point of view, relying on higher consumption taxes alone may be counterproductive, especially if the economic conditions at the time of the increase are weak. These taxes would reduce private income and consumption, especially of low-income households. A GST hike alone could lead to a lower path for GDP and private consumption, and limited external adjustment, relative to using more of the available fiscal space (lowering the surplus and/or bringing more income from reserves on budget) to finance health care increases. A more supportive fiscal policy in the medium-term is affordable given the projected fiscal surpluses will continue to improve the public-sector balance sheet.

Singapore: Central Provident Fund (CPF) Balances and Government Debt
(Outstanding amounts as of end-year; in percent of GDP)

Sources: CEIC Data Co. Ltd.; and IMF staff calculations.

Authorities' Views

25.   The authorities remain committed to medium-term fiscal sustainability against the demographic headwinds. Fiscal policy needs to be forward-looking beyond this decade to cope with rising aging-related spending pressures, infrastructure upgrading and national security. Budget 2018 proposed a 2 percentage point hike in GST rates during 2021-25 to meet the rising recurrent spending needs, including healthcare costs. The plan for the GST increase was carefully considered against other options. The government would also provide enhanced offsets and transfers to ensure that the overall system of taxes and transfers remain fair and progressive. The authorities' decision on the timing of the GST hike will depend on the state of the economy and expenditure needs. For infrastructure spending, they are considering the option of borrowing by the Statutory Boards[6] and government-owned companies with the provision of government guarantees.

26.   The authorities reiterated that fiscal reserves are Singapore's strategic national assets. They noted that the contribution of reserves to the budget, as per the Net Investment Returns Contributions (NIRC) framework, has more than doubled since FY2009/10. Up to 50 percent of the expected long-term real returns from the government's financial reserves are available for budget spending. Following the inclusion of Temasek in the Net Investment Return framework in 2016, the NIRC has become the largest source of revenue. The authorities will

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[6] Statutory boards, such as the Housing and Development Board (HDB) and the Land Transport Authority (LTA), are autonomous government agencies. They are not staffed by civil servants and are separate from the formal government structure and enjoy greater autonomy and flexibility than government departments.

continue to spend reserves prudently but without overly relying on them. They consider past reserves as an important resource against an uncertain future.

C. Financial Sector Issues

**27.   Singapore's property market policies are comprehensive, aiming to manage demand and supply with active monitoring and periodic adjustments.** Staff's empirical analysis suggests that the prices of private housing in Singapore are affected by a host of factors, including incomes, rents and interest rates, and by supply and cost determinants. Moreover, while housing prices in major Asian cities are increasingly synchronized, Singapore's property prices appear to have decoupled and are now relatively attractive to international investors (Appendix VII). Singapore's comprehensive set of property market cooling measures, including Additional Buyer's Stamp Duty (ABSD) and limits on Total Debt Servicing Ratio (TDSR) and Loan to Value (LTV) caps, have been critical to stabilizing the property market. Property prices picked up in the last three quarters and are expected to increase further in the near term. Staff analysis also suggests that prices are now moderately above levels consistent with long-term fundamentals. Higher private property prices have been accompanied by increased transaction volumes amid a stronger economy, improved market sentiments, and the recent increase in collective sales for redevelopment projects. The Seller's Stamp Duty was relaxed in March 2017. In the 2018 Budget, the Buyer's Stamp Duty was raised by one percentage point for residential properties valued over S$1 million, justified by the need to make property taxation more progressive.

Real House Prices: Selected Asian Cities
(Percentage, quarter-on-quarter growth rates)

Source: IMF staff calculations.

**28.   Against this background, staff's views on property market measures are as follows:**

- *On the demand side*, property market cooling measures should be maintained, including structural macroprudential policies (TDSR and LTV caps) and cyclical measures, such as ABSD, given the elevated financial risks. However, ABSD is a residency-based capital flow management/macro-prudential measure, and staff recommends eliminating residency-based differentiation by unifying rates (lowering rates charged foreigners to the level charged Singaporeans and foreign residents), and then phasing out the measure once systemic risks from the housing market dissipate.
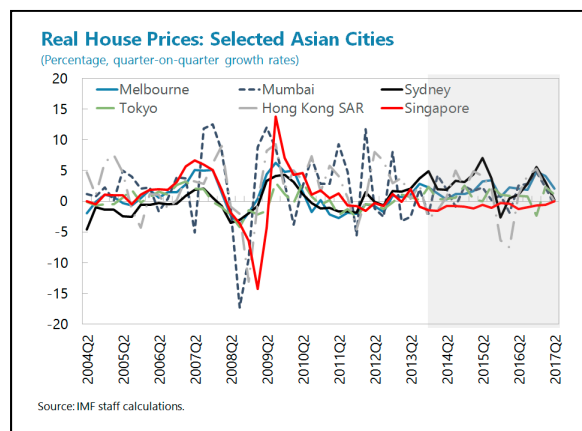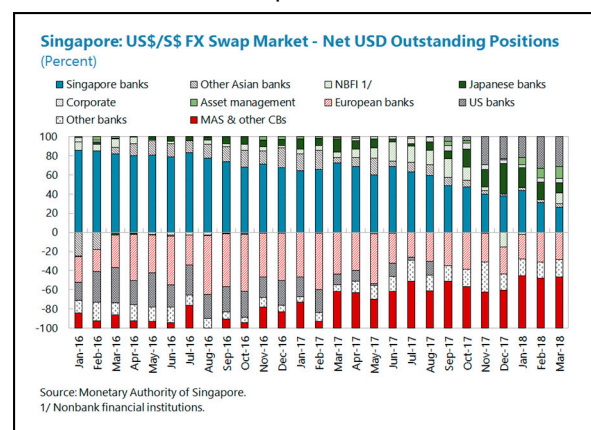
- *On the supply side*, housing supply in the pipeline has continued to rise in 2018Q1. A large part of those will be on the market for sale in later this year or the next year, adding significant new supplies of housing stock. Staff encourages the authorities to continue to monitor the supply side to ensure that sufficient land is reserved and released in a timely manner through the government land sales program. In addition, other supply-side measures such as the process of building approval could be targeted to meet housing demand.

29.   Domestic private sector balance sheets remain strong overall, but elevated levels of debt warrant continued monitoring of pockets of vulnerability.

- Residential property accounts for large shares in household balance sheets: 44 percent of total assets are in residential properties, and 75 percent of liabilities are in mortgage loans. Overall household balance sheets appear healthy with large amount of liquid financial assets, and TDSR and LTV ratio limits alleviates risks stemming from household debt. However, vulnerable households with low income and excessive indebtedness warrant close monitoring, given the expectations of interest rate increases.

Singapore: Household Balance Sheet, 2018Q1
(Percent of GDP)

Sources: Singapore, Department of Statistics; and IMF staff calculations.

- While corporate sector leverage is elevated, the median debt-to-equity ratio has declined, and most liabilities are longer term. However, given the expected rise of interest rates, declining corporate profitability and debt servicing capacity raise concerns. Staff welcomes the authorities' attention to relatively more vulnerable sectors such as marine and offshore engineering.
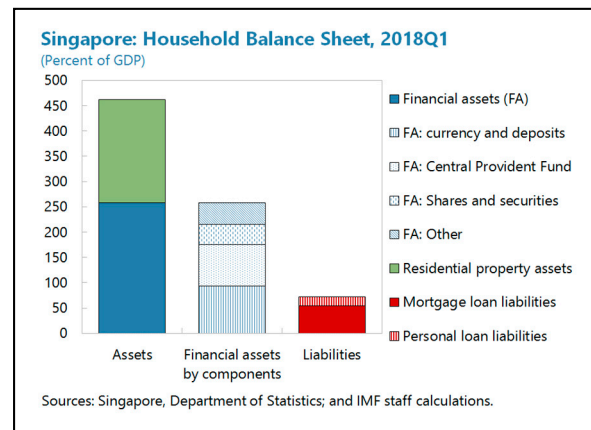
30.   Banking sector liquidity risks are contained, but U.S. dollar funding (US$) conditions need careful monitoring. As a trading and financial services hub, Singapore's financial system relies on adequate U.S. dollar liquidity, including through the FX swap market. Singaporean banks have a net long position in US$/S$ FX swaps. However, this position has declined over the past year. They also have maintained US$ loan-to-deposit (LTD) ratio below 100 percent, partially mitigating US$ funding risks. However, for the entire banking system, foreign-currency LTD ratio continues to rise above 120 percent, reflecting foreign banks' expansion of nonresident credit. Foreign bank branches' reliance on wholesale funding (though largely intragroup) could also pose risks. The share of foreign banks as providers of US$/S$ FX swap liquidity declined in 2017, and the MAS filled the gap. While US$ deposits in Singapore are considered relatively stable,

Singapore: US$/S$ FX Swap Market - Net USD Outstanding Positions
(Percent)

Source: Monetary Authority of Singapore.
1/ Nonbank financial institutions.

large-scale profit repatriation by U.S. corporates could further affect US$ liquidity. Banks should continue their prudent foreign currency risk management practices by reducing their reliance on wholesale funding and foreign currency swaps and by addressing maturity mismatches. The authorities should closely monitor the banking system's rising foreign currency loan-to-deposit ratio for non-bank exposures. The upcoming FSAP will look this issue in more detail.

31.   Staff welcomes the authorities' efforts to strengthen the regulatory framework in line with Basel III principles. The authorities implemented a leverage ratio requirement of 3 percent and revised securitization framework from January 2018, along with the adoption of liquidity requirements. All domestic systemically-important banks are required to meet the Net Stable Funding Ratio requirements on all currency level since January 2018, in addition to the Liquidity Coverage Ratio requirements. Moreover, in July 2017, enhancements to the resolution regime was introduced, including statutory bail-in, recovery and resolution planning, and creditor compensation framework.

32.   Singapore is a financial hub with global innovation aspirations. The MAS appropriately supports development of a financial technology (FinTech) ecosystem while adapting financial regulations to the changing landscape. Risks associated with FinTech developments are closely monitored and increasingly integrated in the supervisory agenda. (Regulations are, for example, becoming more focused on activities rather than entities, Appendix VIII). Risks related to ML/TF, cyber-security, and consumer protection are carefully being monitored. The MAS has been at the forefront of cross-border regulatory cooperation: it has established a regional industry sandbox in partnership with International Finance Corporation and ASEAN Bankers Association, and has put in place information sharing arrangements on FinTech developments. The 2019 FSAP will follow up on emerging risks, including from FinTech, and its implications for the banking sector.

33.   Staff encourages continuation of efforts to enhance the AML/CFT framework and improve its effectiveness. In its 2016 assessment, the Financial Action Task Force identified shortcomings in the implementation of risk-based AML supervision and preventive measures including by company service providers and lawyers, and entity transparency, including the collection of beneficial ownership information. Staff welcomes the authorities' ongoing efforts to address these weaknesses, including the setup of a dedicated AML department and a new Enforcement department by MAS; the development of a regulatory and supervisory framework for dealers in precious metals and stones; strengthening individual accountability of financial institutions' senior managers; an improved assessment of high risk areas, including trusts and complex structures; and enhancing international cooperation. In addition, staff welcome the authorities' support of the industry's development of potential technological solutions to AML/CFT risks using Regulatory Technology ("Regtech") and Supervisory Technology ("Suptech"), including the launch of the AML/CFT Industry Partnership (ACIP) Work Group on data analytics.[7] At the same time, staff encourages the authorities to continue their vigilant stance on AML/CFT

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[7] ACIP is a private public partnership established in April 2017. It brings together the financial sector, regulators, law enforcement agencies and other government entities to collaboratively identify, assess and mitigate key and emerging money laundering and terrorism financing risks facing Singapore.

issues in the wealth management industry, improve the jurisdiction's understanding of ML risks and threats and monitor the implementation of new beneficial ownership provisions.

Authorities' Views

34.   Singapore's financial system is healthy and the authorities are committed to ensuring its stability through proactive supervision and continued improvement in the regulatory framework. In this context, the authorities welcome the upcoming FSAP to help inform future financial sector policies.

- To promote a stable and sustainable property market, a whole-of-government approach is adopted whereby a suite of policy tools are employed in complementary fashion to address demand and supply issues. Even while the authorities ensure that sufficient land is released in a timely manner to meet housing needs, demand-side measures will still need to be taken to mitigate specific risks in the property market (e.g., the pro-cyclical feedback loop between housing credit on one hand, and property transactions and prices on the other). While the moderation in private residential prices over the past five years has improved affordability, Singapore has become a more attractive market to international investors. Considering Singapore's city-state status and relative attractiveness of its property market, the ABSD in its differentiated form is still relevant in limiting speculative demand to limit adverse spillovers to the rest of the market.

- Private sector leverage has shown a welcome stabilization, helped by policies taken in the last several years. Considering the expected rise of interest rates, however, the authorities are closely watching debt servicing burdens in the household and corporate sectors. The risk profile of housing loans remains at prudent levels. The TDSR framework has helped keep debt servicing burdens of most households manageable, and households have taken steps to mitigate risks from rising interest rates by switching to mortgages with less variable rates. The majority of Singaporeans live in public housing with loans from the HDB that has maintained an unchanged interest rate for the past two decades. Overall, household balance sheets are resilient under severe stress, but those with below median income who have purchased private residential properties may come under stress. To encourage prudent borrowing and lending of unsecured credit, a new measure to cap credit limit of borrowers with significant unsecured debt became effective from January 1, 2018. Corporate leverage remained stable and debt profiles resilient. The balance sheet of the median listed firm is strong: stable profitability and current ratios, healthy interest coverage ratio, and an improvement in maturity profile of debt. Stress tests indicate that listed firms are resilient to interest and earnings shocks, with limited impact from trade disputes among Singapore's key trading partners.

- The banking sector is healthy with strong buffers in place. In the past year, overall credit growth was healthy largely due to a robust recovery in non-resident lending by foreign banks to Greater China. Local banks have a diversified loan book and remain vigilant to risks arising from their exposure. Domestically, there is no broad-based credit overheating and the banking system remained supportive of the small- and medium-sized enterprises. Banking

system's asset quality has improved and overall provisioning buffers remain adequate. Industry-wide stress tests show that the banking system is resilient to a significant deterioration in external and domestic conditions and sector-specific shocks. The authorities, however, consider that banks' liquidity management warrants closer monitoring given the increased US dollar funding costs and U.S. monetary policy normalization. They, however, also noted that banks' diversified funding sources and liquid assets that are well above the regulatory minimum are important mitigating factors.

- The authorities are actively supporting the creation of an enabling environment for FinTech and are committed to continued improvement in the AML/CFT framework. FinTech development is supported through the creation of necessary infrastructure (e.g., digital identity, trusted data hub, customer consent architecture) while adapting and adopting policies to deal with emerging risks (e.g., artificial intelligence, scaled computing, cyber security, AML/CFT). Payment services regulations are moving to a risk- and activity-based framework, while regulations of virtual currencies take into consideration ML/TF risks. The MAS has further strengthened its risk-based management of ML/TF risks through intensified supervision, including by means of large data analytics and active industry engagements; additional preventive measures; and greater international cooperation.

D. Structural Policies

35.   Singapore continues to pursue policies to raise productivity and address challenges of population aging and rapid technological change. Singapore has embraced automation and digitalization, encouraging firms to adopt new business models and workers to acquire skills that complement the intangible digital capital dominating the emerging General-Purpose Technology (GPT).

- Strategies of structural transformation have been laid out by the Committee on Future Economy. Sector-specific Industry Transformation Maps (ITMs) of 23 industries drive economic restructuring by focusing on innovation, productivity, reskilling, and internationalization (Box 3).

- Firms are provided with targeted incentives to build digital capabilities, including grants, tax incentives, and advisory services. Efforts to increase research and development (R&D) and intellectual property (IP) have also intensified. The 2018 budget announced some tax incentives for IP registration and a new vehicle is helping companies commercialize IP.

- A variety of active labor market programs aim to augment the skills of workers in tandem with enterprise capabilities through programs such as SkillsFuture and Capability Transfer Program, in cooperation with the Ministry of Manpower.

36.   The longer-term challenge is to make a successful transition to new business models that rely intensively on digital platforms and networks. The basic research that drives technical change and the Schumpeterian creative destruction of product, firms and jobs are

inherently unpredictable. As the new digital GPT diffuses throughout the economy in the coming years and decades, marketing and monetizing new ideas will increasingly require firms to adopt new business models. This may be easier for new/young firms to pull off and expectations for support for incumbents could lead to a longer process of structural adjustment. Staff encourages facilitation of the entry of new, dynamic firms in emerging sectors (IMF Fiscal Monitor, April 2016, Chapter 2). Continued cooperation with trade associations and private sector could enhance the effectiveness of ITMs to facilitate industry transformation. The authorities could consider commissioning independent evaluations of existing approaches to providing support for firms and workers. The "future economy" will also require cultivating an innovation ecosystem and adapting to an accelerated pace of change, a cultural shift for Singapore.[8] Singapore's successful transition to a new innovation-based growth model could have a positive spillover in the rest of the region. As chair in 2018, Singapore aims to strengthen ASEAN's connectivity, resilience, and innovativeness. Singapore can play an active role in the diffusion of innovation and knowledge in ASEAN, thereby helping the region to adapt to rapid technological changes.

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[8] An extensive analysis of Singapore's future economy can be found in Almekinders, G, S. Gupta and U. Rawat, Embracing the Future Economy: Innovation, Automation and Inclusion, IMF Selected Issues Paper 17/241, 13-26.

Box 3.The Role Industry Transformation Maps in Creating the Future Economy

The 2017 report of the Committee on the Future Economy (CFE) laid out seven strategies to guide Singaporeans transformation to the innovation-based economy. These strategies aim to build strong digital capabilities, deepen international connections, and promote stronger partnerships among the government and the private sector, including trade associations and industry chambers. The authorities estimate that their collective efforts should enable them to grow by 2 to 3 percent per year on average over the next decade.

Industry Transformation Maps (ITMs) are a key pillar in operationalizing this overarching effort. They are sector specific plans for 23 sectors that cover 80 percent of the economy. ITMs are best thought of as roadmaps meant to help companies – especially small and medium enterprises – to digitalize and growth and productivity. They also guide the government's facilitation of industry upgrading—for example, by creating a regulatory environment conducive to innovative business models and setting national standards to promote technology adoption. In addition to sector-specific plans, the government provides support for firms to innovate in the 2018 budget by offering grants to adopt technologies and enhance the tax deduction on licensing payments as well as on IP registration fees and qualifying expenses incurred on R&D.

The Council for Skills, Innovation, and Productivity (CSIP) takes overall responsibility for the implementation of the ITMs. Each ITM consists of a growth and competitiveness plan, covering four areas in productivity, jobs and skills, innovation, and trade and internationalization. The government agency is assigned to each ITM and tasked to coordinate among agencies and with the tripartite partners.

The next phase following the launch of ITMs is to group the twenty-three industries into six clusters to maximize opportunities for collaboration, exploiting synergies and strengthen linkages across industries. The sectors are manufacturing, built environment, trade and connectivity, essential domestic services, modern services. Each cluster will be overseen by the sub-committee set up by the CSIP.

Box 3. Table 1. Singapore: Industry Transformation Maps — List of Clusters and Industries

Cluster	Sector	Lead agency
Manufacturing	Energy and chemicals	Economic Development Board
	Precision engineering	Economic Development Board
	Marine and offshore	Economic Development Board
	Aerospace	Economic Development Board
	Electronics	Economic Development Board
Built environment	Construction (incl. architectural and engineering services)	Building Construction Authority
	Real estate	Council for Estate Agencies
	Cleaning	National Environment Agency
	Security	Ministry of Home Affairs

Box 3. The Role of Industry Transformation Maps in Creating the Future Economy (concluded)

Cluster	Sector	Lead agency
Trade and connectivity	Logistics	Economic Development Board
	Air transport	Civil Aviation Authority of Singapore
	Sea transport	Maritime and Port Authority
	Land transport (incl. public transport)	Land Transport Authority
	Wholesale trade	Enterprise Singapore 1/
Essential domestic services	Healthcare	Ministry of Health
	Education (early childhood and private education)	Ministry of Education
Professional services	Professional services	Economic Development Board
	Information and communication technology, and media	Ministry of Communication and Information
	Financial services	Monetary Authority of Singapore
Lifestyle	Food services	Enterprise Singapore 1/
	Retail	Enterprise Singapore 1/
	Hotels	Singapore Tourism Board
	Food manufacturing	Enterprise Singapore 1/

Source: Ministry of Trade and Industry, *Media Factsheet – Industry Transformation Maps*, September 2016.
1/ In April 2018, International Enterprise Singapore and SPRING Singapore were merged to form a single agency.

37.   Staff encourages the authorities to adopt broader social insurance arrangements, including unemployment insurance. While support for workers to adapt and upgrade their skills is necessary and welcome, digital technological change is likely to disrupt incumbent firms, industries, and workforces and accelerate worker churn in Singapore, ASEAN and beyond. This calls for a rethink of social insurance arrangements. With technological unemployment likely to rise, universal, transparent, and time-bound unemployment insurance could help workers cope with unemployment spells, complementing active labor market programs and enabling workers to quickly adapt to technological change. Such arrangements could also address inequality.

Authorities' Views

38.   The structural reform agenda seeks to address challenges and opportunities presented by a rising Asia, shifts in global supply and value chains, rapid technological change and an aging population. The recommendations of the Committee on the Future Economy envision an economy that is: more globally and regionally integrated; with deeper enterprise and human capabilities; at the forefront of innovation; and with strong partnerships with Trade Associations and Chambers, and unions. Support is provided to both incumbents and new firms in each industry and does not preclude an environment of healthy competition, one that will support creative destruction, allowing dynamic firms to invest in physical and human capital, increase adoption of digital technologies, and innovate. Industry Transformation Maps are designed to support and accelerate the transformation process of each industry, including accumulating human capital in a concerted and comprehensive manner. They will take a more

cluster-based approach to reap synergies and strengthen linkages across the 23 industries as a next step.

39.   Policies continue to be calibrated to support the economy's digital transformation. Many programs and grants have been streamlined to encourage firms to innovate and go digital, including the Productivity Solutions Grant, tax deductions on licensing, IP registration fees, and R&D expenses. The Wage Credit Scheme and the corporate income tax rebate continue to help keep business costs manageable while firms are transitioning to achieving quality growth.

40.   Singapore takes a broad-based and upstream approach toward training, reskilling, and placing workers into new jobs. This approach supports the accumulation of human capital, as workers remain employable and make successful career transitions. This approach is well suited for an era of rapid technological change, where workers must remain agile and adaptable. In contrast, unemployment insurance could discourage workers from searching for new jobs and increase both frictional and structural unemployment. Singapore's approach has served the economy well with a much lower unemployment rate than other advanced economies. Singapore relies on active labor market programs with training subsidies, temporary employer wage support, and grants, facilitating fast reemployment of job seekers without affecting incentives to work. These programs provide substantial support for acquiring new skills (e.g., SkillsFuture), targeted support to plug skills gap and reenter employment (e.g., Adapt and Grow), and financial assistance for workers between jobs, including through means-tested social support programs. Active labor market policies and social safety programs are increasingly becoming targeted toward those who are vulnerable and face heightened risks from technological change. This multi-pronged approach is supported by Singapore's strong tradition of tripartite collaboration where employers and unions also take responsibility for workers' development.

STAFF APPRAISAL

41.   Singapore's growth firmed up and became more broad-based in 2017. The growth acceleration was led by the upswing in global growth, trade and capital expenditure, including on information technology. An easing of financial conditions supported a recovery in private domestic demand, and labor market slack was reduced. While the economy is in a cyclically strong position, inflation remains positive but subdued after being negative for two years.

42.   The growth momentum is expected to be sustained but moderate somewhat in 2018, while inflation is set to increase moderately. Final domestic demand will be the main driver of growth. Momentum in electronics exports is expected to remain healthy but at a more sustained pace relative to last year. Headline inflation is forecast to rise modestly but remain contained owing to a healthier labor market, a rise in housing rentals, and pass through of higher global oil prices. Risks to the near-term growth outlook stem mainly from external sources and are broadly balanced.

43.   Over the medium term, rising capital intensity and higher productivity will support growth. As the economy transitions toward more automation and digitalization, and inclusive policies and lower immigration raise the wage-rental ratio, the capital intensity of production and

productivity will rise. Final domestic demand will remain the main driver of growth. Risks to the medium-term outlook are broadly balanced and represent a mix of domestic and external factors.

44.   The current account surplus is expected to narrow gradually over the medium term. Singapore's external position is assessed to be substantially stronger than warranted by medium-term fundamentals and desired policies. A further recovery in private investment and higher aging-related public spending and infrastructure will help boost productivity and future growth, which will also support external rebalancing. Productivity growth would support a trend appreciation in the real exchange rate. More ambitious policy action than currently envisaged will be required to lower private precautionary saving and ease credit constraints, including through unemployment insurance and strengthening of social insurance and safety net arrangements. The CA gap is expected to decline further over the longer term as population aging accelerates.

45.   Macroeconomic policies should strike a balance between the ongoing recovery in domestic demand and risks to the outlook. Currently, monetary policy remains accommodative despite the April 2018 announcement of a slight normalization. Given the economy's cyclical strength, continued recovery in the labor market, and a positive fiscal impulse, further normalization in monetary policy is likely in order during 2018-19. The timing and size of the moves should be data dependent and taken in response to clear signs of inflationary pressure that could impact medium-term price stability. They should be well communicated. Staff supports the planned fiscal impulse under the FY2018/19 budget. Such fiscal support would also help ease medium-term supply-side constraints and facilitate external rebalancing. Staff calls for more ambitious fiscal stimulus if downside risks to growth and/or inflation materialize.

46.   Singapore's proactive tackling of aging-related healthcare and infrastructure needs is welcome. The choice of medium-term fiscal options warrants careful consideration. A variety of options is available to finance long-term healthcare and infrastructure needs. These include higher taxes, running a lower budget surplus, borrowing, or bringing on budget a greater proportion of the government's investment income. Efficiency and equity considerations, both within and across generations, should determine the appropriate financing mix. The government is appropriately considering borrowing to finance long-term infrastructure. From a macroeconomic point of view, relying on higher consumption taxes alone to fund higher health care costs may be counterproductive, especially if economic conditions at the time of the increase are weak, as these taxes would reduce private income and consumption.

47.   The property market should be closely watched and policies adjusted as needed to maintain stability. Staff analysis suggests that prices are now moderately above levels consistent with long-term fundamentals. Singapore's property market policies are comprehensive aiming to manage demand and supply with active monitoring and periodic adjustments. Property demand cooling measures should be maintained, including structural macroprudential policies and cyclical measures, such as the ABSD, given the elevated systemic financial risks. However, residency-based differentiation in the ABSD, a capital flow management/ macroprudential measure, should be eliminated by unifying rates and the measure should be phased out once systemic risks from the housing market dissipate. Staff encourages the

authorities to continue to monitor the supply side to ensure that sufficient land is reserved and released in a timely manner through the government land sales program to meet housing needs.

48.   The financial sector remains healthy with adequate buffers at the banks, but risks require continued monitoring. The banking sector is healthy with strong balance sheets and adequate buffers. Banks' risks from exposures to the real estate and the oil and gas sectors are contained. Overall balance sheets of the household and the corporate sectors are strong, with pockets of vulnerabilities that require continued monitoring. Staff welcomes the authorities' efforts to strengthen the regulatory framework in line with Basel III principles, and encourages continuation of efforts to enhance the AML/CFT framework and improve its effectiveness. The authorities are encouraged to continue to support the development of a FinTech ecosystem while adapting regulations to emerging risks. The upcoming 2019 FSAP will follow up on emerging risks, including from FinTech, and its implications for the banking sector.

49.   Staff supports Singapore's aspiration to transition to a new growth model that addresses challenges posed by technological change and rapid population aging. The structural transformation aims to harness automation and digital technologies as drivers of future productivity. Incentives are being provided to firms to automate, innovate, and integrate; and to workers to retrain, raise skills, and pursue lifelong learning. Efforts to increase research and development and intellectual property have also intensified. However, challenges remain. Staff encourages support of new, dynamic firms. Cooperation with trade associations and the private sector could enhance the effectiveness of the structural transformation. The authorities could also consider commissioning independent evaluations of existing approaches to providing support for firms and workers. The "future economy" will also require cultivating an innovation ecosystem and adapting to an accelerated pace of change. As ASEAN chair, Singapore can play an active role in diffusion of technology and knowledge in ASEAN.

50.   Staff encourages the authorities to adopt broader social insurance arrangements, including unemployment insurance. While support for workers to adapt and upgrade their skills is necessary and welcome, technological change is likely to disrupt incumbent firms, industries, and workforces, with significantly higher rate of churn of workers. This calls for a rethink of social insurance arrangements. With technological unemployment likely to rise, universal, transparent, and time-bound unemployment insurance could help workers quickly adapt to technological change. Such arrangements could also address income inequality.
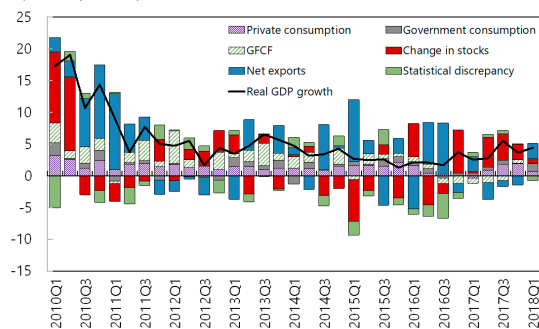
51.   It is recommended that the next Article IV consultation with Singapore be held on the standard 12-month cycle.

Figure 1. Singapore: Real Sector Developments

Growth accelerated in 2017 to its three-year high level. Private domestic demand recovered, including a positive contribution from inventories.

Contribution to Real GDP Growth by Expenditure
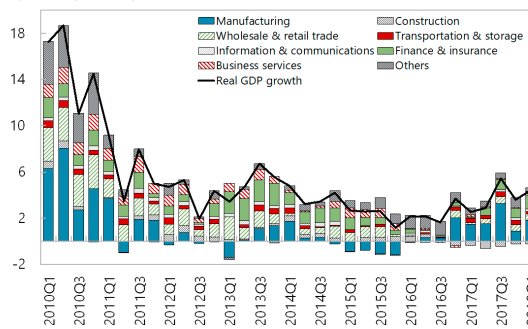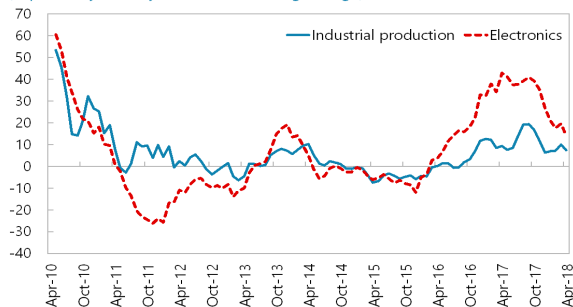(In percent, year-on-year)

Sources: CEIC Data Company Ltd.; and IMF staff calculations.

Strong electronics production supported manufacturing output in 2017 benefitting from a global upswing in electronics demand, but it has softened since end-2017.
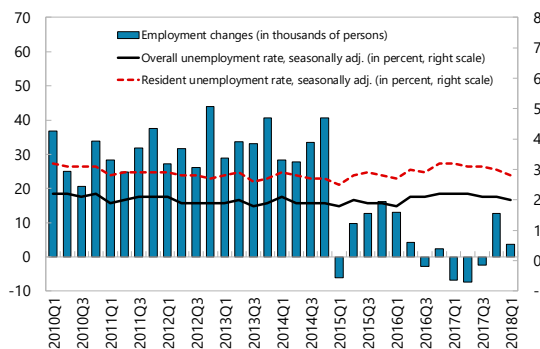
Industrial Production
(In percent, year-on-year; 3-month moving average)

Source: Haver Analytics.

Headline inflation turned positive in 2017 on rising energy prices. But there is no widespread price pressure yet. The MAS core inflation has stayed mostly between 1 and 1.5 percent since mid-2016.

Singapore: Consumer Price Inflation
(In percent, year-on-year)

Sources: CEIC Data Co. Ltd.; and IMF staff calculations.
1/ Share in the CPI basket of components for which inflation exceeds 3 percent.

The manufacturing sector was a key contributor to growth. Wholesale & retail trade, information & communication, and finance & insurance sub-sectors also contributed, but was partly offset by soft construction and business services.

Contribution to Real GDP Growth by Industry
(In percent, year-on-year)

Sources: CEIC Data Company Ltd.; and IMF staff calculations.

Labor market conditions improved slightly in late-2017, with net employment generation helping lower the unemployment rate slightly.
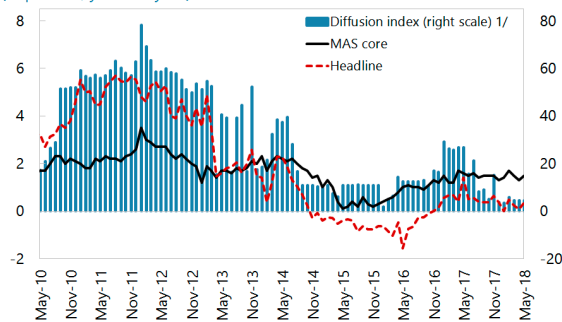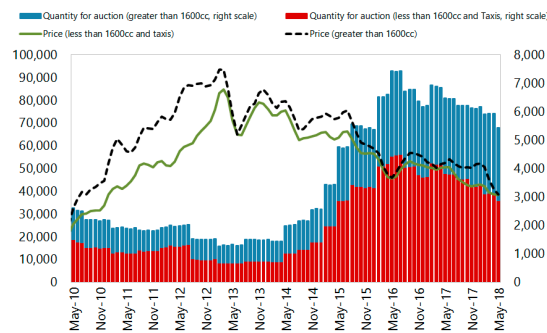
Employment and Unemployment

Sources: CEIC Data Co. Ltd.; and IMF staff calculations.

Declining prices of car ownership certificates have contributed to downward pressure on headline inflation.

Car Certificates of Ownership, Price and Quantity
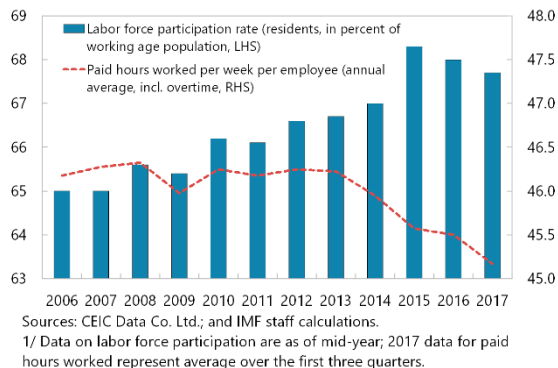(In Singapore dollars; Units, RHS)

Source: CEIC Data Co. Ltd.

Figure 2. Singapore: Labor Market Developments

Residents' labor force participation remains close to the 2015 high; average hours worked was slightly lower in the first three quarters of 2017.

Labor Force Participation Rate and Hours Worked 1/

Sources: CEIC Data Co. Ltd.; and IMF staff calculations.
1/ Data on labor force participation are as of mid-year; 2017 data for paid hours worked represent average over the first three quarters.

Against this backdrop, the overall unemployment rate edged up slightly in early 2017, but has declined in recent quarters.
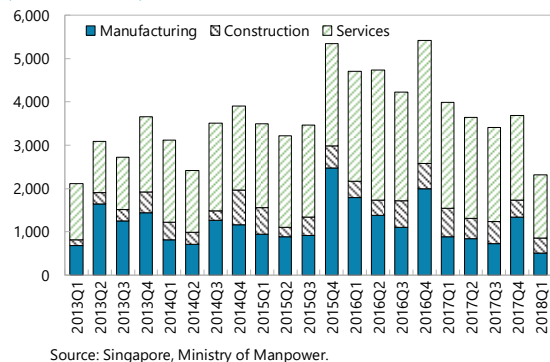
Unemployment Rate: Total and Residents
(In percent; annual averages) 1/

Source: Singapore, Ministry of Manpower.
1/ 2018Q1 data are seasonally adjusted.
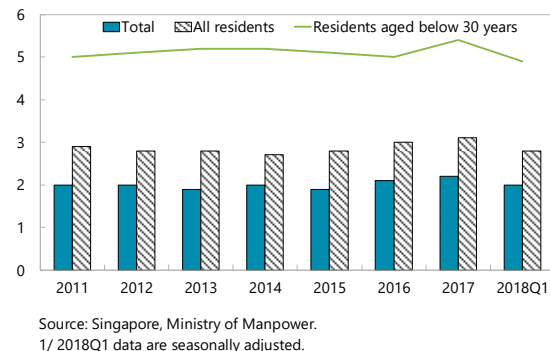
...and the number of retrenched workers declined further.

Retrenchment by Sector
(Number of workers)

Source: Singapore, Ministry of Manpower.
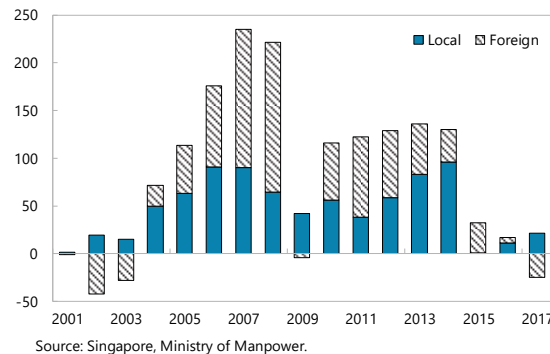
However, net change in employment remained weaker than during 2010-2014, impacting both resident and foreign workers. Total employment grew slightly 2018Q1.
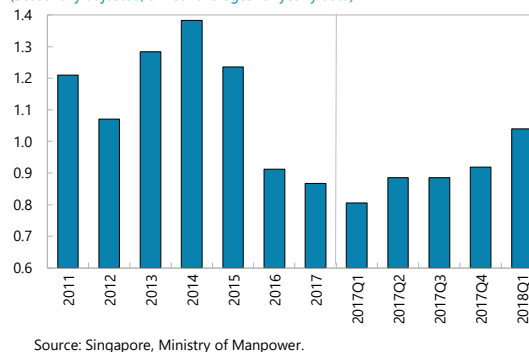
Change in Employment by Residency
(In thousands)

Source: Singapore, Ministry of Manpower.

The ratio of vacancies per unemployed person has returned to around unity for the first time in two years...

Job Vacancy to Unemployed Persons Ratio
(Seasonally adjusted; annual averages for yearly data)

Source: Singapore, Ministry of Manpower.

Meanwhile, real income from work continued to rise, reflecting earlier tightness in the labor market, policy measures, and disinflation in the recent past.

Gross Real Income from Work for Citizens
(Index, 2006=100; excluding employer's contribution to CPF; employed full-time)

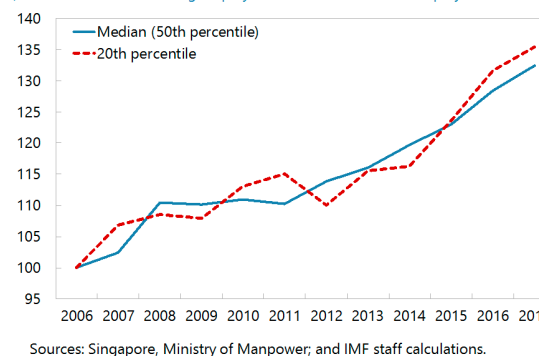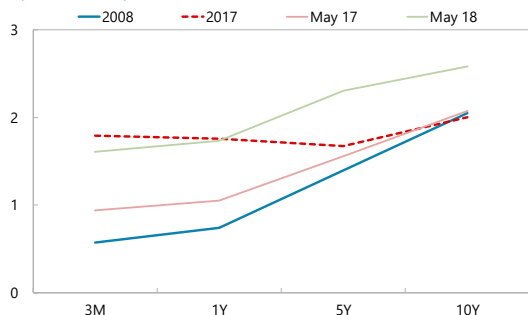Sources: Singapore, Ministry of Manpower; and IMF staff calculations.

Figure 3. Singapore: Monetary and Financial Sector Developments

The treasury yield curve has shifted upward, with rates at the shorter end rising faster than the long end.
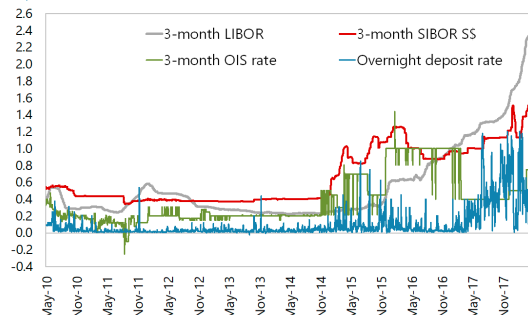
Government Bond Yields
(In percent, end of period)

Legend: 2008, 2017, May 17, May 18

X-axis: 3M, 1Y, 5Y, 10Y

Source: Bloomberg L.P.

With a rise in global rates, money market rates in Singapore have moved up.

Interest Rates
(In percent)

Legend: 3-month LIBOR, 3-month SIBOR SS, 3-month OIS rate, Overnight deposit rate
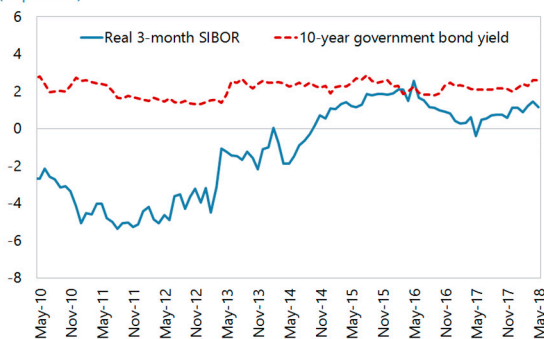
X-axis: May-10 to May-18

Source: Bloomberg L.P.

Reflecting movements in nominal rates, short-term real rates have inched up, but the long-term real rates are largely stable.

Real Interest Rate and Nominal Government Bond Yield
(In percent)

Legend: Real 3-month SIBOR, 10-year government bond yield
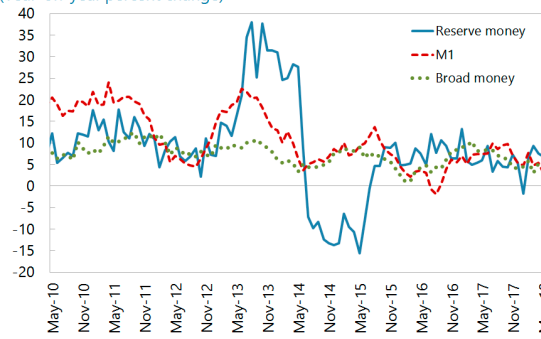
X-axis: May-10 to May-18

Sources: Bloomberg LP; and CEIC Data Company Ltd; and IMF staff calculations.

Broad money growth has slowed down on the back of a slower expansion of credit to domestic nonbanking sector.

Monetary Aggregates
(Year-on-year percent change)

Legend: Reserve money, M1, Broad money

X-axis: May-10 to May-18

Sources: CEIC Data Company Ltd; and IMF staff calculations.

Stock market has remained on an upward trend since early 2016 with low volatility.

Stock Market Index and Volatility

Legend: Strait Times Index, Volatility (in percent, right scale) 1/

X-axis: Jun-10 to Jun-18
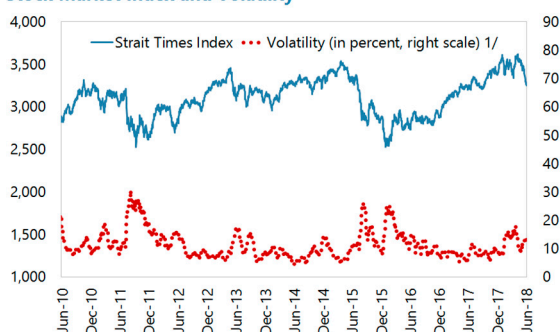
Source: Bloomberg LP.
1/ Standard deviation of 1 year moving average of daily equity price change in log levels.

Growth in foreign exchange market turnover was low in 2017.

Foreign Exchange Market Turnover

Legend: Daily average volume (US$ billions, right scale), Daily average volume growth (y/y)

X-axis: May-10 to May-18

Source: CEIC Data Co. Ltd.

Figure 3. Singapore: Monetary and Financial Sector Developments (Concluded)

The financial services sector has on average contributed about 1 percentage point to total growth over the past decade.

Contribution of Financial Services Sector to Growth 1/
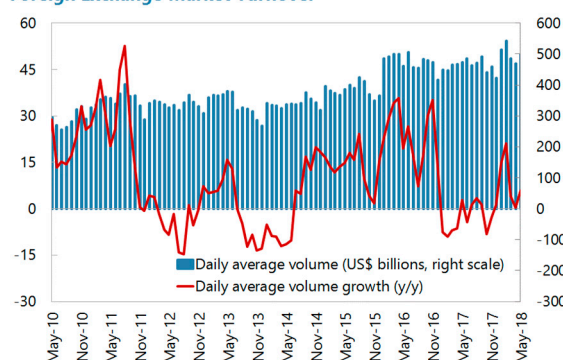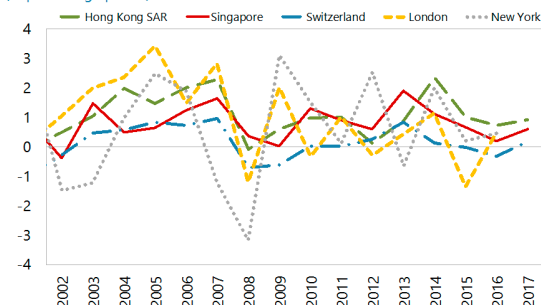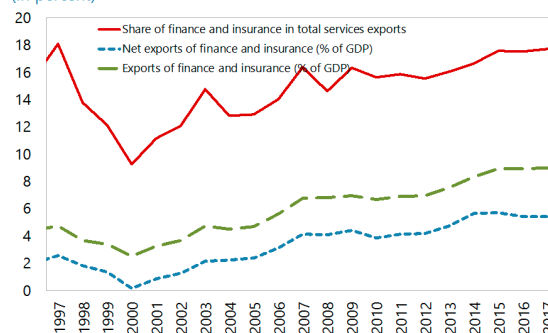(In percentage points)

Sources: CEIC Data Co., Ltd.; and IMF staff calculations.
1/ Latest available data for London and New York are as of 2016.

Financial services activity in Singapore started to recover in 2017 as global risk sentiment stabilizes.

Growth in Financial Services Sector and the VIX Index
(In percent)

Sources: Bloomberg L.P.; CEIC Data Co., Ltd.; and IMF staff calculations.

Cross-border banking activity in Singapore is dominated by East Asian and European regions.

Share of East Asia and Europe in Asian Dollar Market, 2010-2018
(In percent of total cross-border funding and assets 1/)
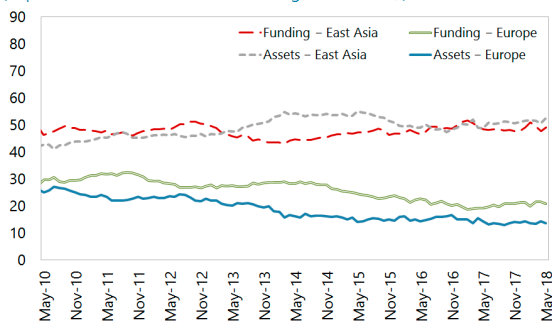
Sources: Monetary Authority of Singapore.; and IMF staff calculations.
1/ Cross-border funding/assets include nonbank deposits/loans to nonbank clients and amounts due to/from banks.

Financial services exports have increased gradually and reached 9 percent of GDP in 2017.
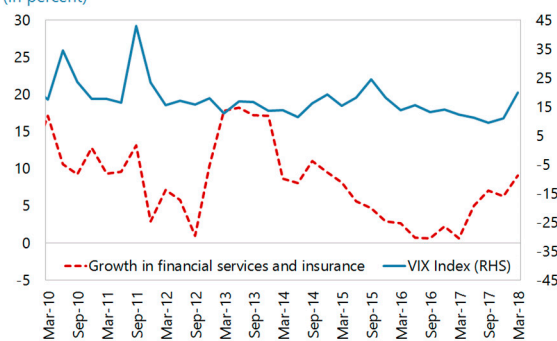
Finance and Insurance Services Exports
(In percent)

Sources: CEIC Data Co., Ltd.; and IMF staff calculations.

Financial services activity in Singapore has been usually correlated with economic activity in ASEAN-5 countries.

Growth in ASEAN-5 and Financial Services and Insurance Value-Added in Singapore

Sources: CEIC Data Co., Ltd.; and IMF staff calculations.

Net lending to nonbank customers in East Asia has increased, and bank funding from both East Asia and Europe have increased in recent quarters.

Asian Dollar Market: Composition of Lending/Funding Positions For East Asia and Europe
(In millions of U.S. dollar)
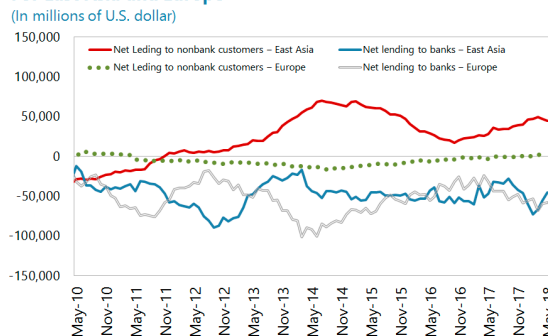
Sources: Monetary Authority of Singapore; and IMF staff calculations.

Figure 4. Singapore: Banking Sector Developments

Banking sector assets grew at a slower pace in 2017.

Banking Sector, Combined Assets
(In billions of Singapore dollars)
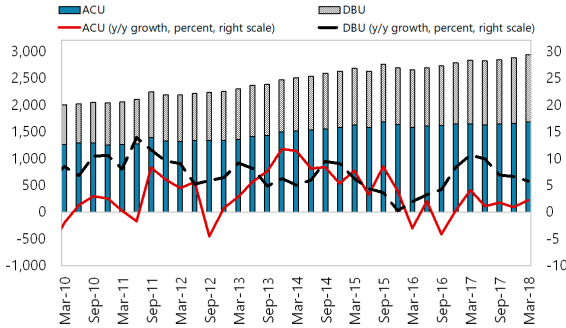
Source: CEIC Data Company Ltd.; and IMF staff calculations.

Property-market related loans, housing loans and loans to the building and construction sectors, account for about 30 percent of total domestic non-bank loans.

Nonbank Loans by Sector, Apr 2018
(In percent of total)
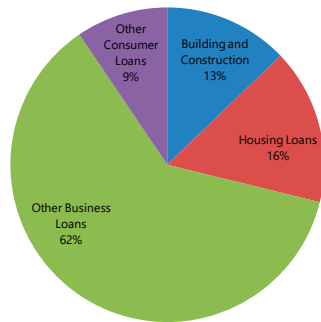
Sources: CEIC Data Co. Ltd.; and IMF staff calculations.

Cross-border loans to nonbanks in US and East Asia rose sharply, while the demand from EU remained strong.

Nonbank Lending by Region
(In percent, year-on-year)
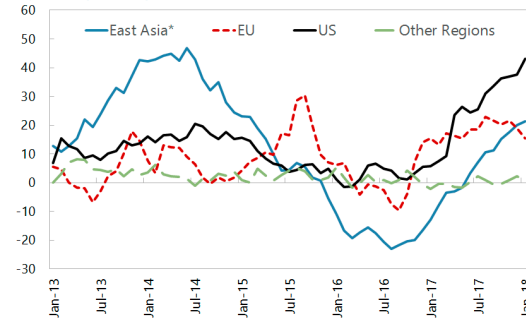
Sources: CEIC Data Co. Ltd.
*Consists of China, Hong Kong, Japan, South Korea, Taiwan and ASEAN (excluding Singapore).

Non-bank deposits and interbank funding from outside Singapore are important funding sources for banks.

Funding Structure of the Banking System, 2017
(In billions of Singapore dollars)
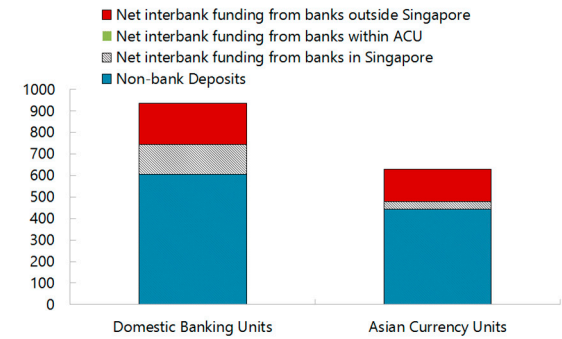
Sources: Haver Analytics, and IMF staff calculations.

Domestic non-bank loan growth in 2017 was supported by credit to general commerce and financial institutions.

Contribution to Domestic Bank Loans to Business by Sector
(In percent, year-on-year)
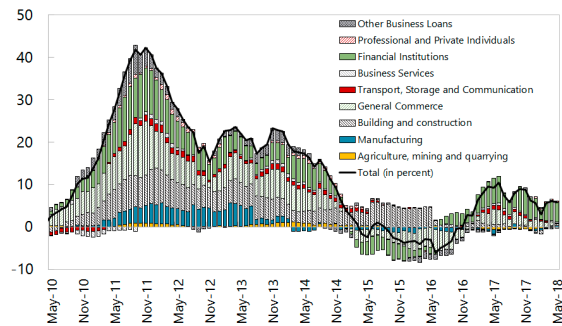
Sources: CEIC Data Co. Ltd.; and IMF staff calculations.

The banking sector's foreign currency loan to deposit ratio has increased.

Banking Sector: Loan to Deposit Ratio
(In percent)
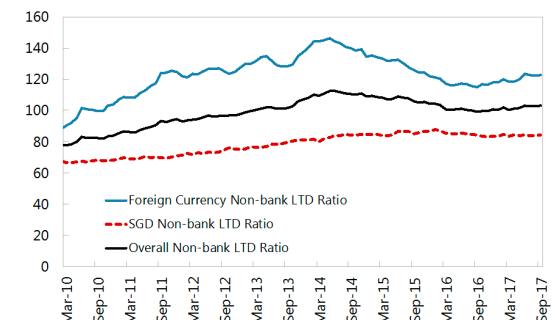
Source: 2016 Financial Stability Review, Monetary Authority of Singapore.

Figure 5. Singapore: Housing Market Developments

The house price-to-income ratio is trending downwards.

Median Private Housing Prices
(Price per sq. ft of non-landed units in each region, as a share of overall annual househould income at the 71st-80th percentile)

Sources: CEIC Data Co. LTD., and IMF staff calcluation

Transactions in the private market accelerated in 2017 to the highest since the previous peak in 2012, as public housing resale transactions continue the gradual increase.

Private and Public Residential Transaction
(Units)

Sources: CEIC Data Co. Ltd. and IMF staff calcluations.

Supply bottlenecks owing to rapid population growth with limited new housing supply...

Housing Supply and Population
(In thousands, left scale; and ratio, right scale)
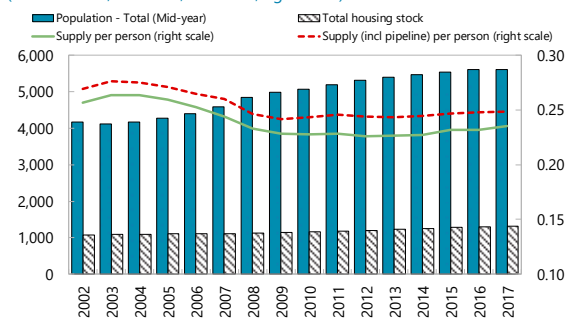
Sources: CEIC Data Co., Ltd.; and IMF staff calculations.
Note: Public housing stock for 2017 is an estimate assuming no changes from 2016.

The house price-to-rent ratio has moved up in the last few quarters.

House Price to Rent Ratio
(Index; 2009Q1=100)

Sources: CEIC Data Co., Ltd.; and IMF staff calculations.

The private vacancy ratio is still elevated, although it declined slightly in 2017.

Housing Stock and Vacancy
(Thousands of units; Percent of total stock)

Sources: CEIC Data Co. Ltd., and IMF staff calculations.
Note: Public housing stock for 2017 is an estimate assuming no changes from 2016.

...look set to ease as a pipeline of housing supply is expected to come on the market in the coming years.

Upcoming Private Residential Supply Pipeline,1 st Quarter 2018
(In percent of 2017 private housing stock)
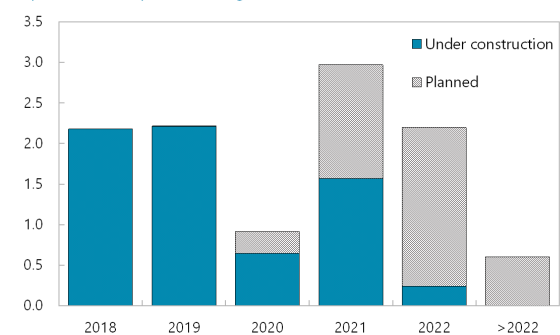
Source: Singapore, Urban Redevelopment Authority (URA).

Figure 5. Singapore: Housing Market Developments (Concluded)

Household debts, including housing loans, have flattened in recent years.

Household debt
(In percent of GDP)

Sources: Haver Analytics, and IMF staff calcluations.

Though household debt-to-GDP ratio is elevated, ...

Household Debt
(In percent of GDP)

Sources: Bank for International Settlements; and Singapore Department of Statistics.
Note: Latest data for Singapore is 2017Q4 and for other countries 2017Q2.
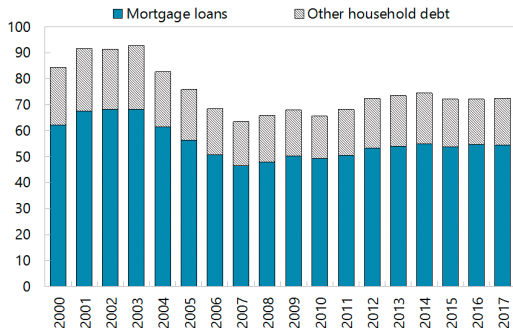
... households' balance sheet is strong with their total net worth reaching close to 400 percent of GDP, ...

Household Net Wealth
(In billions of Singapore dollars, left scale; and in percent, right scale)

Sources: Singapore, Department of Statistics; and IMF staff calculations.

... and financial assets, or currency and deposits alone, are enough to cover current debt outstanding in aggregate.

Household Financial Wealth and Debt Outstanding
(In percent of GDP)
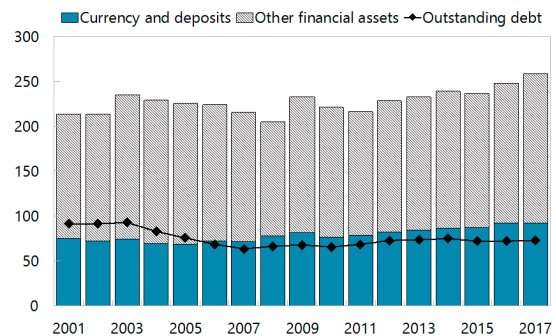
Sources: Haver Analytics, IMF staff calcluations

Banks' exposure to private housing loans has been stable.

Local Banks' Loans by Type of Borrowers
(In percent of local banks' total assets)
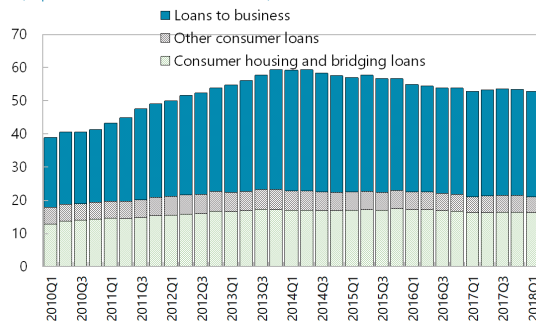
Sources: Haver Analytics and IMF staff calcluations.

Asset quality of housing loans remains relatively strong.

Housing Loans
(In percent)
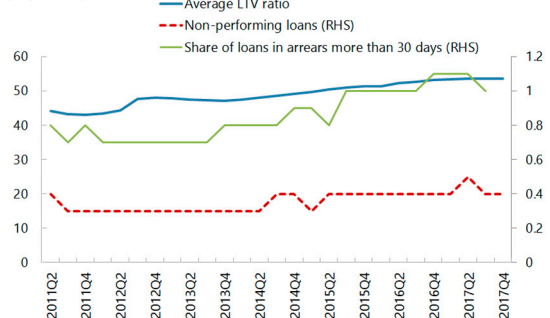
Source: 2017 Financial Stability Review, Monetary Authority of Singapore; CEIC Data Co. Ltd.

Figure 6. Singapore: External Sector

The current account surplus has averaged close to 19 percent of GDP over 2014-17, lower than its post-GFC peak.

Current Account Balance
(In percent of GDP)

Source: Haver Analytics.

NIIP reached 248 percent of GDP in 2017, due to positive valuation effects and continued significant current account surplus.

NIIP Position and Valuation Changes
(In percent of GDP)
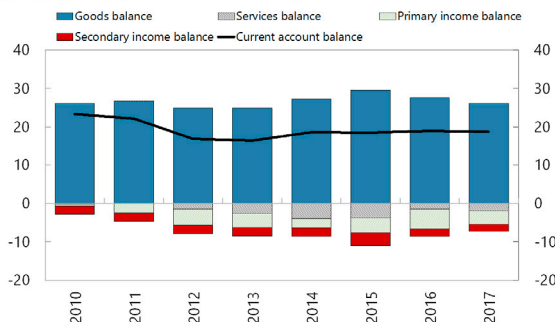
Sources: Singapore, Department of Statistics; CEIC Data Co. Ltd.; and IMF staff calculations.
Note: Ratio to GDP is based on US dollar values.

Singapore has a net asset position in portfolio assets and a net liability position in FDI holdings. Overall net international investments, as a share of GDP, have increased further.

International Investment Position
(In percent of GDP)
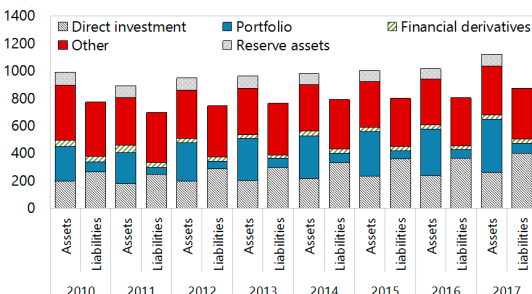
Sources: Singapore, Department of Statistics; Haver Analytics; and IMF staff calculations.
Note: Ratio to GDP is based on US dollar values.

Both gross official reserves and MAS' net long FX position in the forwards and futures market increased steadily in 2017.

Central Bank: Gross Official Reserves and Net Foreign Currency Position in Forwards and Futures
(In billions of U.S. dollars)

Source: Haver Analytics.

The financial account is characterized by net FDI inflows and net portfolio outflows. Total net outflows were lower in 2017.

Financial Account Balance by Type of Investment
(In percent of GDP)
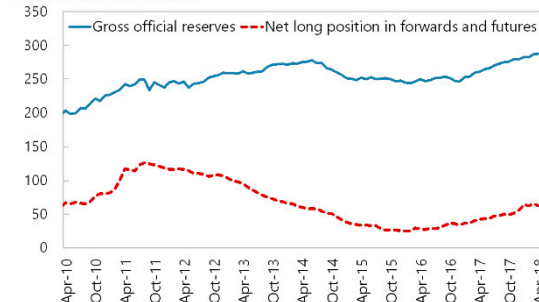
Sources: CEIC Data Co. Ltd.; and IMF Staff calculations.
Note: Under the BPM6 methodology, a negative entry implies net inflows.

Official flows account for most of the financial outflows.

Financial Account Net Flows by Sector
(In percent of GDP)
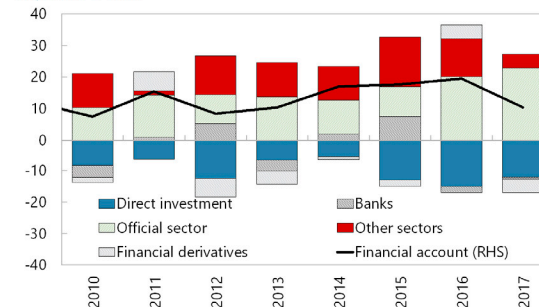
Sources: CEIC Data Co. Ltd.; and IMF staff calculations.
Note: Under the BPM6 methodology, a negative entry implies net inflows.

Figure 7. Singapore: Spillovers

Singapore depends mainly on foreign final demand from the EU and the US, while China, Japan, Indonesia and India are important partners in the region.

Value Added in Foreign Final Demand versus Gross Exports
(In percent of total, 2011)
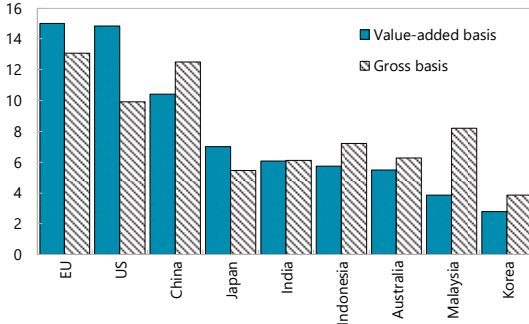
Source: OECD-WTO, *Trade in Value Added (TiVA)* database.

Singapore has large portfolio assets, which would make its external balance sheet vulnerable to shocks in the US and several regional economies such as China and India.

Composition of Singapore's Portfolio Investment Assets
(In percent of total, Dec 2016)
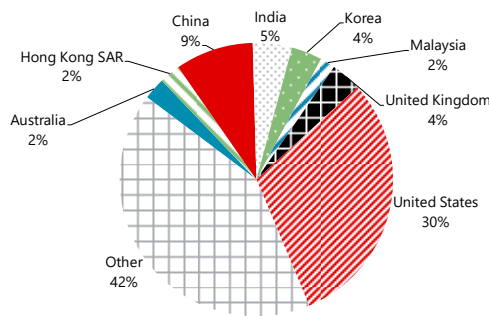
Source: IMF, *Coordinated Portfolio Investment Survey (CPIS).*

East Asia is the largest user of funds and likely to experience outward spillovers from Singapore, in the event of a banking sector stress in Singapore.

ACU Use of Funds by Region, Apr 2018
(In perent of total)
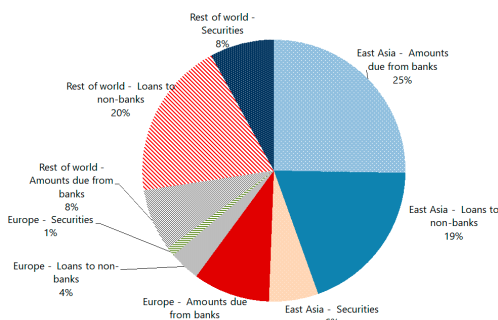
Source: Monetary Authority of Singapore, *Monthly Statistical Bulletin.*

FDI stocks are also dominated by the EU and the US and are mainly concentrated in the finance and insurance sector.

FDI to Singapore by Source Country
(In percent of total stock, end 2016)
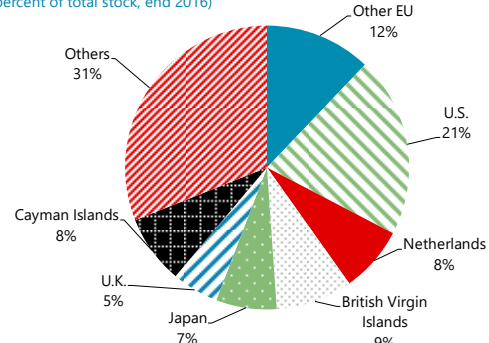
Sources: Singapore, Department of Statistics; and IMF staff caclulations.

Major sources of funding for Singapore's financial center include East Asian and European banks, followed by deposits from East Asian nonbanks.

ACU Funding Sources by Region, Apr 2018
(In percent of total)
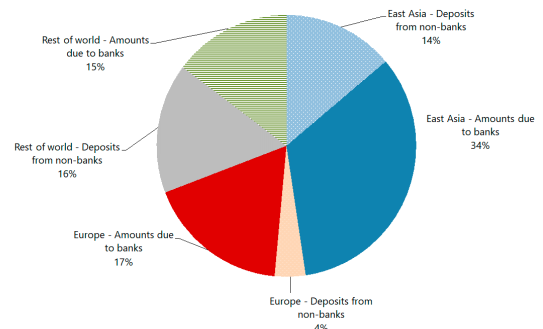
Source: Monetary Authority of Singapore, *Monthly Statistical Bulletin.*

Cross-border exposures of domestic banks in Greater China and other Asian economies remain near their post-GFC highs, leading to higher spillovers from the region.

Cross-Border Exposures of Domestic Banks 1/
(In percent of total loans)
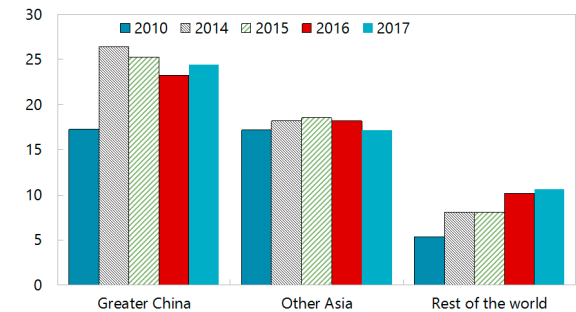
Sources: Banks' financial reports and annual reports; and IMF staff estimates.
1/ Classification varies by bank. OCBC, location of credit risk; DBS, location of borrower incorporation; and UOB, booking location.

Figure 8. Singapore: Social and Equality Indicators

Industry-wide average monthly earnings increased by 3 percent in 2017, representing a steady rise in average earnings since the GFC.

Nominal Wages by Industry 1/
(Index 1999=100; excluding employers' contributions to CPF)
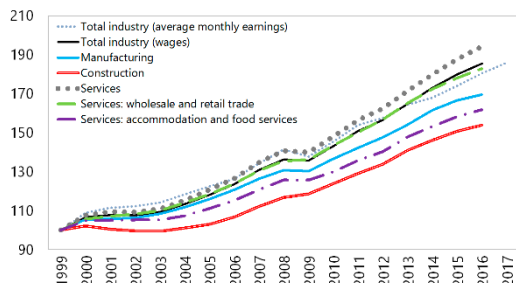
Sources: Haver Analytics; and IMF staff calculations.
1/ Based on wage changes granted by private sector establishments (with at least 10 employees) to full-time resident employees with continuous employment of at least a year. Wages are inclusive of bonuses.

Median household income continues on an upward trend, rising at 2.6 percent compound annual real rate since the GFC.

The U.S. and Singapore: Mean and Median Household Income 1/
(2000=100)
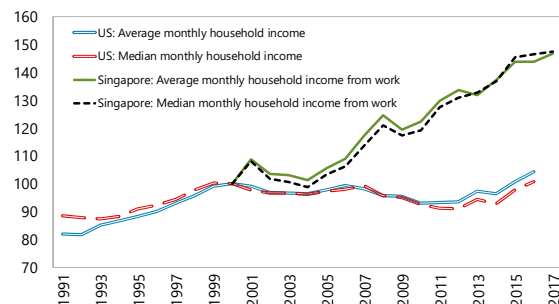
Sources: Singapore, Department of Statistics; Haver Analytics; and IMF staff calculations.
1/ For Singapore data on resident households and includes contributions from employers to CPF. Data for the U.S. are as of 2016.

Lower rate of inflation has helped everybody, but the bottom 20 percent has gained the most in recent years.

Inflation by Income Group
(Year-on-year percent change)

Sources: Singapore, Department of Statistics; and IMF staff calculations.

Median wages for low-skilled workers grew at a faster pace in recent years; at 4.9 percent compound annual rate since 2013.

Weighted Gross Monthly Median Wages
(In Singapore Dollars; full-time employed residents, excluding employer's CPF contributions)

Sources: Singapore, Ministry of Manpower; and IMF staff calculations.
1/ Mid-skilled comprises clerical support workers; sales and service workers; craftsmen; plant and machine operators; and assemblers.
2/ Low-skilled comprises cleaners; laborers; and related workers.
3/ High-skilled comprises managers and administrators; working proprietors; professionals; and technicians.

While largely stagnant during 2000–06, real incomes of lower income groups have recently increased at a faster pace in the last one decade.

Average Monthly Real Household Income by Decile 1/

Decile	2000	2017	Cumulative Change (in percent) 2000–2017	2000–2006	2006–2017
Total	1,735	2,907	67.6	18.5	41.5
1st-10th	315	400	26.9	-6.6	35.8
11th-20th	537	788	46.8	1.1	45.2
21st-30th	720	1,153	60.2	9.2	46.7
31st-40th	911	1,478	62.2	10.6	46.6
41st-50th	1,119	1,837	64.2	12.0	46.6
51st-60th	1,366	2,260	65.4	13.4	45.9
61st-70th	1,669	2,770	66.0	14.8	44.5
71st-80th	2,093	3,494	66.9	17.2	42.5
81st-90th	2,821	5,006	77.5	25.0	42.0
91st-100th	5,801	10,536	81.6	31.0	38.6
Memo:					
Top dec/bottom dec	18.4	26.4			

1/ Income from work per household member in employed households. Household income from work includes employer CPF contributions. Deflated by CPI for the respective income group (lowest 20 percent, middle 60 percent, top 20 percent).
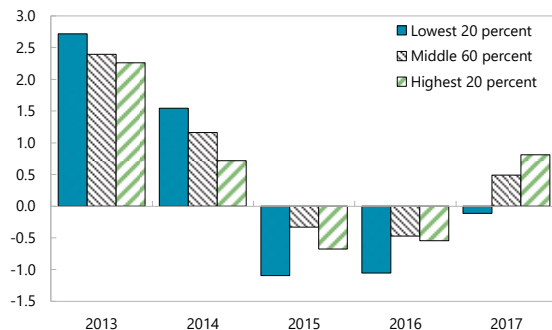
Government policies (taxes and benefit payments) have also contributed to a reduction in inequality.

United States and Singapore: Gini 1/
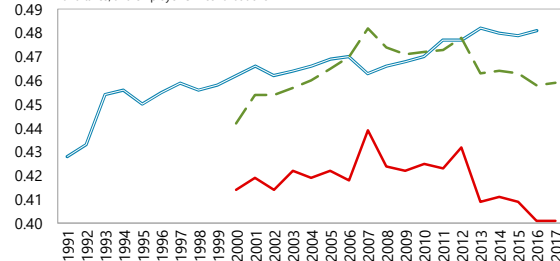
Sources: Singapore, Department of Statistics; and Haver Analytics.
1/ Data for the U.S. are as of 2016.

Figure 9. Singapore: Demographic Transition

Old-age dependency is projected to increase significantly in the medium to long term.

Old-Age Dependency Ratio and Population Growth
(In percent)
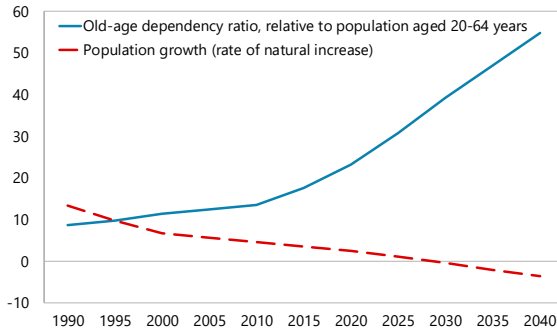
Source: United Nations, World Population Prospects, 2017 Revisions.

The average number of children per woman is among the lowest in the world.

Total Fertility, 2010-2015
(Children per woman)
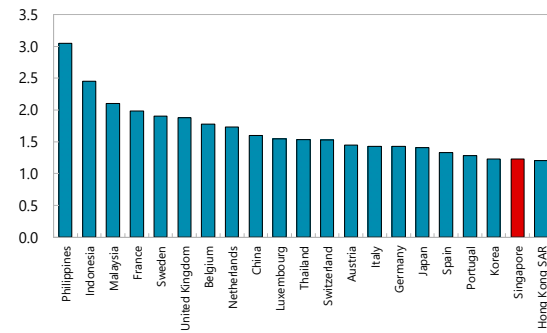
Source: United Nations, World Population Prospects, 2017 Revisions.

Labor force growth declined further in 2017, following a trend deceleration in recent years that has happened after a period of very strong growth during 2005–2009...

Labor Force Growth Rate
(Year-on-year percent change)
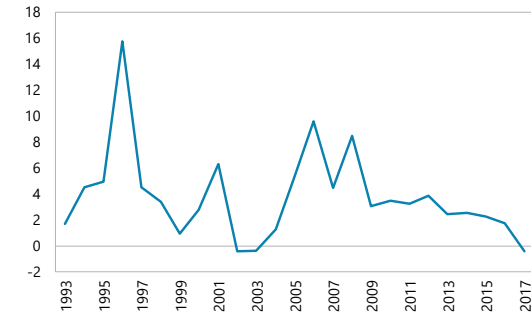
Sources: CEIC Data Co. Ltd.; and IMF staff calculations.

Singapore's aging speeds is among the highest in the region and advanced economies across the world.

Aging Speed Comparison: Change Between 2010 and 2030
(In percent)
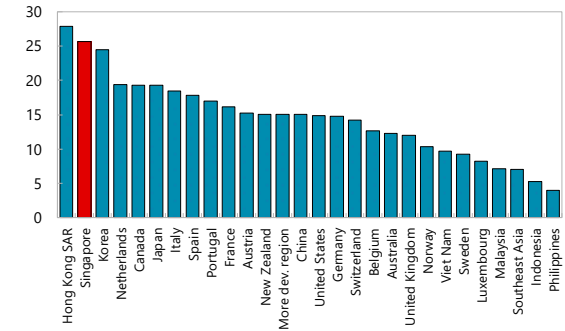
Source: United Nations, World Population Prospects, 2017 Revisions.

Labor force participation rates have risen over the years, particularly for the elderly and women in prime working age. But there is scope for further increase in participation rates for prime working age women.

Resident Labor Force Participation Rate by Gender and Age
(In percent)
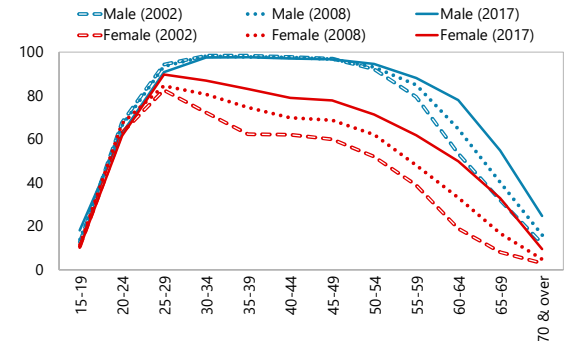
Source: CEIC Data Co. Ltd.

...contributing to an increase in the capital to labor ratio.

Capital to Labor Ratio and Investment
(Index, 1991=100, LHS; In percent of GDP, RHS)
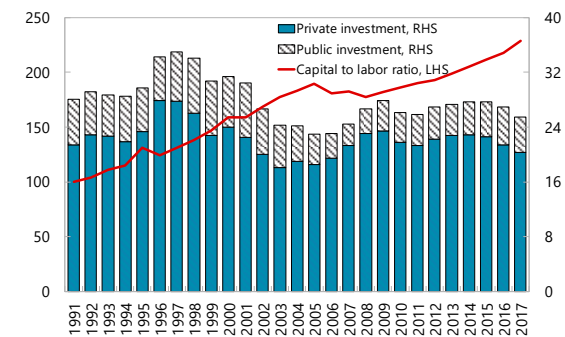
Sources: Singapore, Department of Statistics; CEIC Data Co. Ltd.; and Haver Analytics.

Table 1. Singapore: Selected Economic and Financial Indicators, 2013–19

Nominal GDP (2017): US$324 billion
Population (June 2017): 5.61 million
GDP per capita (2017): US$57,737
Main goods exports (2017, percent of total exports): Electronic products (33 percent); mineral fuels (18 percent); and chemical products (14 percent).
Top three destinations for goods exports (2017, percent of gross goods exports): China (14 percent); Hong Kong SAR (12 percent); and Malaysia (11 percent).

| | 2013 | 2014 | 2015 | 2016 | 2017 | Projections | |
						2018	2019
Growth (percentage change)							
Real GDP	5.1	3.9	2.2	2.4	3.6	2.9	2.7
Total domestic demand	5.2	2.3	0.5	3.1	5.4	3.0	2.4
Final domestic demand	5.7	3.8	4.3	1.1	1.4	3.9	3.8
Consumption	5.2	2.7	5.6	2.1	3.3	3.6	3.5
Private consumption	3.6	3.4	4.9	1.7	3.1	3.4	3.5
Gross capital formation	5.3	1.8	-7.0	4.8	8.7	1.9	0.8
Gross fixed investment	6.5	5.5	2.2	-0.6	-1.8	4.4	4.3
Change in inventories (contribution to GDP growth, percentage points)	-0.2	-1.0	-2.7	1.5	2.9	-0.6	-0.9
Net exports (contribution to GDP growth, percentage points)	1.5	1.6	2.3	2.0	-0.7	0.9	1.0
Saving and investment (percent of GDP)							
Gross national saving	47.2	48.8	45.7	46.0	46.5	46.4	45.8
Gross domestic investment	30.7	30.2	27.1	27.0	27.6	28.2	27.9
Inflation and unemployment (period average, percent)							
CPI inflation	2.4	1.0	-0.5	-0.5	0.6	1.0	1.3
CPI inflation, excluding food and energy 1/	2.7	0.6	-0.7	-0.9	-0.1	0.4	1.3
MAS core inflation 1/	1.7	1.9	0.5	0.9	1.5	1.6	1.9
Unemployment rate	1.9	2.0	1.9	2.1	2.2	2.0	1.9
Central government finances (percent of GDP) 2/							
Revenue	21.6	21.2	21.4	21.9	22.6	21.9	21.8
Expenditure	14.6	15.4	17.7	18.1	18.0	18.9	20.0
Net lending/borrowing	7.0	5.8	3.6	3.8	4.6	3.0	1.9
Budget balance (government's definition)	0.2	2.4	1.5	3.3	0.7	2.4	1.0
Primary balance 3/	0.0	-0.6	-2.4	-1.8	-1.1	-2.8	-3.6
Money and credit (end of period, percent change)							
Broad money (M2)	7.9	7.6	4.0	8.4	4.1	3.9	4.0
Credit to private sector	15.5	7.0	2.5	5.5	3.6	2.9	2.7
Three-month S$ SIBOR rate (percent)	0.4	0.5	1.2	1.0	1.5	...	...
Balance of payments (US$ billions)							
Current account balance	50.3	58.2	56.5	58.8	61.0	63.6	65.7
(In percent of GDP)	16.5	18.7	18.6	19.0	18.8	18.2	18.0
Goods balance	76.1	85.0	89.8	85.5	84.7	87.3	91.9
Exports, f.o.b.	447.6	440.0	384.1	363.0	396.8	441.9	463.5
Imports, f.o.b.	-371.5	-354.9	-294.4	-277.6	-312.1	-354.6	-371.5
Financial account balance 4/	31.5	52.9	53.8	60.6	33.7	52.3	58.1
Overall balance 4/	18.2	6.8	1.1	-1.8	27.4	11.3	7.6
Gross official reserves (US$ billions)	273.1	256.9	247.7	246.6	279.9	294.0	301.9
(In months of imports) 5/	6.3	6.7	6.8	6.1	6.1	6.1	6.1
Singapore dollar/U.S. dollar exchange rate (period average)	1.25	1.27	1.37	1.38	1.38	...	...
Nominal effective exchange rate (percentage change) 6/	2.6	0.9	-0.3	0.9	0.2	...	...
Real effective exchange rate (percentage change) 6/	2.7	-0.3	-2.0	-1.0	-1.0	...	...

Sources: Data provided by the Singapore authorities; and IMF staff estimates and projections.

1/ IMF staff estimates. For MAS core inflation, staff projections from 2018.
2/ IMF staff estimates on a calendar year basis following GFSM 2014.
3/ Overall balance excluding capital receipts and net investment return contribution (NIRC).
4/ Following the BPM6 sign convention, a positive entry implies net outflows.
5/ In months of following year's imports of goods and services.
6/ Increase is an appreciation.

Table 2. Singapore: Balance of Payments, 2013–19 1/

	2013	2014	2015	2016	2017	Projections 2018	2019
			(In billions of U.S. dollars)				
Current account balance	50.3	58.2	56.5	58.8	61.0	63.6	65.7
Goods balance	76.1	85.0	89.8	85.5	84.7	87.3	91.9
Exports, f.o.b.	447.6	440.0	384.1	363.0	396.8	441.9	463.5
Imports, f.o.b.	-371.5	-354.9	-294.4	-277.6	-312.1	-354.6	-371.5
Services balance	-7.7	-12.5	-11.6	-4.5	-6.1	-9.8	-12.5
Exports	143.3	156.0	155.2	157.9	164.7	182.5	189.8
Imports	-151.0	-168.4	-166.8	-162.5	-170.8	-192.4	-202.3
Primary income balance	-11.6	-7.4	-11.5	-16.0	-11.5	-7.4	-6.9
Receipts	65.9	68.2	67.5	72.0	76.3	83.2	87.0
Payments	-77.5	-75.7	-78.9	-88.0	-87.8	-90.6	-93.9
Secondary income balance	-6.5	-6.9	-10.3	-6.1	-6.1	-6.5	-6.8
Capital and financial account balance	31.5	52.9	53.8	60.6	33.7	52.3	58.1
Capital account (net)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Financial account (net)	31.5	52.9	53.8	60.6	33.7	52.3	58.1
Direct investment	-20.0	-17.1	-39.5	-46.3	-39.0	-42.3	-44.4
Assets	44.4	52.4	31.1	27.9	24.7	28.1	30.9
Liabilities	64.5	69.5	70.6	74.3	63.6	70.3	75.3
Portfolio investment	63.6	45.1	59.3	27.1	34.3	53.2	59.0
Assets	62.1	49.2	53.9	32.0	47.5	73.7	81.8
Liabilities	-1.5	4.1	-5.4	4.9	13.2	20.5	22.7
Other investment and financial derivatives	-12.1	24.9	34.0	79.8	38.3	41.4	43.5
Net errors and omissions	-0.7	1.5	-1.6	0.0	0.1	0.0	0.0
Overall balance	18.2	6.8	1.1	-1.8	27.4	11.3	7.6
Memorandum items:							
Current account as percent of GDP	16.5	18.7	18.6	19.0	18.8	18.2	18.0
Goods balance as percent of GDP	25.0	27.3	29.5	27.6	26.2	25.0	25.2
Re-exports as percent of GDP	66.7	64.9	60.8	56.8	57.2	...	...
Net international investment position							
In billions of U.S. dollars	606	585	622	667	804	...	...
In percent of GDP	199	188	205	215	248	...	...

Sources: Monetary Authority of Singapore, *Economic Survey of Singapore*; and IMF staff estimates and projections.

1/ Data for the current account balance, the capital and financial account balance, and net errors and omissions are converted to U.S. dollars from the official presentation in Singapore dollars using period-average exchange rates. The official presentation has adopted the sign convention for assets and liabilities in line with BPM6 manual.

Table 3. Singapore: Monetary Survey, 2013–19 1/

	2013	2014	2015	2016	2017	Projections 2018	2019
	(In billions of Singapore dollars, end of period)						
Net foreign assets	434	458	502	506	531	546	556
Monetary authorities	341	344	353	353	372	387	397
Banks	93	115	149	153	160	160	160
Domestic credit	745	800	823	864	901	928	951
Claims on resident private sector	640	685	702	741	767	790	812
Claims on central government	105	115	121	123	133	138	140
Other items (net)	-509	-535	-573	-556	-584	-593	-591
M2	671	722	751	814	848	881	916
M1	241	262	279	294	310	323	335
Quasi-money	430	461	472	520	538	559	581
	(Annual percentage change)						
Domestic credit	13.0	7.3	2.9	5.0	4.3	3.0	2.5
Claims on private sector	15.5	7.0	2.5	5.5	3.6	2.9	2.7
M2	7.9	7.6	4.0	8.4	4.1	3.9	4.0
	(Contribution to M2 growth, in percentage points)						
Net foreign assets	4.4	3.5	6.1	0.6	3.1	1.8	1.1
Domestic credit (net)	13.8	8.1	3.2	5.5	4.5	3.2	2.6
Claims on private sector	13.8	6.6	2.4	5.1	3.3	2.7	2.5
Claims on central government (net)	0.0	1.4	0.8	0.4	1.2	0.6	0.2
Other items (net)	-10.3	-4.0	-5.2	2.3	-3.5	-1.1	0.2
Memorandum items:							
Total loans to nonbanks (annual percentage change) 2/	19.2	9.2	-0.3	0.2	8.0	...	...
To residents (annual percentage change) 3/	14.7	6.8	4.0	5.0	3.2	...	...

Sources: Monetary Authority of Singapore; and IMF staff estimates.

1/ Based on domestic banking units (DBUs) and Asian currency units (ACUs).
2/ Total loans of DBUs and ACUs to both residents and nonresidents.
3/ For ACUs, data are converted to Singapore dollar using end-of-period exchange rate.

Table 4. Singapore: Indicators of Vulnerability, 2013–2018Q1

	2013	2014	2015	2016	2017	2018Q1
Financial sector indicators						
Broad money (M2, percent change, y/y, end of period)	7.9	7.6	4.0	8.4	4.1	3.1
Private sector credit (percent change, y/y, end of period)	15.5	7.0	2.5	5.5	3.6	3.4
Credit to the property sector (percent change, y/y, end of period) 1/	11.8	9.0	8.2	3.1	2.3	2.5
Share of property sector credit in total nonbank credit (percent, end of period) 1/	44.9	46.3	50.7	50.8	49.2	49.0
Credit rating of local banks (S&P) 2/	AA-	AA-	AA-	AA-	AA-	AA-
Three-month S$ SIBOR (percent, end of period)	0.4	0.5	1.2	1.0	1.5	1.4
NPL ratio (local banks, percent, latest available) 3/ 4/	1.0	0.9	1.1	1.4	1.6	...
Capital adequacy ratio of local banks (percent, latest available) 4/	16.4	15.9	15.9	16.9	16.4	...
Asset market indicators (end of period)						
Stock prices (percent change, y/y)	0.0	6.2	-14.3	-0.1	18.3	8.0
P/E ratio	13.1	12.6	12.8	14.1	17.6	17.9
Stock prices of the finance sector (percent change, y/y)	-1.1	10.3	-12.8	1.1	30.0	19.3
Real estate prices (percent change, y/y)						
Private residential (4-quarter average)	3.2	-2.9	-3.9	-3.1	-1.1	0.9
Private residential (end of period)	1.1	-4.0	-3.7	-3.1	1.1	5.4
Office space (4-quarter average)	4.9	3.2	2.5	-1.9	-5.2	-2.9
Industrial space (annual average)	10.5	2.5	-0.6	-7.0	-7.6	-6.3
External indicators						
Current account balance (US$ billion)	50.3	58.2	56.5	58.8	61.0	15.6
In percent of GDP	16.5	18.7	18.6	19.0	18.8	17.9
Gross official reserves (US$ billion, end of period)	273.1	256.9	247.7	246.6	279.9	287.1
In months of next year's imports of goods and services	6.3	6.7	6.8	6.1	6.1	6.2
Real effective exchange rate (index, 2010=100, end of period)	114.2	112.5	110.2	108.5	108.4	107.1

Sources: Data provided by the Singapore authorities; and IMF, *Information Notice System*.

1/ For domestic banking units (DBU).
2/ Ratings of the three major local banks.
3/ In percent of global nonbank loans.
4/ Data for 2017 are as of end-September.

Table 5. Singapore: Medium-Term Scenario, 2013–23

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
						Projections					
Real growth (percent change)											
GDP	5.1	3.9	2.2	2.4	3.6	2.9	2.7	2.7	2.6	2.6	2.6
Total domestic demand	5.2	2.3	0.5	3.1	5.4	3.0	2.4	3.6	3.6	3.4	3.6
(Contribution to GDP growth, in percent)	3.9	1.7	0.3	2.2	3.9	2.2	1.8	2.6	2.6	2.5	2.7
Final domestic demand	5.7	3.8	4.3	1.1	1.4	3.9	3.8	3.9	3.6	3.6	3.6
Consumption	5.2	2.7	5.6	2.1	3.3	3.6	3.5	3.9	3.9	3.9	3.9
Private	3.6	3.4	4.9	1.7	3.1	3.4	3.5	4.0	4.0	4.0	4.0
Public	11.4	0.2	7.8	3.5	4.1	4.4	3.3	3.3	3.3	3.3	3.3
Gross capital formation	5.3	1.8	-7.0	4.8	8.7	1.9	0.8	3.1	3.1	2.7	3.1
Gross fixed investment	6.5	5.5	2.2	-0.6	-1.8	4.4	4.3	3.9	3.2	3.3	3.2
Private	7.8	4.5	1.0	-3.0	-1.6	2.2	2.7	3.3	2.9	2.9	2.9
Public	0.6	10.6	8.2	10.0	-2.6	13.1	9.8	5.7	4.5	4.6	4.3
Change in inventories 1/	-0.2	-1.0	-2.7	1.5	2.9	-0.6	-0.9	-0.1	0.0	-0.1	0.0
Net exports 1/	1.5	1.6	2.3	2.0	-0.7	0.9	1.0	0.1	0.0	0.1	0.0
Saving and investment (percent of GDP)											
Gross national savings	47.2	48.8	45.7	46.0	46.5	46.4	45.8	45.5	45.3	44.6	44.0
Government 2/	10.8	9.9	8.7	8.1	9.6	7.9	6.9	6.9	7.0	7.2	7.4
Private and other	36.4	39.0	37.0	37.9	36.8	38.4	38.9	38.6	38.3	37.3	36.6
Gross capital formation	30.7	30.2	27.1	27.0	27.6	28.2	27.9	27.8	27.9	27.9	28.0
Government 3/	4.4	4.8	5.0	5.2	4.6	5.2	5.7	5.8	5.9	6.0	6.1
Private and other	26.3	25.3	22.1	21.8	23.0	22.9	22.2	22.0	22.0	21.9	21.9
Inflation and unemployment											
(period average, percent)											
CPI inflation	2.4	1.0	-0.5	-0.5	0.6	1.0	1.3	1.3	1.3	1.3	1.3
CPI inflation, excluding food and energy 4/	2.7	0.6	-0.7	-0.9	-0.1	0.4	1.3	1.5	1.5	1.4	1.3
MAS Core inflation 4/	1.7	1.9	0.5	0.9	1.5	1.6	1.9	1.8	1.8	1.8	1.8
Unemployment rate	1.9	2.0	1.9	2.1	2.2	2.0	1.9	1.9	1.9	1.9	1.9
Output gap	1.0	0.9	-0.2	-0.1	0.9	0.9	0.7	0.6	0.4	0.2	0.0
Central government (percent of GDP) 5/											
Revenue	21.6	21.2	21.4	21.9	22.6	21.9	21.8	22.0	22.2	22.4	22.5
Expenditure	14.6	15.4	17.7	18.1	18.0	18.9	20.0	20.4	20.6	20.7	20.8
Net lending/borrowing	7.0	5.8	3.6	3.8	4.6	3.0	1.9	1.7	1.7	1.7	1.7
Primary balance 6/	0.0	-0.6	-2.4	-1.8	-1.1	-2.8	-3.6	-3.7	-3.7	-3.7	-3.8
Merchandise trade (percent change)											
Export volume	4.2	1.7	3.8	0.5	4.7	3.6	4.1	4.1	4.1	3.9	3.9
Import volume	3.4	-0.4	4.1	-0.5	6.4	3.4	4.2	4.0	4.0	4.0	4.0
Terms of trade	0.0	0.7	5.5	-0.8	-1.2	-2.2	0.2	0.6	0.5	0.0	0.0
Balance of payments (percent of GDP)											
Current account balance	16.5	18.7	18.6	19.0	18.8	18.2	18.0	17.7	17.4	16.7	16.0
Balance on goods and services	22.5	23.3	25.7	26.1	24.3	22.2	21.7	21.4	21.1	20.3	19.5
Exports, f.o.b.	147.0	141.2	126.3	117.2	122.5	126.5	126.8	126.3	126.0	124.7	123.2
Imports, f.o.b.	-122.0	-113.9	-96.8	-89.6	-96.4	-101.5	-101.7	-100.5	-99.7	-98.6	-97.3
Balance on primary and secondary income	-6.0	-4.6	-7.2	-7.1	-5.4	-4.0	-3.7	-3.8	-3.7	-3.6	-3.5
Overall balance	6.0	2.2	0.4	-0.6	8.5	3.2	2.1	2.0	2.1	2.8	2.7
Gross official reserves (US$ billions)	273	257	248	247	280	294	302	312	323	337	351
In months of imports 7/	6.3	6.7	6.8	6.1	6.1	6.1	6.1	6.0	6.0	6.0	6.0

Sources: Data provided by the Singapore authorities; and IMF staff estimates and projections.

1/ Contribution to GDP growth.
2/ Based on fiscal accounts data.
3/ Based on national accounts data.
4/ IMF staff estimates. For the MAS Core inflation measure, staff projections from 2018 onward.
5/ IMF staff estimates on a calendar year basis following GFSM 2014.
6/ Overall balance excluding capital receipts and net investment return contribution (NIRC).
7/ In months of next year's imports of goods and services.

Table 6. Singapore: Summary of Government Operations and Stock Positions 2014/15–2018/19 1/

	2014/15	2015/16	2016/17	2017/18		2018/19	
				Budget	Prel.	Budget 11/	Proj.
I. Statement of government operations							
				(In billions of Singapore dollars)			
Revenue	84.9	89.8	95.9	92.0	102.8	101.6	107.2
Taxes	54.1	55.6	58.7	59.4	65.5	63.3	64.0
Other revenue 2/	30.8	34.1	37.2	32.6	37.3	38.3	43.2
Expenditure	62.5	77.3	78.1	84.1	81.4	90.1	90.4
Expense	46.5	52.5	54.9	58.9	58.3	59.5	59.8
Compensation of employees	7.4	8.0	8.3	8.9	8.9	9.2	9.2
Use of goods and services	16.1	17.5	18.4	19.3	19.1	20.3	20.4
Expense not elsewhere classified	23.0	26.9	28.2	30.7	30.3	30.0	30.1
Grants, subventions & capital injections to organizations	7.9	9.4	10.6	12.5	12.5	12.4	12.7
Transfers	15.1	17.5	17.6	18.2	17.8	17.6	17.5
Net acquisition of nonfinancial assets	16.0	24.8	23.2	25.2	23.0	30.6	30.6
Of which: Development expenditure	15.3	20.8	20.2	20.4	19.6	24.3	24.3
Land-related expenditure	1.4	1.4	1.8	3.1	2.0	2.6	2.6
Gross operating balance	38.4	37.3	41.0	33.1	44.5	42.1	47.4
Net lending/borrowing	22.4	12.5	17.8	7.9	21.4	11.4	16.8
Net acquisition of financial assets	...	...	...	...	...	...	...
Net incurrence of liabilities	...	...	...	...	...	...	...
				(In percent of GDP)			
Revenue	21.2	21.4	22.1	20.3	22.7	21.5	21.6
Taxes	13.5	13.3	13.5	13.1	14.5	13.5	13.6
Other revenue 2/	7.7	8.1	8.6	7.2	8.2	8.0	8.0
Expenditure	15.6	18.4	18.0	18.6	18.0	19.2	19.3
Expense	11.6	12.5	12.7	13.0	12.9	12.7	12.7
Net acquisition of nonfinancial assets	4.2	5.3	5.1	5.2	4.8	5.7	5.7
Gross operating balance	9.6	8.9	9.4	7.3	9.8	8.8	8.9
Net lending/borrowing	5.6	3.0	4.1	1.7	4.7	2.3	2.4
Memorandum items:							
Primary balance 3/	-0.6	-2.4	-1.8	-2.8	-1.1	-2.9	-2.8
Cyclically-adjusted primary balance	-0.7	-2.3	-2.2	-3.0	-1.2	-3.1	-3.7
Expenditures on social development 4/	6.8	7.5	7.5	8.0	...	7.7	...
Land sales revenue	3.7	3.7	2.6	1.8	2.8	2.6	2.6
Spending from Endowment and Trust Funds	1.0	1.1	1.2	...	...	...	...
Fiscal impulse 5/	-0.1	2.2	0.5	0.8	-1.0	1.2	...
Authorities' budgetary accounts 6/							
Operating revenue (1)	15.2	15.5	15.9	15.4	16.6	15.5	...
Total expenditure (2)	14.1	16.1	16.4	16.6	16.3	17.0	...
Primary fiscal balance (3)=(1)-(2)	1.0	-0.6	-0.5	-1.2	0.3	-1.6	...
Special transfers (excl. transfers to endowment funds) (4)	1.0	1.0	0.6	0.6	0.5	0.4	...
Basic balance (5)=(3)-(4)	0.1	-1.7	-1.1	-1.8	-0.2	-2.0	...
Transfers to Endowment and Trust Funds (6)	2.1	1.4	0.8	0.9	0.9	1.6	...
Net investment returns contribution (7)	2.2	2.1	3.4	3.1	3.2	3.4	...
Overall balance (8)=(5)-(6)+(7)	0.1	-1.0	1.4	0.4	2.1	-0.1	...
II. Stock positions							
				(In billions of Singapore dollars, unless otherwise indicated)			
Gross financial assets 7/	878	941	997	...	...	...	...
Gross debt 8/	387	421	463	...	502	...	...
Gross debt (in percent of GDP) 8/	98	101	108	...	112	...	...
Memorandum items:							
Government deposits at the Monetary Authority of Singapore 7/	115	124	79	...	65	...	...
Temasek asset holdings 7/ 9/	266	242	275	...	308	...	...
GIC asset holdings 10/	...	... more than 140		...		...	...

Sources: Data provided by the Ministry of Finance; and IMF staff estimates and projections.

1/ The fiscal year runs from April 1 through March 31. The presentation of the table is based on GFSM 2014.
2/ Includes revenue from land sales and net investment return
3/ Overall balance excluding capital receipts and NIRC.
4/ Includes development and operating expenditure on education, health, national development, environment and water resources, culture, community and youth, social and family development, communications and information, and manpower (financial security). Includes spending on social development purposes from endowment and trust funds set up by the government.
5/ The fiscal impulse is the change in the cyclically adjusted operational balance, excluding top ups to endowments and trust funds.
6/ The authorities' budgetary accounts are based on Singapore's Constitutional rules governing the protection of Past Reserves. It includes the net investment returns contribution, which reflects the amount of investment returns that is taken into the Budget. It excludes receipts such as proceeds from land sales and the remaining part of investment income that accrues to past reserves and cannot be used to fund government expenditures without the approval of the President. While such receipts are not reflected in the overall balance, the information is presented annually to Parliament and included in
7/ Gross asset stock figures are as at the end of March for each year as reported in the "Statement of Assets and Liabilities" in the budget document.
8/ Gross debt stock figures are as at the end of the calendar year. Government debt is issued to develop domestic capital markets and to provide an investment vehicle for the mandatory saving scheme.
9/ The government of Singapore is the sole equity shareholder of Temasek.
10/ GIC Pte. Ltd. (GIC) is a private company wholly owned by the government of Singapore.
11/ The IMF staff projection for GDP is used to calculate the numbers for the 2018/19 budget in the authorities' budgetary accounts in percent of GDP.

Table 7. Singapore: Financial Soundness Indicators—Local Banking Sector, 2013−2017Q3 1/

	2013	2014	2015	2016	2017 Q3
			(End of period; in percent)		
Capital adequacy ratio					
Regulatory capital to risk-weighted assets	16.4	15.9	15.9	16.5	16.4
Regulatory tier I capital to risk-weighted assets	13.8	13.6	13.7	14.3	14.6
Shareholders' equity to assets	8.4	8.6	9.1	9.3	9.2
Asset quality					
NPLs to nonbank loans	1.0	0.9	1.1	1.4	1.6
Total provisions to NPLs	135.4	152.5	130.8	101.5	96.1
Specific provisions to NPLs	34.8	32.6	26.2	29.5	35.7
Loan concentrations (in percent of total loans)					
Bank loans	15.5	14.0	12.7	12.8	13.9
Nonbank loans	84.5	86.0	87.3	87.2	86.1
Of which:					
Manufacturing loans	7.9	7.9	7.4	6.9	7.2
Building and construction loans	12.8	14.9	16.7	17.0	16.6
Housing loans	19.8	20.2	21.2	21.6	21.5
Loans to professionals and private individuals	8.4	9.0	9.1	9.1	9.2
Loans to nonbank financial institutions	8.8	7.2	6.9	7.3	7.7
Profitability					
After tax return on assets	1.0	0.9	1.0	0.9	0.9
After tax return on equity	11.5	10.3	10.8	8.9	9.7
Net interest margin	1.7	1.7	1.8	1.7	1.7
Non-interest income to total income	39.5	33.9	36.4	37.7	37.8
Liquidity (local banking groups)					
Loans to deposits ratio 2/	86.2	85.3	86.1	85.6	84.9

Source: Monetary Authority of Singapore.

1/ The data relates to local banking groups' global operations.
2/ Data in the last column refers to 2017.

Table 8. Singapore: International Investment Position, 2013–17

	2013	2014	2015	2016	2017
		(In billions of U.S. Dollars) 1/			
External assets	2,928	3,051	3,051	3,150	3,620
Direct investment	619	675	712	745	841
Portfolio investment	916	961	971	1,029	1,249
Equity securities	472	486	492	519	636
Debt securities	444	475	479	509	613
Other investment and financial derivatives	1,120	1,157	1,120	1,131	1,250
Reserve assets	272	258	248	246	280
External liabilities	2,322	2,466	2,428	2,484	2,816
Direct investment	897	1,027	1,090	1,123	1,285
Portfolio investment	196	208	174	189	238
Equity securities	164	173	144	146	189
Debt securities	32	35	29	43	49
Other investment and financial derivatives	1,229	1,231	1,165	1,172	1,293
Net international investment position	606	585	622	667	804
		(In percent of GDP) 1/			
External assets	962	979	1003	1017	1118
Direct investment	203	217	234	240	260
Portfolio investment	301	309	319	332	386
Equity securities	155	156	162	168	196
Debt securities	146	152	157	164	189
Other investment and financial derivatives	368	371	368	365	386
Reserve assets	89	83	82	80	86
External liabilities	763	792	799	802	869
Direct investment	295	330	358	363	397
Portfolio investment	64	67	57	61	74
Equity securities	54	56	47	47	58
Debt securities	10	11	10	14	15
Other investment and financial derivatives	404	395	383	378	399
Net international investment position	199	188	205	215	248

Sources: Singapore, Department of Statistics; and IMF staff calculations.
1/ IMF staff estimates using official data published in national currency.

Appendix I. Recent Labor Market Developments

1.   The labor force declined in 2017 for the first time since 2003. Growth in labor force had been slowing down since the Global Financial Crisis (GFC), reflecting a combined effect of slowing working-age population growth and stricter limits on use of immigrant labor in the last 5–6 years. The decline in labor force in 2017 was concentrated in the non-resident population, while growth in residents seeking employment decelerated. Resident labor force participation has not changed much in the last two years after growing steadily for several years on improved female labor force participation.

Singapore: Contributions to Labor Force Growth
(In percentage points)

Sources: CEIC Data Co. Ltd.; and IMF staff calculations.

Singapore: Labor Force Participation Rates for Residents
(In percent of working-age population)

Source: CEIC Data Co. Ltd.
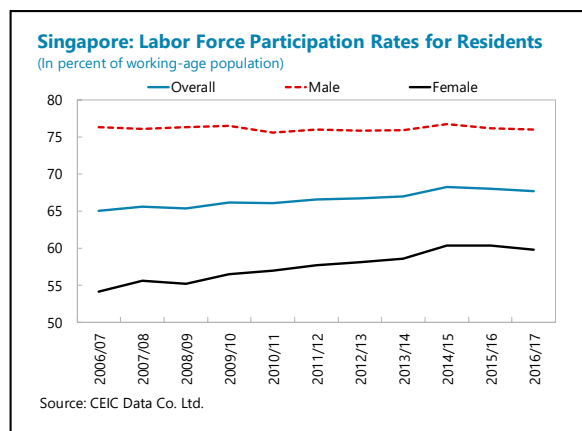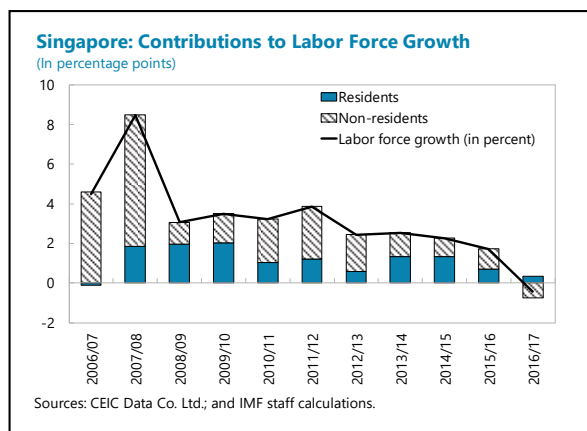
2.   Net changes in employment have slowed down considerably in the last three years. In 2017, total employment fell despite some increase in the fourth quarter on year-end seasonal demand in the services sector. Employment of residents grew, but remained below the levels seen prior to 2015. Total employment for foreign workers declined in 2017 and in 2018Q1, particularly for work permit holders in construction. Singapore uses a system of levies and dependency ceilings (maximum ratio of foreign workers to total workers) to manage inflows of certain categories of foreign workers. These mechanisms have been tightened in the last few years, with some exceptions (e.g., previously scheduled levy increases in the marine sector has not yet been implemented). Employment in manufacturing declined at a slower pace reflecting higher demand, while changes in services sector employment were similar to 2016. Both manufacturing and constructions sectors continued to shed employment in 2018Q1.

Singapore: Change in Employment by Residency
(In thousands)

Source: Singapore, Ministry of Manpower.

Singapore: Change in Employment by Industry
(In thousands)

Source: Singapore, Ministry of Manpower.
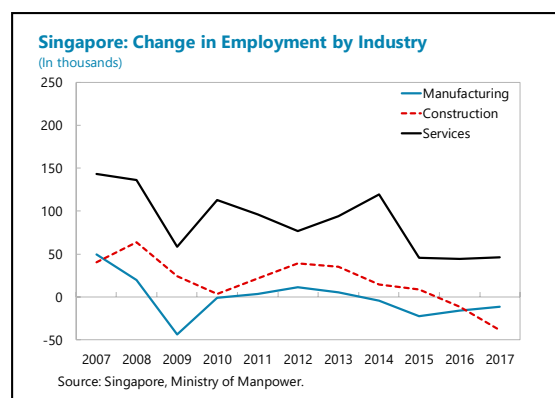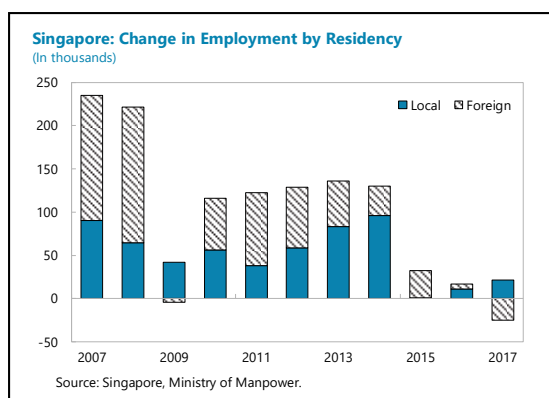
3.   The unemployment rate has remained largely stable. Reflecting the developments in supply of and demand for labor, the overall unemployment rate was largely unchanged in 2017. However, by 2018Q1, unemployment rates for Singapore residents and citizens had fallen from their early-2017 peaks as they saw a faster increase in employment. The ratio of job vacancies to unemployed persons ratio has steadily improved since early 2017, reaching slightly above unity in 2018Q1, which indicates that the labor market slack has reduced.

Singapore: Unemployment Rate
(In percent, seasonally adjusted)

Source: CEIC Data Co. Ltd.

Singapore: Job Vacancies to Unemployed Persons Ratio
(Seasonally adjusted)

Source: Singapore, Ministry of Manpower.
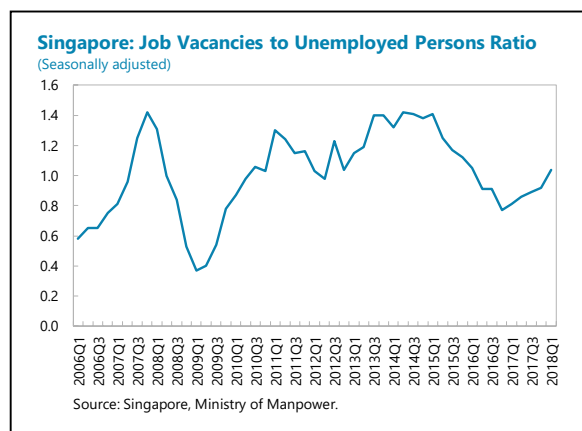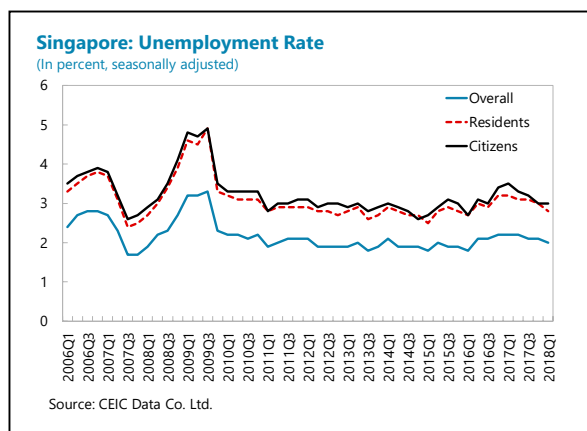
4.   Labor productivity improved in 2017. On the back of a strong performance in the manufacturing sector, value-added per actual hours worked grew by 4.5 percent in 2017 for the entire economy, highest since 2010. Labor productivity increased at a double-digit rate in the manufacturing sector, and it also noticeably improved in wholesale and retail trade; transportation and storage services; and business services sub-sectors. Productivity growth slowed down in the construction sector and declined in information and communication, and accommodation and food services sub-sectors. Workers' earnings increased, but productivity gains helped keep unit labor cost under control, particularly in the manufacturing sector.

Singapore: Value Added per Actual Hours Worked
(Year-on-year change, in percent)

Sources: CEIC Data Co. Ltd.; and IMF staff calculations.

Singapore: Unit Labor Cost
(Year-on-year percent change in 4-quarter moving average, end of period)

Sources: Haver Analytics; and IMF staff calculations.

	Singapore	Overall Assessment
Foreign asset and liability position and trajectory	**Background.** The net international investment position (NIIP) increased to 248 percent of GDP in 2017, reaching the highest level since 2009 (though still lower than pre-GFC peak of 265 percent of GDP in 2006). Current account (CA) surplus has been a main driver since the GFC, although in 2017 valuation effects also contributed significantly to the increase of NIIP. CA and growth projections imply that the NIIP will rise over the medium term. **Assessment.** The external balance sheet is not a major source of risk. Potential vulnerabilities posed by the large gross non-FDI liabilities (473 percent of GDP in 2017)—predominantly cross-border deposit taking by foreign bank branches—are mitigated by banks' large short-term external assets and authorities' close monitoring of banks' liquidity risk profiles. However, given Singapore's status as a financial center, global financial conditions should be carefully monitored. Singapore has large official reserves and other official liquid assets. 2/	**Overall Assessment**: The external position in 2017 was *substantially stronger than what is consistent with fundamentals and desirable policies*. The current account balance was similar to the previous year. The assessment for 2017 and the size of the imbalance are subject to a wide range of uncertainty, reflecting Singapore's very open economy and position as a global trading and financial center. **Potential policy responses**: Singapore's economy is undergoing structural transformation in light of rapidly aging population and challenges posed by transition to a new digital economy. Higher public investment addressing these issues, investments in physical infrastructure, human capital, and public health-care related expenditure would help moderate the current account imbalances over the medium term by lowering net public saving. Structural reforms also aim at improving labor productivity, which support a trend appreciation of the currency. The gradual normalization of monetary policy recently initiated by MAS will help rebalancing by allowing gradual appreciation of the NEER over time.
Current account	**Background.** The CA surplus of 19 percent of GDP in 2017, similar as in 2016, reflects a strong goods balance that is partly offset by deficits in the services and income account balances. 3/ The oil trade deficit widened in 2017. 4/ Structural factors and policies that boost savings, such as Singapore's status as a financial center, limited social safety net, high income inequality and the rapid pace of aging combined with a mandatory defined-contribution pension scheme (whose asset were about 70 percent of GDP in 2015) are the main drivers of Singapore's high saving rate and strong external position. Fiscal policy has been associated with increased social and infrastructure spending in recent years. If this trend continues, it will contribute to a lower CA surplus over the medium term. **Assessment.** Singapore is a small, very open economy with a large positive NIIP and high income per capita, but it is aging rapidly. Such non-standard factors make a quantitative assessment of its CA subject to a wide range of uncertainty. Guided by the EBA framework, staff assesses the 2017 CA as substantially higher than the level consistent with fundamentals and desirable policies, by 2.5–8.5 percent of GDP. /5 The fiscal balance contributed about 2 percent of GDP to the identified policy gap.	

CA Assessment 2017	Actual CA	18.8	Cycl. Adj. CA	18.9	EBA CA Norm	--	EBA CA Gap	--	Staff Adj.	--	Staff CA Gap	5.5

Real exchange rate	**Background.** The real effective exchange rate (REER) depreciated by 1 percent y/y in 2017 due to low inflation in Singapore, while the nominal effective exchange rate (NEER) appreciated by 0.2 percent y/y. This followed depreciation of REER by 3 percent and appreciation of NEER by 0.6 percent, both in cumulative, between 2014 and 2016. Estimates through April 2018 show that the REER has depreciated by 0.6 percent relative to the 2017 average. **Assessment.** Notwithstanding the nonstandard factors that make a quantitative assessment difficult, staff assesses that the REER is 4-16 percent weaker than warranted by fundamentals and desirable policies. This assessment is subject to a wide range of uncertainty about both the underlying CA assessment and the semi-elasticity of the CA with respect to REER.	
Capital and financial accounts: flows and policy measures	**Background.** Singapore has an open capital account. The financial account deficit tends to rise during periods of lower uncertainty in global financial markets. It reflects in part reinvestment abroad of income from the foreign assets of the official sector. Financial flows also encompass sizable net inward FDI and smaller but more volatile net bank-related flows. 6/ In 2017, the deficit on the capital and financial account narrowed substantially to 10 percent of GDP, compared to the large deficits of 17-20 percent in 2014-16. This reflects the decrease in outflows in other investments (driven by inflows to banks) and resumed inflows in financial derivatives. As a trade and financial center in Asia, changes in market sentiment in emerging and low-income countries in the region can affect Singapore significantly. **Assessment.** The financial account is likely to remain in deficit as long as the trade surplus remains large.	
FX intervention and reserves level	**Background.** With the NEER as the intermediate monetary policy target, intervention is undertaken to achieve inflation and output objectives. Official reserves held by the Monetary Authority of Singapore (MAS) reached US$ 280 billion (86 percent of GDP) in 2017. As a financial center prudential motives call for a large NIIP buffer also in the form of reserves. **Assessment.** In addition to FX reserve held by the MAS, Singapore also has access to other official foreign assets managed by Temasek and the GIC. 7/ The current level of official external assets appear adequate, even after considering prudential motives, and there is no clear case for further accumulation for precautionary purposes.	

Singapore (continued)
Technical Background Notes	1/ Staff estimates in US dollar terms. Valuation changes have been an important driver of changes in the NIIP, given the large gross assets and liabilities. 2/ Singapore's official reserves held by the Monetary Authority of Singapore (MAS) amounted to about 86 percent of GDP in 2017. 3/ Singapore has a negative income balance despite its large positive NIIP position. This reflects the lower rate of return on its foreign assets relative to the return paid on its foreign liabilities. The lower return on foreign assets may reflect the fact that the composition of Singapore's assets is tilted toward safer assets which yield lower returns. 4/ Singapore is a net oil importer, with a net oil trade deficit of about 2 percent of GDP in 2017. The oil trade deficit would be smaller if one considers the high imported petroleum product content in Singapore's exports of petrochemicals and other oil intensive products and services like water transportation. In addition, Singapore has some sectors that are closely linked to investment in the oil sectors such as production of oil rigs. The decline in investment in the oil sector is expected to reduce Singapore's exports of these products. 5/ Nonstandard factors make quantitative assessment of Singapore's external position difficult and subject to significant uncertainty. Singapore is not included in the sample used to estimate the EBA models because it is an outlier along several dimensions (e.g., large external asset and liability positions, highly positive NFA position). Estimates from regression models that are guided by the EBA CA framework suggest that Singapore's CA surplus is mainly explained by the high level of productivity, fiscal surplus, and its large NFA position. The model estimated CA gap is about 5.5 percent of GDP (relative to cyclically-adjusted level of the CA of about 18.9 percent of GDP in 2017 and norm of about 13.4 percent of GDP). Identified policy gaps under the regression models are driven largely by the need for more fiscal spending to strengthen the social safety net. 6/ The latter is the result of considerably large gross inflows and outflows. 7/ The reserves-to-GDP ratio is also larger than in most other financial centers, but this may reflect in part that most other financial centers are in reserve-currency countries or currency unions. External assets managed by the government's investment corporation and wealth fund (GIC and Temasek) amount to at least 70 percent of GDP.

Appendix III. Financial Conditions and Growth-at-Risk in Singapore

In a globally-integrated financial system, economic developments can be affected by domestic and external financial conditions. Financial conditions also serve as a useful predictor for downside risks to GDP growth and detecting the buildup of financial vulnerabilities (Adrian et al., 2016). Using a country-specific Financial Conditions Index (FCI) for Singapore, we find that the FCI is a good leading indicator of GDP, and that external financial conditions play an important role in explaining GDP growth in Singapore.

1. **Financial Conditions Index (FCI) refers to the ease of obtaining funding and summarizes information about the price, terms and conditions, and other costs associated with obtaining credit for various agents in the economy, including households and small businesses.** Based on a wide range of financial variables, the FCI is an unobservable (latent) variable which reflects borrowing conditions by domestic households and firms. In particular, a factor-augmented vector autoregression with time-varying parameters (TVP-FAVAR) model based on Koop and Korobilis (2014) is employed.[1] The FCI includes information which can be grouped into three main categories: the domestic price of risk (such as asset returns and volatility), credit aggregates (such as private sector leverage), and external conditions (such as commodity prices).[2]

2. **Financial conditions in Singapore are strongly influenced by external factors, reflecting its status as a global financial center.** Building on IMF (2017a; 2017b), the FCI estimated for Singapore is shown in Figure 1.1. Decompositions of the FCI are seen in Figure 1.2 and 1.3. Major events such as the Asian financial crisis (1997–98) and the global financial crisis (2007–09) are clearly reflected in Singapore's FCI by sharp contractions in global financial conditions. In addition, other episodes such as the European sovereign debt turmoil and the taper tantrum are noticeable. These dynamics could potentially capture the substantial presence of international banks, the elevated level of financial intermediation, and the central role of Singapore in channeling cross-border capital flows.

3. **External conditions and leverage-based indicators have recently led to a relaxation of financial conditions.** External conditions, leverage-, and price-based indicators explained on average about 40, 20, and 15 percent of the FCI in 2017, while the remainder was captured by

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[1] The main features of the TVP-FAVAR model include the joint modeling of a large set of financial variables, changing weights over time, and purging shocks that originate outside the financial sector such as the business cycle. As a robustness check, an alternative FCI is estimated using principal component analysis (PCA).

[2] The full set includes 17 variables: term spread, corporate spread, interbank spread, sovereign spread, equity returns, equity historical volatility, house price returns, real long-term rate, exchange rate SGP dollar to US dollar, domestic commodity price inflation, equities trading volume, equity and bond market capitalizations, financial sector share (change), private credit growth, credit-to-GDP ratio (change) and banking sector vulnerability. Bank vulnerability, financial sector share, trading volume, equity market capitalization, and bond market capitalization are included in the "Other" category. In the case of Singapore which is a global financial center and where capital account openness is very high, global risk sentiment is well reflected in local market volatility. Data sources and variable partitioning are presented in Annex Tables 1 and 2, respectively.

other factors such as equity market capitalization and trading volume (Figure 1.4). Interestingly, the share in the overall FCI of price-based indicators such as equity market volatility and corporate spreads has picked up at the end of the year, at the expense of external indicators, potentially reflecting the unusual risk-on environment in Q4 2017.

Figure 1. Singapore: Financial Condition Index (FCI)

1. FCIs – Different Estimations
(Index, 0=neutral, +/-=tighten/loosen)
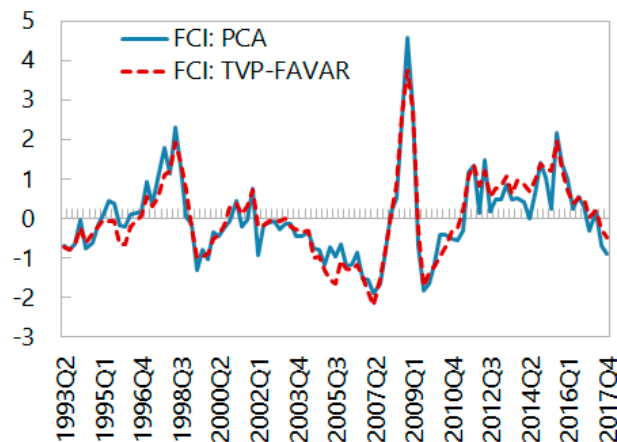
2. Individual Contributions to FCI
(Index, 0=neutral, +/-=tighten/loosen)
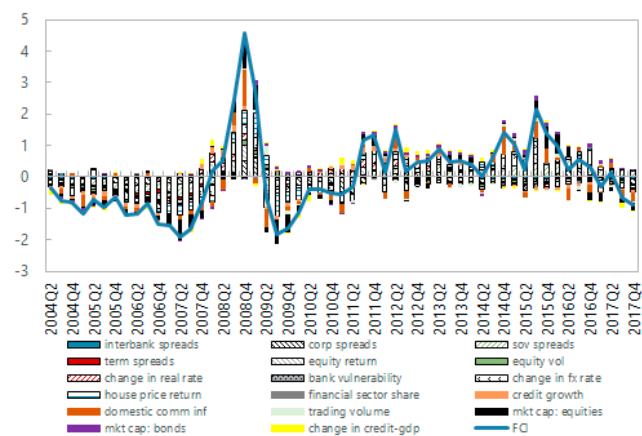
3. Aggregated Contributions to FCI
(Index, 0=neutral, +/-=tighten/loosen)
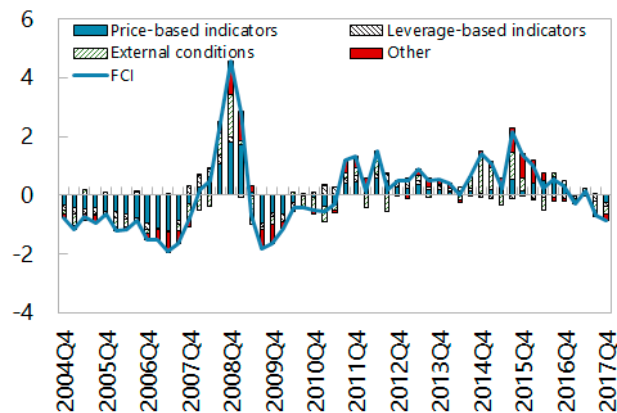
4. Share of FCI contributions (2017)
(Average)
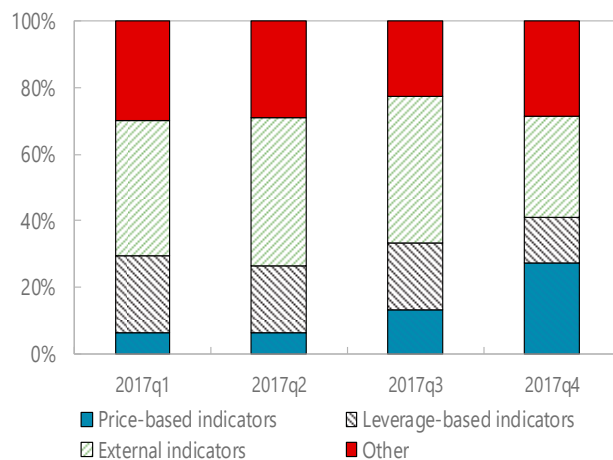
Source: IMF staff calculations.
Notes: The FCI is normalized to have zero mean and a standard deviation of one over the estimated period 1990Q1:2017Q4. In panel 1, two different estimations were considered: principle component analysis (PCA) and TVP-FAVAR model based on Koop and Korobilis (2014). In panels 2-4, the FCI based on PCA estimation is decomposed into its contributors, taking into account the estimated factor loadings.

4.   Tighter financial conditions were associated with a decline in output growth (Figure 2.1). Most of the forward-looking information is embedded in asset prices (such as stock market prices and corporate bond spreads) and leverage dynamics (e.g., buildup of private sector debt), and thus FCIs are considered a good predictor of the conditional volatility and mean of GDP growth. In addition, tail risks to future GDP growth, and more broadly, the entire growth distribution, could be estimated for Singapore by calibrating a reduced-form model with factors such as financial conditions (Adrian et al., 2016).

5.   Relying on different moments, the predicted growth distribution for one year ahead closely tracks the realized growth (Figure 2.2). Quantile regression models are calibrated to the real growth rates in Singapore based on coefficients' significance and goodness-of-fit statistics.[3] The benchmark model of growth one year ahead is a function of Singapore's past growth rate, changes in financial conditions, and changes in real house prices. The model is further augmented by China's past growth rate, which seems to provide additional predictive power. Based on the benchmark model, the interquartile interval of the forecasted real growth ranges from 2.1 to 6.5 percent at the end of 2018, with the median rate at 3.5 percent.

6.   In terms of risk assessment, the growth-at-risk analysis points to lower probability of recession in 2018 compared to 2017. As depicted in Figure 2.3, the left tail of the growth distribution was fatter in 2017 and the recession probability which is the distribution area at the left of the vertical bar was larger compared to 2018. The probability of recession declined from 14.9 in 2017 to about 8 percent in 2018. The probability of recession in 2018 is projected below the 12 percent historical average.[4] As shown in Figure 2.4, different model specifications point to a similar conclusion, with comparable patterns in terms of recession probability forecast.[5] However, as pointed out in the IMF (2018), prolonged accommodative financial conditions might breed seeds for a global recession down the road, with an elevated probability of recession three years ahead.

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[3] Quantile regression results are presented in Table 3. For robustness purposes other models have been employed (Table 4). Throughout this paper, the forecast horizon is four quarters ahead (i.e., h=4). For more details regarding the methodology see Technical Appendix.

[4] The recession is defined here as negative year-on-year real GDP growth rate.

[5] Three models were considered for this exercise: Model 1 includes FCI Overall (change), China's GDP growth, and residential house prices (growth rate); Model 2 includes FCI Overall (change), and residential house prices (growth rate); Model 3 includes FCI prices, FCI leverage, and FCI external. All three models include the autoregressive term (Singapore's GDP growth). All regressors are lagged four quarters.

Figure 2. Singapore: Growth-at-Risk

1. FCI and Real GDP Growth

(GDP growth = right-axis, in percent)

- FCI (In standard deviations, inverted, LHS)
- GDP growth (average of y/y based on quarterly data, RHS)
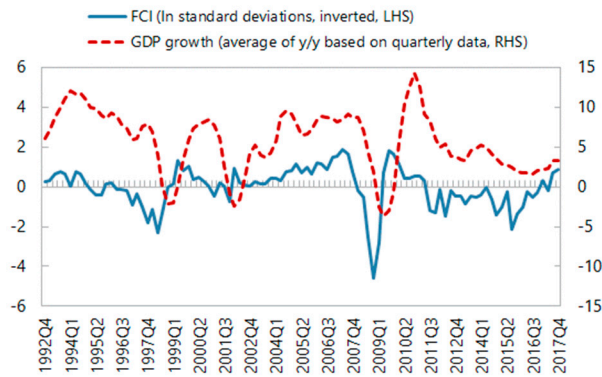
2. Forecasted GDP Growth Distribution

(Percent, 1-year ahead)

0.1   0.5   0.9   ·Realized Growth
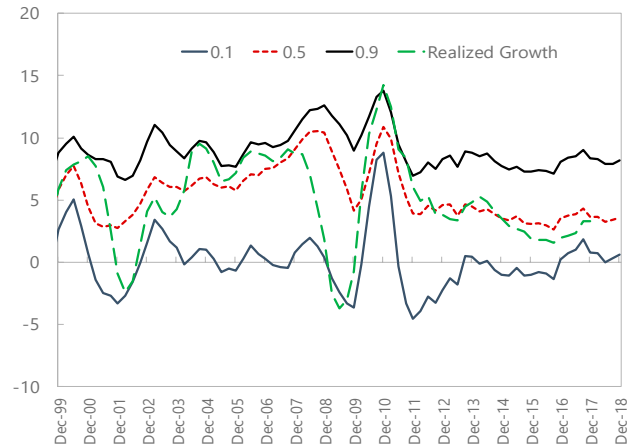
3. Growth-at Risk Density

Recession

2017   2018
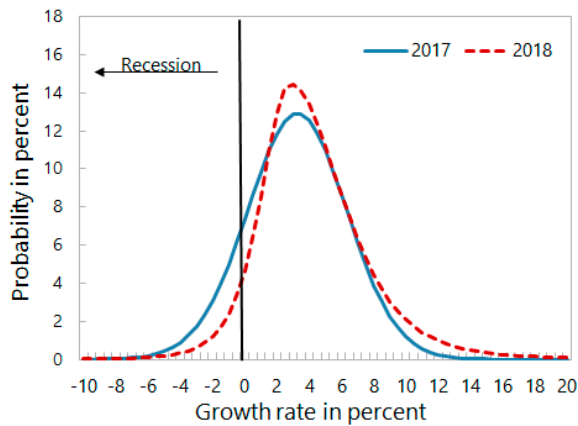
4. Probability of Recession

(One-year ahead)

Model 1   Model 2   Model 3   ·Average
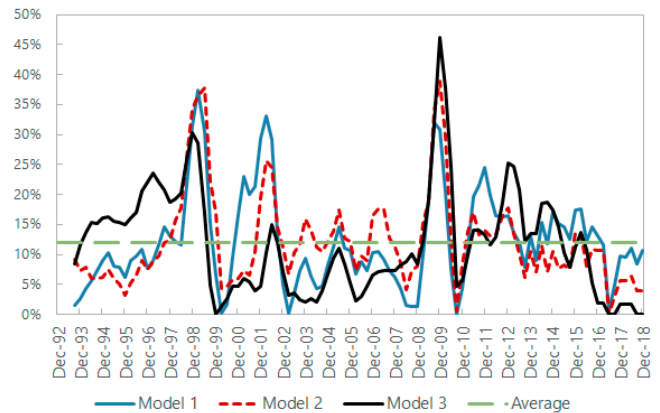
Source: IMF staff calculations.

Notes: In panel 2, 0.1, 0.5, and 0.9 denote 10th, 50th, and 90th percentile of the forecasted growth distribution, respectively. In panel 4, average (dotted red line) is the overall average across all three models and over time, which is about 12 percent. Three-quarter moving averages are depicted. See main text for model specification.

Table 1. Data Sources

Variables	Description	Source
Domestic-Level Variables		
Term Spreads	Yield on 10-year government bonds minus yield on three-month Treasury bills	Bloomberg Finance L.P.; IMF staff
Interbank Spreads	Interbank interest rate minus yield on three-month Treasury bills	Bloomberg Finance L.P.; IMF staff
Change in Long-Term Real Interest Rate	Percentage point change in the 10-year government bond yield, adjusted for inflation	Bloomberg Finance L.P.; IMF staff
Corporate Spreads	Corporate yield of the country minus yield of the benchmark country. JPMorgan CEMBI Broad is used for emerging market economies where available	Bloomberg Finance L.P.; Thomson Reuters Datastream
Equity Returns (local currency)	Log difference of the equity indices	Bloomberg Finance L.P.
House Price Returns	Log difference of the house price index	Bank for International Settlements; Haver Analytics; IMF staff
Equity Return Volatility	Exponential weighted moving average of equity price returns	Bloomberg Finance L.P.; IMF staff
Change in Financial Sector Share	Log difference of the market capitalization of the financial sector to total market capitalization	Bloomberg Finance L.P.
Credit Growth	Percent change in the depository corporations' claims on private sector	Bank for International Settlements; Haver Analytics; IMF, International Financial Statistics database
Sovereign Spreads	Yield on 10-year government bonds minus the benchmark country's yield on 10-year government bonds	Bloomberg Finance L.P.; IMF staff
Banking Sector Vulnerability	Expected default frequency of the banking sector	Moody's Analytics, CreditEdge; IMF staff
Exchange Rate Movements	Change in US dollar per national currency exchange rate.	Bloomberg Finance L.P.; IMF, Global Data Sources; IMF, International Financial Statistics.
Domestic Commodity Price Inflation	A country-specific commodity export price index constructed following Gruss 2014, which combines international commodity prices and country-level data on exports and imports for individual commodities. Change in the estimated country-specific commodity export price index is used.	Bloomberg Finance L.P.; IMF, Global Data source; United Nations, COMTRADE database; IMF staff
Trading Volume (equities)	Equity markets' trading volume, calculated as level to 12-month moving average	Bloomberg Finance L.P.
Market Capitalization (equities)	Market capitalization of the equity markets, calculated as level to 12-month moving average	Bloomberg Finance L.P.; Thomson Reuters Datastream
Market Capitalization (bonds)	Bonds outstanding, calculated as level to 12-month moving average	Dealogic; IMF staff
Change in Credit to GDP	Change in credit provided by domestic banks, all other sectors of the economy, and nonresidents (in percent of GDP)	Bank for International Settlements; Haver Analytics; IMF staff
Controls (real variables)		
Real GDP Growth	Percent change in GDP at constant prices	IMF, World Economic Outlook database
Inflation	Percent change in the consumer price index	Haver Analytics; IMF, International Financial Statistics database

Table 2. Underlying FCI Variables by Category			
Price-based indicators	**Leverage-based indicators**	**FX and commodities**	**Other**
Interbank Spreads	Credit Growth	Exchange Rate Movements	Change in Financial Sector Share
Corporate Spreads	Change in Credit to GDP	Domestic Commodity Price Inflation	Banking Sector Vulnerability
Sovereign Spreads			Trading Volume (equities)
Term Spreads			Market Capitalization (equities)
Equity Returns (local currency)			Market Capitalization (bonds)
Equity Return Volatility			
Change in Long-Term Real Interest Rate			
House Price Returns			

Table 3. Quantile Regressions: Main Results

	Quantile	Value	Std. Error	t.value	P-value	GoF test (P-value)	Pseudo R squared
(Intercept)	0.1	-0.0315	0.0560	-0.56	0.58	0	0.21
FCI overall (change)	0.1	-0.1202	0.0425	-2.83	0.01	0	0.21
Real GDP CHN (yoy growth)	0.1	0.6194	0.6776	0.91	0.36	0	0.21
Real GDP SGP (yoy growth)	0.1	-0.4735	0.4004	-1.18	0.24	0	0.21
Residential HP (yoy growth)	0.1	0.0141	0.1000	0.14	0.89	0	0.21
(Intercept)	0.25	-0.0542	0.0238	-2.28	0.02	0.01	0.21
FCI overall (change)	0.25	-0.0741	0.0206	-3.60	0.00	0.01	0.21
Real GDP CHN (yoy growth)	0.25	1.3482	0.2775	4.86	0.00	0.01	0.21
Real GDP SGP (yoy growth)	0.25	-0.7047	0.2366	-2.98	0.00	0.01	0.21
Residential HP (yoy growth)	0.25	0.1045	0.0558	1.87	0.06	0.01	0.21
(Intercept)	0.4	-0.0653	0.0203	-3.21	0.00	0	0.27
FCI overall (change)	0.4	-0.0575	0.0199	-2.88	0.00	0	0.27
Real GDP CHN (yoy growth)	0.4	1.4601	0.2243	6.51	0.00	0	0.27
Real GDP SGP (yoy growth)	0.4	-0.3035	0.1525	-1.99	0.05	0	0.27
Residential HP (yoy growth)	0.4	0.0184	0.0409	0.45	0.65	0	0.27
(Intercept)	0.5	-0.0541	0.0185	-2.92	0.00	0	0.30
FCI overall (change)	0.5	-0.0697	0.0196	-3.55	0.00	0	0.30
Real GDP CHN (yoy growth)	0.5	1.4205	0.2016	7.05	0.00	0	0.30
Real GDP SGP (yoy growth)	0.5	-0.3324	0.1173	-2.83	0.01	0	0.30
Residential HP (yoy growth)	0.5	0.0149	0.0365	0.41	0.68	0	0.30
(Intercept)	0.6	-0.0263	0.0186	-1.41	0.16	0.04	0.29
FCI overall (change)	0.6	-0.0727	0.0237	-3.07	0.00	0.04	0.29
Real GDP CHN (yoy growth)	0.6	1.1451	0.2063	5.55	0.00	0.04	0.29
Real GDP SGP (yoy growth)	0.6	-0.2658	0.1050	-2.53	0.01	0.04	0.29
Residential HP (yoy growth)	0.6	0.0273	0.0353	0.77	0.44	0.04	0.29
(Intercept)	0.75	0.0053	0.0212	0.25	0.80	0.02	0.27
FCI overall (change)	0.75	-0.4003	0.1669	-2.40	0.02	0.02	0.27
Real GDP CHN (yoy growth)	0.75	0.9527	0.2462	3.87	0.00	0.02	0.27
Real GDP SGP (yoy growth)	0.75	-0.0900	0.0270	-3.33	0.00	0.02	0.27
Residential HP (yoy growth)	0.75	0.1109	0.0449	2.47	0.02	0.02	0.27
(Intercept)	0.9	0.0339	0.0249	1.36	0.18	0.45	0.32
FCI overall (change)	0.9	-0.5185	0.2129	-2.43	0.02	0.45	0.32
Real GDP CHN (yoy growth)	0.9	0.8923	0.3011	2.96	0.00	0.45	0.32
Real GDP SGP (yoy growth)	0.9	-0.0669	0.0138	-4.84	0.00	0.45	0.32
Residential HP (yoy growth)	0.9	0.1016	0.0395	2.57	0.01	0.45	0.32

Note: The dependent variable is real output growth (yoy). All regressors are lagged 4 quarters. GoF test is a goodness-of-fit test for quantile regressions based on He and Zhu (2003). Pseudo R-squared is based on the methodology introduced by Koenker and Machado (1999).

Table 4. Quantile Regressions: Coefficient Comparison

	Quantile	Main Version	Version 2	Version 3	Version 4	Version 5
(Intercept)	0.1	-0.0315	0.0165	0.0074	-0.0373	0.0284
FCI External	0.1					-0.0111
FCI Leverage	0.1					-0.0232
FCI Prices	0.1					0.0019
FCI Overall (change)	0.1	-0.1202	-0.0775	-0.1464	-0.1182	
Real GDP CHN (yoy growth)	0.1	0.6194			0.6828	
Real GDP SGP (yoy growth)	0.1	-0.4735	-0.4114	-0.3049	-0.4684	-0.5510
Residential HP (yoy growth)	0.1	0.0141		0.1349		
(Intercept)	0.25	-0.0542	0.0251	0.0457	-0.0731	0.0448
FCI External	0.25					-0.0323
FCI Leverage	0.25					-0.0220
FCI Prices	0.25					0.0013
FCI Overall (change)	0.25	-0.0741	-0.1013	-0.0825	-0.0430	
Real GDP CHN (yoy growth)	0.25	1.3482			1.4428	
Real GDP SGP (yoy growth)	0.25	-0.7047	0.1129	-0.4026	-0.3414	-0.1368
Residential HP (yoy growth)	0.25	0.1045		0.1716		
(Intercept)	0.4	-0.0653	0.0401	0.0492	-0.0729	0.0527
FCI External	0.4					-0.0308
FCI Leverage	0.4					-0.0133
FCI Prices	0.4					0.0114
FCI Overall (change)	0.4	-0.0575	-0.1017	-0.1066	-0.0534	
Real GDP CHN (yoy growth)	0.4	1.4601			1.5289	
Real GDP SGP (yoy growth)	0.4	-0.3035	0.1579	-0.0348	-0.2620	0.0177
Residential HP (yoy growth)	0.4	0.0184		0.0847		
(Intercept)	0.5	-0.0541	0.0531	0.0613	-0.0588	0.0597
FCI External	0.5					-0.0322
FCI Leverage	0.5					-0.0114
FCI Prices	0.5					0.0152
FCI Overall (change)	0.5	-0.0697	-0.0825	-0.1065	-0.0643	
Real GDP CHN (yoy growth)	0.5	1.4205			1.4609	
Real GDP SGP (yoy growth)	0.5	-0.3324	0.0907	-0.1182	-0.2971	0.0153
Residential HP (yoy growth)	0.5	0.0149		0.0972		
(Intercept)	0.6	-0.0263	0.0683	0.0782	-0.0483	0.0666
FCI External	0.6					-0.0221
FCI Leverage	0.6					-0.0109
FCI Prices	0.6					0.0092
FCI Overall (change)	0.6	-0.0727	-0.0569	-0.0945	-0.0671	
Real GDP CHN (yoy growth)	0.6	1.1451			1.3678	
Real GDP SGP (yoy growth)	0.6	-0.2658	0.0895	-0.2237	-0.2719	0.0387
Residential HP (yoy growth)	0.6	0.0273		0.1135		

Table 4. Quantile Regressions: Coefficient Comparison (concluded)

	Quantile	Main Version	Version 2	Version 3	Version 4	Version 5
(Intercept)	0.75	0.0053	0.0808	0.0902	-0.0185	0.0855
FCI External	0.75					-0.0295
FCI Leverage	0.75					-0.0103
FCI Prices	0.75					0.0157
FCI Overall (change)	0.75	-0.4003	-0.0738	-0.0870	-0.0639	
Real GDP CHN (yoy growth)	0.75	0.9527			1.1689	
Real GDP SGP (yoy growth)	0.75	-0.0900	0.1082	-0.2367	-0.2646	-0.0656
Residential HP (yoy growth)	0.75	0.1109		0.1259		
(Intercept)	0.9	0.0339	0.1110	0.1174	0.0529	0.1250
FCI External	0.9					-0.0304
FCI Leverage	0.9					-0.0057
FCI Prices	0.9					0.0255
FCI Overall (change)	0.9	-0.5185	-0.1149	-0.0702	-0.0464	
Real GDP CHN (yoy growth)	0.9	0.8923			0.7081	
Real GDP SGP (yoy growth)	0.9	-0.0669	-0.0129	-0.4189	-0.2783	-0.2699
Residential HP (yoy growth)	0.9	0.1016		0.1655		

Note: The dependent variable is real output growth (yoy). All regressors are lagged 4 quarters.

Parametric Estimation of Future Growth Distribution Conditional on Financial Variables

1. Estimation of the conditional quantiles

For the horizon $h \in \{4, 8, 12\}$, where h represents the quarters ahead, quantile regressions of the dependent GDP growth variable y_{t+h} are estimated conditional on macro-financial variables $X_{i,t}$, $Q(y_{t+h}, \tau \mid \{X_i\}_{i \in P})$, based on the point estimates of the coefficients $\hat{\alpha}^\tau$ and $\hat{\beta}_i^\tau$:

$$Q(y_{t+h}, \tau \mid \{X_i\}_{i \in P}) = \hat{\alpha}^\tau + \sum_{i \in I} \hat{\beta}_i^\tau X_{i,t}$$

The independent regressions are estimated at different points of the distribution (i.e., quantiles) of y_{t+h}, with $\tau \in \{.1, .25, .4, .5, .6, .75, .9\}$.

Using quantile regressions for estimating the conditional distribution has many advantages: first, under standard assumptions, quantile regressions provides the best unbiased linear estimator for the conditional quantile; second, quantile regressions are robust to outliers. Finally, the asymptotic properties of the quantile regression estimator are well-known and easy to derive.

2. Parametric fit of the conditional distribution of future GDP growth

The conditional quantiles are a sufficient statistic for describing the full conditional cumulative distribution function (cdf). From the cdf, we derive the probability distribution function (pdf) using a parametric method to fit the conditional quantiles for the sake of robustness with regards to quantiles crossing and extreme quantiles estimation. Following Adrian et al. (2016), a parametric t-skew fit is used to represent more accurately fatter tails. The skew version of the t-distribution is useful to model tail events, given that most of the macro-financial variables present this feature.

Fitting the cdf estimated from the quantile regressions represents another dimensionality reduction, after the data partitioning presented above. The Student t-skew distribution is fully characterized by five parameters (location/mode, degree of freedom, scale/variance, kurtosis, and skewness) which represents a good compromise between describing the distribution as accurately as possible and keeping a low number of parameters to avoid over-fitting.

3. The estimation of the t-skew distribution parameters is done in two different steps.

First, degrees of freedom are computed directly while the mean parameter of the conditional distribution can be retrieved from OLS fit, with the same specification as the quantile regressions:

$$mu^* = g(E[y_{t+h} | \{X_i\}_{i \in P}]) = g(\hat{\alpha}^{OLS} + \sum_{i \in I} \hat{\beta}_i^{OLS} X_{i,t})$$

Second, the sigma, the kurtosis, and the skewness, which are truly the quantities of interest, are estimated via the following minimization program:

$$sigma^*, skew^*, kurtosis^*$$

$$= argmin[\sum_\tau [tskew.quantile(\tau,\ mu^*, df^*, sigma, skew, kurtosis) -\ Q(y_{t+h}, \tau\ |\ \{X_i\}_{i\ \in P})]^2]$$

An algorithm based on Singer and Nelder (2009) is used to perform the optimization program under the constraint that these quantities should be strictly positive. Once the optimal three t-skew parameters have been estimated from the conditional quantiles, it is straightforward to derive the fitted t-skew cdf and pdf, therefore allowing to estimate the associated Growth-at-Risk (GaR).

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Appendix IV. Risk Assessment Matrix 1/

Sources of Risk		Likelihood and Transmission	Expected Impact of Risk	Recommended Policy Response
External	Policy uncertainty	**Medium** Two-sided risks to U.S. growth with uncertainties about the positive short-term impact of the tax bill on growth and the extent of potential medium-term adjustment to offset its fiscal costs; uncertainty associated with negotiating post-Brexit arrangements and NAFTA and associated market fragmentation risks; and evolving political processes, including elections in several large economies, weigh on the whole on global growth.	**High**	Continue to implement structural reforms to transform Singapore into a knowledge-based innovation-driven economy. Should domestic demand weaken substantially, use temporary and targeted fiscal stimulus, loosen monetary policy, including recentering the NEER band if the shock is large, and recalibrate macro-prudential policy as necessary, while maintaining financial stability.
	Retreat from cross-border integration.	**Medium** Fraying consensus about the benefits of globalization leads to protectionism and economic isolationism, resulting in reduced global and regional policy and regulatory collaboration with negative consequences for trade, capital and labor flows, and growth.	**High**	Continue to advocate for multilateralism, trade openness, and free flow of capital. As ASEAN Chair in 2018, redouble efforts to accelerate ASEAN economic and financial integration.
	Weaker-than-expected global growth	**Significant China slowdown and its spillovers: Low (short term)/Medium (medium term) Significant U.S. slowdown and its spillovers: Medium (medium term) Structurally weak growth in key advanced economies: High (medium term)** *Trade linkages.* A significant slowdown in China would have both direct and indirect effects on Singapore's exports. China is also the second largest source of tourists for Singapore. Domestic demand would also be hit through worsening investment sentiment. Singapore's high degree of openness and position as a financial center and a trading hub would imply large spillovers from global lower growth. High household leverage and potential asset price corrections could exacerbate a slowdown in economic activity, with potential spillovers to banks. *Financial linkages.* Although most of the domestic banks' lending to China is assessed to be of high quality, total exposures remain high. Widespread corporate defaults could lead to rising NPLs. More broadly, given Singapore's role as a financial center, financial stress in China could lead to a decline in investor sentiment, pullback of funding and market volatility. Inward spillovers from banks in advanced markets with significant presence in Singapore are also possible.	**Medium to High**	Provide temporary and targeted fiscal support and loosen monetary policy to offset headwinds from a potential slowdown. Continue to monitor banks' exposures to China and the rest of the region. Use prudential policies and bank supervision to ensure risks are managed well. Continue to ensure that stress tests are up to date in an evolving environment with changing risks. Should growth weaken substantially, use temporary and targeted fiscal stimulus, loosen monetary policy. including recentering of the NEER band, and recalibrate macro-prudential policy as necessary while maintaining financial stability.
	Tighter global financial conditions	**High** *Higher debt service and refinancing costs, and corrections in asset prices* could affect growth prospects through wealth effects and deteriorate banks' capital, especially in light of the elevated levels of household and corporate debt and prevalence of variable interest rates. *A decline in financial sector activity*—an important driver of the economy and very sensitive to the global risk sentiment—could slow growth.	**Medium**	Ensure financial institutions maintain prudent risk management practices and have adequate liquidity and capital buffers. Continue to ensure that stress tests are up to date in an evolving environment with changing risks. Maintain close links with home country supervisors. Recalibrate macro-prudential policies to mitigate financial sector stress. In an extreme event, the strong official reserve position could provide an additional cushion. Swap lines with other central banks could complement this.
	Cyber-attacks	**Medium** Given Singapore's role as a financial sector, cyber-attacks on interconnected financial systems and broader private and public institutions that trigger systemic financial instability or widely disrupt socio-economic activities could significantly impact the financial sector – an important driver of growth.	**Medium to High**	Continue to assess the adequacy of the information technology risk management practices in the financial system and prepare a contingency plan. Coordinate with global financial regulators. Should significant disruptions take place, provide temporary and targeted emergency liquidity support and/or fiscal support to ensure a functional banking system.
Domestic	Disorderly correction in property prices	**Low** *Decline in collateral values and wealth effects* could trigger a fall in economic activity and bank lending with further adverse feedback effects on household indebtedness and property prices	**Medium**	Adjust macro-prudential policies while safeguarding financial stability. Use targeted assistance measures to households whose debt servicing capacity is adversely affected.
	Low growth in productivity and investment	**Medium** *Sharp increase in unit labor costs and loss of competitiveness.* Tighter immigration policy may reduce competitiveness and profitability and provide disincentives to invest in some sectors. *Higher than expected transitional costs* such as high frictional unemployment or higher than expected hallowing out in some sectors can have long-term effects on growth.	**Medium**	Adjust foreign worker policies to relax tightness in labor markets. Provide targeted and temporary fiscal stimulus in areas of education and skills training to help reduce frictional unemployment.
	Delays in the implementing AML standards and associated reputational risks	**Medium** *Reputational risks.* If risks related to opaque ownership structures, including in the wealth management sector, are not adequately addressed, changes in perceptions about Singapore's good reputation could adversely affects the viability of the industry.	**Medium**	Continue to strengthen the AML/CFT regime in line with international standards, including with regard to entity transparency and international exchange of information.

1/ The Risk Assessment Matrix (RAM) shows events that could materially alter IMF staff's baseline path (the scenario most likely to materialize in the view of the mission). The relative likelihood is staff's subjective assessment of the risks surrounding the baseline ("low" is meant to indicate a probability below 10 percent, "medium" a probability between 10 and 30 percent, and "high" a probability between 30 and 50 percent). The RAM reflects staff's views on the source of risks and overall level of concern as of the time of discussions with the authorities. Nonmutually exclusive risks may interact and materialize jointly.

Appendix V. Estimating a Monetary Policy Rule

Singapore's monetary policy is based on a basket, band, and crawl (BBC) exchange rate framework that can be characterized by a Taylor Rule-like reaction function. In this analysis, we estimate such a monetary policy function, which suggests a policy tightening in the near term.

1.   **Context.** The Monetary Authority of Singapore (MAS) has used a basket, band, and crawl (BBC) exchange-rate based monetary policy framework since 1981, using the NEER as a policy instrument. The MAS sets a target rate of change in the NEER (slope of the policy band) that is consistent with its price stability objective for sustainable economic growth. The MAS does not follow an inflation targeting regime. The width of the band around the central parity is adjusted occasionally and it allows monetary policy to absorb short-term volatility and/or transitory shocks. Over the years, the NEER has seen a trend appreciation.

Currently, the monetary policy is geared toward achieving a 2 percent rate for the MAS core inflation over the medium term. The MAS core inflation measures the underlying domestic price pressures, abstracting from the impact of policy measures on prices. It excludes private road transportation and accommodation components from the headline inflation, but includes food prices, for example. In its monetary policy communications, usually announced twice a year, the MAS makes qualitative clarification on the parameters of the BBC framework. Unlike a central bank that uses policy interest rate as a tool, the MAS does not disclose the numerical values of the BBC parameters and/or their changes. For example, the January 2015 interim monetary policy statement said that "the slope of the policy band will be reduced". However, in the April 2016 statement, the MAS announced a zero rate of appreciation for the policy band, which was further clarified in the October 2016 statement, for example, as to be maintained for an "extended period." The MAS publishes the prevailing level of the weekly NEER with a lag of about a month.

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

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

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

Where, Δe_t^* is the target rate of change in NEER (positive for appreciation), $(\pi_t^e - \pi_t^*)$ is the deviation of forward-looking inflation expectation at time "t" from the authorities' desired level, and $(y_t - y_t^*)$ is a measure of domestic economic activity relative to its potential. We use one-period ahead inflation expectation and assume a fixed π_t^* over the estimation period. Measures

of output gap and labor market conditions have been used for $(y_t - y_t^*)$. In equation (2), the coefficient ρ measures the extent of inertia in NEER to adjust to the target $(0 < \rho < 1)$.

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

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

Different measures of expected inflation (viz., 4-quarter forward moving averages of actual headline MAS core inflation, and unit labor cost; 1-year ahead inflation from MAS survey of professional forecasts; and 1-year ahead inflation forecasts from Consensus Economics) and strength in domestic economic conditions (viz., staff estimate of the output gap and official data on the vacancies to unemployed persons ratio, a measure of labor market slack when it is below unity) are used. Market instrument-based inflation expectations information are not available. Singapore being a highly open economy, equation (3) is also augmented with the U.S. Federal Funds target rate to estimate the spillover from U.S. monetary policy. Equation (3) is estimated by Generalized Method of Moments instrumental variable (GMM-IV) techniques with heteroscedasticity and autocorrelation consistent weighting matrix. Four lags of inflation and output gap are used as instruments.

3.   Summary of findings. The analysis uses quarterly data over 1990–2017. Regression estimates from various specifications of equation (3) confirm the results of previous studies (Table 1): the MAS puts a higher weight on expected inflation than the output gap. The parameter estimates on expected inflation are much higher and statistically significant across all specifications, whereas the parameter estimates on output gap are not always statistically significant. Also, there is a high degree of policy inertia, indicating that monetary policy does not adjust abruptly. Finally, parameter estimates for the indicator on labor market slack/tightness and changes in the U.S. Federal Funds rate are not found to be statistically significant.

Table 1. Regression Results

Dependent variable: y/y change in NEER	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15
Constant	-0.03	-0.20	-0.11	-0.70	-0.69	-0.83	-0.05	-0.55	-0.3	-0.69 ^	-1.49	-0.81	-0.04	0.76	-0.08
1-period lagged dependent variable	0.70 *	0.70 *	0.62 *	0.67 *	0.73 *	0.61 *	0.59 *	0.59 *	0.46 *	0.61 *	0.57 *	0.56 *	0.58 *	0.74 *	0.57 *
Forward-looking inflation															
Headline inflation	0.31 *	0.51 *	0.38 *												
MAS core inflation				0.74 **	0.92 *	0.88 *									
MAS survey of professional forecasters							0.29 *	0.42 *	0.5 *						
Consensus Economics										0.60 *	0.58 **	0.65 *			
Unit labor cost													0.55 *	0.31 *	0.59 *
Domestic economic condition															
Output gap	0.12 ^		0.18 ^	0.01		0.04	0.12 ^		0.1	0.13 *		0.15 *	-0.29 ^		-0.3
Vacancies to unemployed persons ratio		-0.25			-0.3			0.15			0.64			-0.6	
Change in the Federal Funds target rate			-1.34			-1.02			-1.9 *			-0.94			0.08
Adjusted R-squared	0.68	0.56	0.58	0.61	0.54	0.51	0.57	0.51	0.27	0.67	0.64	0.62	0.68	0.63	0.66
No. of observations	112	102	112	105	100	105	74	72	72	108	102	108	108	100	108

Source: IMF staff estimates.
Note: * indicates statistically significant at 95 percent confidence level, ** at 90 percent level, and ^ at 85 percent level.

Comparing across different specifications, it appears that regressions based on 4-quarter-ahead average headline inflation and unit labor costs, and 1-year ahead inflation expectations from

Consensus Economics perform better than those based on 4-quarter-ahead average MAS core inflation or inflation forecasts from MAS survey of professional forecasters.

4.   Looking forward. Under staff's baseline, results from the first regression imply an increase in the target slope (Δe_t^*) to about 1.5 percent by end-2019. Under the assumption of unit labor costs growing at its long-term average rate, this analysis also points to similar magnitude of change in the target slope. However, the predicted change in target slope is higher when the model with Consensus Economics 1-year inflation forecast is used owing to higher inflation forecasts in both 2018 and 2019. Actual NEER would adjust slowly given the estimated inertia and phasing-in of policy tightening.

5.   Inflation expectations. In recent years, Singapore's inflation came down significantly and it even went into the negative territory in 2015-16. Inflation also underperformed short-term forecasts consistently over the past several years. While both policy-induced effects on, for example, prices of motor vehicle purchases and accommodation had direct bearing on headline inflation, a steep decline in global oil prices also contributed. However, the long-term inflation expectation surveys conducted by Consensus Economics found that expectations have remained largely stable for the last three years. This is likely due to credibility of Singapore's monetary policy framework, policy coordination, and overall prudent approach to macroeconomic policy making. Gupta (2016) reports that inflation expectations in Singapore have become better anchored in the last decade. Monetary policy should continue to monitor developments in the economy and remain data dependent on its decisions.

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Appendix VI. Public Debt Sustainability Analysis

1.   **Background**. The debt sustainability analysis (DSA) framework for market access countries is used to assess Singapore's debt sustainability and other risks related to its funding and debt structure. The Singapore government's gross debt stood at about 112 percent of GDP as of 2017 but its net debt is significantly negative. All debt is held domestically and issued in local currency. There is no external debt. To put the DSA in context, it should be noted that fiscal operations in Singapore are guided by a conservative fiscal rule according to which the government must run a balanced budget over its term in office. Moreover, under the Protection of Reserves Framework in Singapore's Constitution and the Government Securities Act, the government cannot spend the funds raised from issuing debt. Substantial fiscal surpluses have over time resulted in the accumulation of substantial net financial assets reflected in the government's investment agencies, GIC and Temasek. The government earns substantial income on these assets, which is not fully on budget. Although GIC does not report assets, Temasek had assets of about 63 percent of GDP at end-March 2017. The government's gross financial assets amounted to about 230 percent of GDP at end-March 2017.

2.   **Types of government debt.** The main types of debt securities issued by the government are Singapore Government Securities (SGS), Special Singapore Government Securities (SSGS), and Singapore Savings Bonds (SSB):

- SSGS are non-tradable bonds issued primarily to the CPF Board, Singapore's national pension fund, a mandatory social security scheme funded by payroll contributions from workers and employers.
- SGS bonds and treasury bills are tradable debt instruments issued for the purpose of developing Singapore's debt markets.
- Since October 2015, non-tradable SSB are issued to individuals to provide them with an option for long-term saving.

In practice, the Singapore government's gross debt is largely explained by the cash flow generated by CPF contributions. Payroll contributions are credited to members' personal CPF accounts and are invested in SSGSs. The proceeds from these bonds are pooled with the rest of the government's funds and invested over a long investment horizon through GIC. At the end of 2015, the CPF's holdings of SSGS amounted to about 71 percent of GDP. Most of the investments are held abroad. The investment returns exceed debt servicing costs.

3.   **Macro-fiscal assumptions**. Real GDP growth is projected at 2.9 percent in 2018 and would average at 2.7 percent over 2019–23. In staff's baseline projections, the central government surplus decreases from an estimated 4.6 percent of GDP in calendar year 2017 to 1.7 percent of GDP in 2023. The fiscal position strengthened significantly in 2017 due mostly to cyclical and one-off revenue factors. The projected fiscal path reflects a normalization in revenues and further increases in outlays for aging-related healthcare and physical infrastructure needs. Staff's baseline currently does not include the proposal of raising the Goods and Services Tax rate after 2020.

4. **Data coverage and choice of framework**. Consistent with the data on government debt reported by the authorities, the fiscal assumptions in this DSA are based on the central government debt. Singapore's high level of government assets calls for using the basic framework with some country-specific adjustments. The current framework delinks the evolution of gross debt from the government's fiscal accounts.

5. **Debt is projected to rise at a slower pace than in the recent past and is backed by high and rising level of financial assets, mitigating risks.** Under the baseline, the debt-to-GDP ratio is projected to increase gradually to about 118 percent by 2023, an increase of about 6 percentage points of GDP since end-2017 (increase over 2011–17: 10.2 percentage points of GDP). This slower increase in debt-to-GDP ratio reflects, in part, a deceleration in the rise in investment needs by the Central Provident Fund (CPF) Board: employment growth is projected to slow down, reflecting both an aging population and restrictions on use of foreign labor, which will contribute to a deceleration in CPF contributions and investment needs by the CPF Board. Gross financing needs (GFN) are expected to average at close to 8½ percent of GDP per annum in the medium term. Lower fiscal surpluses going forward would contribute to a higher GFN to GDP ratio.

Figure 1. Singapore: Public Sector Debt Sustainability Analysis (DSA) – Baseline Scenario
(In percent of GDP unless otherwise indicated)

Debt, Economic and Market Indicators [1]

	Actual/ staff est.			Projections						As of June 18, 2018		
	2007-2015 [2]	2016	2017	2018	2019	2020	2021	2022	2023	Sovereign Spreads		
Nominal gross public debt	99.3	108.2	112.2	113.9	115.2	116.2	117.0	117.5	117.9	EMBIG (bp) 3/		-51
Public gross financing needs	13.6	5.2	3.6	7.2	7.9	9.2	10.1	8.0	8.0	5Y CDS (bp)		N/A
Real GDP growth (in percent)	5.2	2.4	3.6	2.9	2.7	2.7	2.6	2.6	2.6	Ratings	Foreign	Local
Inflation (GDP deflator, in percent)	1.4	0.0	0.9	0.9	1.2	1.3	1.3	1.3	1.3	Moody's	Aaa	Aaa
Nominal GDP growth (in percent)	6.7	2.4	4.5	3.9	4.0	4.0	4.0	4.0	4.0	S&Ps	AAA	AAA
Effective interest rate (in percent) [4]	...	...	...	...	3.5	3.6	3.7	3.8	4.0	4.2	Fitch	AAA	AAA

Contribution to Changes in Public Debt

	Actual/ staff est.			Projections							
	2007-2015	2016	2017	2018	2019	2020	2021	2022	2023	cumulative	debt-stabilizing
Change in gross public sector debt	1.4	7.5	4.0	1.7	1.3	1.0	0.7	0.6	0.4	5.7	primary
Identified debt-creating flows	...	-2.1	-1.1	1.0	0.8	0.7	0.7	0.9	0.9	5.1	balance
Primary deficit [5]	...	...	...	...	...	...	...	...	...	...	...
Primary (noninterest) revenue and grants	...	16.1	16.8	15.8	16.0	16.1	16.2	16.4	16.4	97.0	
Primary (noninterest) expenditure	...	18.0	17.9	18.6	19.6	19.8	20.0	20.1	20.3	118.5	
Automatic debt dynamics [6]	...	-2.3	-4.7	-0.5	-0.5	-0.4	-0.2	0.1	0.3	-1.2	
Interest rate/growth differential [7]	...	-2.3	-4.7	-0.5	-0.5	-0.4	-0.2	0.1	0.3	-1.2	
Of which: real interest rate	...	0.0	-0.9	2.7	2.5	2.6	2.7	3.0	3.2	16.9	
Of which: real GDP growth	...	-2.4	-3.7	-3.2	-3.0	-3.0	-3.0	-3.0	-3.0	-18.1	
Exchange rate depreciation [8]	...	0.0	0.0	...	...	...	...	...	...	...	
Other identified debt-creating flows	...	0.2	3.5	1.5	1.3	1.1	1.0	0.8	0.7	6.4	
Net privatization proceeds (negative)	...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Contingent liabilities	...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Other debt creating flows [9]	...	0.2	3.5	1.5	1.3	1.1	1.0	0.8	0.7	6.4	
Residual	...	9.6	5.2	0.7	0.5	0.2	0.0	-0.3	-0.6	0.5	

Debt-Creating Flows (in percent of GDP)

Legend: Primary deficit; Real GDP growth; Real interest rate; Exchange rate depreciation; Other debt-creating flows; Residual; Change in gross public sector debt
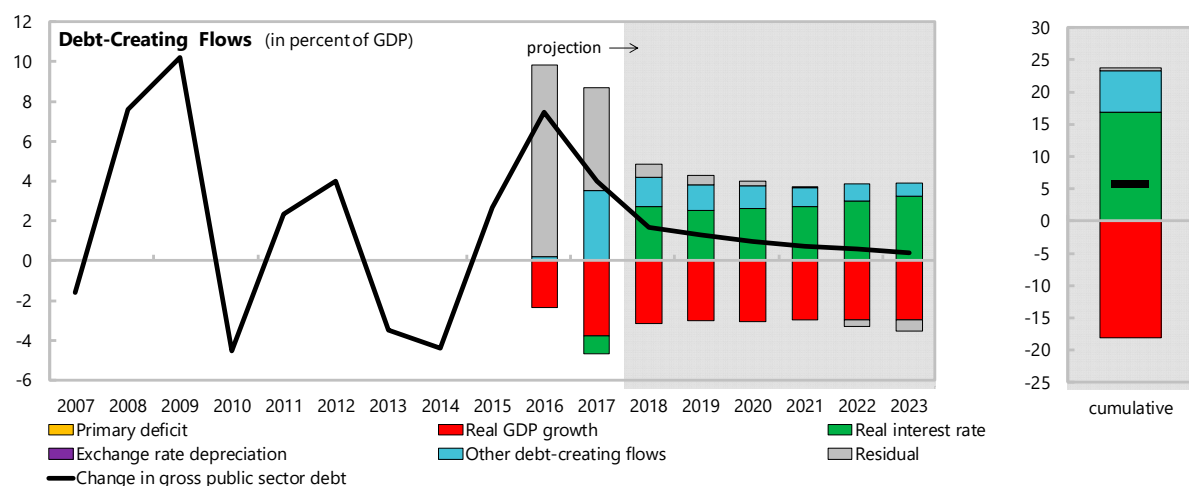
Source: IMF staff estimates.

1/ Public sector is defined as central government.

2/ Based on available data.

3/ Long-term bond spread over U.S. bonds.

4/ Defined as interest payments divided by debt stock (excluding guarantees) at the end of previous year.

5/ The primary balance is calculated by excluding capital receipts and Net Investment Returns Contributions (NIRC) from revenues. Legislative changes that took effect in 2016 brought on budget a higher share of NIRC. The fiscal balance does not affect the size of gross debt in Singapore as the government is prohibited by law from borrowing to fund its budget.

6/ Derived as [(r - π(1+g) - g + ae(1+r)]/(1+g+π+gπ)) times previous period debt ratio, with r = interest rate; π = growth rate of GDP deflator; g = real GDP growth rate;
   a = share of foreign-currency denominated debt; and e = nominal exchange rate depreciation (measured by increase in local currency value of U.S. dollar).

7/ The real interest rate contribution is derived from the numerator in footnote 6 as r - π (1+g) and the real growth contribution as -g.

8/ The exchange rate contribution is derived from the numerator in footnote 6 as ae(1+r). The Government of Singapore does not have foreign currency-denominated debt.

9/ Includes staff estimates and projections of changes in assets from 2016.

Figure 2. Singapore: Public DSA – Composition of Public Debt and Alternative Scenarios

Composition of Public Debt

By Maturity
(in percent of GDP)

- Medium and long-term
- Short-term

By Currency
(in percent of GDP)

- Local currency-denominated
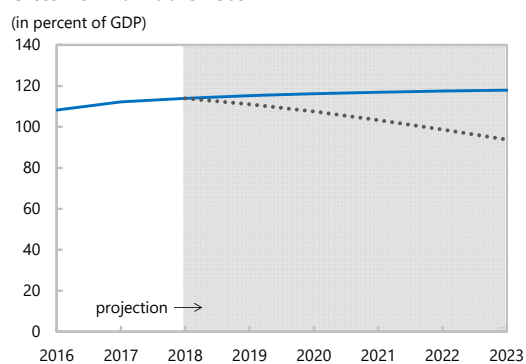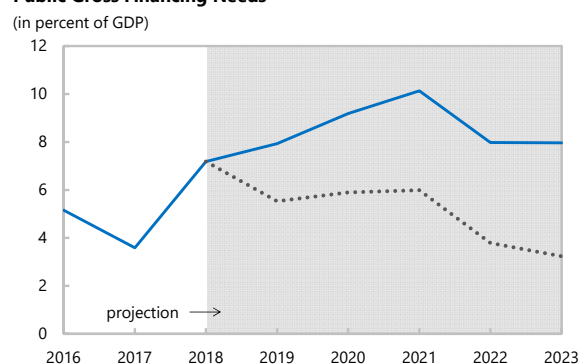- Foreign currency-denominated
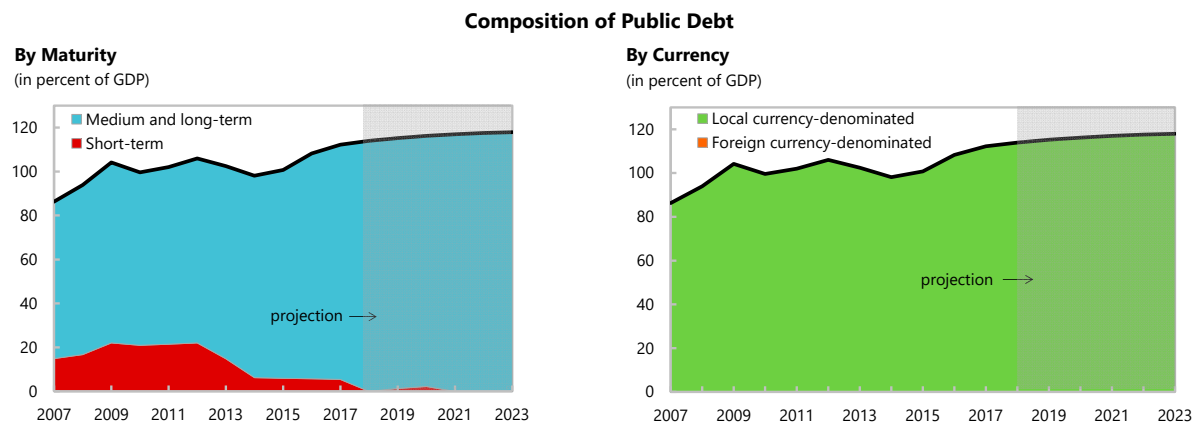
Alternative Scenarios

—— Baseline ········· Historical

Gross Nominal Public Debt
(in percent of GDP)

Public Gross Financing Needs
(in percent of GDP)

Underlying Assumptions
(in percent)

Baseline Scenario	2018	2019	2020	2021	2022	2023
Real GDP growth	2.9	2.7	2.7	2.6	2.6	2.6
Inflation	0.9	1.2	1.3	1.3	1.3	1.3
Primary Balance [1/]	-2.8	-3.6	-3.7	-3.8	-3.8	-3.8
Effective interest rate	3.5	3.6	3.7	3.8	4.0	4.2
Constant Primary Balance Scenario						
Real GDP growth	2.9	2.7	2.7	2.6	2.6	2.6
Inflation	0.9	1.2	1.3	1.3	1.3	1.3
Primary Balance [1/]	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8
Effective interest rate	3.5	3.6	3.7	3.8	4.0	4.2

Historical Scenario	2018	2019	2020	2021	2022	2023
Real GDP growth	2.9	4.4	4.4	4.4	4.4	4.4
Inflation	0.9	1.2	1.3	1.3	1.3	1.3
Primary Balance [1/]	-2.8	-1.3	-1.3	-1.3	-1.3	-1.3
Effective interest rate	3.5	3.6	3.3	3.1	2.9	2.7

Source: IMF staff estimates.
1/ Staff estimates of overall balance as per GFSM 2014, excluding capital receipts and Net Investment Returns Contributions.

Appendix VII. Housing Market Development and Policies

This appendix reviews the unique features of housing markets in Singapore and government measures implemented between 2009-17, with a focus on their rationale and effectiveness. We also examine the determinants of long-run equilibrium prices of residential properties and find that current residential property prices are moderately above equilibrium.

Singapore's Housing Markets

1.   The government plays a central and active role in housing market policies given the scarcity of land and its importance for social, economic and financial stability. Given the scarcity of land, residential property has been central in policy makers' efforts to create a property owning middle class and a Singaporean identity. It is also important for macroeconomic and financial stability: property accounts for 44 percent of total household assets and mortgage loans form three-quarter of household liabilities. Property-related loans are about 30 percent of banks' loan books.

2.   Singapore takes a multi-pronged approach to manage the housing markets. On the supply side, the government invests in land reclamation and controls the land supply for development of residential units through the lease of state-owned land – more than three-quarter of total land in Singapore.[1] The government also provides public housing to residents at affordable prices. About 80 percent of residents live in housing provided by the Housing and Development Board (HDB), a statutory board set up by the Government. HDB resale transactions are subject to restrictions and prices tend to be lower than in the private housing market. The remaining 20 percent of residents live in private housing, which is subject to few restrictions and is entirely driven by market. Prices are driven by purchase by wealthy Singaporeans and foreigners and are significantly higher and more volatile. On the demand-side, the authorities used macroprudential policies, fiscal and credit-based measures to promote housing market stability—especially after the Global Financial Crisis (GFC, see below).

Housing Market Developments and Policies, 2009–17

3.   Property prices surged during the economic recovery in 2009–10. Property market picked up quickly as Singapore bounced back from the GFC, and the global economy recovered (Figure 1, first panel). Property prices increased fast and transaction volume stayed high. Foreign demand came back to the pre-crisis level and lasted until 2013 (Figure 1, second panel). Since 2009, Singapore implemented a series of tightening measures: Loan-to-Value (LTV) ratio limits were tightened and Seller's Stamp Duty (SSD) was introduced in 2010Q1. These measures were further tightened in 2010Q3 and 2011Q1 respectively.

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[1] The government manages the development of land and provision of residential housing through the cross-agency coordination among Urban Redevelopment Authority (URA), Housing and Development Board (HDB), and Singapore Land Authority (SLA). URA, as land planning authority, formulates strategic land use plan and uses its regulatory power to guide the developments. It also works with HDB and SLA to manage land supply and optimize land use. HDB is tasked with the provision of affordable public housing. The Monetary Authority of Singapore (MAS) regulates the housing market from a financial stability perspective, using macro-prudential measures.

4.   Prices continued to rise during 2011–13 despite subdued economic fundamentals.
Singapore's real GDP growth slowed down from 15.2 percent in 2010 to 4.1 percent in 2012,
reflecting in part slower resident population growth (down from 2.5 percent in 2009 to 0.8
percent in 2012). Despite the downward trends, and the series of LTV ratio limits and SSD
tightening, the property market continued to attract both local and foreign investors in a low
interest environment with uncertain stock markets. Transaction volumes were high, and prices
continued to rise.

**5.   After implementing a comprehensive set of cooling measures, including Additional
Buyer's Stamp Duty (ABSD) and limits on Total Debt Servicing Ratio (TDSR), the property
market stabilized.** To address the divergence of property price developments from economic
fundamentals, the authorities introduced Additional Buyer's Stamp Duty (ABSD) at end-2011,
applying higher tax rate for foreign buyers (7 percent higher at the time). ABSD was effective in
keeping foreign demand in check. Transactions involving foreigners declined in the following
quarters (Figure 1, second panel), while domestic demand rose further despite disappointing
domestic economic growth. Although transaction volumes stayed high, price increase moderated
in 2012. In 2013, ABSD rates were raised further (by 5-7 percentage points across the board), the
LTV ratio limit was lowered, and Total Debt Servicing Ratio (TDSR) limit was introduced.[2] These
measures were proved to be effective, and by 2017Q3 prices had declined by over 10 percent
from their peak in 2013Q3. Housing loan growth also stabilized to 3-5 percent, y/y, from the
peak level of 23 percent y/y in 2010Q3. The authorities did not intervene any more since 2013
until March 2017 (see Table 1 for the set of measures currently in place).

**6.   Macroprudential policies and fiscal-based measures have been designed to target
speculative activity in the residential property market and address household over-
indebtedness.** The effectiveness of the macroprudential measures relies on the credibility of the
commitment to continue using these tools. Empirical evidence to date suggests that these
measures have been effective. Fu and others (2014) find that the increase in stamp duty
transaction taxes has reduced speculative activity in Singapore by 75 percent, and the effect was
mostly driven by the withdrawal of informed forward-looking speculators. In addition, the
effectiveness of the interventions depends on the adjustment of different levers within the policy
package. Agarwal and others (2018) show that measures targeting LTV ratios have been effective
at dampening household leverage only after a shift in household expectations, persuaded by
tighter TDSR limits.

**7.   Under the Government Land Sales Program (GLS), the government also increased
land supply to meet property demand.** Potential supply under the GLS gradually rose from
2010 until end-2013, while potential supply from private developers dwindled (Figure 1, third
panel).[3] Supply-side support was an important part of the Government's policy to maintain a

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[2] Other measures adjusted include: minimum cash down payment raised to 25 percent; SSD introduced on
industrial property (5-15 percent); and measures for public housings such as caps on the Mortgage Servicing
Ratios for housing loans at 30 percent of a gross monthly income and restrictions on permanent residents (not
allowed to sublet their HDB flats and obliged to sell their HDB flats within 6 months of purchasing private
property).

[3] Potential supply includes residential units currently under construction or planned with written or provisional
permission granted.

sustainable property market, complementing the demand-side policies, even though it is geared toward addressing medium-term demand. In addition, there is a great emphasis on decentralization, which will provide jobs and business opportunities closer to homes outside the city center, by offering alternative options for office space.

8.   **Property market shows sign of recovery after 4 years of falling prices.** Private residential property prices started to pick up in end-2017 and recorded an increase of 4.6 percent, y/y in 2018Q1—highest since 2012. The turnaround of the market came in the context of strong economic performance and improved market sentiment. The Seller's Stamp Duty was relaxed in March 2017.

Long-run equilibrium housing prices

9.   **Both supply and demand factors play a significant role in determining long-run housing prices in Singapore.** We estimate a long-run equilibrium model of housing market prices in Singapore, using quarterly data of real prices between 1995-2017.[4] After testing property prices and the fundamental drives for cointegration relationships, we estimate a long-run relationship of property price levels and supply-demand fundamental factors is estimated for each type of residential property in Singapore. For example, the relationship between the residential house prices (overall) and supply factors such as construction costs and private residential supply is considered in (1) in Table 2. Real interest rates which might affect both supply and demand are considered in (2). Additionally, our benchmark model, presented in (3), finds a strong positive relationship between residential prices and rental index. Furthermore, GDP per capita (a proxy for income), household credit (a proxy for households' access to credit), as well as construction costs are found to be positively associated with real house prices. In contrast, an increase in private residential supply or real interest rates is accompanied by a decline in house prices. In terms of goodness-of-fit, supply factors seem to explain about half of the house price variations in the long-run.

10.   **The effects of demand and supply factors vary by area and the type of residential property.** The regression results show that private residential supply and construction costs are important for landed house prices, while being less relevant for the non-landed house prices. Moreover, property prices in the central area are largely driven by rental income compared to the other areas rather than supply factors. This could also indicate that properties in this area are likely to be rented out, which might make them more attractive to foreign investors.[5] In contrast, the outside-central area seems to be more affected by construction costs and private residential supply, and to a lesser degree by the availability of credit.

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[4] Data series of property prices and supply-demand factors such as rental income, GDP per capita, household credit were seasonally-adjusted, logarithmic-transformed and in constant prices. Individual unit root tests, as well as Johansen cointegration tests were utilized to confirm the cointegration equation. See also IMF (2018a), Craig and Hua (2011), and Ahuja and others (2010).

[5] However, Liao and others (2015) found a tight relationship between the number of private residential property sales made to foreigners in the central region and the overall house price index in all regions of Singapore, due to a ripple effect from the central area to the suburbs.

Figure 1. Singapore: Property Market Developments and Policies

Property Market Price and Policies, 2006-2017
(2009 Q1 = 100 for prices on LHS; Y/Y percent increase on RHS)

- █ Total debt servicing ratio limit
- █ Additional buyer's stamp duty
- █ Seller's stamp duty, tightening
- ── Private residential property price index
- ┄┄ Real GDP growth (Y/Y, percent, RHS)
- █ LTV ratio, tightening
- █ Buyer's stamp duty concession withdrawn
- █ Seller's stamp duty, easing
- ── HDB resale price index
- ── Resident population growth (Y/Y, percent, RHS)
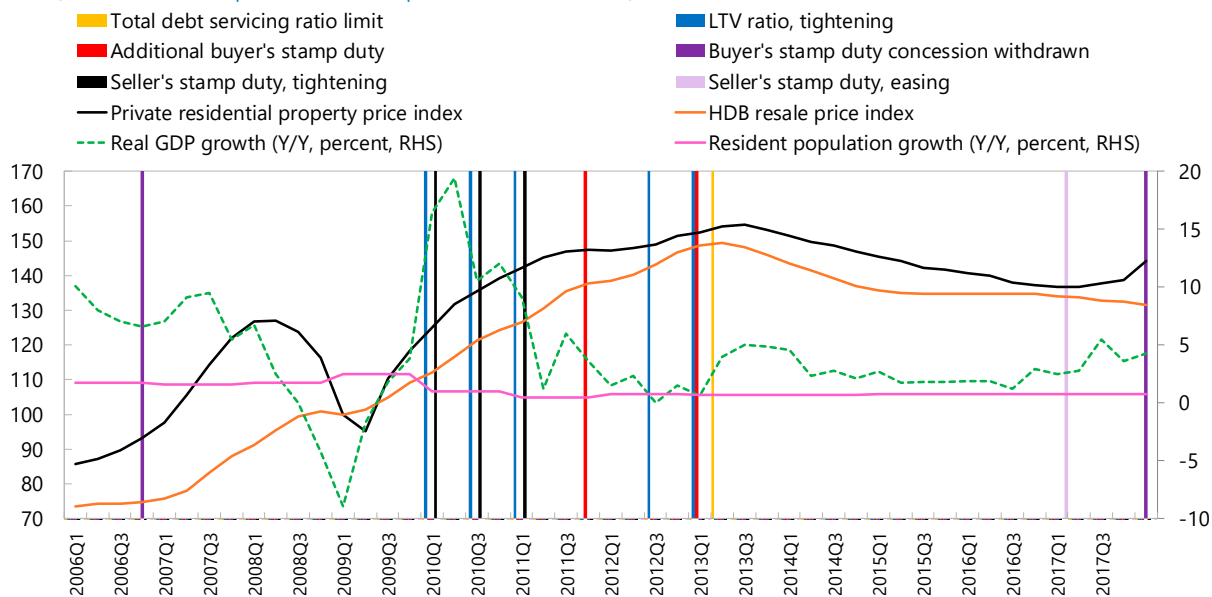
Sources: CEIC Data Co. Ltd.; Monetary Authority of Singapore; Inland Revenue Authority of Singapore

Private Resiential Units Sold, by Buyer's Residency
(Thousands of units)

- █ Sold to foreigners
- ▨ Sold to permanent residents
- █ Sold to Singaporeans
- █ Sold to companies
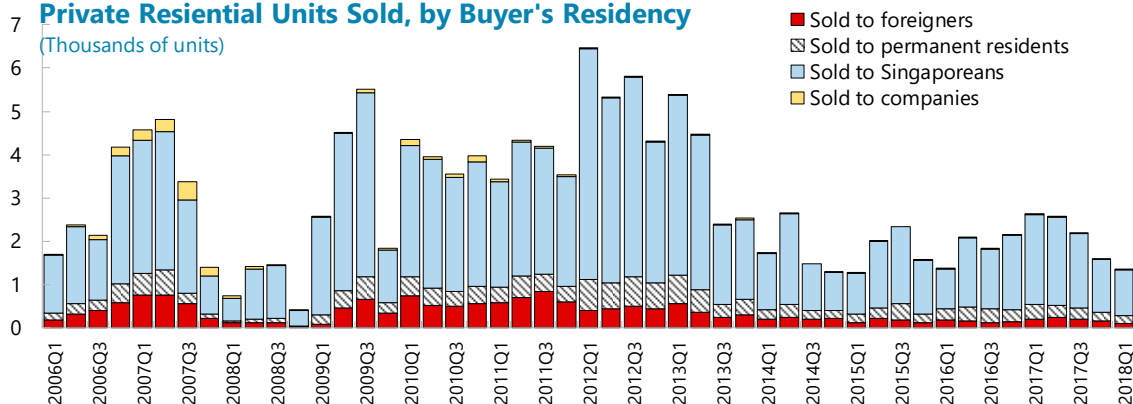
Source: CEIC Data Co Ltd.

Private Residential, Potential Supply and Price
(Thousands of units; Index)

- ▨ Potential supply, private
- █ Potential supply, GLS
- ── Vacancy rate (RHS)
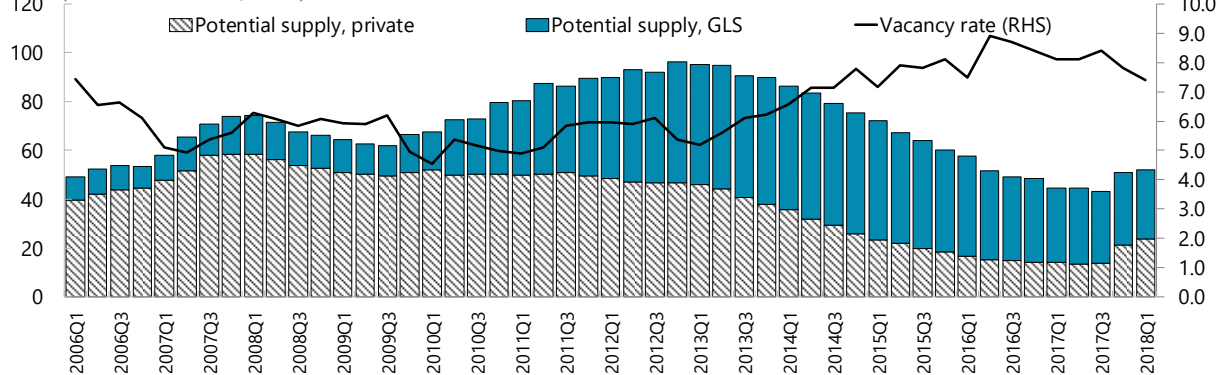
Source: CEIC Data Co. Ltd.

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Table 1. Singapore: Property Market Policies

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	Date 1/	Limits or Applicable Tax Rates (current)
Loan-to-Value ratio	Jan. 2013	80% for individuals who are applying housing loans for their first home
		50% for second housing loans, or 30% if loan tenure is longer than 30 yrs.
		40% for third or subsequent housing loans, or 20% if loan tenure is longer than 30 yrs.
		20% for non-individual borrowers
Total Debt Servicing Ratio	Jun. 2013	Total monthly debt obligation not to exceed 60% of gross monthly income. 2/
Seller's Stamp Duty	Mar. 2017	Tax rate of 12% applies for properties sold within 1 year of purchase;
		8% if sold within 2 years; 4% if sold within 3 years
Buyer's Stamp Duty 3/	Feb. 2018	Tax rate of 1% applies to first $ 180,000 of the market value of the property; 2% for next $180,000; 3% for next $640,000; and 4% for remaining amount (i.e., over $ 1million).
Additional Buyer's Stamp Duty	Jan. 2013	Not applicable for Singaporean Citizens buying first residential property;
		Tax rates of 7% applies for citizens buying second residential property, or 10% if buying third or subsequent;
		5% for Permanent Residents buying first residential property; or 10% if buying second or subsequent;
		15% for foreigners and non-individuals buying any residential property
Minimum cash down payment	Jan. 2013	25% for individuals buying second or subsequent housing loans

1/ Months in which the latest change in each policy measure is made.

2/ Monthly repayments of all loans, new and all other outstanding property and non-property loans, are considered. Gross income is assessed by applying haircut on all variable and rental income, and also when calculating income streams from eligible financial assets.

3/ Buyer's Stamp Duty is also considered as a measure to make the tax system more progressive in a broader context.

11.   Estimated long-run relationship suggests that current residential property prices are above the level explained by fundamentals (Figure 2.1).[6] The positive deviations seem to be larger for the outside central area than for core areas (Figure 2.2). However, these deviations are relatively small compared to the levels experienced before and after the Asian Financial Crisis, suggesting that policies used might have mitigated strong deviations.

12.   House prices of major Asian cities are highly synchronized, similar to the patterns seen in other parts of the world (Figure 3).[7] House prices in Singapore are highly connected to those in Melbourne, Sydney, Mumbai, and Hong Kong SAR. Other ASEAN cities such as Kuala Lumpur, Jakarta, and Manila (depicted in red) seem to be more influenced by house prices in

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[6] For robustness purposes, residuals from equations 1-3 in Table 2 are depicted in Figure 2.1. Moreover, demographic factors such as dependency ratios have been considered and not found significant. This could potentially reflect that demographic dynamics are slow-moving or that are well captured by the income per capita.

[7] Using the approach developed by Diebold and Yilmaz (2014) and controlling for global factors, the analysis of house price interconnectedness is based on quarterly real growth rates spanning from 2004Q1 to 2017Q2. For more details see IMF (2016). City's location on the network map, the size of the node, and its proximity to other cities reflect the influence of the city.

Tokyo and Beijing. The fact that Tokyo is at the core of the network might also reflect its role as a global financial center and its attractiveness to global investors. The presence of high correlation in cross-country house prices imply that house prices are driven not only by domestic factors. For instance, financial and trade linkages may also play an important role, while historical patterns of shock transmission might be relevant. Also, demand for safe assets or global investors' search for yield may also be an explanation of house price interconnectedness (IMF 2018b). The choice of macroprudential tools will thus depend on which segment of the market financial vulnerabilities are emerging.

Figure 2. Singapore: Estimated Residuals from Long-Run House Price Equilibrium

1. Residential House Prices (overall)
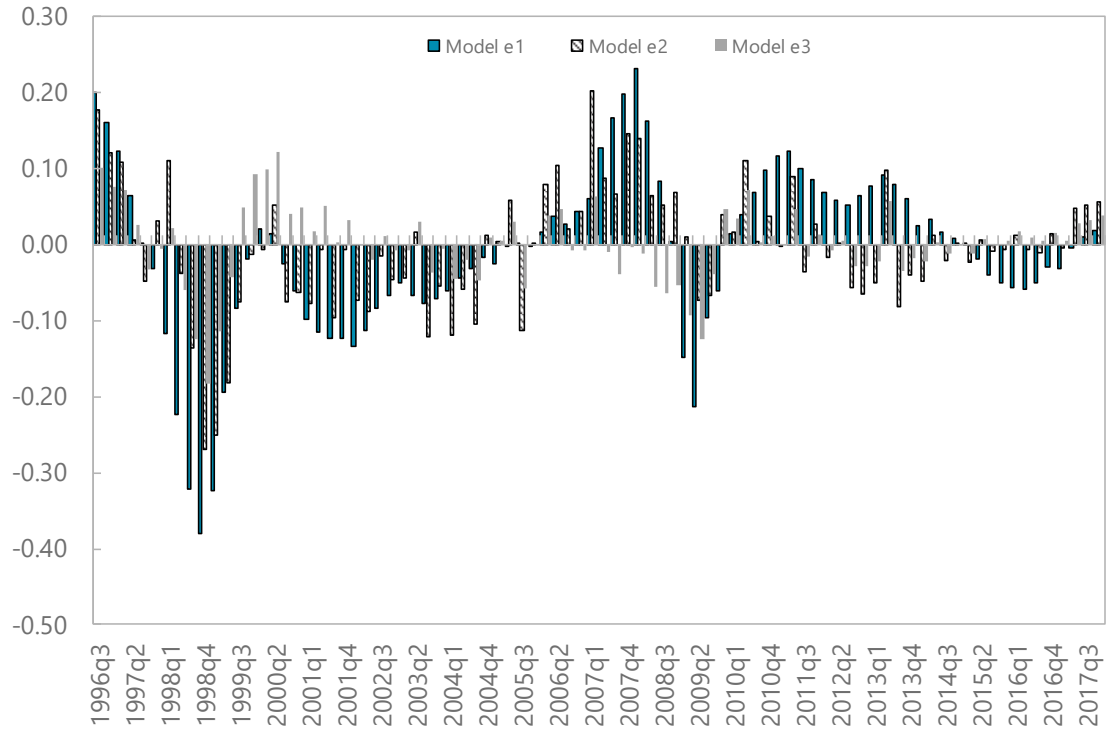
2. Residential House Prices (by region)
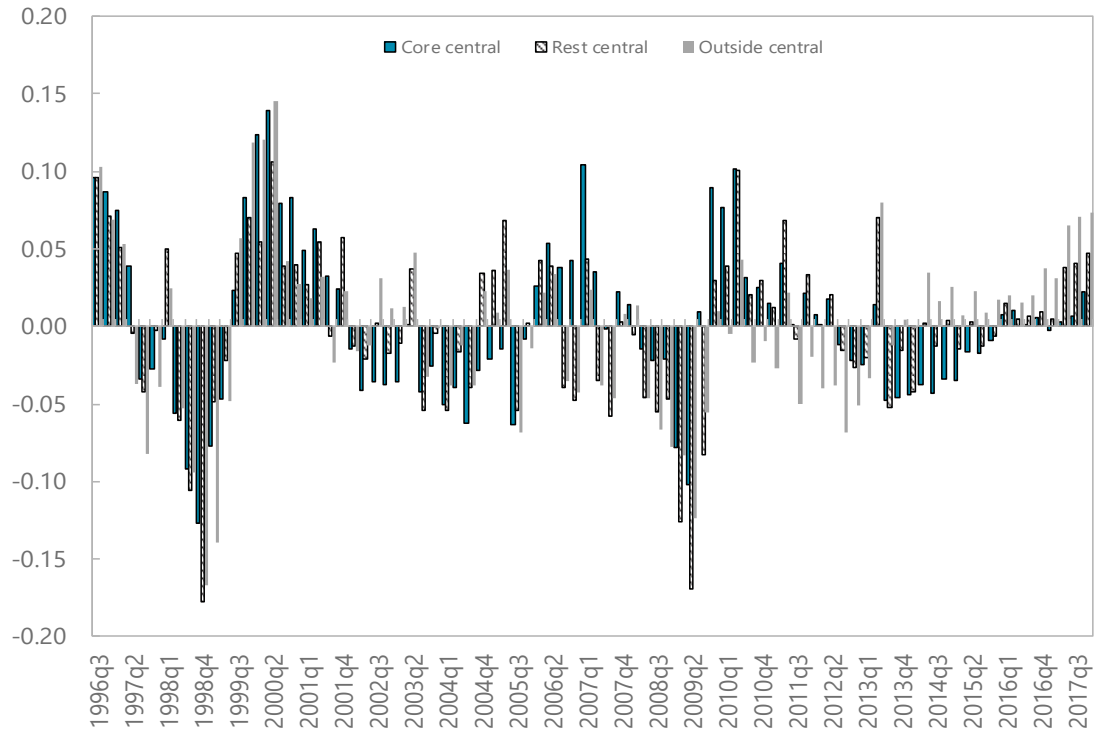
Sources: IMF staff estimates.

Note: Residuals from model e1-e3 depicted in Panel 1 correspond to regressions 1-3 in Table.2. Residuals depicted in Panel 2 correspond to regressions 6-7 in Table.2.

Figure 3. Asia-Pacific Region: House Price Interconnectedness

House prices in Singapore are highly connected to those in selected Australian cities, Hong Kong SAR, and Mumbai.
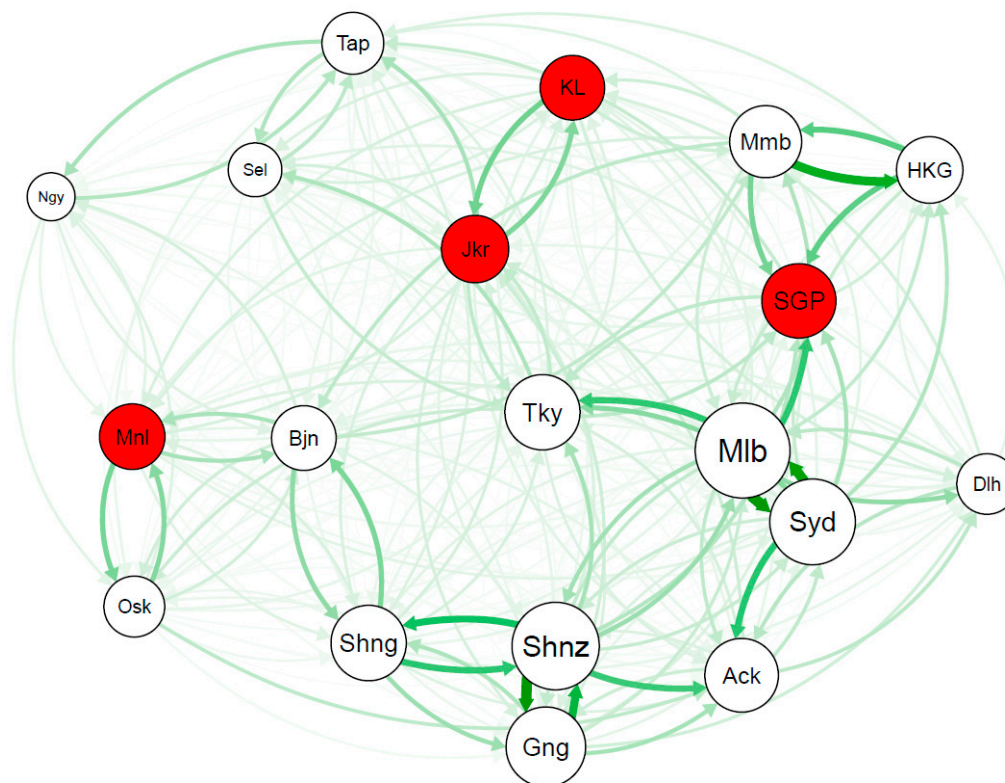
Sources: IMF staff calculations.

Note: The figure is based on a vector autoregression (VAR) of city-level house price real growth rates (quarter over quarter) controlling for global factors (i.e., global financial conditions), spanning 2004Q1 to 2017Q2. For methodology details, see April 2018 Global Financial Stability Report. Node size is based on the city's total inward and outward spillovers. Red nodes represent cities from the ASEAN region. Arrows' thickness is based on link distribution. The figure layout is based on the algorithm by Fruchterman and Reingold (1991). Ack = Auckland; Bjn = Beijing; Dlh = Delhi; Gng = Guangzhou; HKG = Hong Kong SAR; Jkr = Jakarta; KL= Kuala Lumpur; Mmb = Mumbai; Mnl = Manila; Mlb = Melbourne; Ngy = Nagoya; Osk = Osaka; Sel = Seoul; Shng = Shanghai; SGP = Singapore; Shn = Shanghai; Syd = Sydney; Tap = Taipei; Tky = Tokyo.

Table 2. Singapore: Long-Run Determinants of Residential House Prices

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Price index residential			Price index landed	Price index nonlanded	Price index core central	Price index rest central	Price index outside central	Price (med) core central	Price (med) rest central	Price (med) outside central
Private residential supply (units)	-0.289***	-0.661***	-0.336*	-4.396***	0.161	-0.177	-0.639**	-0.500***	-0.898***	-1.828***	-0.460***
	(0.072)	(0.058)	(0.173)	(0.977)	(0.133)	(0.394)	(0.267)	(0.147)	(0.252)	(0.265)	(0.090)
Construction cost	0.519***	0.449***	0.159***	0.349***	0.046	-0.048	0.232***	0.390***	0.270**	0.199	0.145
	(0.049)	(0.046)	(0.054)	(0.067)	(0.045)	(0.087)	(0.069)	(0.052)	(0.112)	(0.145)	(0.105)
Real interest rate		-0.083***	-0.042***	-0.055***	-0.040***	-0.027**	-0.052***	-0.046***	-0.016*	-0.024**	-0.021**
		(0.010)	(0.010)	(0.011)	(0.011)	(0.010)	(0.012)	(0.010)	(0.009)	(0.012)	(0.010)
Rental index			0.528***	0.317**	0.680***	0.786***	0.311**	0.121	0.411***	0.095	0.209*
			(0.114)	(0.144)	(0.104)	(0.131)	(0.133)	(0.107)	(0.122)	(0.143)	(0.120)
GDP per capita			0.260	0.417	-0.262	-0.051	0.188	0.264	1.423***	1.031**	0.221
			(0.257)	(0.283)	(0.259)	(0.363)	(0.306)	(0.249)	(0.421)	(0.469)	(0.344)
Household credit (lag)			-0.028	0.076	-0.029	0.111	-0.014	0.034	-0.238	0.373	0.324**
			(0.109)	(0.150)	(0.108)	(0.095)	(0.122)	(0.123)	(0.195)	(0.255)	(0.156)
Constant	1.930**	7.151***	1.218	43.146***	1.163	2.134	5.099**	1.819	0.497	11.496***	4.517*
	(0.763)	(0.713)	(2.239)	(10.801)	(2.083)	(2.223)	(2.454)	(2.418)	(2.985)	(3.983)	(2.379)
Observations	92	92	92	92	92	89	89	89	56	56	56
Adjusted R-squared	0.451	0.712	0.890	0.880	0.854	0.863	0.820	0.870	0.940	0.846	0.965
Period		1995Q1-2017Q4		1995Q1-2017Q4		1996Q1-2017Q4			2004Q1-2017Q4		

Source: IMF staff estimates.

Note: Robust standard errors are reported in parentheses. Significance levels: *** $p<0.01$, ** $p<0.05$, * $p<0.10$. All variables are seasonally-adjusted, logarithmic-transformed, and in constant prices. Data for price, supply, and rental index vary based on type of property, where available for the respective time span. Private residential supply refers to total available units by type and location of property.
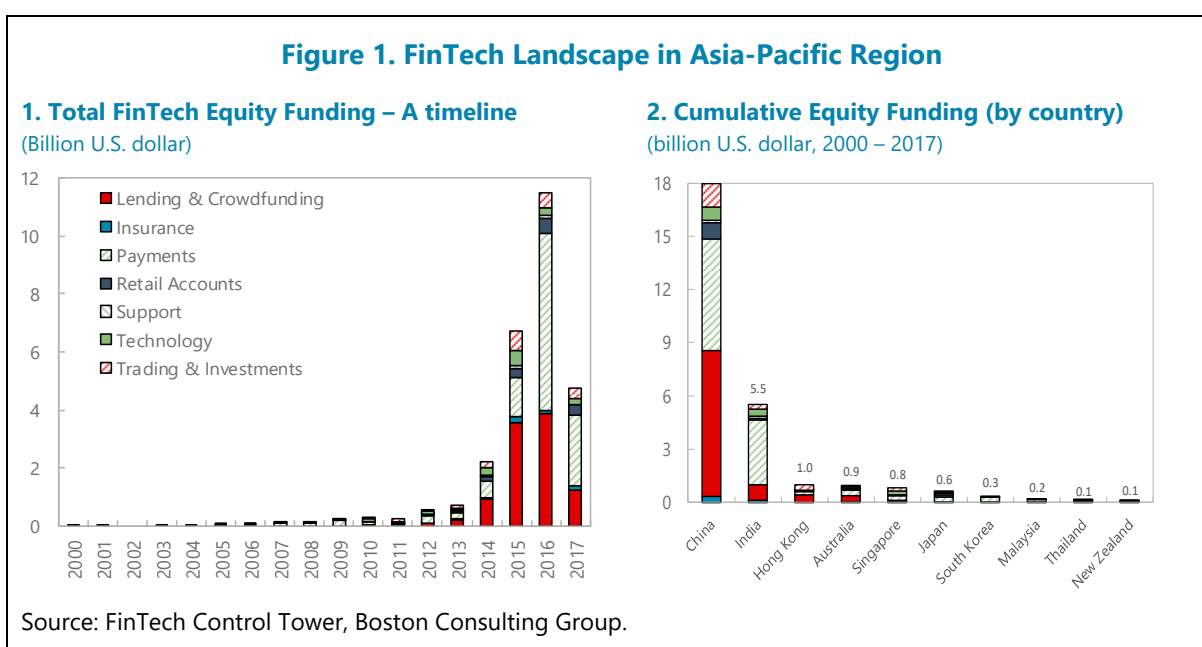
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Appendix VIII. Fintech Opportunities and Challenges

This note takes stock of the landscape of FinTech activities and potential opportunities in Singapore and, more broadly, in the Asia-Pacific region based on a novel commercial dataset. It discusses the regulatory challenges stemming from FinTech activities.

1.   FinTech funding activity in Asia has grown substantially in the past five years. According to BCG's Fintech Control Tower database, cumulative fintech equity funding in Asia reached about US$28 billion in 2017, with two-thirds of that growth captured by China.[1] Asian FinTech startups received about US$9 billion in funding over 2013-2017 period. Investments have picked up since 2010, with yearly funding reaching a peak of US$12 billion in 2016 (Figure 1.1). In Southeast Asia, FinTech funding is dominated by Singapore, followed by Malaysia and Thailand (Figure 1.2).

Figure 1. FinTech Landscape in Asia-Pacific Region

1. Total FinTech Equity Funding – A timeline
(Billion U.S. dollar)

2. Cumulative Equity Funding (by country)
(billion U.S. dollar, 2000 – 2017)

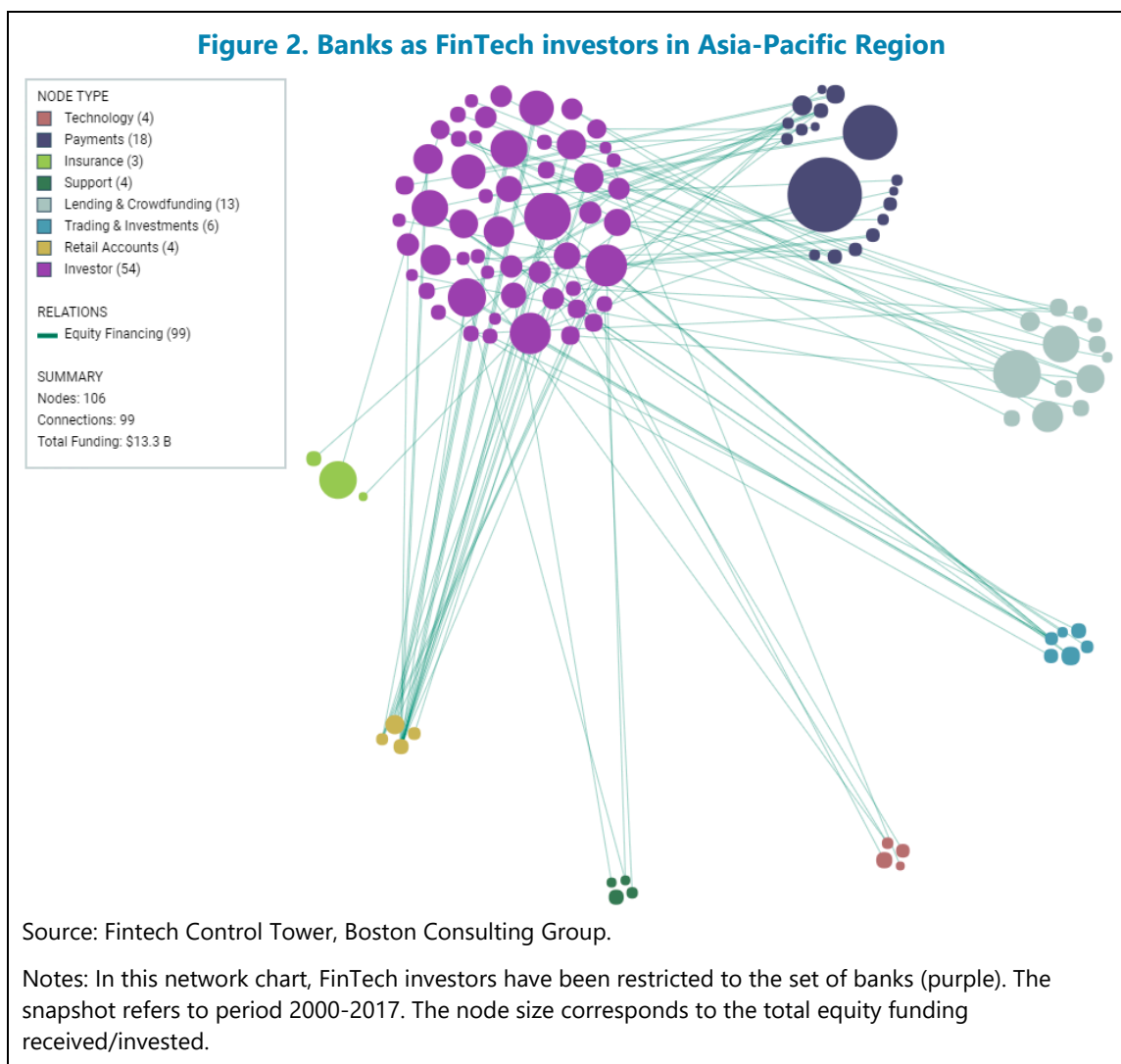Source: FinTech Control Tower, Boston Consulting Group.

2.   FinTech activities focused on retail financial services—such as payments, lending and crowdfunding—attracted the largest amounts of funding in Asia-Pacific region. The FinTech ecosystem can be classified across seven broad activities: payments, insurance, lending and crowdfunding, trading and investments, technology, support, and retail accounts. At the same time, FinTech activities can be mapped within existing financial intermediation and services such as retail banking, SME financing, wealth management, insurance, corporate banking, capital markets and cross-industry.[2] So far, FinTech firms associated with retail banking such as payments and lending attracted most of the funding, exceeding US$20 billion by the end of 2017.

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[1] BCG's FinTech Control Tower database covers about 11,000 firms worldwide, with a cumulative funding of more than US$125 billion at the end of 2017.
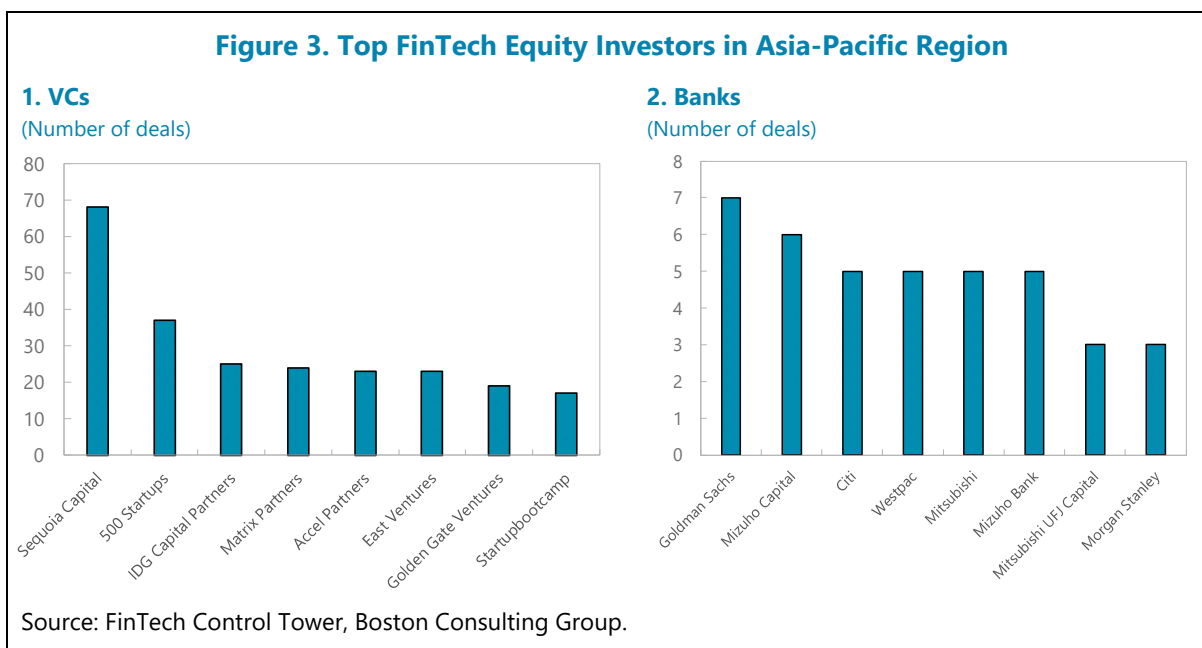
[2] For a discussion about the FinTech activities see also IOSCO (2017).

3.   Singapore-based FinTech companies received more than US$800 million, with almost one-third of that funding going to FinTech firms related to trading and investments activities. FinTech firms from this field—such as M-DAQ, SGX bond trading, and Smartkarma—are among the top regional investments in this field. Blockchain technology firms, such as TenX, were able to raise funding from Startupbootcamp, PayPal Incubator (an accelerator), and Fenbushi Capital (an investment fund). In the insurance field, Singapore Life received the most funding of about US$50 million in 2017.

Figure 2. Banks as FinTech investors in Asia-Pacific Region

Source: Fintech Control Tower, Boston Consulting Group.

Notes: In this network chart, FinTech investors have been restricted to the set of banks (purple). The snapshot refers to period 2000-2017. The node size corresponds to the total equity funding received/invested.

4.   Banks are among the main Fintech investors with more than US$13 billion – almost half of total Fintech equity funding— channeled to firms headquartered in Asia. Figure 2 depicts the network of Fintech firms by activity type, together with their investors. The large cluster of nodes represents banks as FinTech equity investors. The links between banks and FinTech investments are especially interesting from an efficiency point of view and from a financial-stability
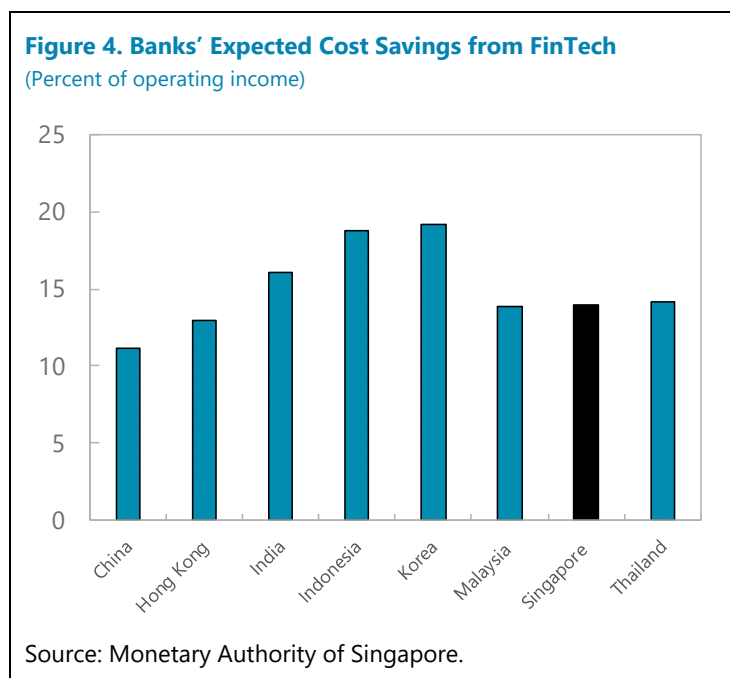
angle. More than two-thirds of the FinTech funding from banks came through equity financing.[3] Goldman Sachs, Mizuho, Citi, Mitsubishi UFJ, and Morgan Stanley were among the largest bank investors in the Asia-Pacific region. So far, the largest share of bank investments is associated with activities related to payments. However, in terms of number of deals, venture capital firms such as Sequoia Capital, 500 Startups, IDG Capital Partners, and Accel Partners were among the most active investors in Asia-Pacific region during 2000-2017.

Figure 3. Top FinTech Equity Investors in Asia-Pacific Region

1. VCs
(Number of deals)

2. Banks
(Number of deals)

Source: FinTech Control Tower, Boston Consulting Group.

5.   Banks are actively investing in retail payments to be able to compete with FinTech players such as Paypal that engage in cross-border activities. Three recent FinTech innovations concern retail payments: mobile payments, real-time payments, and digital currencies (Rysman and Schuh 2017). For instance, Paytm in India and Ant Financial in China managed to raise more than US$7 billion, in several investment rounds, from such banks as Silicon Valley Bank and China Development Bank. Moreover, TransferWise, an online provider of international remittance services with offices in Tokyo, Sydney, and Singapore, among others, obtained close to US$400 million in funding in the past six years.

6.   The adoption of artificial intelligence (AI), such as robo-advisors and chatbots, is expected to improve banks' efficiency and revenue. For instance, AI applied to transaction data can help banks better understand customer behavior, improve their experience, and eventually encourage them to use credit cards ahead of competitors. Similarly, RegTech companies – those firms providing solutions to facilitate compliance with regulatory requirements – use AI to monitor transactions for AML (i.e., anti-money laundering) or suspicious trading activities.

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[3] According to CB Insights, banks' M&A activity targeting FinTech startups started to pick up in 2017 and is expected to continue in 2018.

Figure 4. Banks' Expected Cost Savings from FinTech
(Percent of operating income)

Source: Monetary Authority of Singapore.

7.   The Monetary Authority of Singapore (MAS) estimated that the adoption of FinTech, for instance via automation of banking functions or the use of AI, could result in a decline in banks' cost-to-income ratios averaging about 15 percent across selected Asian economies, with a projected decline of 13.9 percent for Singapore-based banks (Figure 4). For instance, digitalization has recently helped DBS Digibank, a Singaporean bank with activities abroad (e.g., in India, Indonesia), to operate with a cost-to-income ratio of about 34 percent, compared to 55 percent for the traditional banking. According to UBS, AI could potentially increase bank revenue by 3.4 percent and reduce costs by about 4 percent over the next three years. Recently, the MAS has launched a S$27 million grant to support the adoption of new data analytics technologies such as AI and machine learning by financial institutions.

8.   At the same time, the nexus between FinTech companies and the financial system poses challenges for financial stability (IMF 2017). For instance, credit risks emerge when unsecured lending is provided to FinTech companies. Furthermore, banks' investment portfolios could suffer substantial losses if, for example, correlated negative shocks are triggered by a loss of confidence in FinTech-related activities such as cryptocurrencies. Regulators will therefore need to carefully balance the tradeoffs between efficiency and stability:

- Their growing focus on entities should thus be complemented by increased monitoring of activities, especially given the intertwined ownership of the FinTech ecosystem across different countries.

- Governance and the integrity of data, algorithms, and platforms needs to rely on a set of clear rules and standards.

9.   **FinTech regulation can also be shaped to promote lower barriers to entry, while maintaining a level playing field where regulatory arbitrage opportunities are minimal.** This approach should allow for more competition and reduce further the costs of financial intermediation, while helping solve some problems of the current banking environment, such as the too-big-to-fail issue. Recent research suggests that the unit cost of financial intermediation in the US and other advanced economies has been relatively stable at around 2-4 percent over the past century (Philippon 2015; 2016). Allowing new entrants is particularly important given that incumbents are well-entrenched in some parts of the financial system, such as custody and securities settlement. In addition, regulation could encourage low leverage among new market participants from the beginning, which would allow for the sustainable growth of the industry and would improve discipline, while addressing risks arising from AML/CFT and cybersecurity threats.

10.   **Cross-border regulatory cooperation is paramount to the FinTech expansion.** Along these lines, FinTech Memoranda of Understanding (MoUs) are a recent phenomenon that could improve the monitoring of FinTech developments and international cooperation. Regulators—including the MAS, the UK's Financial Conduct Authority, the Australian Securities and Investments Commission, the Hong Kong Monetary Authority, and the Canadian Securities Administrators—have signed more than 30 Fintech MoUs since 2016. The primary purpose of Fintech MoUs is to establish a mechanism that enables the relevant regulators to share and use information on innovation in their respective markets (Bromberg, Godwin and Ramsay 2018). In addition, global or regional industry sandboxes could enhance the collaboration amongst regulators and attempt to address challenges related to cross-border FinTech activities.

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INTERNATIONAL MONETARY FUND

SINGAPORE

STAFF REPORT FOR THE 2018 ARTICLE IV CONSULTATION—INFORMATIONAL ANNEX

Prepared By	Asia and Pacific Department

CONTENTS

FUND RELATIONS

(As of May 31, 2018)

Membership Status: Joined August 3, 1966; Article VIII.

General Resources Account

	SDR Millions	Percent of Quota
Quota	3,891.90	100.00
Fund holdings of currency (exchange rate)	3,394.94	87.23
Reserve tranche position	498.37	12.81
Lending to the Fund:		
New Arrangements to Borrow	68.74	

SDR Department

	SDR Millions	Percent of Allocation
Net cumulative allocation	744.21	100.00
Holdings	749.63	100.73

Outstanding Purchases and Loans: None.

Financial Arrangements: None.

Projected Payments to the Fund: None.

Exchange Arrangement

Singapore's de facto exchange rate arrangement is classified as "stabilized arrangement." The de jure exchange rate arrangement is "other managed." The Monetary Authority of Singapore (MAS) monitors its value against an undisclosed basket of currencies and intervenes in the market to maintain this value within an undisclosed target band. The U.S. dollar is the intervention currency. Singapore has accepted the obligations of Article VIII, Sections 2, 3, and 4 and maintains an exchange rate system free of restrictions on the making of payments and transfers for current international transactions, except for restrictions maintained solely for the preservation of national or international security, which have been notified to the Fund in accordance with the procedures set forth in Executive Board decision 144-(52/51). Singapore maintains restrictions on Singapore dollar credit facilities to, and bond and equity issuance by, nonresident financial institutions. Singapore dollar proceeds obtained by nonresident financial entities (such as banks, merchant banks, finance companies, and hedge funds) from loans exceeding S$5 million, or any amount for equity listings or bond issuance to finance activities outside Singapore, must be swapped or converted into foreign currency upon draw down. Financial institutions are prohibited from extending Singapore dollar credit facilities in excess of S$5 million to nonresident financial entities if

there is reason to believe that the Singapore dollar proceeds may be used for Singapore dollar currency speculation. In a bid to contain a real estate price bubble, Singapore imposed additional stamp duties on purchases by foreigners and corporate entities of residential properties in Singapore.

Article IV Consultation

Singapore is on the 12-month consultation cycle. The 2017 Article IV consultation discussions were held during April 27–May 9, 2017 in Singapore and the Executive Board concluded the consultation on July 13, 2017 (IMF Country Report No. 17/240).

FSAP Participation

The FSAP Update involved two missions: May 15–22, 2013 and July 25–August 7, 2013. The findings were presented in the Financial System Sustainability Assessment (IMF Country Report No. 13/325). An FSAP is planned for 2019.

Technical Assistance: None.

Resident Representative: Mr. Jochen Schmittmann has been posted in Singapore since August 2017.

STATISTICAL ISSUES

I. Assessment of Data Adequacy for Surveillance
General: Data provision is broadly adequate for surveillance. While the authorities have continued to expand the range of publicly available data, dissemination of more disaggregated data would enhance the basis for macroeconomic policy analysis, particularly in the external, monetary, and fiscal areas.
National accounts: The Singapore Department of Statistics (DOS) has made improvements in data sources and methodology. The reconciliation of various national accounts estimates was conducted in 2014, resulting in lower statistical discrepancies. DOS has completed the rebasing of Singapore's national accounts to reference year 2010. **Price statistics**: DOS has completed the rebasing of the Consumer Price Index (CPI) to base year 2014. The CPI is rebased once every five years to reflect the latest consumption pattern and composition of goods and services consumed by resident households.
Government finance statistics: Information on government assets held abroad is neither published nor provided to the Fund. The government publishes annually partial information on the interest and dividends on these assets. Debt service payments on domestic debt made from the extra budgetary Government Securities Fund are published on an annual basis. Data on the financial position of the consolidated public sector are not published.
Monetary statistics: The Monetary Authority of Singapore has not submitted the standardized report forms (SRFs) for monetary statistics introduced in October 2004. The SRFs provide for accounting data to be broken down by instrument, sector, and currency.
Balance of payments: In February 2012, the DOS concluded the migration of the balance of payments accounts to the 6th edition of the *Balance of Payments and International Investment Position Manual (BPM6)*. The main changes relative to the 5th edition include: reclassification of repairs on goods and processing fees to services (from goods); reclassification of merchanting to goods (from services); and treating banks' Asian Currency Units (ACUs) as residents (previously they were regarded as nonresidents, and hence their transactions were excluded from the balance of payments). Data on Singapore's international investment position (IIP) is not provided on a disaggregated sectoral basis as suggested by the BPM6. The authorities have completed revising the IIP data to include all foreign assets held by Singapore's Government Investment Corporation. The associated flows were already included in the balance of payments data.

II. Data Standards and Quality	
Singapore provides data on a timely basis and meets all the SDDS specifications. These include the coverage, periodicity, and timeliness of the data; and the dissemination of advance release calendars; quarterly certification of the metadata posted on the Fund's Dissemination Standards Bulletin Board; and provision of information to allow users to assess data quality.	No data ROSC is available.

Singapore—Table of Common Indicators Required for Surveillance (As of June 20, 2018)					
	Date of Latest Observation	Date Received	Frequency of Data[1]	Frequency of Reporting[1]	Frequency of Publication[1]
Exchange rates	6/20/18	6/20/18	D	D	D
International reserve assets and reserve liabilities of the Monetary Authorities[2]	5/2018	6/2018	M	M	M
Reserve/base money	4/2018	5/2018	M	M	M
Broad money	4/2018	5/2018	M	M	M
Central bank balance sheet	4/2018	5/2018	M	M	M
Consolidated balance sheet of the banking system	4/2018	5/2018	M	M	M
Interest rates[3]	6/20/18	6/20/18	D	D	D
Consumer price index	4/2018	5/2018	M	M	M
Revenue, expenditure, balance and composition of financing[4]—general government[5]	3/2017	9/2017	A	A	A
Revenue, expenditure, balance and composition of financing[4]—central government	4/2018	5/2018	M	M	M
Stocks of central government and central government-guaranteed debt[6]	2018:Q1	5/2018	Q	Q	Q
External current account balance	2018:Q1	5/2018	Q	Q	Q
Exports and imports of goods and services	2018:Q1	5/2018	Q	Q	Q
GDP/GNP	2018:Q1	5/2018	Q	Q	Q
Gross external debt[7]	2017:Q4	3/2018	Q	Q	Q
Net international investment position	2017:Q4	3/2018	Q	Q	Q

[1] Daily (D); weekly (W); monthly (M); quarterly (Q); annually (A); irregular (I); and not available (NA).
[2] Includes reserve assets pledged or otherwise encumbered as well as net derivative positions.
[3] Both market-based and officially determined, including discount rates, money market rates, rates on treasury bills, notes, and bonds.
[4] Foreign and domestic banks, and domestic nonbank financing.
[5] The general government consists of the central government (budgetary funds, extra budgetary funds, and social security funds) and state and local governments.
[6] Including currency and maturity composition.
[7] Official external debt is zero.

Statement by Juda Agung, Executive Director for Singapore
and Chengyi Ong, Advisor to the Executive Director
July 20, 2018

1   Introduction

1.1   The Singapore authorities would like to thank the IMF mission team for a constructive and engaging 2018 Article IV consultation. The authorities welcome the useful analytical studies prepared for this year's consultation.

2   Recent Economic Developments and Outlook

2.1   Global GDP growth in 2017 was at its strongest since 2011. This momentum has carried into the first half of this year, anchored on three mutually reinforcing upturns—in manufacturing, trade and investment. Against this backdrop, the Singapore economy expanded by a firm 4.1% in the first half of 2018. Although the pace of growth was similar to that in H2 2017 (4.5% y-o-y growth), the growth profile was more evenly distributed across industry clusters, compared to the IT-led growth in the preceding period. While the trade-related cluster remained a key pillar of growth, the contribution of modern services increased discernibly in H1 2018. Meanwhile, latest indicators suggest that the weakness in domestic-oriented industries could have receded.

2.2   Since the Article IV mission in May, prospects for the global economy have become more uncertain. Notably, the announcements of tariff impositions by the US and the subsequent retaliatory measures by a few major economies present new downside risks to global growth. While the estimated impact from first-round trade linkages is fairly limited, any escalation in tariff actions could significantly impair the trade and investment climate worldwide. Barring the materialisation of tail risks, Singapore's GDP growth is expected to come in at 2.5–3.5% in 2018, in line with potential. Growth in the manufacturing sector is likely to moderate further, reflecting the attenuated though still-firm global demand for electronics and precision engineering products. At the same time, support from resilient regional demand, ongoing efforts at digital transformation of the Singapore economy, as well as stronger labour market outcomes will provide support to the modern and domestic- oriented services clusters.

2.3   Underlying inflation has continued on its gradual ascent since 2016. MAS Core Inflation, which excludes the costs of accommodation and private road transport, averaged 1.5% in 2017 and in Jan–May 2018, compared to a low of 0.5% in 2015. CPI-All Items inflation has also turned positive since late 2016, but was still subdued at an average of 0.5% over 2017 to May this year.

2.4   The continued improvement in labour market conditions should boost consumer sentiment and support domestic demand, contributing to a projected rise in core inflation over the second half of 2018. At the same time, external inflationary pressures have picked up, with the recent rally in global oil prices already filtering through to domestic oil-related components,

such as electricity tariffs. There are also some upside risks to food inflation, emanating from the ongoing trade disputes and potential weather-related disruptions. Overall, inflationary pressures are expected to broaden across the main categories of the core CPI basket in the quarters ahead. The authorities expect core and headline inflation to average in the upper half of the 1–2% and 0–1% ranges, respectively for 2018.

3   Macroeconomic and Financial Stability

The authorities are committed to a macro-policy mix that keeps the economy on an even keel as GDP growth continues apace and core inflation rises mildly. They continue to be vigilant over internal balance, encompassing both macroeconomic and financial stability.

Monetary Policy

3.1   Against the backdrop of a mild ascent in core inflation and continued economic expansion since H2 2016, MAS undertook a gradual normalisation of monetary policy in April 2018, after keeping to a neutral policy stance for two years. The slope of the S$ Nominal Effective Exchange Rate (S$NEER) policy band was increased slightly, consistent with a modest and gradual appreciation path.

3.2   This policy response is predicated on baseline projections of rising core inflation, underpinned by steady economic growth, and does not aim to pre-empt tail risk scenarios. MAS' approach is to commence with policy normalisation but to do so in an incremental fashion in view of still-benign inflation, particularly as there are growing risks to the immediate outlook. In the short term, the policy band provides sufficient room for fluctuations in the S$NEER to accommodate modest shocks. MAS will continue to closely monitor economic developments including global risk factors. Further adjustments to policy will depend on how the economy evolves, and the latest assessments of inflation and growth prospects.

Property Market Measures

3.3   The authorities announced, on 5 Jul 2018, adjustments to the Additional Buyer's Stamp Duty (ABSD) rates and Loan-to-Value (LTV) limits on private residential property purchases, to cool the market and keep price increases in line with economic fundamentals. The measures were carefully calibrated to dampen the current upswing of the property price cycle, which had taken on a strong and broad-based momentum since late-2017, and address risks of a destabilising correction. As the strength in demand was evident across a range of buyer profiles, a comprehensive package of both tax and credit-based measures was implemented. The authorities gave due consideration to the strong pipeline of private housing supply which will progressively come on-stream over the medium-term. The measures, alongside the government's medium-term land supply policies, were assessed to be appropriate to promote sustainable conditions in the private residential property market.

Financial System

3.4   The authorities welcome staff's acknowledgement of Singapore's high financial regulatory and supervisory standards. MAS' stress tests also indicate that Singapore's financial system remains resilient under severe macroeconomic and financial stresses due to its financial institutions' strong capital and liquidity buffers. The authorities also appreciate staff's acknowledgement of Singapore's developmental efforts at the forefront of financial technology (FinTech) while adapting regulations to the changing financial landscape.

4   Medium-term Issues

4.1   Beyond cyclical issues, the authorities are also focused on the medium term structural issues facing Singapore, including the opportunities and challenges posed by a rising Asia, changing global value chains, rapid technological advancements and population ageing. The Committee on the Future Economy (CFE) envisages a globally and regionally integrated Singapore economy with strong digital capabilities and innovative firms, and a labour force that has deep skills.

4.2   The CFE recommendations aim to create a pro-growth, pro-business environment that encourages private business to invest in physical and human capital, and increase their adoption of digital technologies. The Industry Transformation Maps (ITM) support both incumbents and new firms in each industry, through a suite of programmes that encompass capability development and technology adoption. For instance, the financial services ITM aims to create an ecosystem where established financial institutions and FinTech startups compete as well as collaborate to build a thriving FinTech hub. There is government support to connect incumbents and new firms to mutual advantage – for example, the National Research Foundation's Early Stage Venture Fund matches investments by large local enterprises to local technology start-ups. The Partnerships for Capability Transformation (PACT) programme also provides funding support for firms to collaborate and develop new capabilities.

4.3   Singapore takes a more upstream and broad-based approach towards providing support to the workforce in an era of rapid technological change. First, substantial support is provided to help all Singaporeans to acquire new skills and stay relevant through the SkillsFuture initiative, and this minimises the risk of unemployment for workers. Second, the Adapt and Grow (A&G) initiative helps displaced workers to plug skills gaps and take up new jobs or new careers. This includes the provision of career matching services at career centres as well as the recently launched MyCareersFuture, a national jobs portal, to facilitate job matching. Such an approach minimises unemployment hysteresis, and helps workers better cope with technological disruption. Third, those who require more support may also receive direct wage support, training subsidies and allowances, conditional on workers making the effort to participate in training or accepting a job placement. Additionally, these labour market interventions are complemented by means-tested social support, such as GST Vouchers and ComCare, which provide income security to displaced jobseekers, while medical insurance schemes such as MediShield Life provide lifelong assurance for citizens and their families.

4.4   The authorities view this combination of carefully targeted measures to be more effective in addressing ongoing structural challenges, compared with a universal social support scheme like unemployment insurance. Singapore's approach is well suited for an era of rapid technological change, where workers should remain agile and adaptable. Active labour market interventions have meant that a significant number of workers, including older workers, are placed in new jobs, for example through the A&G initiative.

4.5   The pro-growth agenda described above, and other structural challenges will have implications on the government's finances. There will be significant increases in broad- based, recurrent expenditure, such as in healthcare and security, as well as in long-lived infrastructure investments. Combined with the budget's already significant reliance on the Net Investment Returns Contribution framework, the government will be considering other revenue sources, including changes to the GST, for financing higher recurrent expenditure arising from ageing-related spending pressures, for example. The government will ensure that the overall tax and transfers system remains equitable and progressive. Meanwhile, major infrastructure investments that will yield future economic benefits will be financed through a mix of government grants, user fees and borrowing.

4.6   Singapore's public sector net savings has fallen as a share of GDP over the past decade. A further acceleration of the fall is expected, reflecting to a large part the dynamics of demographic transition. At the same time, net savings by households, the largest contributor to the national savings-investment gap, is also expected to decline given the current trends in population ageing. As noted in Figure 9 of the Staff Report, Singapore's ageing speed is among the highest in the region and advanced economies across the world. When these trends accelerate in the next ten years, there will be a drawdown of the current account surpluses.

5   Final Remarks

5.1   The current expansion in the global economy is likely to be sustained this year. However, tail risks to growth in the external front have grown significantly over the past six months. The authorities will continue to carefully monitor developments and their impact on the Singapore economy. In the event of a negative shock, the authorities have the wherewithal to respond in a timely and appropriate manner to provide the necessary support to the economy and ensure macroeconomic and financial stability.