AMRO Annual Consultation Report

Singapore – 2019

The ASEAN+3 Macroeconomic Research Office (AMRO)

May 2020

The report was prepared on the basis of AMRO's Annual Consultation Visit to the country from November 18 to December 11, 2019 and data availability as of February 28, 2020. AMRO notes that Singapore's outlook has been revised downwards due to the COVID-19 pandemic, and continues to monitor emerging developments.

Acknowledgements

1. This Annual Consultation Report on Singapore has been prepared in accordance with the functions of AMRO to monitor and assess the macroeconomic status and financial soundness of its members; identify relevant risks and vulnerabilities; report these to member authorities; and if requested, assist them in mitigating these risks through the timely formulation of policy. This is done in accordance with Article 3(a) and (b) of the AMRO Agreement.

2. This Report is drafted on the basis of AMRO's Annual Consultation Visit to Singapore from 18 November to 10 December 2019 (Article 5 (b) of AMRO Agreement). The AMRO Mission team was headed by Dr. Chaipat Poonpatpibul, Group Head and Lead Economist. The team members included Mr. Justin Lim Ming Han (Researcher and Main Desk for Singapore), Mr. Yang-Hyeon Yang (Senior Economist), Dr. Simon Liu Xinyi (Economist), and Ms. Madeleine Vinuya (Research Data Analyst). AMRO Director Mr. Toshinori Doi and Chief Economist Dr. Hoe Ee Khor also participated in key policy meetings with the authorities. This AMRO Annual Consultation Report on Singapore for 2019 was peer reviewed by Dr. Matthew Yiu (Group Head and Lead Economist) and Mr. Foo Suan Yong (Senior Economist); and approved by Dr. Khor.

3. The analysis in this Report is generally based on information available up to 28 February 2020.

4. By making any designation of or reference to a particular territory or geographical area, or by using the term "member" or "country" in this Report, AMRO does not intend to make any judgments as to the legal or other status of any territory or area.

5. No part of this material may be disclosed unless so approved under the AMRO Agreement.

6. On behalf of AMRO, the Mission team wishes to thank the Singaporean authorities for their comments on this Report, as well as their excellent meeting arrangements and hospitality during our visit.

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Executive Summary

1. **Singapore's growth declined significantly to 0.7 percent in 2019 from 3.4 percent in 2018.** The electronics and wholesale trade sectors contracted mainly as a result of the U.S.-China trade conflict and the global electronics downturn.

2. **Growth is expected to remain soft at 0.8 percent in 2020**. The COVID-19 epidemic (without policy support) is estimated to reduce GDP growth by 0.8 - 1.0 percentage point, with the tourism, manufacturing, transport, and wholesale and retail sectors being hit significantly. However, the large fiscal stimulus measures in the FY2020 Budget are expected to mitigate the impact. The ongoing structural transformation and infrastructure spending will further support the ICT and construction sector.

3. **The labor market is resilient, with net employment continuing to increase.** The strong momentum in job creation continued in 2019, led by services and a turnaround in the construction sector. Nevertheless, signs of a softening labor market have emerged.

4. **Inflationary pressure in 2019 was low due to weaker growth and a decline in the prices of fuel and utilities.** Headline inflation continued to stay muted in 2019, while MAS Core Inflation declined from 1.7 percent in 2018 to 1.0 percent in 2019, due to the sharp slowdown in the economy, a reduction in electricity tariffs following the liberalization of the retail electricity market, and weaker global oil prices.

5. **Non-oil domestic exports (NODX) have contracted amid the global electronics downturn and the spillover from the U.S.-China trade conflict.** Non-oil domestic exports (NODX) declined by 9.2 percent in 2019, and the decline was sharper for electronics.

6. **The COVID-19 epidemic has become a major risk to growth in the short term.** There is a further downside risk to Singapore's economy if the COVID-19 epidemic is prolonged and becomes more severe and widespread, or if more stringent measures are taken to contain further contagion in Singapore, China, or in the region. Continued supply chain disruptions would weaken exports. Domestically, deteriorating sentiments could dent private consumption and investment, and worsen the labor market outlook more broadly.

7. **The U.S.-China trade conflict and a sharp slowdown in global growth remains key risks for Singapore's economy.** Despite the completion of the phase-one deal, there is still risk of a setback in implementation and re-escalation of the U.S.-China trade tension. Much slower growth in G3 would have a large impact on Singapore as two-thirds of value-added in the manufacturing and services sectors are derived from external demand. Conversely, the move towards further trade deals between the U.S. and China and a faster recovery in semiconductor output are important upside risks.

8. **Cybersecurity threats can undermine financial stability and may affect Singapore's digitalization pace ahead.** Cyberattacks on key financial institutions or financial service providers can have systemic impacts on the financial sector due to the high degree of interconnectedness of financial institutions. Firms are also wary of the impact of cybersecurity attacks on their business operations.

9. **Slower labor force growth will limit growth potential, and social welfare and healthcare spending needs are expected to rise due to a rapidly aging population.** The contribution of labor to Singapore's growth over the long term is expected to slow further due to a rapidly aging workforce, a plateauing resident labor force participation rate, and tighter immigration policies. The recurrent social spending needs from a rapidly aging population will increase significantly and lead to rising fiscal deficits should the increases persistently outpace tax revenue growth.

10. **AMRO supports the sizable fiscal stimulus that has been introduced in the FY2020 Budget to mitigate the impact of the COVID-19 epidemic and near-term structural economic uncertainties.** Special transfers (excluding Top-ups to Endowment and Trust Funds) totaling SGD4.7 billion will be rolled out to support households and businesses. Also, total expenditures are projected to grow by 7.0 percent, mainly in the areas of healthcare, public housing and transport. These policy efforts are expected to lead to an overall budget deficit of 2.1 percent of GDP and a significantly higher fiscal impulse in FY2020. While we assess that the stimulus measures would help lessen the impact of the COVID-19 epidemic and shore up confidence in the near term, additional fiscal spending will likely be needed if it becomes prolonged and lead to a weaker regional and global outlook.

11. **Monetary policy was eased slightly in 2019 in view of the growth slowdown and subdued inflation outlook.** Monetary condition eased at the start of 2020 with the outbreak of COVID-19. However, if the impact of the COVID-19 epidemic on the economy becomes more severe, monetary policy could be eased further to support growth.

12. **The tight macroprudential stance should be maintained to prevent excessive property price increases.** Maintaining the current stance will help mitigate the risk of a sharp price correction when a sizable supply of private residential properties in the pipeline comes on stream in the next few years. If private residential property prices rise more sharply, authorities could consider further macroprudential tightening.

13. **AMRO also welcomes continuing efforts to pursue the structural transformation plans and focus on workers' reskilling.** A significant budget has been set aside to drive Singapore's structural transformation and growth strategies by deepening firms' and workers' capabilities. Additional supports would also be provided for mid-career and older workers to remain employed and gain new skills. Policy efforts to mitigate climate change and cybersecurity and data security risks have also been strengthened.

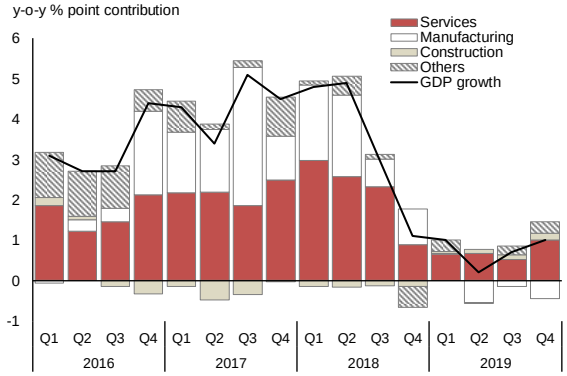
14. **Various initiatives to address socioeconomic challenges have been pushed forward and this momentum should continue.** Social safety nets have also been strengthened, and the retirement adequacy of elderly Singaporeans are expected improve notably over the next few years. A fund has been set up to offset the impact of the planned GST hike, especially among the lower- to middle-income Singaporean households.

A. Recent Developments and Outlook

A.1 Real Sector Developments and Outlook

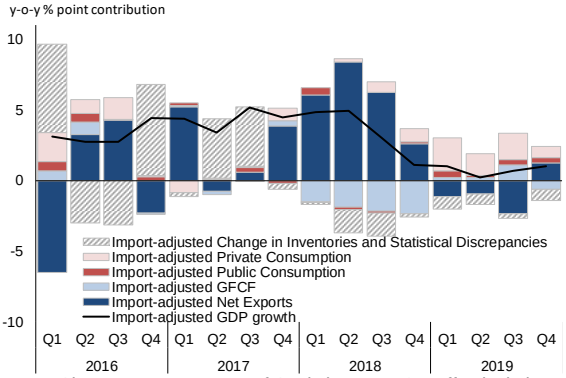
1. **Singapore's economy slowed sharply in 2019.** The economic growth declined significantly to 0.7 percent in 2019 from 3.4 percent in 2018 (Figure 1). The sharp slowdown was partly due to contractions in the electronics and wholesale trade sectors. The decline in these sectors stemmed mainly from the ongoing U.S.-China trade conflict and a downswing in the global electronics cycle. However, activities in the financial services, ICT, tourism-related services and the construction sector continued to be robust. On the expenditure side, AMRO's estimated import-adjusted GDP shows that Singapore's net exports contracted in 2019 after expanding strongly in 2018 (Figure 2). Nevertheless, domestic demand remained resilient, supported by a pick-up in private consumption and a turnaround in investments.

Figure 1. Contribution to Real GDP Growth: Supply Side



Source: Singapore Department of Statistics.

Figure 2. Import-adjusted Contribution to Real GDP Growth: Expenditure Side



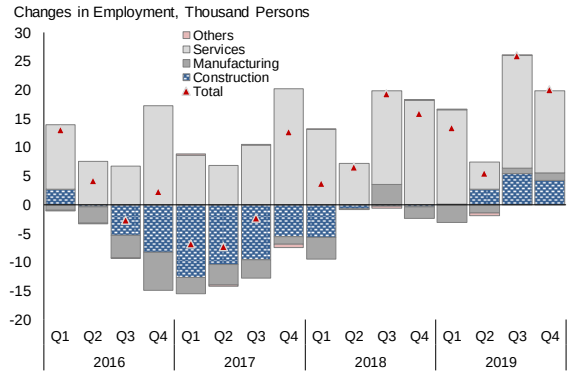
Source: Singapore Department of Statistics; AMRO staff calculations. See AMRO Annual Consultation for Singapore Box A (2018), "Alternative Approach to Estimating the Net Contribution of Key Demand Components to GDP Growth in Singapore".

2. **Growth is projected to remain soft in 2020.** According to AMRO staff's projection, Singapore's economy is expected to grow at 0.8 percent in 2020. The overall impact of the COVID-19 epidemic on Singapore is estimated at 0.8 - 1.0 percent of GDP. First, a sharp decline in the number of tourists would have a notable impact on the tourism, transport and retail sectors. The impact from a decline in tourist arrivals from China alone is significant as Chinese tourists accounted for about 18.5 percent of total tourist arrivals and 14.5 percent of total tourism receipts in 2018, which is equivalent to about 0.8 percent of GDP. Second, the epidemic is expected to have a significant negative impact on China's and the region's growth in the short term and also result in some supply chain disruptions. This in turn would affect Singapore's manufacturing output. In particular, the share of exports to China is large, comprising 17.3 percent of total NODX in 2019. In addition, AMRO's estimated domestic VA in Singapore's goods and services exports to China amounts to 14.0 percent of total VA, which is equivalent to 8.2 percent of Singapore's GDP. As a result of the sharp slowdown in China, there will be additional knock-on effects on the rest of the region which will further dampen Singapore's exports. Thirdly, the deterioration of sentiments domestically will lead to a sharp pullback in private consumption and investment. However, AMRO estimates that the fiscal stimulus announced in the FY2020 Budget is large and is assessed to offset approximately half of the above negative impact of the COVID-19 epidemic on growth. In addition, the accelerated structural transformation efforts and

continued infrastructure spending will also underpin growth in the construction, ICT and other services sectors (education, health and social services).

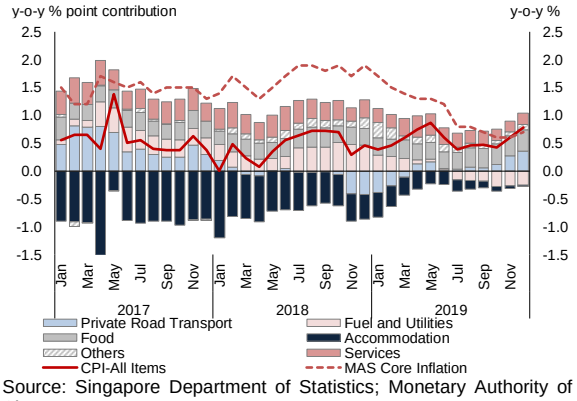
3. **Following the sustained increases in total employment in late 2018 and 2019, the labor market is showing signs of softening.** The strong momentum in job creation that started in H2 2018 was evident in 2019, led by services and a turnaround in the construction sector (Figure 3). However, signs of a softening labor market have emerged since Q2 2019, when resident wage growth slowed. Also, the number of retrenched workers increased slightly in 2H 2019 and the seasonally-adjusted unemployment rate edged up to 2.3 percent in September 2019, from 2.1 percent in September 2018 and 2.2 percent in June 2019.

Figure 3. Net Change in Employment by Sector



Source: Ministry of Manpower.

Figure 4. Headline and MAS Core Inflation



Source: Singapore Department of Statistics; Monetary Authority of Singapore.

4. **Headline inflation continued to stay muted in 2019, while MAS Core Inflation declined in 2019 due to weaker growth and a decline in the prices of fuel and utilities (Figure 4).** Headline inflation continued to remain muted in 2019. MAS Core Inflation, meanwhile, declined from 1.7 percent in 2018 to 1.0 percent in 2019. This is due to the sharp slowdown in the economy, a reduction in electricity tariffs following the liberalization of the retail electricity market and weaker global oil prices. MAS Core Inflation is expected to remain low but edge up to 1.3 percent in 2020 given the dissipation of the impact of the lower electricity prices.

Authorities' Views

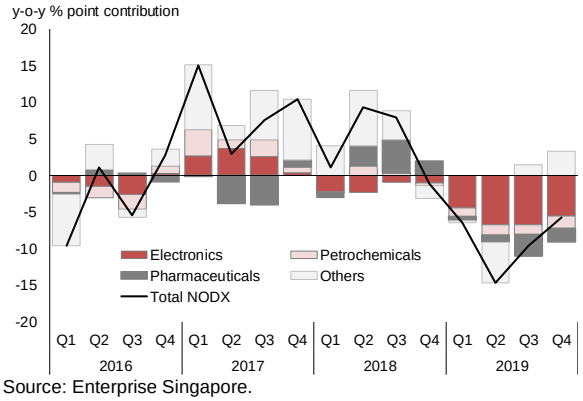
5. **Singapore's economy is expected to weaken further in 2020 due to the COVID-19 epidemic.** Singapore's economy slowed sharply in 2019 due to the downturn in the global electronics cycle and U.S.-China trade tension. As a result of the COVID-19 outbreak, the growth forecast for 2020 has been revised lower to -0.5 to 1.5 percent. They shared a similar view about the channels of the impact on the economy and stressed that there are pockets of strengths in Singapore's economy, particularly in construction, ICT and other services.

A.2 External Sector and the Balance of Payments

6. **NODX has contracted, led by electronics, given the global electronics downturn and the spillover from the U.S.-China trade conflict.** After having expanded by 4.2 percent in 2018, NODX declined by 9.2 percent in 2019. Electronics NODX declined by 22.5 percent, while the non-electronics segment declined by 4.5 percent, led by pharmaceuticals and petrochemicals (Figure 5). By destination, NODX declined for key markets such as the E.U.,

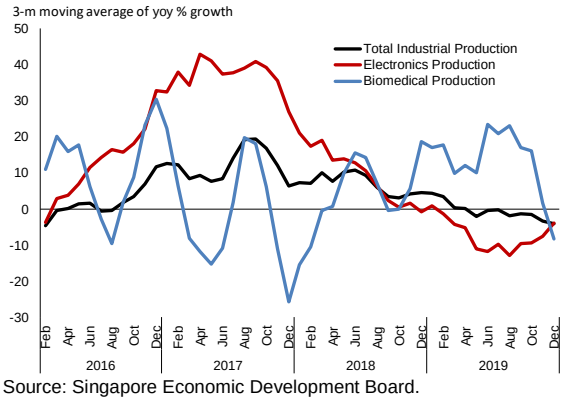
China and a few countries in the region. There are signs of a bottoming out in the semiconductor business cycle in recent months and the contraction in electronics production appears to be stabilizing. Moreover, growth in biomedical output has stayed firm in 2019 (Figure 6). However, the spillover from the recent COVID-19 epidemic in China is likely to stall the recovery in Singapore's exports in the near term.

Figure 5. NODX Growth by Product



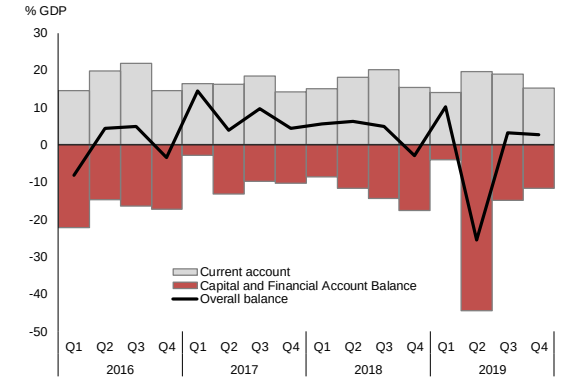
Source: Enterprise Singapore.

Figure 6. Electronics, Biomedical and Industrial Production, 3-Month Moving Average Growth Rate



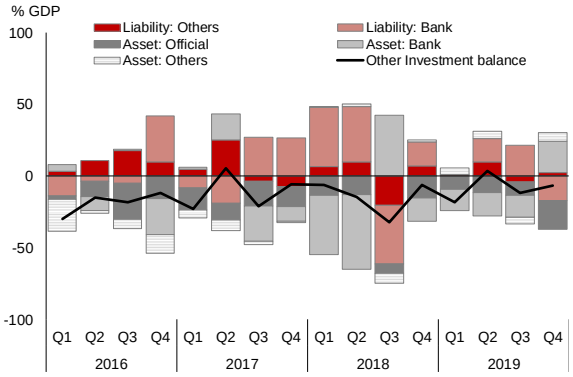
Source: Singapore Economic Development Board.

Figure 7. Components of BOP



Source: Singapore Department of Statistics.

Figure 8. Components of the Other Investment Account



Source: Singapore Department of Statistics.

7. **Singapore's external position continues to be strong.** The current account balance remained sizable due to the large trade surplus (Figure 7), and Singapore's net international investment position continued to register higher net asset positions on a quarterly basis in 2019. The large portfolio outflows from the capital and financial account recorded in Q2 2019 were mainly due to a surge in official and deposit-taking corporations' net purchases of overseas securities, amounting to SGD82.3 billion. Foreign reserves were ample at 9.4 months of retained imports of goods and imports of services as at end-2019.

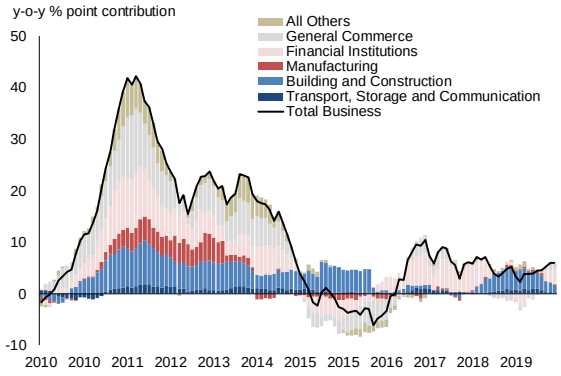
8. **Net foreign direct investment (FDI) inflows continued to be robust in 2019, partly reflecting investment diversion as a result of the U.S.-China trade tension.** Direct investment inflows rose in 2019. Although still significantly lower than inward FDI, outward FDI from Singapore into the regional economies—particularly China, Malaysia, Thailand and Indonesia—continued to increase, and was concentrated in the advanced manufacturing, traditional and modern services sectors (see Annex 1: Singapore's Rising Role as an FDI Hub).

9. **The Net Other investment Account continued to register net outflows in 2019, with larger sustained net increases in cross-border lending abroad compared with net inflows of deposits into Singapore-domiciled banks (Figure 8).** Reflecting its role as an international financial hub, Singapore-domiciled banks continued to be net lenders to overseas entities as evidenced by an increase in their net external assets, which averaged 6.0 percent of GDP in 2019. This was larger than the increase in their net external liabilities (which stood at 5.3 percent of GDP) in this period. In particular, cross-border lending to emerging Asian economies continued to grow, while net funding from abroad still came mainly from Europe and advanced Asian economies.

A.3 Monetary Conditions and the Financial Sector

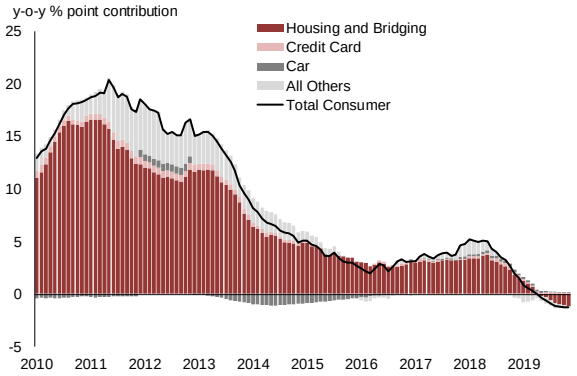
10. **Domestic bank lending to businesses continued to grow, but that to households started to decline due to softer demand for housing loans.** Lending to businesses in the building and construction sector was a key driver for business loan growth in 2019 (Figure 9). On the other hand, growth in outstanding housing loans, which started to slow in H2 2018 following the property cooling measures introduced in July 2018, has turned negative since Q1 2019 (Figure 10). In the near term, bank lending is expected to stay modest, given the soft demand for housing loans.

Figure 9. Growth in DBU Loans and Advances to Businesses



Source: Monetary Authority of Singapore.

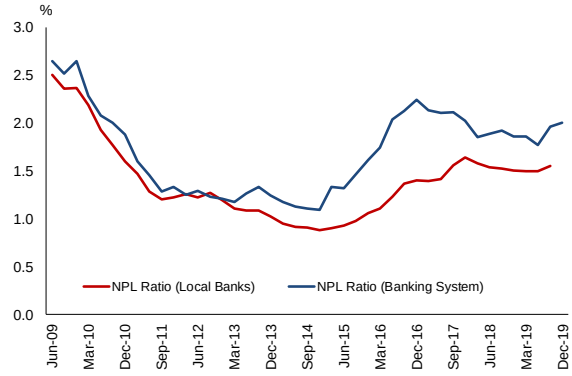
Figure 10. Growth in DBU Loans and Advances to Consumers



Source: Monetary Authority of Singapore.

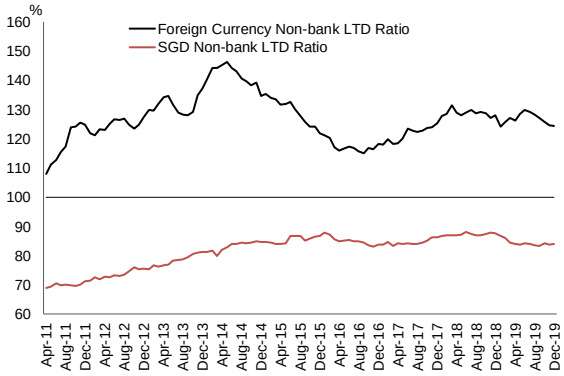
11. **Banks have ample capital and liquidity buffers, and asset quality remains strong.** The banking system's non-performing loan (NPL) ratio edged up slightly from an average of 1.9 percent in 2018 to 2.0 percent in Q4 2019 (Figure 11), reflecting the impact of the economic slowdown and U.S.-China trade tension. At the sectoral level, the pick-up in the NPL ratio was driven mainly by the manufacturing and transport, storage and communications (TSC) sectors. Nevertheless, local banking groups are well capitalized, and liquidity remains ample and above MAS' regulatory requirements. For the entire banking system, the foreign currency loan-to-deposit (LTD) ratio has edged down slightly (Figure 12). This is due to relatively stronger foreign currency deposit growth compared with foreign currency loan growth in recent months. In comparison, the local currency LTD ratio of local banks has continued to be much lower than that of foreign currencies.

Figure 11. Banking System's and Local Banks' NPL Ratios



Source: Monetary Authority of Singapore.

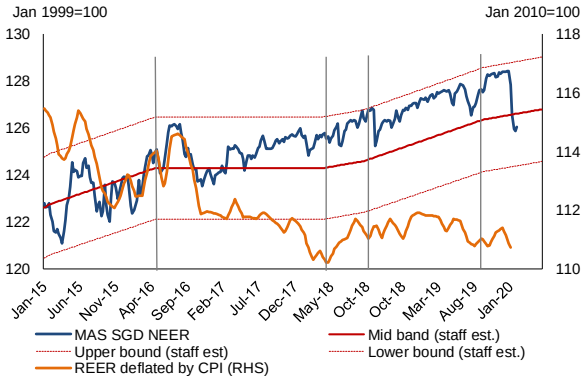
Figure 12. Banking System's Non-Bank Loan-to-Deposit (LTD) Ratios



Source: Monetary Authority of Singapore.

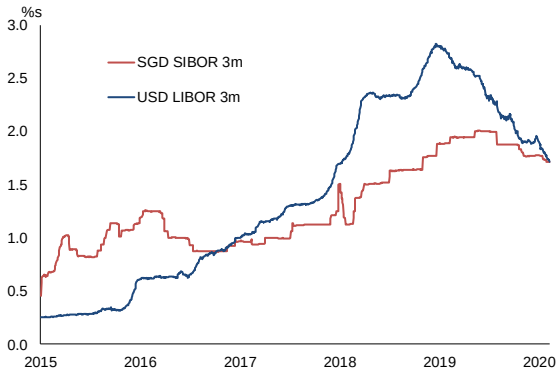
12. **The SGD NEER appreciated in 2019 while the 3-month SIBOR rate continued to edge up in the first half of the year before trending down.** The SGD NEER remained in the upper half of the policy band in 2019, but has weakened in 2020 due to the impact of the COVID-19 epidemic on Singapore (Figure 13). The 3-month SIBOR rate declined only slightly despite the continuously declining 3-month LIBOR rate (Figure 14). The gap between the 3-month SIBOR and 3-month LIBOR rates has also narrowed.

Figure 13. SGD NEER and the Estimated Exchange Rate Policy Band



Source: Monetary Authority of Singapore; CEIC; AMRO staff calculations.

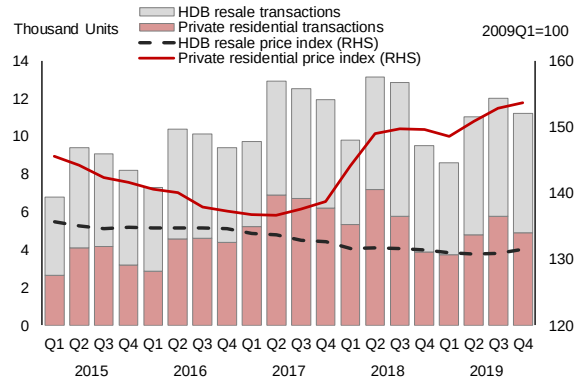
Figure 14. Interbank Rates



Source: ABS Benchmarks Administration; ICE Benchmark Administration.

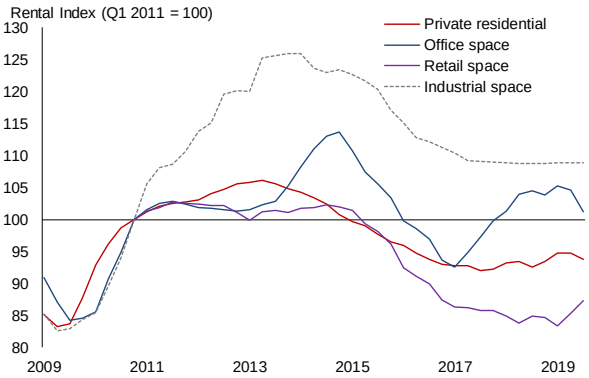
13. **Prices and transactions of private residential properties rose gradually in 2019.** Compared to the sharp price increase between Q4 2017 and Q2 2018, private residential property prices declined slightly by 0.7 percent between Q3 2018 and Q1 2019 following the cooling measures, and rose gradually by a cumulative 3.4 percent between Q1 2019 and Q4 2019 (Figure 15). In this period, transaction volumes for new property launches increased but resale volumes remained low. Meanwhile, the prices of resale public housing have stabilized and even edged up in 4Q 2019. In addition, the supply of new Build-To-Order (BTO) flats will be expanded from 14,600 in 2019 to between 16,000 and 17,000 in 2020, in order to meet the expected higher demand following enhanced measures to improve housing affordability and accessibility for Singaporeans. Rentals for office space and private residential properties edged down slightly, while those for retail and industrial spaces have stabilized (Figure 16).

Figure 15. Property Prices and Transaction Volumes



Source: Housing and Development Board; Urban Redevelopment Authority.

Figure 16. Rental Index

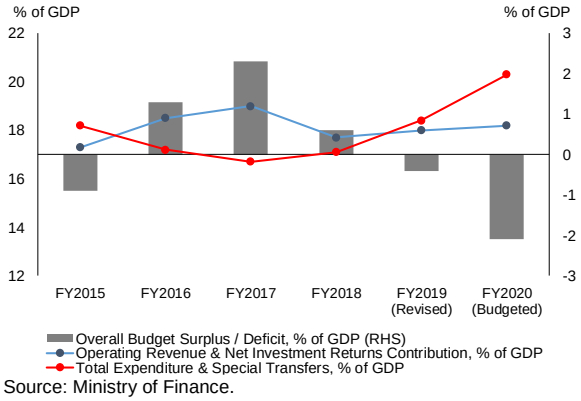


Source: Urban Redevelopment Authority.

A.4 Fiscal Sector

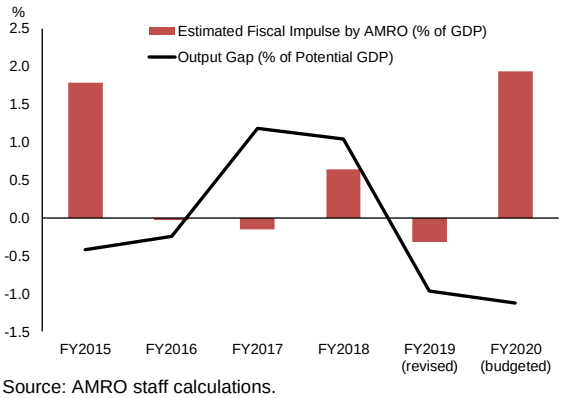
14. **The revised FY2019 Budget shows a small overall budget deficit compared to the surplus recorded in the FY2018 Budget.** The FY2019 overall budget position was slightly revised from a deficit of 0.7 percent of GDP to 0.3 percent of GDP (Figure 17). This was due to a downward revision in total expenditures of approximately SGD2.1 billion, mainly attributed to delays in infrastructure and amenities projects. The revised operating revenue was also marginally lower due to lower collections from the Motor Vehicle Tax, Vehicle Quota Premiums and Goods and Services Tax.

Figure 17. Fiscal Revenue and Expenditure



Source: Ministry of Finance.

Figure 18. AMRO's Estimated Fiscal Impulse and Output Gap



Source: AMRO staff calculations.

15. **A large stimulus package was introduced in the FY2020 Budget to mitigate the impact of the COVID-19 epidemic and near-term structural uncertainties.** The FY2020 Budget is significantly expansionary with a projected large overall deficit of SGD10.9 billion (2.1 percent of GDP). To support businesses and households in this time of uncertainty, and mitigate the impact of the COVID-19 epidemic in the near term, the Budget includes special transfers (excluding top-ups to endowments and trust funds) to businesses and households totaling SGD4.7 billion (further discussions in Section C.2). In addition, total expenditures are projected to grow by 7.0 percent, mainly in healthcare, upgrading of public housing and infrastructure development. On the other hand, operating revenue is projected to increase by 1.7 percent over the revised FY2019 estimates, mainly led by higher Statutory Boards' Contributions, and Corporate and Personal Incomes Tax collection. As a result, the fiscal impulse is expected to be much higher in FY2020 due to the large transfers and total expenditure increase (Figure 18).

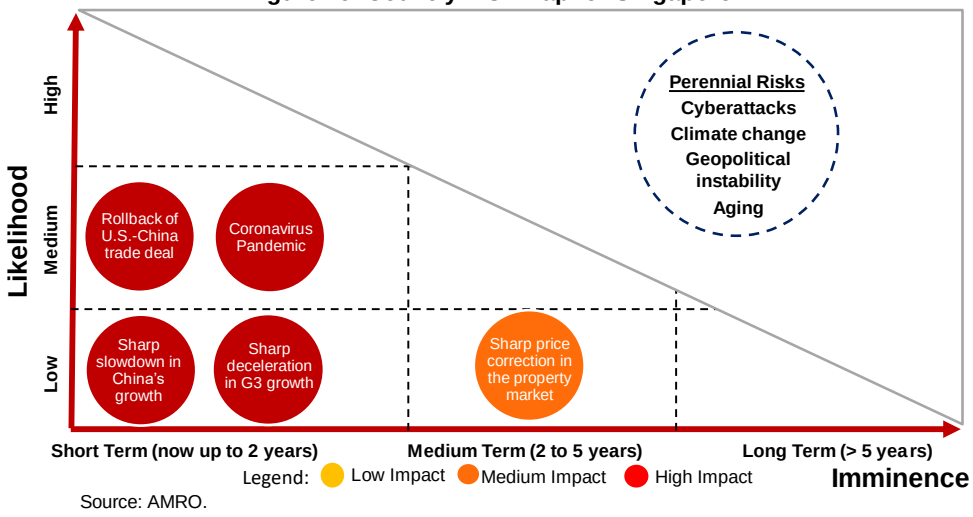
The FY2020 Budget also focuses on longer-term measures to boost Singapore's competitiveness, upskill workers, strengthen social safety nets, enhance the retirement adequacy of older Singaporeans, foster a more inclusive society, prepare for climate change, and pave the way towards a more sustainable economy (further details in Section C.1).

B. Risks, Vulnerabilities and Challenges

B.1 Rising Short-term Risks Especially Due To The COVID-19 Outbreak

16. **The risks to growth for the Singapore economy stem mainly from external factors, such as the COVID-19 epidemic, a sharp slowdown in China's growth, and re-escalation of the U.S.-China trade tension (Figure 19).** The economy would be adversely affected by a flare-up in the US-China trade conflict and global growth slowdown. A sharp property price correction can adversely affect consumer confidence in the medium term too. In addition, Singapore is also faced with the challenges of cybersecurity threats, climate change, aging and geopolitical instability.

Figure 19. Country Risk Map for Singapore



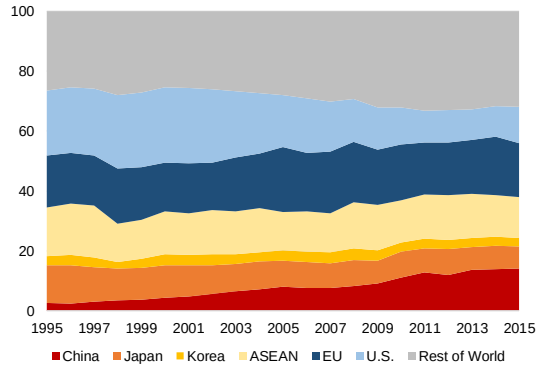
Source: AMRO.

17. **A global COVID-19 pandemic is likely to worsen Singapore's near-term outlook.** Singapore's economic outlook will be much worse if the COVID-19 epidemic becomes a global pandemic, requiring more countries, including Singapore, to adopt stringent measures to contain the virus. The measures will lead to disruptions to economic activities and weaken global growth. Domestically, deteriorating sentiments would dent private consumption and investment, and worsen the labor market outlook more broadly.

18. **A sharp slowdown in China's and G3 growth can weigh further on Singapore's outlook.** Much slower growth in China and the G3 economies would have a large impact on Singapore since two-thirds of value-added (VA) in the manufacturing and services sectors is derived from external demand. It is about 80 percent in the manufacturing sector, and close to 60 percent in the services sector (see Annex 2: Assessing the Changing Elasticities of Singapore's Goods Exports). In terms of the share of exports on a VA basis, the E.U., China, the U.S. and Japan are among the key final demand markets for Singapore's goods and services (Figure 20).

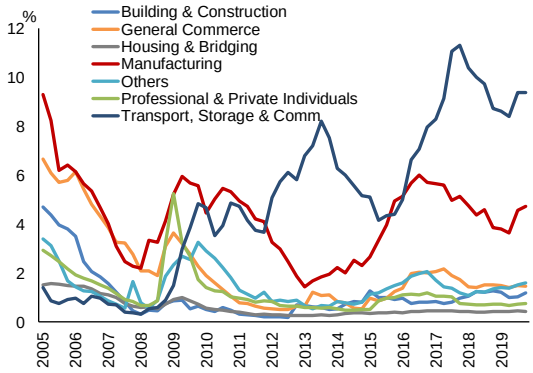
There could also be second-round impacts through Singapore's economic linkages with China and the G3 countries via ASEAN countries.

Figure 20. Singapore's Value-added in Manufacturing and Services Exports by Country



Source: OECD TiVA database.

Figure 21. Banking System NPLs by Sector

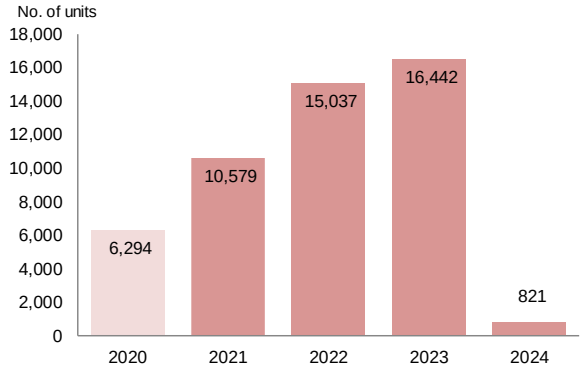


Source: Monetary Authority of Singapore.

19. **Exports and growth would also be impacted if there is a re-escalation of the U.S.-China trade tension due to setbacks in implementation of Phase I.** Despite the completion of the phase-one deal, there is risk of setbacks in the implementation and a re-escalation in the trade tension. Given Singapore's deep integration in GVCs, exports will be affected, particularly electronics exports. While further trade deals between the U.S. and China are uncertain, they pose as an important upside risk to the economy and can spur a faster recovery in semiconductor output.

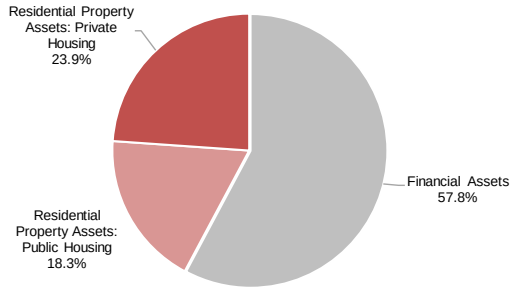
20. **Corporates, banks and households could be affected by a re-escalation in the trade conflict and a sharp slowdown in the global economy.** NPLs, especially in the manufacturing sector, have picked up and could rise further if the trade conflict escalates and the global economy slows sharply (Figure 21). In addition, retrenchments may increase further and affect households' income and debt repayment, especially among the highly leveraged segments.

Figure 22. Pipeline Supply of Private Residential Units by Expected Year of Completion, Q4 2019



Source: Urban Redevelopment Authority.

Figure 23. Composition of Household Assets, 2019 Q4



Source: Singapore Department of Statistics.

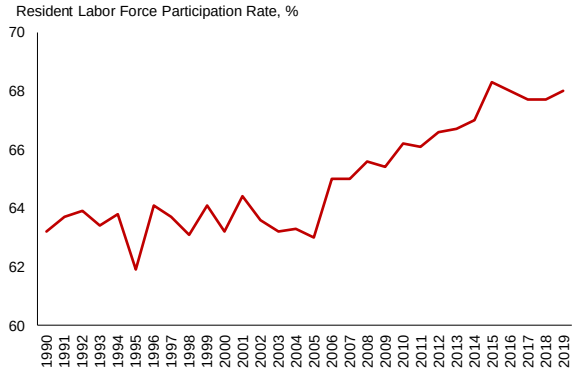
21. **A sharp property price correction may affect confidence and consumption through wealth effects.** In the medium term, the risk of a sharp price correction in the private residential market remains, in view of the large private residential property supply in the pipeline,

of which a sizable share remains unsold (Figure 22). The large incoming supply may not be well-absorbed if the economy were to weaken and take longer to recover. As of Q4 2019, private and public residential property assets account for 42.2 percent of total household assets (Figure 23). Therefore, a sharp price correction can adversely affect growth through weaker confidence and the negative wealth effect on consumption. Banks may also experience credit losses arising from their exposures to the property-related sector, which accounts of around 30 percent of banks' total loans to businesses and individuals.

B.2 Perennial Risks and Challenges

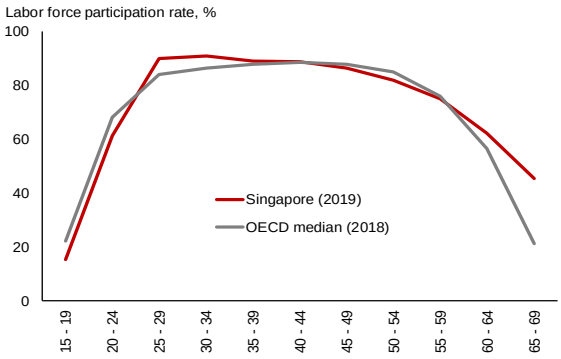
22. **Singapore's potential growth will face downward pressures due to slower labor force growth, while social welfare and healthcare spending needs will rise due to a rapidly aging population.** The contribution of labor to Singapore's growth over the long term is expected to slow further due to a rapidly aging workforce, a plateauing resident labor force participation rate, and tighter immigration policies. In particular, the resident labor force participation rate appears to have leveled off since 2015 at around 68 percent, after having increased steadily since the early 2000s (Figure 24). Further gains in the labor force participation rate would be quite limited compared to the past given that the labor force participation rates of male and female workers aged 50 and above, are already broadly in line with the OECD's median for workers in these segments, and that for workers aged 60 and above is already higher than the OECD countries' median (Figure 25). Moreover, recurrent social spending needs for a rapidly aging population will also rise significantly and lead to rising fiscal deficits should the growth in social spending persistently outpace tax revenue growth in the longer term.

Figure 24. Resident Labor Force Participation Rate



Source: Ministry of Manpower.

Figure 25. Singapore and OECD Median Labor Force Participation Rate by Age Group



Source: Ministry of Manpower, OECD.

23. **The increasing frequency and sophistication of cybersecurity threats can have financial stability implications and may hamper Singapore's digitalization efforts.** Given the high degree of interconnectedness of financial institutions, cyberattacks on key financial institutions or financial service providers can have systemic implications for the broader financial sector. In addition, the rapid adoption of new digital technologies will also increase financial institutions' exposure to technology-related risks, which can lead to disruptions in day-to-day operations, data breaches, damages to critical IT systems or loss in confidence. Survey findings from the 2019 Allianz Risk Barometer and the October 2019 Carbon Black's Global Threat Report show that organizations in Singapore are concerned about the impact of cyberattacks

on their businesses, particularly in light of more rapid implementation of the digital transformation projects. While businesses have stepped up investments and undertaken additional measures to enhance cybersecurity, they remain wary of potential cybersecurity threats, which can be amplified and become more widespread due to the greater dependency on upcoming key digital infrastructures such as 5G. The growing skills gap in cybersecurity is another key constraint for firms looking to develop their cybersecurity risk management capabilities.

24. **The negative effects of climate change will intensify further, requiring substantial fiscal spending to help finance Singapore's climate change mitigation and adaptation plans over the long term.** As a small island state, Singapore is vulnerable to the negative effects of climate change. In particular, rising sea levels can result in large economic and financial losses due to the potential damages to physical assets in low-lying coastal areas. The authorities have estimated that at least SGD100 billion is required over the next 50 to 100 years to fund Singapore's coastal protection efforts. These could include the building of coastal defences such as sea walls, tide gates, and pumping stations.

Authorities' Views

25. **The authorities viewed that downside risks to growth have increased due to the COVID-19 epidemic, while progress has continued in addressing risks and challenges across different fronts.** Downside risks to growth would be greater if the COVID-19 outbreak becomes more protracted and widespread in China and the region. They also viewed that uncertainties over the U.S.-China trade relations remain a key risk despite the recent Phase I trade deal. Nevertheless, concerted policy efforts have been continuously undertaken to address the challenges and vulnerabilities facing Singapore. Domestically, the recalibration of macroprudential measures and adjustment of housing supply have helped moderate activity in the private residential property market. Despite slower employment growth, investments in digitalization and continued reskilling and upskilling efforts are expected to bolster productivity growth, helping mitigate long term risks to growth stemming from an aging population. Measures to enhance cybersecurity in the financial sector, key infrastructures and public institutions have been strengthened to mitigate growing cybersecurity risks. In response to climate change risk and its substantial impact over the long term, the authorities have stepped up efforts towards climate change mitigation and adaptation – these plans are being incorporated in key infrastructure projects, for example. In the FY2020 Budget, a new Coastal and Flood Protection Fund with an initial injection of SGD5.0 billion is to be set up to address the risk of rising sea levels. Moreover, the Carbon Pricing Act and its accompanying regulations have also been in effects since January 2019, and the carbon tax rate will be reviewed by 2023 to help nudge businesses to further reduce CO2 emissions.

C. Policy Discussion and Recommendations

C.1 Promoting Comprehensive and Inclusive Structural Transformation

26. **Singapore continues to firmly pursue the structural transformation plans with a view to enhance productivity growth and innovative capabilities.** The structural transformation agenda is aimed at mitigating the longer-term challenges associated with aging,

technological changes and uncertainties emanating from a changing external environment. All 23 sector-specific Industry Transformation Maps (ITMs) are being implemented by different government bodies with coordination among themselves. To further drive Singapore's transformation and growth strategies, the authorities have announced an allocation of SGD8.3 billion over the next 3 years to deepen firms' and workers' capabilities as part of the FY2020 Budget. The foreign labor quotas in the lower- to mid-skill segments in the construction, marine shipyard and process sector will also be tightened, in addition to the services sector announced in 2019, with the view that the lower quotas will further incentivize firms to improve labor productivity.

27. **AMRO commends the continued concerted efforts made by the authorities to reskill and upskill workers through various customized and targeted training programs.** The participation rate of Singapore's resident labor force in training rose from 35 percent in 2015 to 49 percent in 2019. These programs have been effective in promoting employment and enhancing the productivity of workers. For example, the Adapt and Grow initiative has helped to retrain workers and led to new employment for more than 100,000 jobseekers since 2016. In addition, employers have also reported that the SkillsFuture program, which encourages lifelong learning and upskilling, has helped improve workers' performance and brought about better wage outcomes. Given the challenging outlook in the near term, we welcome the additional support announced in the FY2020 Budget to help mid-career and older workers remain employed or reskill via the newly announced SkillsFuture Mid-Career Support Package. To further encourage lifelong learning, SkillsFuture Credit top-up of SGD500 is made available to every Singaporean as part of the FY2020 Budget, with an additional SGD500 top-up for workers aged 40 to 60. These efforts are commendable and should be continued.

28. **The initiatives undertaken to facilitate the employment of older workers to address the issue of an aging population are commendable.** The phased increases in the retirement and re-employment ages will help older workers who are fit enough stay employed longer. A more age-friendly workplace and equal access to upskilling and reskilling training programs can also help promote a more inclusive labor market. The raising of the retirement and reemployment age, together with incentives for firms, such as the Special Employment Credit (SEC) and Additional Special Employment Credit (ASEC), have helped increase the labor force participation rate of older workers. In this regard, the introduction of the Senior Worker Support Package in the FY2020 Budget, which replaces the SEC and ASEC, will help firms and workers transition towards a more age-friendly and inclusive workplace.

29. **We welcome the initiatives taken by the authorities on various socioeconomic fronts to improve the livelihoods of Singapore citizens.** Spending and fund allocations for aging-related insurance and healthcare have been increased to meet the growing needs. The Enhanced CPF Housing Grant and the increase in the monthly household income ceiling for homebuyers are expected to further improve housing affordability and accessibility. Commitments to further improve accessibility and affordability of early childhood education will also help improve social mobility, and expenditure in this area is expected to grow significantly in the next few years.

30. **We also commend the policy move to strengthen the retirement adequacy of Singaporeans, especially among the elderly and low-income households.** Several initiatives were announced in the FY2020 Budget to further strengthen Singapore's social security system. The Basic Retirement Sum (BRS) was adjusted for cohorts turning 55 in 2021 and 2022 to account for long-term inflation and some improvements in standard of living. The Government will also be increasing the CPF contribution rates to strengthen retirement adequacy of senior workers aged above 55 to 70. To help lower- to middle-income Singaporeans save more for retirement, the Matched Retirement Savings Scheme will match dollar-for-dollar top-ups made to the CPF Retirement Account of those aged 55 to 70. The scheme will run for five years from 2021 to 2025. From 2021, Silver Support Scheme will also be enhanced to strengthen support for seniors who had low incomes during their working years, and now have less in retirement. Eligible seniors aged 65 and over will receive 20 percent higher payouts from the scheme. The scheme will be expanded to benefit close to 250,000 Singaporeans, significantly more than the 150,000 who currently receive Silver Support. In addition, the Lease Buyback Scheme and Silver Housing Bonus will be enhanced to better support Singaporeans who wish to tap onto their housing assets for retirement purposes. Efforts to strengthen social safety nets should continue as some segments of the population may remain vulnerable as the economy transforms. Furthermore, a clear policy—within the policy frameworks of public housing and welfare—should be considered to address the 99-year Housing Development Board (HDB) flat lease decay issue based on a thorough assessment of the implications of the sharp loss in value of the HDB flats for the residents and the effects on the economy (Box A).

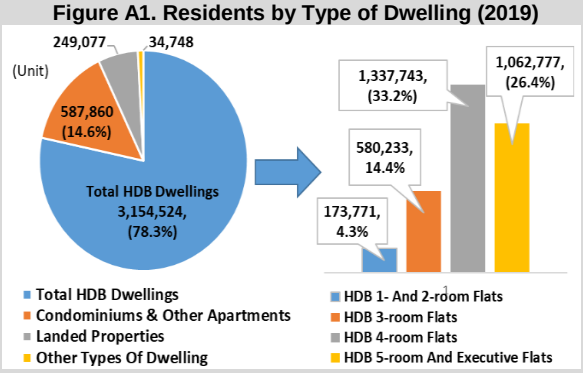
Authorities' Views

31. **Despite the near term challenges, it is important that Singapore remains focused in navigating the long-term structural shifts.** The structural transformation efforts are already showing notable progresses being made in the areas of productivity growth, wages and businesses' expansion abroad. These plans will continue and are being accelerated. Workers are encouraged to continually learn and develop new skills - especially among the mid-career segment. Firms are also encouraged to support older workers who wish to remain employed for longer. At the same time, expenditures in the areas of healthcare, education, public housing will be further increased to ensure that the gains from Singapore's structural transformation can be shared more widely. Social safety nets will be strengthened and collaborative efforts with non-governmental social service partners to help those in need are being deepened. The accelerated policy efforts to mitigate climate change and cybersecurity and data security risks are central to addressing Singapore's vulnerabilities.

Box A. HDB Lease Decay, Macroeconomic Implications and Policy Efforts[1]

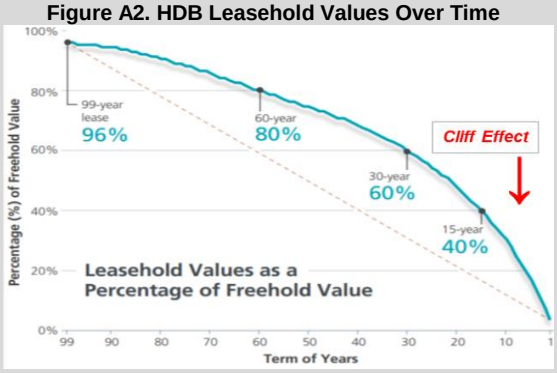
The lease decay (expiry) of Housing and Development Board (HDB) flats is one of the important socioeconomic challenges that the Singapore government needs to address. Since the 1960s, under a Home Ownership for the People scheme, HDB flats were built primarily to provide affordable housing with subsidies from the government. The flats were available for sale on 99-year leases in land-scarce Singapore. Currently, 80 percent of Singaporeans live in HDB flats (Figure A1). As these flats reach the end of their 99-year leaseholds, their values are expected to fall progressively to zero. To assuage public concern over declining asset values and to mitigate potential adverse macroeconomic impacts, policy directions and details around public housing reform and relevant welfare policies need to be worked out and communicated to the people.

Figure A1. Residents by Type of Dwelling (2019)



Source: Singapore Department of Statistics

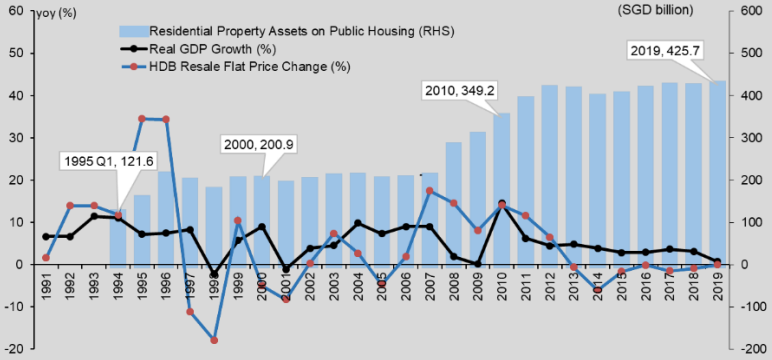
Figure A2. HDB Leasehold Values Over Time



Note: Singapore Land Authority's table ("Bala's Table") was used to calculate development charges for land leases.
Source: Centre for Liveable Cities

The lease decay effect is more pronounced for older HDB flats, which can affect the elderly owners' retirement adequacy. Based on the Singapore Land Authority (SLA)'s leasehold table, the value of HDB flats could decrease rapidly when the remaining lease terms become shorter (Figure A2). These flats could also become difficult to sell and cash out. For owners who are unable to meet their retirement adequacy, they can consider other housing monetization options such as renting out a room to supplement their retirement income.

Figure A3. GDP Growth, HDB Resale Flat Price Change and Residential Property Assets on Public Housing



Source: Singapore Department of Statistics, Housing Development Board

The potential price cliff effect of older HDB flats will remain in the coming decades. While flat values have generally appreciated over time in line with economic growth, it may not be realistic to expect flat values to keep rising, especially as Singapore's growth trajectory slows over time. The government's upgrading programs for older flats have helped to maintain the value of aging flats. Empirical findings by a National University of Singapore study argued that HDB flats survived depreciation better than private condominiums when they are more than 30 years old[2]. In addition, economic growth has supported property prices (Figure A3). Currently, HDB manages a total of about

[1] Prepared by Yang Yang-Hyeon (Senior Economist).
[2] National University of Singapore, Sumit Agarwal & Sing Tien Foo, "*Aging and Decaying Leases of Residential Property*" (Feb 2019). The study found differences in depreciation among three housing types. At 21 year mark, HDB flats was depreciated about 3 percent, while the depreciation rate for freehold private homes was 10 percent, and leasehold private home was 30 percent (using resale transaction prices from 1997 to 2017).

one million flats. Of these, about 10,000 (1 percent) are more than 50 years old based on when their leases commenced. However, considering that many aging flats were built in the 1970s and 1980s, the share of older flats will grow rapidly over the next decade.

From a macroeconomic perspective, uncertainty related to lease expiry could have a negative wealth effect on Singapore's economy. The prospect of depreciating HDB flat values could adversely affect households' confidence and result in lower consumer spending. The adverse wealth effects could be large for elderly people whose savings are insufficient for retirement[3]. If these effects on consumption are large, they would become a drag on growth. These wealth effects should be thoroughly assessed, and the government should consider taking pre-emptive measures to mitigate these potential effects.

Singapore has thus far introduced several public housing policies to meet various objectives such as ensuring affordability of HDB flats for young buyers, supplementing retirement adequacy of elderly flat owners, and pacing out the redevelopment of ageing estates. The Lease Buyback Scheme (LBS) was introduced in 2009 as an additional monetisation option for owners of 3-room or smaller flats. Under the LBS, eligible owners sell part of the remaining lease to HDB. Part of the proceeds goes into the owners' CPF Retirement Account, and the savings in the CPF RA will be used to purchase a CPF LIFE annuity, which will provide the owner with monthly income for life. In 2015, the LBS was extended to 4-room flats, and in 2019, it was further extended to all HDB flats, including 5-room and larger flats, so that owners of all HDB flat types have the option to monetise their flat while continuing to age-in-place. The Voluntary Early Redevelopment Scheme (VERS) was announced in 2018 to allow flat owners to vote on whether they want the authorities to redevelop their precincts when they are aged 70 years and older. However, it may not be available to HDB owners of all housing estates and will come into force in about 20 years. The details of VERS, including compensation terms, are still under discussion. In addition, the updated rules on Central Provident Fund (CPF) usage and HDB housing loan announced in May 2019 will enable flat buyers to obtain maximum CPF usage and HDB housing loan to finance their purchases, provided the remaining lease of the flat covers the youngest buyer till at least the age of 95[4]. This could potentially help mitigate the impact of depreciating prices of older flats by making them more attractive to buyers. The Enhanced CPF Housing Grant (EHG), targeted at enhancing affordability, regardless of the types of HDB options or areas, can support buyers who want to stay in older HDBs. This policy provides a lot more flexibility in the HDB resale market. These efforts are commendable, but it remains to be seen whether more targeted policies are required to address the potential challenges arising from cliff effects of the 99-year lease expiry.

A clear policy—within the policy frameworks of public housing and welfare—should be considered to address the lease decay challenges; and the policy should be clearly communicated to the public. Lease expiry is a multifaceted problem with no easy solutions as each potential solution can also have significant trade-offs[5]. The government has been seeking feedback and there have been discussions and suggestions by various groups of people. A comprehensive policy analysis of HDB owners' consumption pattern by different cohorts and adverse wealth effects should be undertaken. The relevant policies need to strike a balance between the retirement adequacy of HDB residents, housing affordability, fiscal sustainability, inter-generational fairness, and address potential negative impacts on consumption. In addition, effective communication is needed to anchor people's expectations. This will help citizens to make sound housing and retirement decisions, which will also help lessen the potential adverse impact on the economy.

[3] Housing has been facilitated by dominant withdrawals from CPF since 1968, when CPF funding was allowed to be used for HDB purchasing.

[4] Those who do not meet the criterion will still be able to use CPF and take up an HDB housing loan, but the amount will be pro-rated. The total amount of CPF that can be used for property purchase will depend on the extent the remaining lease of the property can cover the youngest buyer until at least the age of 95 (Previously, the use of CPF to buy properties focused on the remaining lease of the property).

[5] For example, one proposal in the public debate is a one-time automatic lease top-up for ageing flats once they are 50 years old. This proposal provides a clear criterion for HDB owners but it might lead to significant challenges among stakeholders to reach an agreement. For instance, some owners may prefer for lease extensions but others may not want it. An increase in initial prices of HDB flats might be good for sellers but not for first-time buyers. Also, automatic extensions of leases could slow down the pace of urban renewal (Vikram Khanna, 2019). Another proposal suggests that all eligible owners be able to sell back the remaining leases to the government at any time after the unit has completed 30 years of the lease term. The compensation for this scheme is based on future imputed rents. Although this proposed scheme will directly benefit HDB owners who wish to sell their flats after 30 years of ownership, it will likely become a significant fiscal burden for the government.

C.2 Expansionary Fiscal Policy to Address Near-Term Challenges and Anchor Structural Transformation

32. **AMRO supports the sizable fiscal stimulus package in the FY2020 budget, which supports businesses and households, and seek to mitigate the impact of the COVID-19 epidemic and economic uncertainties.** Additional fiscal spending may be needed if the COVID-19 epidemic worsens and lead to a weaker regional and global outlook. This may include extending and enhancing the wage subsidy schemes, providing larger corporate tax rebates or higher financing for SMEs.

33. **We also welcome the additional top-ups to support the elderly as well as financing for climate change adaptation and mitigation efforts over the long term.** Additional allocations are made to further support the elderly and finance their healthcare spending needs via the ElderCare Fund, ComCare Fund and MediFund which totals SGD1.45 billion. These allocations are in addition to the sizable top-ups totaling SGD11.2 billion announced in the FY2019 Budget, which includes the Merdeka Generation Package and the Long-Term Care Support Fund. To offset the impact of the impending GST increase, a SGD6.0 billion Assurance Package will be provided to Singaporeans over a 5 to 10 year period when the GST rate is raised. The authorities have also announced a new SGD5.0 billion Coastal and Flood Protection Fund as part of Singapore's efforts to address rising sea levels. As it requires a large amount of resources, the authorities will use a combination of funding tools, including this fund, borrowing, budget from Government-of-the-day, as well as past reserves for measures such as land reclamation.

34. **It is prudent that the authorities are pursuing several financing options to meet the rapidly growing socioeconomic, infrastructure and climate change spending needs and ensure fiscal sustainability.** The recurrent expenditure for socioeconomic needs, such as early-childhood education, public housing and healthcare costs, will rise significantly over the longer-term. In this regard, the plan is to increase the goods and services tax (GST) rate from 7 to 9 percent to help fund these recurrent spending. Although the authorities have announced that the GST increase will not take place in 2021 following its review of fiscal projections and the current state of the economy, they remain committed to its implementation by 2025. Meanwhile, debt-financing options, supported by the provision of guarantees, are being explored by the authorities to help fund large infrastructure projects. We support this as one of the financing options to distribute costs more equitably across generations.

Authorities' Views

35. **Strong fiscal policy supports have been deployed to help stabilize the economy and cope with near-term uncertainties.** The Stabilization and Support Package is aimed at supporting firms' cash flow needs and help workers remain employed, with additional support for the hard-hit sectors. Meanwhile, the Care and Support Package is provided for households to help alleviate the financial pressures during the uncertain economic climate, with greater support for the lower income households. In addition, funding for frontline agencies that are helping to contain the COVID-19 outbreak has been bolstered.

C.3 Accommodative Monetary Policy to Support Growth

36. **If the impact of the COVID-19 epidemic on the economy becomes more severe, monetary policy could be eased further to support the economy.** Monetary policy was eased slightly in 2019 in view of the growth slowdown and subdued inflation outlook. The slope of the SGD NEER policy band was decreased slightly in October 2019, in response to the widening negative output gap and waning inflationary pressure. In response to the weaker economic outlook arising from the COVID-19 epidemic, MAS signaled to the market that there was room for the SGD NEER to ease within the current policy band which caused the NEER to drop to the lower half of the band. However, if the COVID-19 epidemic were to worsen, then the authorities could further ease monetary policy.

37. **We welcome the announcement by MAS to further enhance the transparency of its monetary policy operations.** MAS has announced plans to release data on its net purchases of foreign currency on a half-yearly aggregated basis, with a six-month lag in 2020. The enhanced disclosure is expected to help inform market participants about MAS' foreign exchange intervention operations.

Authorities' Views

38. **The authorities remain vigilant and is monitoring economic developments closely.** The monetary stance remains unchanged. However, there is space for the S$NEER to fluctuate within the policy band, in line with the weakening outlook due to the COVID-19 outbreak.

C.4 Maintaining a Tight Macroprudential Stance to Safeguard Financial Stability

39. **The tight macroprudential stance should be maintained to prevent excessive property price increases.** Since the GFC, the authorities' targeted and calibrated macroprudential measures have been effective in preventing excessive property price increases, and in mitigating the spillover effects of macroprudential policy adjustments from foreign jurisdictions to Singapore's private residential property market (Box B). Additional cooling measures implemented in July 2018 were also effective at reining in the sharp upswing in property prices that began in 2018. Against the backdrop of a pickup in private residential property prices and transactions since Q2 2019, the macroprudential measures should be maintained to mitigate the risk of a sharp price correction when a sizable supply of private residential properties in the pipeline comes on stream in the next few years. If the private residential property prices rise more sharply, authorities could consider further tightening of the macroprudential measures, accompanied by adjustments in the supply of government land for private residential properties.

Authorities' Views

40. **The recalibration of macroprudential policy has helped mitigate risks in the private residential property market.** The pace of growth in private residential property prices has moderated since the cooling measures were introduced in July 2018. Although the volume of new property sales picked up, the resale market volume was steady but lower compared to the period before the pre-cooling measures were implemented. Additionally, the share of transactions by foreigners and corporates remained broadly stable in 2019. In addition, outstanding housing loan growth has moderated, resulting in an improving household balance sheet since the cooling measures were put in place.

Box B. Effects of Domestic and Foreign Macroprudential Policies on Singapore's Private Residential Property Market[6]

Apart from macroprudential measures implemented by the authorities locally, macroprudential policy adjustments in foreign jurisdictions can also have an effect on the Singapore property market. The objectives of macroprudential policy are to increase the resilience of the financial system and the real economy to shocks, including spillovers from the property sector to banks. However, the use of these measures can generate unintended cross-border spillovers within the context of a financially integrated global economy. For example, a study by MAS shows that macroprudential policy changes, particularly in Asian jurisdictions, generated spillover effects to Singapore's housing loans extended by foreign banks, although the effects were mitigated by the corresponding macroprudential policy adjustment in Singapore (MAS, 2018).[7] Patel (2017)[8] also described Singapore's experience from macroprudential policy spillovers along two dimensions – Singapore as a recipient of foreign inflows into the property sector when macroprudential policy is tightened abroad, and also a contributor to increased overseas purchases by Singapore residents when MAS implemented its cooling measures. Based on the IMF-integrated Macroprudential Policy (iMaPP) database,[9] this box seeks to assess the impact of Singapore's macroprudential measures and spillovers from abroad on Singapore's private residential property prices and transactions.

Singapore's private residential property prices have decoupled from global trends following the series of cooling measures implemented by the government since the GFC. Property prices increased sharply in the post-GFC period, but have eased following the series of cooling measures, particularly with the hike in the Additional Buyer's Stamp Duty (ABSD) rates and the introduction of the Total Debt Service Ratio framework in 2013 (Figure B1). Transactions have also fallen in tandem. Prices of private residential prices also appeared to have decoupled from global trends since 2013 as a result of the cooling measures (Figure B2).

Figure B1. Singapore's Private Residential Property Price Index and Transactions

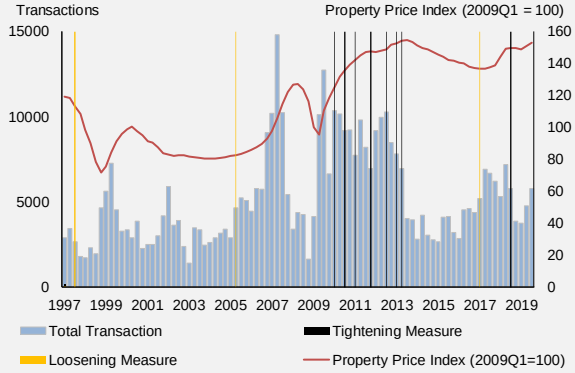
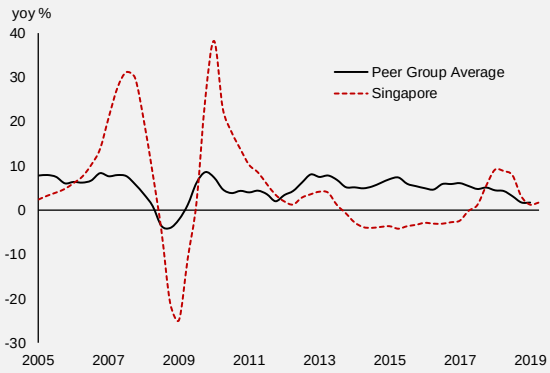


Figure B2. Property Price Growth in Singapore and Selected Peers

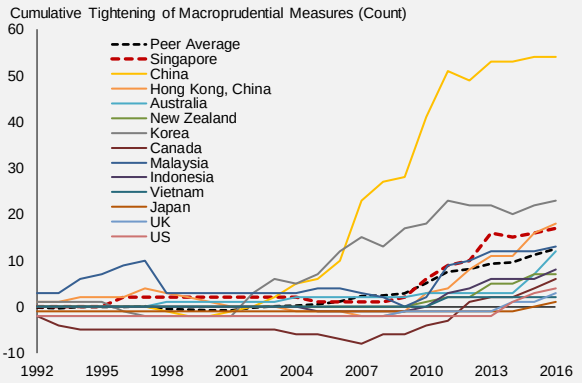


Note: Peers include Australia, New Zealand, China, Malaysia, Japan, Indonesia, Canada, U.S., U.K., Korea and Hong Kong, China.
Source: URA; MAS; CEIC; AMRO staff estimates.

The comparatively more subdued Singapore property price trend can be attributed partly to Singapore's tighter macroprudential policy stance as compared to advanced country peers and other ASEAN countries. Figure B3 shows that the cumulative number of macroprudential tightening measures for Singapore as well as most of its peers and other ASEAN countries has risen steadily in the post-GFC period. However, Singapore's macroprudential measures were tightened at a faster pace since 2011, and continued to remain higher than other economies except China, Korea and, more recently, Hong Kong. This can potentially lead to a diversion of private residential property purchases by foreigners away from Singapore, and also redirect Singaporean residents' purchases elsewhere.

[6] Prepared by Justin Lim Ming Han (Researcher).
[7] Monetary Authority of Singapore. 2018. "Box H: Driver of Domestic Credit – Do Spillover Effects of Macroprudential Policies Matter?" In *Financial Stability Review 2018*, Singapore: Macroprudential Surveillance Department.
[8] Patel, Nikhil. 2017. "Macroprudential frameworks: cross-border issues." https://pdfs.semanticscholar.org/13f4/1b3166d7047a9c3f01e8c0ecaa82fa51e0e9.pdf
[9] Alam, Zohair, Adrian Alter, Jesse Eiseman, Gaston Gelos, Heedon Kang, Machiko Narita, Erlend Nier, and Naixi Wang. 2019. "Digging Deeper—Evidence on the Effects of Macroprudential Policies from a New Database." IMF Working Paper 19/66.

Figure B3. Macroprudential Measures of Singapore and Selected Peers



Note: Peers include Australia, New Zealand, China, Malaysia, Japan, Indonesia, Canada, U.S., U.K., Korea and Hong Kong, China.
Source: iMaPP database; AMRO staff estimates.

Table B1. Determinants of Growth in Quarterly Private Residential Prices (2000-2016)

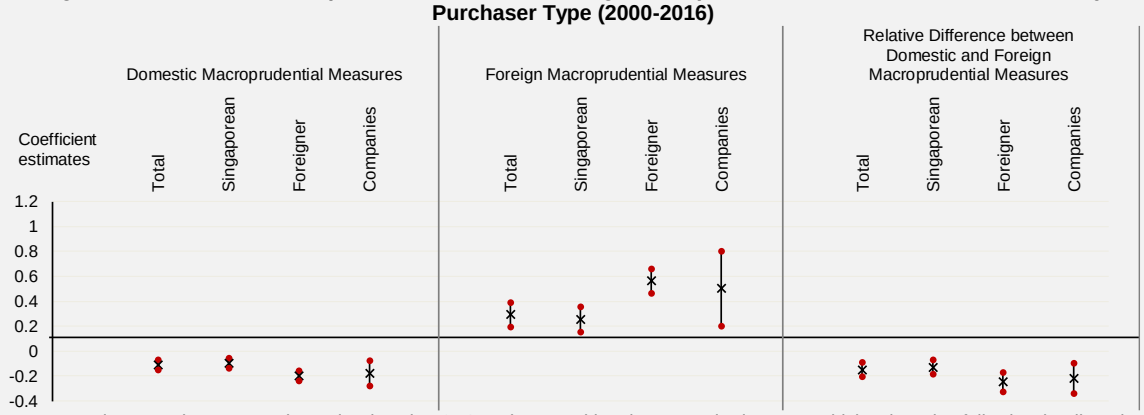
Explanatory Variables	(1)	(2)	(3)
Logged total transactions	0.030***	0.031***	0.026***
Quarterly Change in Real Interest Rate	-0.532	-0.615*	-0.377
Quarterly Housing Loan Growth	0.236	0.261	0.214
Quarterly GDP Growth	0.002	0.002	0.002*
Domestic Macroprudential	-0.001***		
Foreign Macroprudential		0.001	
Relative Macroprudential			-0.004***
GFC	-0.069***	-0.063**	-0.081***
Constant	-0.246***	-0.259***	-0.205***
Number of Observations	67	67	67
Adjusted R-squared	0.580	0.565	0.605

*** Indicates that the coefficients are statistically significant at 1 percent; ** indicates that the coefficients are statistically significant at 5 percent; * indicates that the coefficients are statistically significant at 10 percent.
Note: The change in logged quarterly in the private residential property price index is estimated via the following regression: $\Delta lnPrice_t = \alpha + \beta\, lnTransactions_t + \rho\, \Delta r_t + \mu\, \Delta\, lnCredit_t + \omega\, \Delta\, lnGDP_t + \partial Macropru_t + GFC + \varepsilon_t$, where r is the real interest rate, which is the difference between inflation and 3-m SIBOR, and $Credit$ refers to DBU housing and bridging loans.
Source: AMRO staff estimates.

AMRO's findings suggest that the impact of foreign macroprudential measures on Singapore's private residential property prices was insignificant as the measures undertaken by the authorities have helped mitigate these spillovers. The impact of domestic and foreign macroprudential measures on prices are estimated using data from the iMaPP database. The empirical findings in Table B1 show that domestic tightening measures lead to a 0.1 ppts decline in the quarterly growth rate of property prices. It is statistically significant and exhibits the expected relationship. Meanwhile, a tightening of foreign measures does not have a statistically significant impact on private residential property prices in Singapore. Taken together, the impact from the relatively tighter stance of domestic measures since 2009 is estimated to be large and statistically significant at 0.4 ppts, which indicates that the cooling measures have potentially helped to mitigate the policy spillovers from overseas on domestic property prices.

The findings also suggest that the authorities' calibrated and targeted measures have helped dampen property transactions, particularly purchases by foreigners and companies, which have been more sensitive to policy adjustments overseas. Figure B4 shows that the number of transactions typically falls when domestic cooling measures are implemented. However, foreigners and companies appear to be more sensitive to foreign macroprudential measure adjustments compared to Singapore citizens. Hence, from a transaction standpoint, the authorities' calibrated and tailored approach—particularly the increase in the tiered ABSD rates to 20 percent and 25 percent for foreigners and companies respectively—has been effective in mitigating spillovers due to changes in macroprudential policies abroad.

Figure B4. The Estimated Impact of Domestic and Foreign Macroprudential Measures on Transactions by Purchaser Type (2000-2016)



Note: Logged transactions are estimated using the OLS estimator with robust standard errors, which takes the following log-linearized form: $lnTransactions_t = \alpha + \beta\, lnPrice_t + \partial\, Macropru\, Gap_t + \rho\, lnCredit + \mu\, \Delta ForeignPrice_t + \omega\, \Delta\, lnGDP_t + GFC + \varepsilon_t$. The charts show the mean coefficient estimates represented by the cross, while the range represents the plus and minus two standard deviations.
Source: AMRO staff estimates.

C.5 Enhancing Singapore's Role as an International Financial Center by Strengthening Cybersecurity and Promoting Green Finance

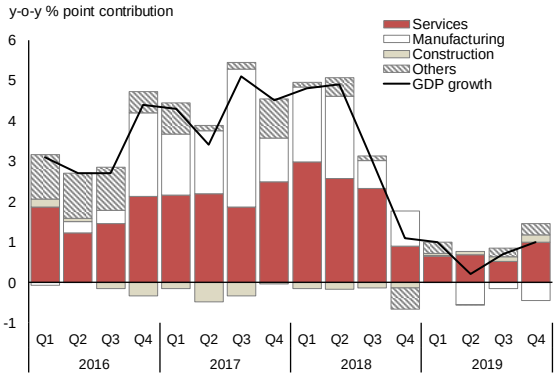
41. **The authorities have strengthened cybersecurity and climate change risk mitigation efforts.** To further complement the country's digitalization initiatives, SGD1.0 billion is being set aside to develop cybersecurity and data security capabilities over the next 3 years as part of the FY2020 Budget. Cyber resilience in the financial sector has been enhanced further, including through periodic industry-wide cybersecurity stress tests, guidelines to promote better cyber hygiene standards, and various collaborations with peer economies. The authorities have also been forward-looking and have stepped up initiatives to address challenges emanating from climate change, including implementing a major long-term project to deal with the problem of rising seawater level over time. For this purpose, a new Coastal and Flood Protection Fund with an initial injection of SGD5.0 billion is to be set up to address the risk of rising sea levels. Moreover, the authorities are also intending to phase out the use of Internal Combustion Vehicles (ICE) by 2040 and encourage the adoption of energy-efficient household appliances. Efforts to develop green financing will further promote environmentally sustainable growth in Singapore and the region, and will position Singapore as a leading green finance hub. In addition, MAS and the Bank for International Settlements (BIS) have jointly launched a new BIS Innovation Hub Centre in Singapore, which will promote greater collaboration in the development of Fintech in Singapore and the region. These policy efforts will help promote Singapore as an international financial center (IFC) going forward (See Annex 3: Perspectives on Singapore's Development as an International Financial Center).

Appendices

Appendix 1. Selected Figures for Major Economic Indicators

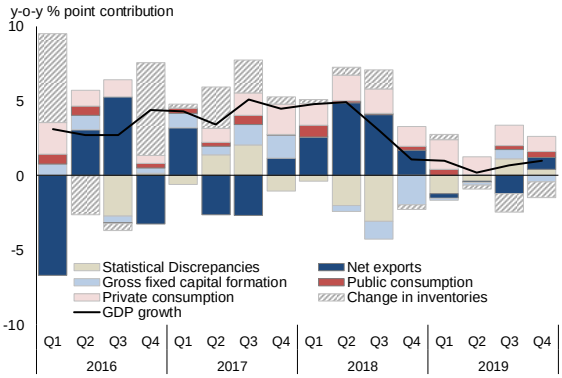
Figure 1.1. Real Sector

Singapore's growth slowed sharply to 0.7 percent in 2019 due to a contraction in manufacturing.



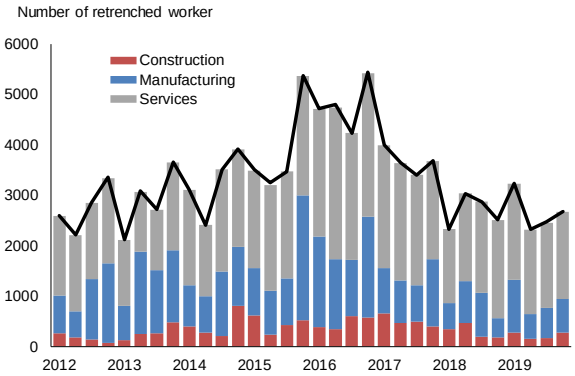
Source: Singapore Department of Statistics

On the demand side, net exports have contracted.



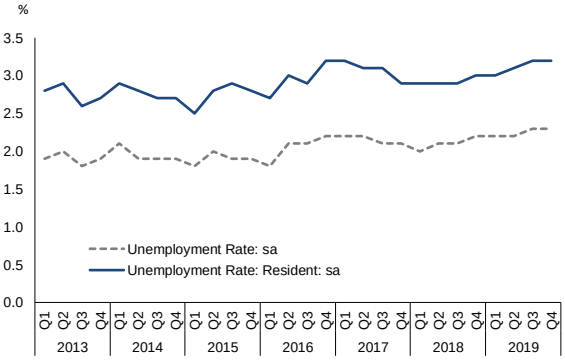
Source: Singapore Department of Statistics

The number of retrenched workers rose…



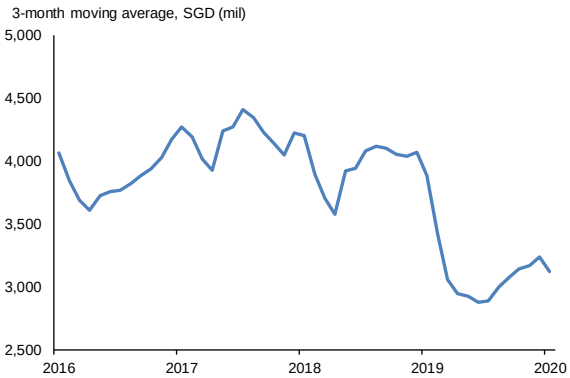
Source: Ministry of Manpower

…and the unemployment rate edged up.



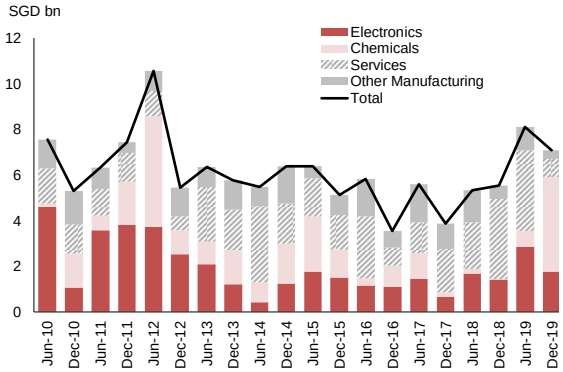
Source: Manpower Research & Statistics Department, Ministry of Manpower

However, the electronics NODX is stabilizing…



Source: Enterprise Singapore, AMRO staff calculations

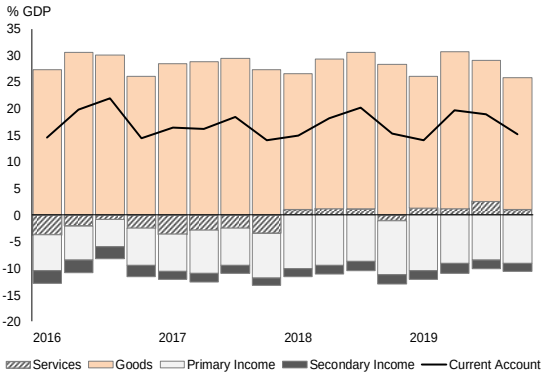
… and growing investment commitments indicate higher gross fixed capital formation going forward.



Source: Economic Development Board; CEIC; Singapore Department of Statistics

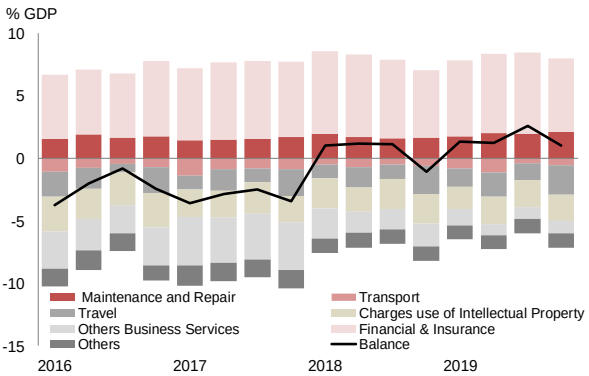
Figure 1.2. External Sector

The current account balance surpluses remains high.



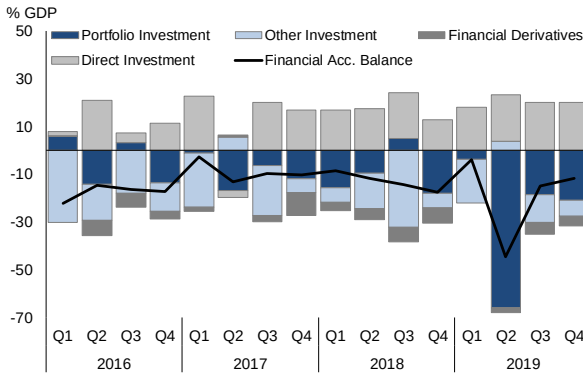
Source: Singapore Department of Statistics; CEIC

The services trade balance recorded a slight surplus in 2019.



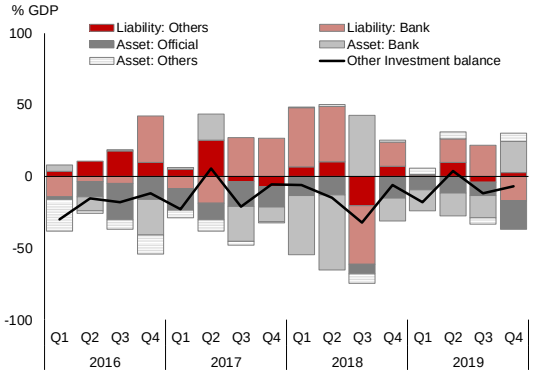
Source: Singapore Department of Statistics; CEIC

The net outflows in the financial account in 2019 was primarily due to a surge in resident official net purchases of overseas securities.



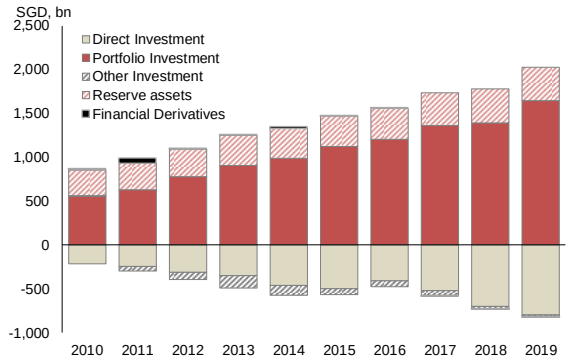
Source: Singapore Department of Statistics; CEIC

The Net Other investment Account continued to register net outflows in 2019.



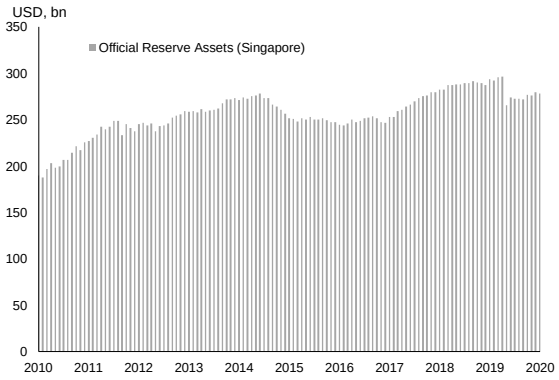
Source: Singapore Department of Statistics; CEIC

The net investment position improved, driven mainly by portfolio investment and reserve assets growth.



Source: Singapore Department of Statistics; CEIC

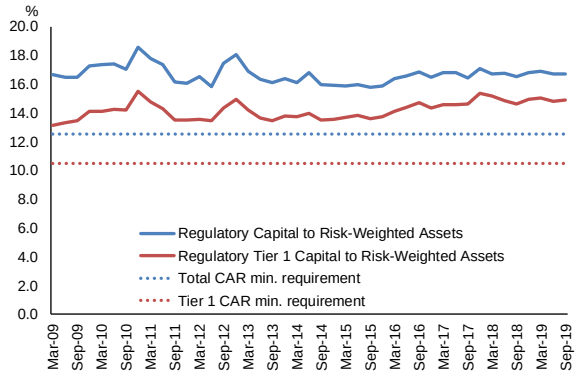
Gross official reserves remain high despite the SGD45 billion transfer to the government for longer term investment in May 2019.



Source: Monetary Authority of Singapore

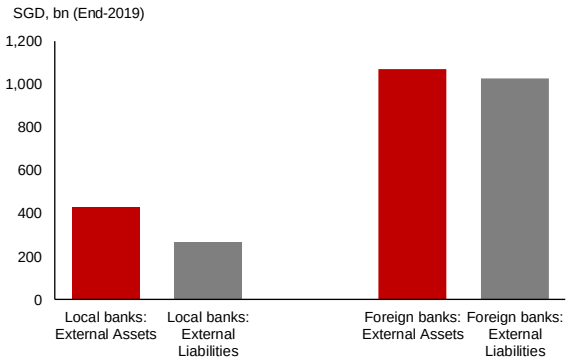
Figure 1.3. Monetary and Financial Sector

Banks remain well capitalized, and liquidity is above the MAS requirements.



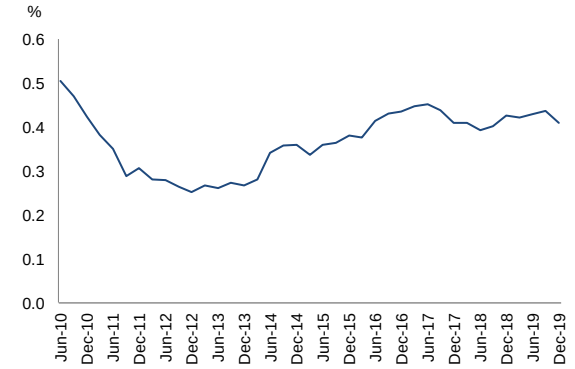
Source: Monetary Authority of Singapore

Local and foreign banks' external liabilities are matched by their external assets.



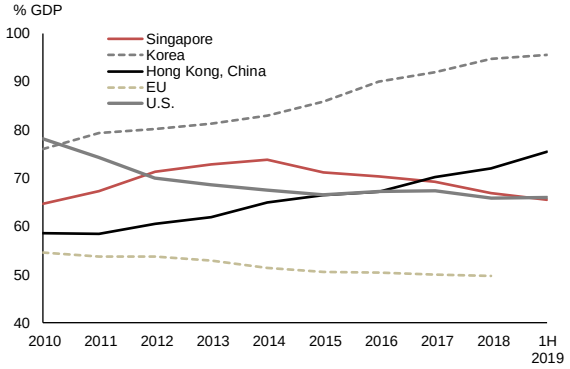
Source: Monetary Authority of Singapore

The non-performing housing and bridging loan ratio remains low …



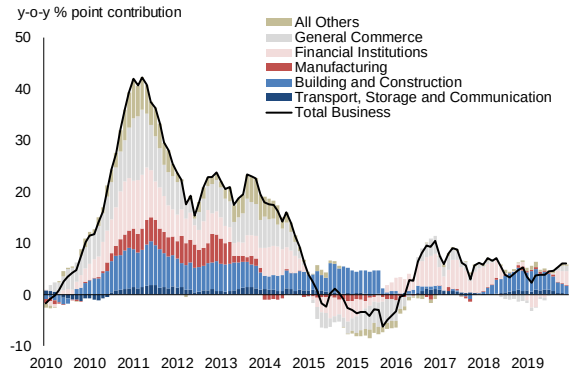
Source: Monetary Authority of Singapore

… and Singapore's household debt-to-GDP ratio has continued to decline.



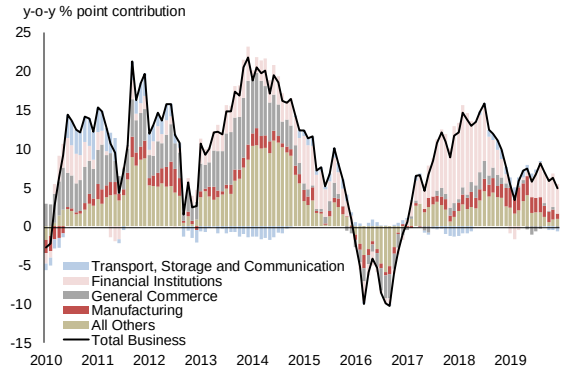
Source: CEIC, AMRO staff calculations

Domestic Banking Unit lending to businesses in the building and construction sectors grew…



Source: Monetary Authority of Singapore

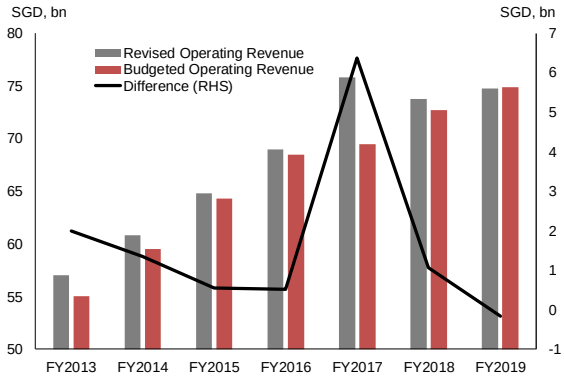
…while Asian Currency Unit lending to financial institutions and the manufacturing sector continued.



Source: Monetary Authority of Singapore

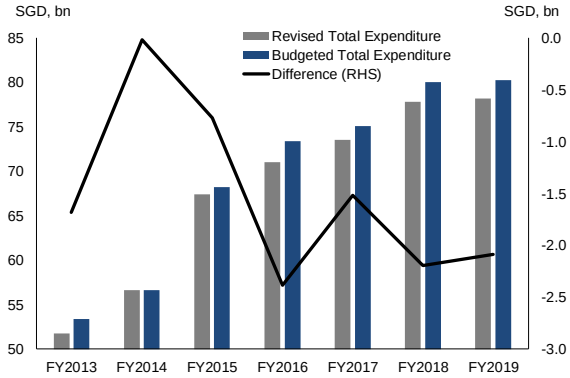
Figure 1.4. Fiscal Sector

Operating revenue outturn in FY2019 was slightly lower-than-expected but higher than that of FY2018…



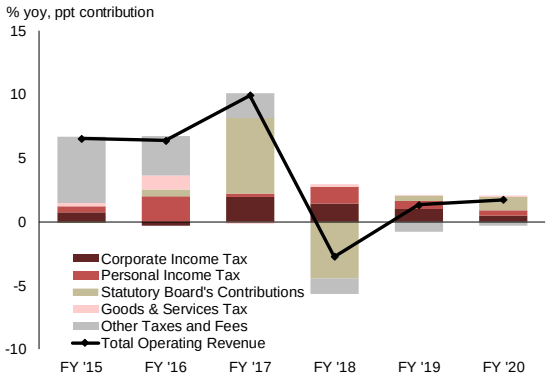
Source: Ministry of Finance; AMRO staff calculations.

…actual expenditure rose slightly but shortfalls continued.



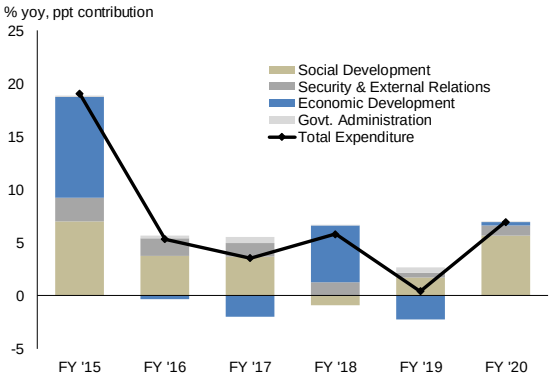
Source: Ministry of Finance; AMRO staff calculations.

Operating revenue is projected to increase slightly due to higher Statutory Boards' Contributions, and corporate and personal income tax collection.



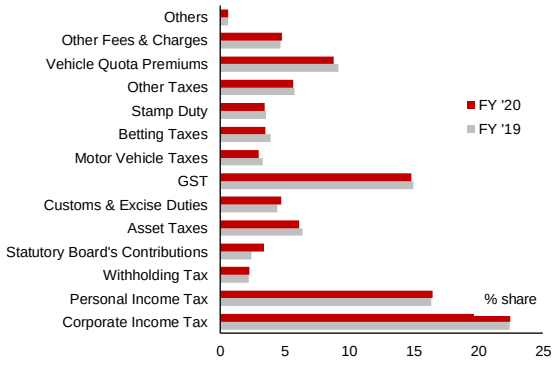
Source: Ministry of Finance; AMRO staff calculations.
Note: Other Taxes refer to Withholding Tax, Statutory Board's Contributions, Asset Taxes, Customs and Excise Taxes, Betting Taxes, Stamp Duty, Other Taxes and Other Fees and Charges and Others.

The large expenditure growth is attributed to greater social development-related spending, especially in healthcare and public housing.



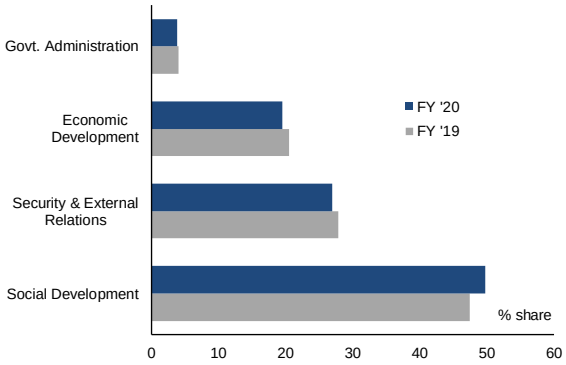
Source: Ministry of Finance; AMRO staff calculations.

More than half of operating revenue is derived from corporate, personal income and Goods & Services taxes.



Source: Ministry of Finance; AMRO staff calculations.

The share of Social Development expenditure is the largest and is increasing.



Source: Ministry of Finance; AMRO staff calculations.

Appendix 2. Selected Economic Indicators for Singapore

	2015	2016	2017	2018	2019	Projection	
						2020	2021
Real Sector and Prices	(in annual percentage change, unless otherwise indicated)						
Real GDP	3.0	3.2	4.3	3.4	0.7	0.8	2.6
Real private consumption	5.2	3.2	3.0	4.2	3.7	3.3	4.8
Real public consumption	8.9	3.8	3.1	2.9	2.8	6.8	1.0
Gross fixed capital formation	2.0	1.5	4.2	-3.4	-0.2	1.0	2.4
Exports of goods & services	5.0	0.0	6.2	8.1	-1.6	-0.3	2.7
Imports of goods & services	3.4	0.2	7.5	7.3	-1.7	0.5	2.9
MAS core inflation	0.5	0.9	1.5	1.7	1.0	0.6	1.0
Consumer price inflation	-0.5	-0.5	0.6	0.4	0.6	0.7	1.5
Overall Unemployment rate, Annual Average	1.9	2.1	2.2	2.1	2.3	2.5	2.3
External Sector	(in percent of GDP, unless otherwise indicated)						
Current account	18.7	17.6	16.3	17.2	17.0	15.6	15.4
Goods balance	30.1	28.5	28.5	27.9	26.3	-	-
Capital and Financial Account [1]	17.0	17.6	9.1	13.2	18.7	-	-
Direct investment (net)	-8.0	-9.7	-14.3	-16.4	-19.4	-	-
Portfolio investment (net)	20.0	4.9	9.1	9.6	27.1	-	-
Other investment (net)	6.8	18.5	10.9	14.8	8.2	-	-
Derivatives (net)	-1.8	3.8	3.4	5.2	2.8	-	-
Overall Balance of Payments	0.4	-0.6	8.0	3.4	-2.3	-	-
International Reserves (USD bn, end period)	247.7	246.6	279.9	287.7	279.5	-	-
Fiscal Sector	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020	FY2021*
Operating Revenue (% GDP)	15.2	15.3	15.9	14.5	14.7	14.6	14.8
Total Expenditure (% GDP)	15.8	15.8	15.4	15.3	15.4	16.1	15.7
Primary Surplus / Deficit (% GDP)	-0.6	-0.5	0.5	-0.8	-0.7	-1.5	-0.9
Overall Budget Surplus / Deficit (% GDP)	-1.0	1.4	2.3	0.7	-0.3	-2.1	1.0
Monetary	(in annual percentage change, unless otherwise specified)						
3-month SGD Sibor (% end period)	1.19	0.97	1.50	1.89	1.77	-	-
Narrow Money, M1 (DBU and ACU)	6.7	5.5	5.5	0.1	5.0	-	-
Broad Money, M2 (DBU and ACU)	4.0	8.4	4.2	5.0	4.4	-	-
Memorandum items							
Nominal GDP (SGD, bn)	423.4	440.2	472.1	503.4	507.6	-	-
Nominal GDP (USD, bn)	308.0	318.7	341.9	373.2	372.1	-	-
Private Residential Property Index (2009Q1=100)	141.6	137.2	138.7	149.6	153.6	-	-
Spot exchange rate (SGD/USD, period avg.)	1.37	1.38	1.38	1.35	1.36	-	-

* Fiscal Sector figures for FY2021 reflects AMRO staff calculations.
Source: Singapore authorities; CEIC; AMRO staff calculation.

Appendix 3. Balance of Payments and International Investment Position

in percent of GDP, unless otherwise indicated	2015	2016	2017	2018	2019
Current Account	18.7	17.6	16.3	17.2	17.0
Goods Balance	30.1	28.5	28.5	27.9	26.3
Exports	128.6	117.5	121.1	123.4	118.5
Imports	98.6	89.0	92.6	95.5	92.1
Services Balance	-2.8	-2.2	-3.1	0.6	1.5
Exports	49.7	47.6	49.6	54.3	55.0
Imports	52.5	49.9	52.7	53.7	53.5
Primary Income Balance	-6.8	-6.3	-7.6	-9.6	-9.2
Secondary Income Balance	-1.8	-2.3	-1.5	-1.6	-1.7
Capital and Financial Account	17.0	17.6	9.1	13.2	18.7
Direct Investment	-8.0	-9.7	-14.3	-16.4	-19.4
Assets	14.7	12.5	14.3	8.0	8.9
Liabilities	22.7	22.2	28.6	24.4	28.3
Portfolio Investment	20.0	4.9	9.1	9.6	27.1
Assets	18.0	7.1	14.4	8.7	28.0
Liabilities	-2.0	2.2	5.4	-0.8	0.9
Other Investments	6.8	18.5	10.9	14.8	8.2
Assets	8.6	32.2	22.7	29.0	15.9
Liabilities	1.9	13.7	11.7	14.2	7.7
Financial Derivatives	-1.8	3.8	3.4	5.2	2.8
Overall Balance	**0.4**	**-0.6**	**8.0**	**3.4**	**-2.3**
Net International Investment Position (SGD bn, end period)	914.9	1,090.7	1,159.1	1,050.7	1,207.1
External Assets	4,354.5	4,701.2	5,087.7	5,278.5	5,690.2
External Liabilities	3,439.6	3,610.5	3,928.6	4,227.8	4,483.1

Source: Singapore authorities; CEIC; AMRO staff calculations

Appendix 4. Government Accounts

Unit: SGD Billion	FY2015	FY2016	FY2017	FY2018	FY2019 (revised)	FY2020 (budgeted)
Operating Revenue	**64.8**	**69.0**	**75.8**	**73.7**	**74.7**	**76.0**
% of GDP	15.2	15.3	15.9	14.5	14.7	14.6
% yoy	6.6	6.4	9.9	-2.7	1.3	1.7
Tax Revenue	**55.6**	**58.7**	**66.4**	**66.2**	**67.9**	**69.3**
Income Tax	24.5	25.6	27.2	29.3	30.6	31.3
Corporate Income Tax	13.8	13.6	14.9	16.0	16.8	17.1
Personal Income Tax	9.2	10.5	10.7	11.7	12.2	12.5
Withholding Tax	1.4	1.5	1.5	1.6	1.7	1.7
Statutory Boards' Contributions	0.4	0.8	4.9	1.5	1.8	2.6
Assets Taxes	4.5	4.4	4.4	4.6	4.7	4.6
Customs, Excise and Carbon Taxes	2.8	2.7	3.1	3.1	3.3	3.6
Goods and Services Tax	10.3	11.1	11.0	11.1	11.2	11.3
Motor Vehicle Taxes	1.8	2.1	2.2	2.6	2.5	2.3
Betting Taxes	2.7	2.7	2.7	2.7	2.6	2.6
Stamp Duty	2.8	3.3	4.9	4.6	4.3	4.3
Other Taxes	5.9	6.0	6.0	6.6	6.8	6.7
Fees and Charges	**8.7**	**9.8**	**9.1**	**7.1**	**6.4**	**6.3**
Vehicle Quota Premiums	5.4	6.6	5.8	3.6	2.9	2.6
Other Fees and Charges	3.2	3.2	3.3	3.5	3.5	3.6
Other Receipts	**0.5**	**0.5**	**0.4**	**0.4**	**0.5**	**0.5**
Total Expenditure *	**67.4**	**71.0**	**73.6**	**77.8**	**78.2**	**83.6**
% GDP	15.8	15.8	15.4	15.3	15.4	16.1
% yoy	19.1	5.3	3.5	5.8	0.4	7.0
Social Development	**31.3**	**33.8**	**36.5**	**35.8**	**37.1**	**41.6**
Security and External Relations	**18.5**	**19.5**	**20.5**	**21.4**	**21.8**	**22.5**
Economic Development	**15.5**	**15.3**	**13.9**	**17.8**	**16.1**	**16.3**
Government Administration	**2.2**	**2.4**	**2.8**	**2.8**	**3.2**	**3.2**
Primary Surplus/Deficit	**-2.6**	**-2.1**	**2.3**	**-4.1**	**-3.4**	**-7.6**
% of GDP	-0.6	-0.5	0.5	-0.8	-0.7	-1.5
Less: Special Transfers Excluding Top-ups to Endowment and Trust Funds ***	**4.4**	**2.8**	**2.1**	**1.7**	**1.7**	**4.7**
Basic Surplus / Deficit	**-7.0**	**-4.9**	**0.1**	**-5.8**	**-5.1**	**-12.3**
Less: Top-ups to Endowment and Trust Funds **	6.0	3.6	4.0	7.3	13.6	17.3
Add: Net Investment Returns Contribution ****	8.9	14.6	14.7	16.4	17.0	18.6
Overall Budget Surplus / Deficit	**-4.0**	**6.1**	**10.9**	**3.3**	**-1.7**	**-10.9**
% GDP	-1.0	1.4	2.3	0.7	-0.3	-2.1

* Total Expenditure consists of operating expenditure and development expenditure.
** The government endowment fund is a fund established with an injection of government monies as principal, for which only the income earned will be used to finance specific programs on an ongoing basis. Examples include the Community Care Endowment Fund and Edusave Endowment Fund. The government trust fund is a fund established with an injection of government monies as principal, for which both the principal and income earned on the principal could be drawn down to finance specific programs on an ongoing basis. Examples include the National Research Fund and the GST Voucher Fund.
*** Refers to discretionary transfers made by the government and these include one-off direct transfers to businesses and households.
**** Contributions from investment returns on Singapore's reserves, where Net Investment Returns Contributions is the sum of: (1) up to 50 percent of the expected long-term real returns on the relevant assets specified in the Constitution; and (2) up to 50 percent of the Net Investment Income on the remaining assets. Through the NIR contributions that supplement the annual Budget, Singaporeans benefit from the investments of MAS, GIC and Temasek.
Source: Ministry of Finance

Appendix 5. Data Adequacy for Surveillance Purposes: A Preliminary Assessment

Criteria/ Key Indicators for Surveillance	Availability[(i)]	Reporting Frequency/ Timeliness[(ii)]	Data Quality[(iii)]	Consistency [(iv)]	Others, if Any[(v)]
National Account	Available	Quarterly, no later than 8 weeks after the end of the reference quarter for the "Preliminary Estimates".	-	-	-
Balance of Payments (BOP)	Available	Quarterly, no later than 8 weeks after the end of the reference quarter.	-	-	-
International Investment Position (IIP)	Available	Quarterly, no later than 3 months after the end of the reference quarter.	-	-	-
External Debt	Available	Quarterly, no later than 3 months after the end of the reference quarter.	-	-	-
State Budget and Government	Available	Central government revenue (monthly, within two months of the end of the reference period). Central government expenditure (quarterly, within two months of the end of the reference period).	-	-	-
Money Supply and Credit Growth	Available	Monthly, within one month of the end of the reference period	-	-	-
Financial Sector Soundness Indicators	Available	Quarterly, within six months	-	-	-
State-owned enterprises Statistics (vi)	Available if publicly listed on the stock exchange, otherwise limited	Quarterly data available for listed companies within two months of the reference quarter, but not available for non-listed companies.	-	-	-
Housing Market Indicators	Available	Quarterly, within two months of the end of the reference quarter (for preliminary data)	-	-	-

Notes: (i) Data availability refers to whether the official data are available for public access by any means.
(ii) Reporting frequency refers to the periodicity that the available data are published. Timeliness refers to how up-to-date the published data are relatively with the publication date.
(iii) Data quality refers to the accuracy and reliability of the available data given the data methodologies are taken into account.
(iv) Consistency refers to both internal consistency within the data series itself and its horizontal consistency with other data series of either the same or different categories.
(v) Other criteria might also apply, if relevant. Examples include but are not limited to potential areas of improvement for data adequacy.
(vi) This refers to the government-linked companies, not SOEs.

Source: AMRO staff compilation. This preliminary assessment will form the “Supplementary Data Adequacy Assessment" in the EPRD Matrix.

Annexes: Selected Issues

Annex 1. Singapore' Rising Role as an FDI Hub[10]

1. Singapore's role as a foreign direct investment (FDI) hub has expanded from a regional to a global level. It has been buttressed by its growing status as an international financial center, with an efficient government and a conducive business environment. In addition, its role has been increasingly driven by the rise of emerging markets, complexity of multinational enterprise (MNE) ownership structures and operations, and digitalization in Asia. The United Nations Conference on Trade and Development (UNCTAD) reported that Singapore was the fifth largest recipient and 8th largest source of FDI flows in 2018 (UNCTAD 2019). As an FDI hub, Singapore offers the region a wide range of business services, financial infrastructure and a favorable business environment conducive to fulfilling the growing demands of Asian corporates and other global investors interested in Asia's growth story.

2. Singapore is the main conduit for FDI to ASEAN countries. As of 2017, the city-state's inward FDI position-to-GDP ratio had reached 335 percent, while its outward FDI position-to-GDP reached 187 percent. Singapore had received more FDI from outside the region as of 2017. The bulk of its FDI were from the EU, the U.S. and ASEAN+3 economies. Investments also came from other emerging market economies (EME) and international financial centers (IFCs) (See Table A1.1)[11]. FDI was also channeled outwards from Singapore to the Plus 3, ASEAN economies, E.U., and elsewhere (EMEs include India and IFCs; see Table A1.2).

Table A1.1. Inward FDI Position of ASEAN Plus 3[12]
(as percent of recipient's GDP, 2017)

		Recipient													
		BN	KH	CN	HK	ID	JP	KR	LA	MY	MM	PH	SG	TH	VN
Investors	Plus 3	0.0	6.7	12.1	121.1	4.0	0.3	3.9	1.7	12.0	17.3	4.4	54.4	23.0	13.5
	ASEAN	0.0	10.3	1.0	22.9	7.4	0.4	1.1	20.0	9.1	15.9	1.4	25.3	8.0	3.0
	Europe	1.1	9.2	1.9	58.8	7.3	2.0	5.4	2.0	11.4	3.9	4.5	79.6	7.9	3.6
	Latin America	n.a.	n.a.	0.0	0.0	0.1	0.0	0.0	n.a.	0.0	0.0	0.1	0.5	0.1	0.0
	Northern America	0.3	2.0	0.8	36.5	2.8	1.0	2.5	n.a.	4.0	0.2	1.2	81.2	3.5	0.9
	Others	0.0	0.1	3.1	224.8	0.9	0.4	0.6	0.1	4.0	0.9	1.1	94.3	5.2	0.8
	Total	n.a.	n.a.	19.0	464.1	22.6	4.1	13.5	n.a.	40.5	38.2	12.7	335.3	47.7	22.0

Source: IMF-CDIS 2016-2017.
Note: The CDIS database presents inward direct investment positions (i.e. FDI into the reporting country) cross-classified by economy of immediate investor. Country classifications and calculations are by AMRO staff. BN = Brunei Darussalam; CN = People's Republic of China; HK = Hong Kong, China; JP = Japan; ID = Indonesia; KH = Cambodia; KR = Korea; LA = Lao PDR; MM = Myanmar; MY = Malaysia; PH = Philippines; SG = Singapore; TH = Thailand; VN = Vietnam. For Singapore, official data from authorities was used.

[10] Prepared by Ms. Madeleine Vinuya (Research Data Analyst), with contributions from Dr. Simon Liu (Economist) and Dr. Huanhuan Zheng (Consultant).
[11] See Investors class "Others" in Table A1.1, which is mostly comprised of IFCs and EMEs.
[12] Plus 3 refers to China, Hong Kong, Japan and Korea.

Table A1.2. Outward FDI Position of ASEAN Plus 3
(as percent of investor's GDP, 2017)

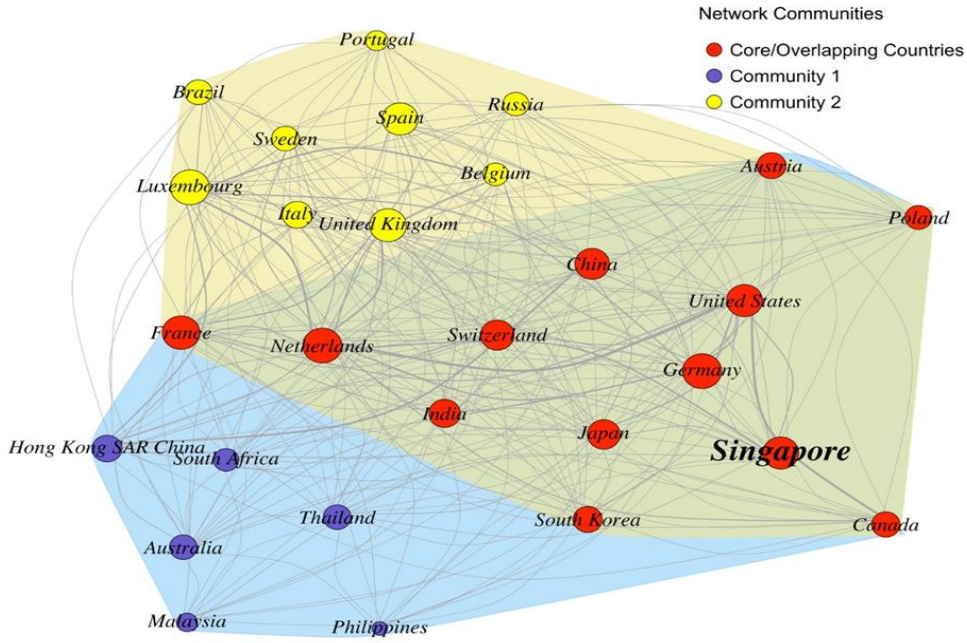
Investor \ Recipient	Plus 3	ASEAN	Europe	Latin America	Northern America	Others	Total
BN	20.1	4.2	3.5	0.2	0.0	0.0	28.0
CA	0.9	0.9	0.1	0.0	0.0	0.1	1.9
CN	3.2	0.6	0.5	0.0	0.4	0.4	5.1
HK	368.2	24.6	53.8	1.5	16.8	179.8	644.8
ID	0.1	1.9	0.1	0.0	0.0	0.1	2.3
JP	5.0	4.7	5.5	0.8	10.1	3.5	29.7
KR	5.0	2.6	2.4	0.7	3.6	2.0	16.3
LA	0.1	0.3	0.0	0.0	0.0	0.0	0.4
MY	2.5	22.0	6.0	0.0	0.3	9.8	40.6
MM	0.1	1.6	0.0	0.0	0.0	0.0	1.7
PH	1.0	1.5	1.0	0.0	0.2	1.6	5.4
SG	58.4	40.1	49.6	1.0	7.0	30.9	187.0
TH	7.3	5.6	1.4	0.0	0.7	4.9	19.9
VN	0.0	0.4	0.3	0.0	0.0	0.0	0.7

Source: IMF-CDIS 2016-2017.
Note: The CDIS database presents outward direct investment positions (i.e. direct investments abroad by the reporting economy) cross-classified by economy of immediate recipient. Country classifications and calculations are by AMRO staff. BN = Brunei Darussalam; CN = People's Republic of China; HK = Hong Kong, China; JP = Japan; ID = Indonesia; KH = Cambodia; KR = Korea; LA = Lao PDR; MM = Myanmar; MY = Malaysia; PH = Philippines; SG = Singapore; TH = Thailand; VN = Vietnam.

3. Singapore has become a hub for FDI flows between advanced economies and regional emerging economies. To illustrate how Singapore is embedded in the global investment network, AMRO used the Clique Percolation Method (CPM) to determine a country's role in the network (See Appendix A1). FDI hubs are defined as economies transacting significant amounts of FDI and connected within multiple communities of countries. The results based on FDI flows in 2017 of economies appearing as hubs are presented in Figure A1.1, where Singapore is nestled within the core area (light green region). The core region is the overlap between Community 1 (blue region) and Community 2 (yellow region). The diagram shows that Singapore serves as a gateway for FDI flows between the advanced economies (primarily from North America and the EU.) and the Asia-Pacific region. Singapore is similarly positioned in terms of FDI volume and connectivity compared with other IFCs such as Switzerland and the U.S., along with other global FDI hubs identified in the CPM analysis such as the Netherlands, Germany, Austria, Poland, Canada and France. Within the ASEAN+3, Singapore shares its FDI hub status with countries such as China, Korea and Japan.[13]

[13] Hong Kong is more confined (Community 1), where most Asia-Pacific countries are connected. Hong Kong's FDI partners are less diverse compared to Singapore, with the former receiving more intra-regional FDI, mostly from China.

Figure A1.1. Hubs Identified by FDI Flows (in USD)



Source: CPM calculation results based on the IMF-CDIS for 2017

4. National economic development strategies have played a significant role in bolstering the regional and global FDI hub status of Singapore. Singapore initially aligned its economic policy with being a center for free trade and investment to spur employment in the 1960s and 1970s. In 1985, the Plaza Accord led to the appreciation of the Japanese yen, which resulted in increased FDI from Japan to Thailand, Malaysia and Singapore. Additionally, in the 1980s, Singapore gradually shifted its focus from traditional manufacturing to advanced services and products, and continuously moved toward high-value added economic activities after that. In the 1990s, trade and investment agreements were instituted in the context of ASEAN integration, which led to trade liberalization and the removal of investment barriers. In the 2000s, innovation and competitiveness were the main themes, coupled with the continued upgrading of its laborers' skills. Such progressive policy decisions in Singapore were implemented against the backdrop of a sound legal framework, a competitive taxation regime, sound financial regulations, simple business procedures and stable governance. These factors are the hallmarks of an attractive location for corporates that have made Singapore an FDI destination and hub.

5. Strong performance across business environment indicators relating to reliable infrastructure, border compliance and legal structures are crucial in attaining FDI hub status. The host economy's business environment measured by the World Bank's Ease of Doing Business Index is one of the most significant determinants for the number of FDI projects received by a country, according to the 2018 Asian Development Bank investment report. To further examine the relevance of each of the 'doing business' indicators in this regard, AMRO analyzed the relationship between being an FDI hub and the various doing business indicators. The findings indicated that certain business indicators could be more

closely associated with FDI hub status of a country – such as trading across borders and resolving insolvency.[14]

6. The growth of Asian corporates and digitalization has also catapulted Singapore to global FDI hub status. In the past decade, China's rise as an economic powerhouse has transformed trade and supply chain structures, creating synergies across emerging Asia. ASEAN's share of inward FDI from the global inward FDI has risen from 3.57 to 5.24 percent. The rise in cross-border investments in the region has brought with it the growth of Asian corporates. It has also shifted the strategy from the traditional economies of scale approach towards internationalization and localization efforts (such as setting up shop in target markets).[15] In addition, digital transformation has also increased technology related FDI. Thus, there has been a stronger demand for services that facilitate the commercialization of intangible assets such as intellectual property (IP) rights, copyrights, trademarks and patents.[16] Such developments have paved the way for joint ventures and for mergers and acquisitions (M&As), which serve as an attractive mode of investment, with FDI hubs like Singapore providing convenient platforms.[17]

7. The growing demand for corporate services requires sophisticated expertise typically offered by FDI hubs like Singapore. M&A requires specialization in complicated business arrangements related to legal and deal structures, taxation, compensation and benefits, labor, IP, cyber security and data privacy. Singapore, having developed segments of its services sector over time, has the capability to service the growing needs of MNEs' M&A transactions. According to the 21st Ernst & Young Global Capital Confidence Barometer in 2019, Singapore was ranked as the 10th global destination for M&A FDI, behind China (4th) and Japan (9th). Furthermore, Singapore also plays an active role in facilitating M&As within the ASEAN+3 economies given the internationalization agenda of Asian corporates. The Singapore government has introduced incentives to help Singapore-based companies grow and expand locally and overseas through the M&A scheme introduced in 2010 which provides M&A tax allowance and double tax deduction benefits on qualifying M&A transaction costs.[18]

8. The tendency among investors to use Singapore as an FDI hub for M&A facilitation has led to a significant increase in FDI flows into Singapore. Based on actual M&A deals registered in the Orbis database, Singapore's inward M&A deals in 2013 were

[14] Singapore ranked second in the World Bank Doing Business Report in 2020. However, comparing its scores across each business indicators against other FDI hubs reveals that Singapore does not compromise on documentation and compliance efforts despite its liberal stance on offshore business. For example, Singapore's slightly low score for registering property is due to the higher number of procedures owing to the country's strict compliance protocols. Yet, in terms of cost and time spent, Singapore performs better than some of its peer FDI hubs.
[15] The top 100 MNEs in the latest report from UNCTAD have, on average, more than 500 affiliates each, spread across 50 countries, with multi-layer levels across six borders, 20 holding companies in various jurisdictions and almost 70 entities in IFCs.
[16] In 2016, UNCTAD reported that factors including the liberalization of ownership, constraints due to country specific tax rules, relative advantages of treatises across jurisdictions, and the fragmented global supply chains have contributed to the increasing complexity of MNEs.
[17] In Damgaard, et. al., 2018: intangible assets are bought through acquisitions.
[18] These schemes were initially applicable to M&As executed between 1 April 2010 to 31 March 2015, but were further enhanced and extended to 31 March 2020. It was recently announced in Budget 2020 that the M&A scheme will be extended to cover M&As executed on or before 31 December 2025. Although M&As do not contribute actual production to the economy, most M&As are facilitated by Singapore's biggest investment banks and are a source of revenue for them. Based on Refinitiv data, in 2019, investment banking fee reached USD1.17 billion, comprising real estate (27 percent), financials and government and agencies, with M&A advisory fees taking up the highest share at USD354.29 million, with syndicated lending and underwriting businesses taking up the rest. Data quoted from the Singapore Business Review. Available online at https://sbr.com.sg/financial-services/news/investment-banking-fees-hit-record-breaking-117b-in-2019.

about 50 percent of its total inward FDI in 2018. Singapore's M&A FDI soared by 133 percent between 2013 and 2018, with the majority originating from other IFCs. About 36 percent of the total value of M&A deals entering Singapore between 2013 and 2018 came from ASEAN+3. M&As during that period mostly consisted of secondary and tertiary sectors such as logistics, financials and utilities. Singapore was second to China as the most sought after country in the ASEAN+3 for M&A transactions, accounting for 26 percent of FDI inflows received by ASEAN+3, with China receiving the majority share at 51 percent. From 2013 to 2018 on average, around 80 percent of FDI going to the other regional economies from Singapore was via M&As, and most of these transactions were directed to China (23 percent), Vietnam (20 percent), Japan (13 percent), Thailand (17 percent) and Malaysia (6 percent) (Figure A1.2). The biggest deals in 2018 in the ASEAN+3 were in traditional business services, telecommunications and innovation centers (Figure A1.3).

Figure A1.2. Total Outward M&A FDI from Singapore to ASEAN+3 by Type
(Billions of US dollars (LHS), in percent (RHS))

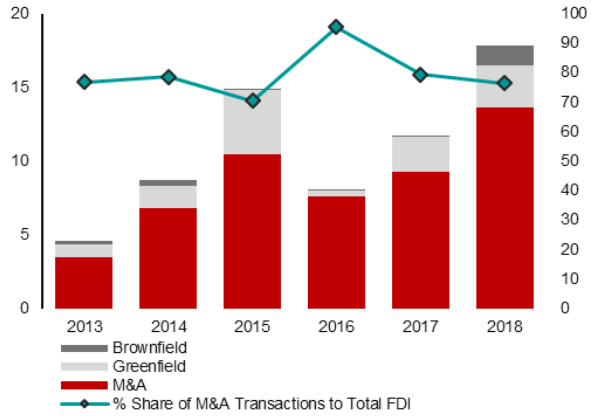
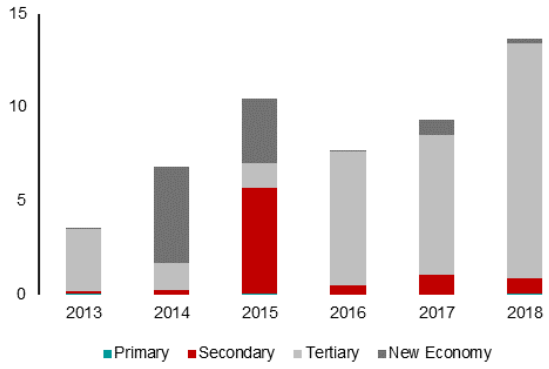


Figure A1.3. Total Outward M&A FDI from Singapore to ASEAN+3 by Sector
(Billions of US dollars)



Source: Data is from the database provider Orbis, Bureau van Dijk. Available at: https://orbis2.bvdep.com/ (Accessed: November 25, 2019)
Note: The dataset is comprised of announced FDI projects, by firm level transactions. Country, sector and classifications, and other computations are done by AMRO staff.

9. Given the growing complexity of company ownership structures, a significant proportion of M&A investments have been undertaken through special purpose entities. Singapore is found to be one of the top 10 countries globally in terms of the number of special purpose entities SPE-related FDI (Damgaard et. al, 2019). SPEs, which are separate legal entities that take the form of private limited companies (typically holding companies), are created for investment purposes to allow investors to ring-fence and achieve bankruptcy remoteness.[19] As of December 2019, Singapore has more than 200 registered SPEs in operation.[20] SPEs are supported by corporate service providers (CSPs), who offer outsourced services to meet the required legal, tax, accounting and regulatory requirements for corporates registered in the FDI hub. A large share of inward FDI stocks in Singapore are found to be related to CSP activity (43 percent) (see Hers. et. al 2018). SPEs and CSPs are expected to continue playing a key role in FDI facilitation as Singapore attracts new

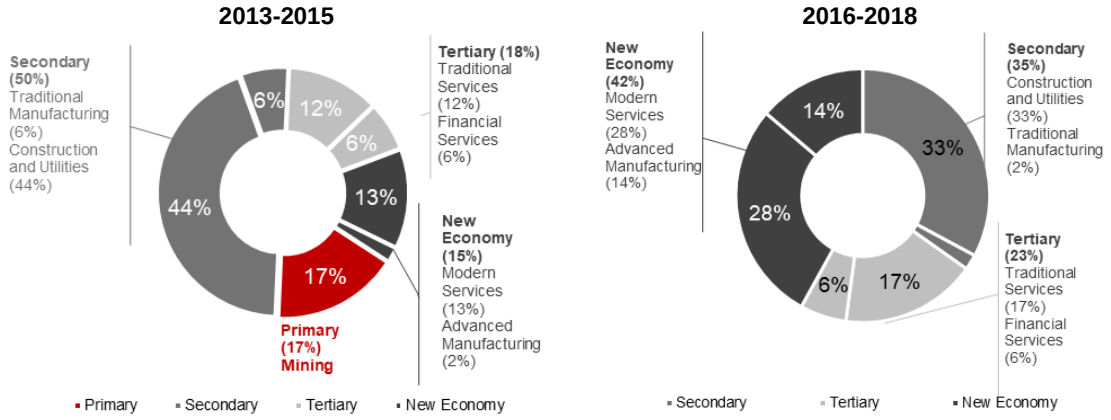
[19] Ring-fencing refers to the steps to separate assets and liabilities and profits of affiliates to protect the entity in the event the parent company faces liquidation. It represents the steps necessary to make an entity bankruptcy remote. Bankruptcy remoteness refers to minimized financial and bankruptcy risk.
[20] This data is culled from the National Information Center which is a repository of financial data and institutional characteristics of various financial holding companies.

investments targeting venture capital firms in need of capital to invest in businesses and startups. However, the contribution of M&A activities to the economy via these entities is hard to assess.

10. Singapore's FDI inflows as well as greenfield FDI outflows to the region are shifting towards high-value added sectors such as the new economy. The bulk of investments that Singapore receives is focused on the new economy sector especially modern services and advanced manufacturing, in addition to financial services. The significant presence of global and regional technology companies provides a dynamic business ecosystem for regional companies to benefit from. Looking at Singapore's investments in ASEAN+3, firm level data from Orbis shows that greenfield investments from Singapore to the region were mostly in the new economy sector (42 percent) and the secondary sector (35 percent) during 2016 to 2018, a major shift from the secondary sector (44 percent) and the primary sector (17 percent) during 2013 to 2015. (Figure A1.4). China, Malaysia, Thailand and Indonesia were the major beneficiaries of high-tech investments.

Figure A1.4. Shifting Sectoral Distribution of Greenfield FDI from Singapore to ASEAN+3

(as a Percent of Total Outward FDI)



Source: Data is from the database provider Orbis, Bureau van Dijk. Available at: https://orbis2.bvdep.com/ (Accessed: November 25, 2019)
Note: The dataset is comprised of announced FDI projects, by firm level transactions. Country and sector classifications, and other computations are done by AMRO staff.

11. Going forward, strengthening innovation strategy and targeting partnerships with counterpart economies will foster Singapore's role as an FDI hub. As innovation capacity will take center stage in investor's choice of FDI host, Singapore should ramp up innovation efforts to compete with and support other global FDI hubs like China, Korea and Japan. Identifying key partnerships between Singapore and the MNEs' countries of origin and destination could be useful in enhancing Singapore's strategic advantages as an FDI hub from its clients' perspectives.

Appendix A1

1. AMRO's CPM to identify FDI hubs. To find out Singapore's position in a web of global FDI transactions, AMRO applied the CPM, initially developed by Palla et. al (2005). Given this framework, FDI hubs are defined as countries connected within multiple communities of countries and are transacting significant amounts of FDI.[21] Two factors are at play to include interconnectedness in the analysis. The first factor entails determining the optimal number of connections to form among communities. This allows the amount of connections in each community to be maximized given the structure of the FDI network. The second factor includes setting the FDI threshold level, which will determine what the connections will depend on. A connection is established between two countries if their FDI transactions for the whole dimension is among the 50th percentile of the sample. Each connection is called a *clique*. A community on the other hand, is a group of countries having members with an optimal amount of *k-cliques*, and each k- clique is adjacent with at least one other clique in the same community. The size of each community, the optimal k-cliques and the number of communities formed, are determined algorithmically. An FDI hub is identified when a country falls within overlapping communities.

2. Effect of business environment indicators on FDI hub status. To examine this relationship, a probit model is specified as:

$$P\left(Hub_{i,t} = 1\right) = C + \sum_{j=1}^{j=n} \beta_{i,j} Ind_{i,j,t-1} + \varepsilon_{i,t} \ ,$$

where $Hub_{i,t}$that equals 1 if country *i* is an FDI hub at period t and 0 otherwise, $Ind_{i,j}$is the score of World Bank's Doing Business indicator *j* in country *i* at period *t-1* with $\beta_{i,j}$ being the corresponding coefficient, C is the constant, and $\varepsilon_{i,t}$ is the error term. The list of doing business indicators are from a year ago, so as to mitigate the endogeneity problem. The various measures of FDI (FDI/GDP, FDI/reserves, FDI of country/Total Global FDI and FDI) represent the FDI stock/flow measures used to determine the FDI hub status of the dependent variable $Hub_{i,t}$. The hub status of countries is derived from the CPM analysis described in Paragraph 1.

[21] Such an approach is similar to the 2012 version of the methodology for the Financial Sector Assessment Program of the IMF when identifying jurisdictions with "systemically important financial sectors".

Table A1.3. Relationship of Business Environment Indicators and Network-determined FDI Hub Status Using Horse Race Estimation

	FDI/GDP	FDI/Reserve	FDI of country/Global FDI	FDI
Getting electricity	0.028**		0.029**	
	(0.01)		(0.01)	
Paying taxes		0.031**		
		(0.02)		
Trading across borders	0.074***	0.073***	0.038**	0.076***
	(0.02)	(0.02)	(0.02)	(0.03)
Resolving insolvency			0.018**	
			(0.01)	
Constant	-10.642***	-10.930***	-8.444***	-8.839***
	(2.51)	(2.82)	(1.70)	(2.49)
Observations	355	401	348	401
Log Likelihood	-68.228	-59.644	-86.821	-50.361
AIC	142.457	125.288	181.642	104.722
	-0.022	-0.031		-0.045

Table A1.4. Relationship of Business Environment Indicators and Network Determined FDI Hub Status Using LASSO Estimation

	FDI/GDP	FDI/Reserve	FDI of country/Global FDI	FDI
Starting a business		-0.0002		-0.074**
		(0.03)		(0.03)
Getting electricity	0.028**	0.01	0.031***	0.025
	(0.01)	(0.02)	(0.01)	(0.02)
Registering property		-0.053***		
		(0.02)		
Getting credit		0.015		-0.001
		(0.01)		(0.01)
Protecting minority investors		-0.050**	-0.027**	-0.078***
		(0.02)	(0.01)	(0.03)
Paying taxes		0.060**		
		(0.03)		
Trading across borders	0.074***	0.086***		0.122***
	(0.02)	(0.03)		(0.05)
Enforcing contracts				0.064**
				(0.03)
Resolving insolvency		0.014	0.032***	0.008
		(0.01)	(0.01)	(0.02)
Constant	-2.630***	-3.841***	-4.169***	-2.059**
	(0.80)	(1.21)	(1.00)	(0.82)
Observations	401	401	401	401
Log Likelihood	-105.355	-71.361	-122.221	-60.678
AIC	214.711	146.722	248.441	125.357

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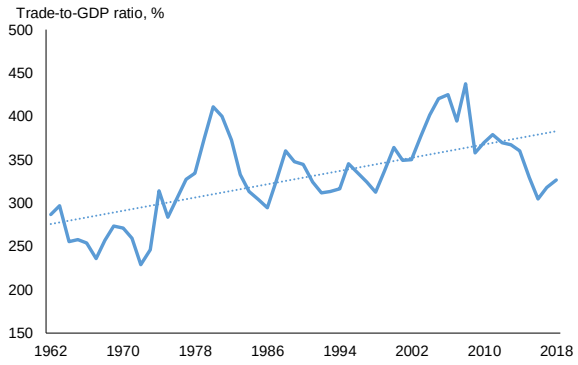
Annex 2. Assessing the Changing Elasticities of Singapore's Goods Exports[22]

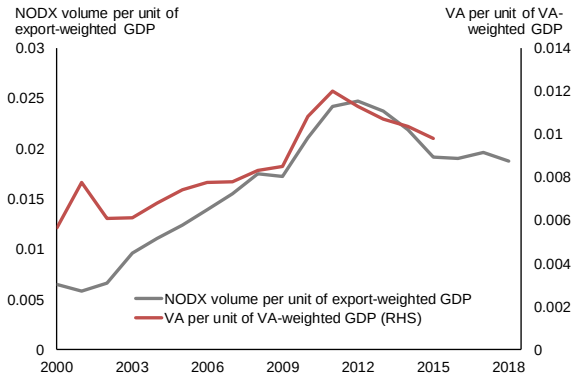
1. **As a small and very open economy, Singapore is highly dependent on external demand for growth.** Its trade-to-GDP ratio has been trending up since the 1960s and is at about 300 percent of GDP in 2018 (Figure A2.1). For the past several decades, this high degree of trade openness reflected Singapore's deeper integration into global value chains (GVCs), which led to the rising trade in intermediate goods. Singapore also serves as a trading and financial hub with strong links with the U.S., China and the region. Nevertheless, Singapore's trade to GDP ratio (Figure A2.1) has declined over the past decade. In tandem, non-oil domestic exports (NODX) and VA of NODX per unit of trading partners' GDP (Figure A2.2) have also declined, indicating that exports have grown less rapidly than trading partner's GDP.

Figure A2.1. Singapore's Trade-to-GDP Ratio



Source: World Bank.

Figure A2.2. Export per Unit of Export-Weighted GDP



Source: Enterprise Singapore; OECD TiVA database; CEIC; AMRO staff calculations.

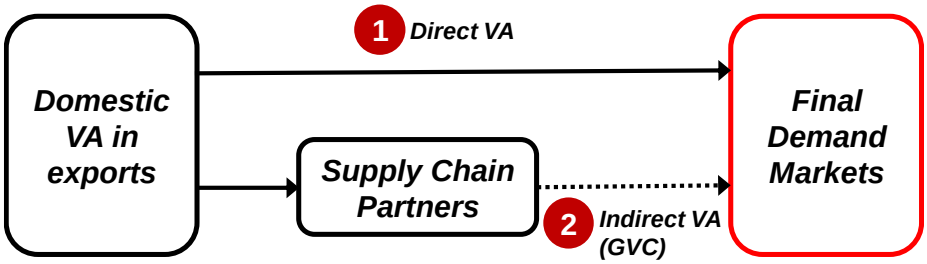
2. **This study assesses the above changing trends and the sensitivity of Singapore's NODX, total VA in NODX, as well as VA in GVC- and non-GVC related exports to foreign final demand.** We estimate the elasticity of Singapore's NODX[23] to foreign final demand based on an error correction model underpinned by an exports demand theoretical framework (Constantinescu et al, 2015). We also assess the elasticity of domestic value-added in NODX to foreign demand, and further distinguishes between products that are exported directly to its final demand markets and as inputs in other countries' exports.

3. **An assessment on the changing elasticities of GVC and non-GVC exports could help policymakers better understand the impact of changing external demand on Singapore's exports.** Recent studies have highlighted the importance in distinguishing between gross and value-added exports in assessing the impact of GVC activities on trade elasticities (Johnson and Noguera, 2014; Ahmed et al, 2015; Constantinescu et al, 2015 and Arbatli and Hong, 2016). In addition, we further assess the elasticities of VA in exports to foreign final demand, distinguishing between goods that are directly exported to the final demand markets (Direct VA) vis-à-vis goods that are used as intermediary inputs in other countries' exports (GVC VA). For example, Singapore's exports which are part of the

[22] Prepared by Mr Justin Lim Ming Han (Researcher).
[23] The scope of this study is limited to Singapore's domestic non-oil exports, which excludes domestic oil exports which makes up about one-third of Singapore's total domestic exports.

electronics global value chains would be more adversely impacted by the U.S. trade tensions and the slowing tech cycle (GVC VA). On the other hand, goods that are directly exported to their final export markets are expected to be more sensitive to demand shocks in those countries instead (Direct VA). The conceptual difference between the two types of value-added in exports are illustrated in Figure A2.3 below.

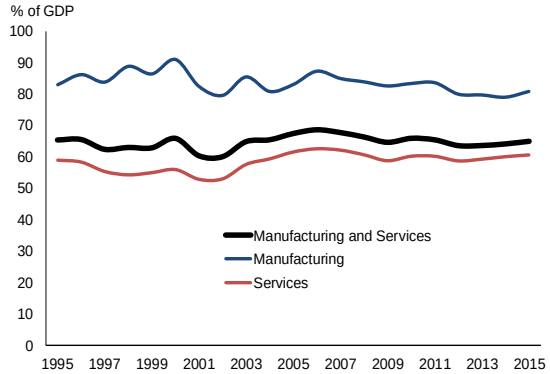
Figure A2.3. Transmission channels of external demand for value-added in exports



Source: Adapted from Yu and Zhou (2016) and Anna Ignatenko, Faezeh Raei, and Borislava Mircheva (2019).

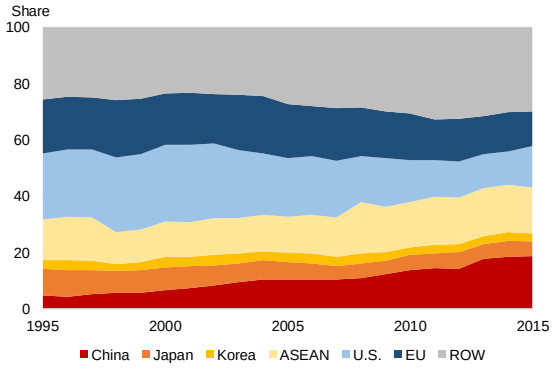
4. **Over 80 percent of VA in the manufacturing sector is derived from external demand.** Data from the OECD Trade in Value-Added (TiVA) shows that global demand accounted for as much as 90 percent of Singapore's manufacturing VA in the late 1990s, but it has declined ever since and remained stable at between 80 to 85 percent in recent years (Figure A2.4). Furthermore, Figure A2.5 shows that the region as a whole, particularly China and the ASEAN countries, are becoming key final demand markets for Singapore's exports, while the share of final demand from the U.S. and E.U. has fallen steadily in recent decades.

Figure A2.4. Share of VA in Exports from External Demand, % GDP



Source: OECD TiVA database.

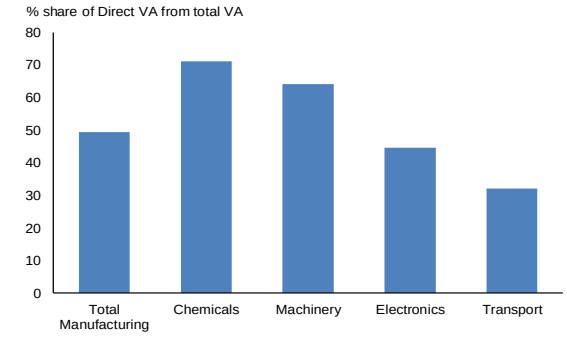
Figure A2.5. Singapore's VA in Manufacturing Exports by Country of Final Demand



Source: OECD TiVA database.

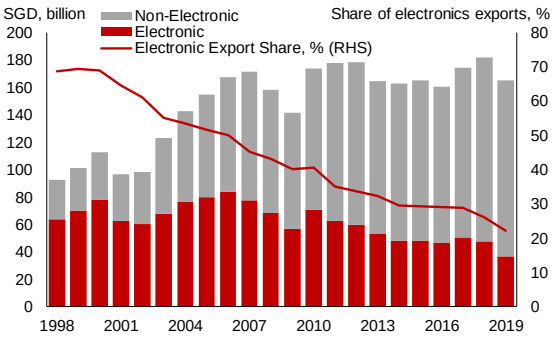
5. **The share of VA from goods that are exported directly to their final demand markets has risen due to the increase in non-electronics exports.** The OECD TiVA database shows that VA from direct exports makes up about half of total VA, and non-electronics exports such as chemicals and machinery goods have higher shares of direct VA (Figure A2.6). Moreover, non-electronics exports have grown more rapidly compared to electronics exports (Figure A2.7), indicating that the overall share of direct VA from gross exports has increased during this period. On the other hand, the share of electronics exports which are linked to the electronics GVCs has declined over time.

Figure A2.6. Share of Direct VA of Total VA in Exports



Source: OECD TiVA database, AMRO staff calculations.

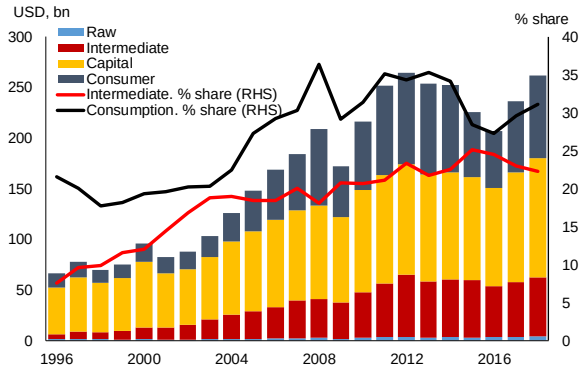
Figure A2.7. NODX by Product



Source: Enterprise Singapore, AMRO staff calculations.

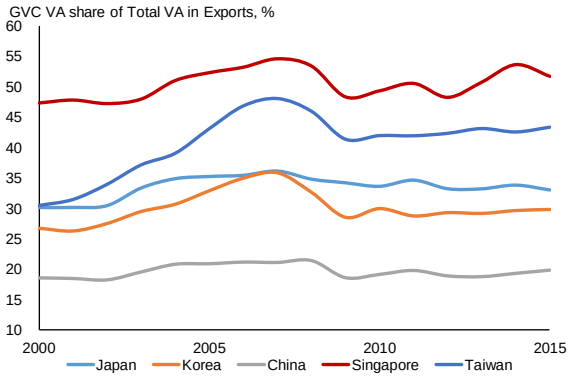
6. **At the same time, Singapore's GVC-related exports has slowed, in line with the experiences of other key exporters in region.** Singapore's exports to the rest of the world according to the Broad Economic Categories (BEC) end-use classification shows that intermediate goods exports rose between 1996 and mid-2010s, but has declined steadily ever since. At the same time, goods exported for final consumption purposes have increased notably (Figure A2.8). Similarly, the shares of VA from GVC exports for Singapore and other advanced regional countries have started to decline sometime between 2005 and 2010, which indicates a plateauing in GVC trade-related activities, after having increased steadily in the earlier period (Figure A2.9). The maturing of GVCs in the region can be attributed to a combination of factors, including the growing domestic capabilities of electronics production in China, slower pace of tariff reductions, rising non-tariff barriers, and slower global capital formation (AREO 2018; Constantinescu et al, 2015; Kee and Tang, 2014).

Figure A2.8. Singapore's Exports by End-Use Classification



Source: World Integrated Trade Solution (WITS) database, AMRO staff calculations.

Figure A2.9. GVC VA Share of Total VA in Exports



Source: Singapore Department of Statistics, OECD TiVA database, AMRO staff calculations.

7. **An error correction model is used to the estimate the sensitivity of Singapore's exports to external demand growth.** To examine the relationship between export volume and foreign final demand in greater detail, we follow the literature in using the generalized

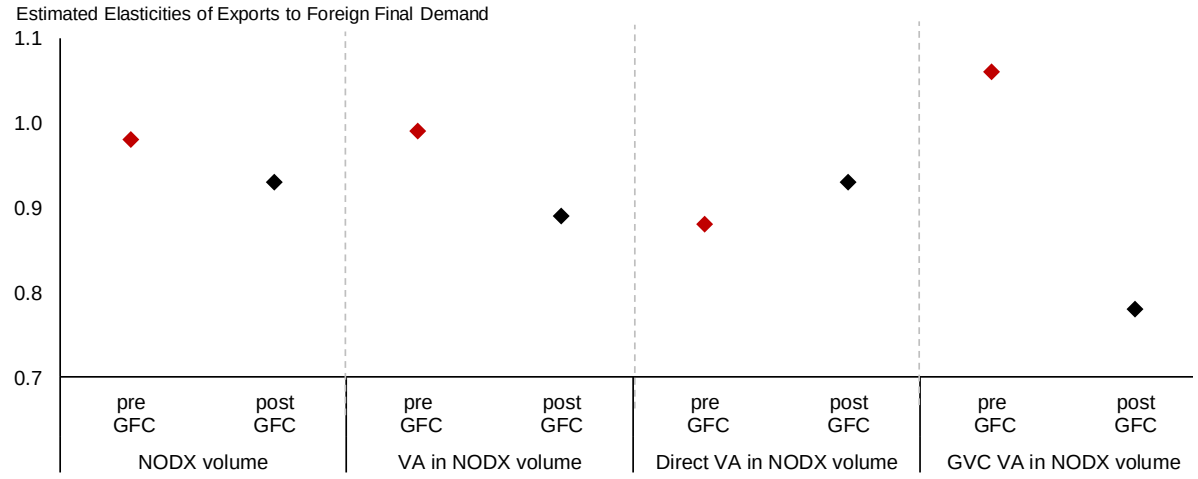
single-equation error correction model (ECM)[24] based on an exports demand framework[25]. We estimate the elasticities of NODX volume, VA in NODX volume, as well as direct and GVC VA in NODX volume to foreign final demand using data from the OECD's TIVA database. It is fitted using the Ordinary Least Square (OLS) estimator and the error structure allows for both heteroscedasticity and autocorrelation, which takes the following log-linearized form[26]:

$$\Delta lnX_t = \alpha\, lnX_{t-1} + \beta\, lnY_{t-1} + \delta\, lnP_{t-1} + \gamma\, \Delta lnY_t + \rho\, \Delta lnP_t + \varepsilon_t \qquad (1)$$

Where Δ denotes first differences, the dependent variable X_t is Singapore's NODX volume at time t, Y_t is export-weighted real foreign final demand (GDP) of Singapore's major export partners at time t, P_t is the relative price of Singapore's NODX to global export price at time t, and ε_t is the error term. The long- and short-run export elasticities are denoted by $-\beta/\alpha$ and γ, respectively, while the long- and short-run price elasticities are denoted by $-\delta/\alpha$ and ρ, respectively.

8. **The sensitivity of exports to real foreign final demand has declined slightly in the post-GFC period.** The results also show that elasticities of NODX and VA in NODX to foreign final demand have fallen slightly during the post-GFC period (Figure A2.10). The rolling regressions in Figure A2.11 further indicates that the demand elasticities have indeed fallen over time. This is in line with prior findings showing the relatively weaker export performance in the past decade.

Figure A2.10. Point Estimates of Elasticities of Exports to Foreign Final Demand



Note: Full empirical findings can be found in Table A1 and A2 in the Appendix A2.
Source: AMRO staff calculations.

9. **The demand elasticity of VA in GVC exports has declined markedly.** The declining demand elasticity of NODX in Figures A2.11 and A2.12 can be attributed to the falling demand elasticity of VA in GVC exports. This is seen in Figure A2.11, whereby the point estimate for

[24] This setup is widely used in the empirical trade literature (Constantinescu and others (2015), Bussiere and others (2013) and Freund and others (2011)) in estimating trade elasticities. The alternative specification is the Engle-Granger two-step ECM, but is shown to be less efficient compared to the single-equation ECM both empirically and theoretically (Keele, and de Boef. 2004).
[25] The model is underpinned by a theoretical export demand framework as discussed by Goldstein and Khan (1985). Consumers are assumed to have constant elasticity of substitution (CES) utility preferences, with export demand as a function of aggregate demand and an aggregate relative price index of exported goods.
[26] The model implicitly assumes exogeneity conditions between export demand and external demand and relative prices, when the causality is bi-directional. This approach is useful in describing the sensitivity of export volumes to its determinants under a reduced-form setting, which does not fully capture the underlying behavioral relationships among the variables.

the demand elasticity of VA in GVC exports fell from 1.0-1.1 in the pre-GFC period to less than 0.8 in the post-crisis period. In addition, the rolling regressions in Figure A2.12 also shows a rapid decline in the demand elasticity for VA in GVC exports. These findings concur with previous findings on the slowing expansion of GVC trade in the post-crisis period. However, a slight increase in the demand elasticity of VA in direct exports was observed in Figure A2.11 and A2.12, which can be attributed to Singapore's rising non-electronics exports as shown in Figure A2.7.

Figure A2.11. Time-Varying Demand Elasticity of NODX and VA in NODX to Foreign Final Demand

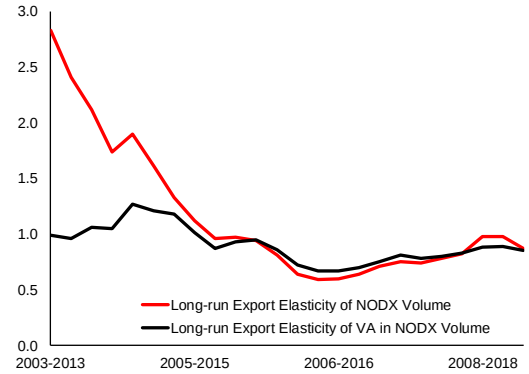
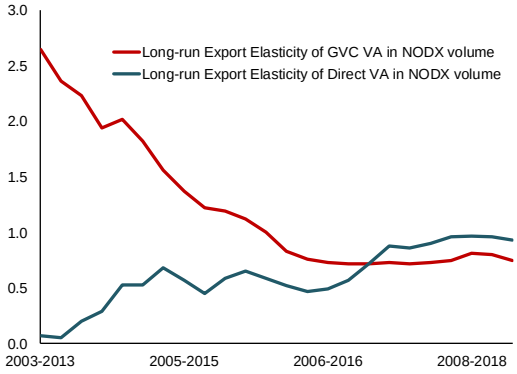


Figure A2.12. Time-Varying Elasticity of Direct and GVC VA in NODX to Foreign Final Demand



Note: Based on rolling regressions (10-year windows) of the export demand framework (Equation 1).
Source: AMRO staff calculations.

10. **The impact of the recent trade tensions and electronics down-cycle on Singapore's economy could have been greater if the elasticity of Singapore's GVC exports and electronics exports share were larger and similar to the pre-GFC period.** The sensitivity of Singapore's GVC exports to global demand, the bulk of which are electronics goods, has declined in the post-GFC period. One possible reason for the declining GVC trade elasticity could be the growing role of factory-less goods producing firms. These firms focus on the design of semiconductor chips, while outsourcing the manufacturing production to firms outside of Singapore (MTI, 2018). Therefore, electronic exports from Singapore have become less responsive to the rising final demand. In addition, these firms would gain from VA generated though the chip design process.

11. **On the other hand, the non-electronics segment would stand to benefit more from a global growth upswing due to its increasing elasticity of direct exports and rising non-electronics exports share.** Past policy efforts to develop new sectors in Singapore, such as the pharmaceutical, petrochemical and chemical sectors, have been successful in growing and diversifying Singapore's exports. The elasticity of direct exports has also risen over time, which indicate that these exports will benefit more during the trading partners' economic upturn. In this regard, the authorities' commitment in exploring and expanding into non-GVC spheres such as pharmaceutical and high-tech farming, is commendable and should continue.

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Appendix A2

Table A2.1. Determinants (Logged) of Total NODX and VA in NODX Volume Growth

Dependent Variable (logged)	Total NODX Volume Growth			VA in NODX Volume Growth		
	Full Sample	2000Q1 - 2008Q4	2009Q1 - 2019Q2	Full Sample	2000Q1 - 2008Q4	2009Q1 - 2019Q2
	(1)	(2)		(3)	(4)	
Long-run Export Elasticity ($-\beta/\alpha$)	0.97***	0.98***	0.93***	0.96***	0.99***	0.89***
Long-run Price Elasticity ($-\delta/\alpha$)	-1.71***	-2.20***	-2.13***	-1.61***	-1.93***	-1.60***
Short-run Export Elasticity (γ)	0.81***	0.73***	0.73***	0.80***	0.79***	0.70***
Short-run Price Elasticity (ρ)	-0.81***	-0.93***	-0.99***	-0.69***	-1.25***	-0.75***
Lagged NODX Volume (α)	0.54***	0.41	0.51***	0.58***	0.46	0.55***
Lagged External Demand (β)	-0.52***	-0.40*	-0.48***	-0.56***	-0.46*	-0.49***
Lagged Relative Price (δ)	0.92***	0.90**	1.10***	0.94***	0.90**	0.88***
Constant	2.28	1.00		3.02	2.02	
Time Fixed Effects	Yes	Yes		Yes	Yes	
GFC Dummy	Yes	Yes		Yes	Yes	
Number of Observations	67	67		67	67	
Adjusted R-squared	0.79	0.83		0.75	0.78	

*** Indicates that the coefficients are statistically significant at 1 percent, ** indicates that the coefficients are statistically significant at 5 percent, * indicates that the coefficients are statistically significant at 10 percent.

Table A2.2. Determinants (Logged) of Direct and GVC VA in NODX Volume Growth

Dependent Variable (logged)	Non-GVC / Direct Domestic VA in NODX Volume Growth			GVC / Indirect Domestic VA in NODX Volume Growth		
	Full Sample	2000Q1 - 2008Q4	2009Q1 - 2019Q2	Full Sample	2000Q1 - 2008Q4	2009Q1 - 2019Q2
	(5)	(6)		(7)	(8)	
Long-run Export Elasticity ($-\beta/\alpha$)	0.76***	0.88*	0.93**	1.55***	1.06***	0.78***
Long-run Price Elasticity ($-\delta/\alpha$)	-1.58***	-1.68***	-2.14***	-1.93***	-2.27***	-1.24***
Short-run Export Elasticity (γ)	0.57***	0.73***	0.63***	1.04***	0.82***	0.73***
Short-run Price Elasticity (ρ)	-0.65***	-1.25***	-0.65***	-0.73***	-1.29***	-0.84***
Lagged NODX Volume (α)	0.50***	0.34	0.38**	0.41**	0.53*	0.84***
Lagged External Demand (β)	-0.38***	-0.30	-0.35**	-0.63**	-0.56**	-0.65***
Lagged Relative Price (δ)	0.78***	0.57	0.82***	0.78***	1.20**	1.04***
Constant	0.89	1.27		6.98**	2.75	
Time Fixed Effects	Yes	Yes		Yes	Yes	
GFC Dummy	Yes	Yes		Yes	Yes	
Number of Observations	67	67		67	67	
Adjusted R-squared	0.66	0.66		0.75	0.84	

*** Indicates that the coefficients are statistically significant at 1 percent, ** indicates that the coefficients are statistically significant at 5 percent, * indicates that the coefficients are statistically significant at 10 percent.

Annex 3: Perspectives on Singapore's Development as an International Financial Center[27]

1. **Singapore has grown in prominence as a major global financial center, underpinned by continuous efforts to explore new strategic opportunities, and ensure sound risk management.** In our view, the Singapore's approach seems to have adhered to the following principles:

i. Striking a balance between financial sector development and risk management;

ii. Laying the groundwork for continuous financial sector development and proactively seeking new opportunities;

iii. Using its strengths and serving the regional economy.

How has Singapore's Role Grown in the International Financial Services Arena?

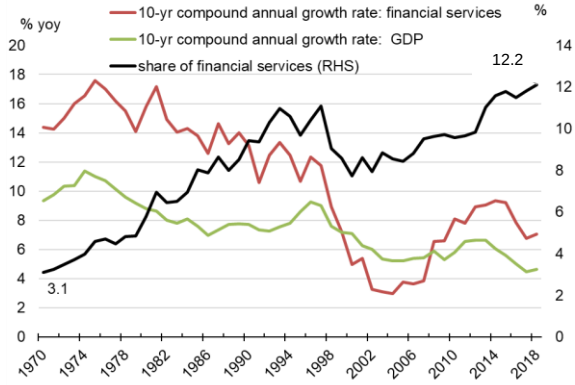
2. **Over the past five decades, Singapore has spotted key opportunities, and has channeled resources and focused on policies to develop the financial services sector.** Singapore has long leveraged on its role as a trading hub and gateway to Southeast Asia, and recently, also a gateway to China and India. The Monetary Authority of Singapore (MAS) was set up 1971, and took on the functions of central banking, financial regulation, and financial sector development. When the U.S. de-linked the U.S. Dollar from gold in 1971, Singapore quickly seized the opportunity to promote foreign exchange trading operations. Moreover, in the 1970s, Singapore made a strategic decision to develop the Asian Dollar Market (ADM)[28] emulating the UK-based Eurodollar markets. Since the 1990s, Singapore has welcomed and participated in the globalization of finance. Singapore has stepped up the pace in financial market liberalization, attracted a large number of global financial institutions (FIs), and developed a spectrum of activities across different segments of the financial markets. In recent years, by leveraging the region's growing affluence and serving the needs of aging populations, Singapore has become a leader of Asia's asset management industry and also (re)insurance pricing center. Over the years, Singapore's financial sector and MAS have proven on many occasions their capacity to react quickly to emerging opportunities and to address new challenges.

3. **Key foundations for Singapore's rapid financial sector development include the country's sound macroeconomic fundamentals and rigorous yet flexible prudential oversight of the financial sector.** Singapore's economic resilience and strong fiscal position have enabled its financial sector to weather severe crises – such as the Asian Financial Crisis (AFC) and Global Financial Crisis (GFC) well. During the AFC and GFC, the financial sector remained sound, in part due to MAS' supervision and regulation, and was thus able to rebound quickly. MAS has consistently implemented stringent yet effective outcome-focused and risk-based financial regulations.[29] Financial market infrastructures (FMI) have been steadily

[27] Prepared by Dr. Simon Liu (Economist).
[28] ADM allowed foreign banks in Singapore to invest and trade foreign currencies that they did not repatriate back to their home countries or convert to Singapore dollars. This market has developed into a large FX hub, serving international funding activities.
[29] This is illustrated by MAS monograph "Tenets of Effective Regulation".

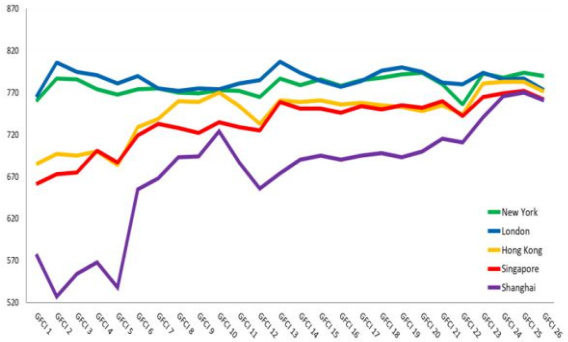
developed and improved, which have facilitated the efficient clearing, settling, or recording of payments, securities, derivatives or other financial transactions. This has enabled the efficient and secured functioning of the financial system.

Figure A3.1. Growth of Singapore GDP and the Share of Financial and Insurance Sector



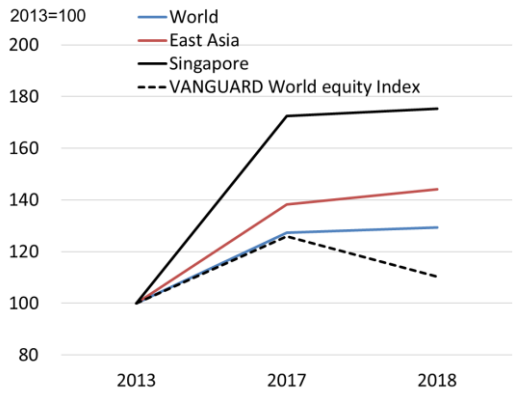
Note: GDP is based on 2015 price (chained dollars).
Financial services refers to the finance and insurance sector of Singapore's National account.
Source: CEIC, AMRO staff estimate.

Figure A3.2. Global Financial Centers Index Rating Over Time



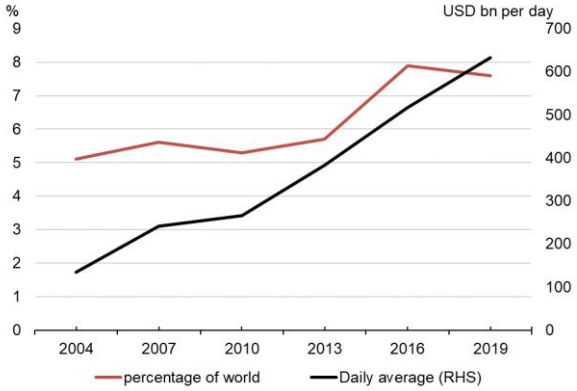
Source: Z/Yen Partners and China Development Institute.

Figure A3.3. Growth of Assets Under Management



Note: Data for World and East Asia are from BCG; data for Singapore is from MAS; the ticker of Vanguard world equity index ETF is NYSEARCA: VT.
Source: BCG "Global Wealth 2019", MAS, Google Finance.

Figure A3.4. FX Turnovers in Singapore (Net-Gross)



Source: BIS Triennial Central Bank Survey Foreign exchange turnover in April 2019.

4. **The Industry Transformation Roadmap (ITM) builds on five decades of financial sector development, with the sector having become a pillar of the economy – financing enterprises and contributing to growth and employment.** In 1970, prior to the establishment of the MAS, financial services accounted for only 3.1 percent of GDP. By 2018, the financial services sector has come to account for 12.2 percent of Singapore's GDP (Figure A3.1). Currently, its banking sector's assets are about six times the size of GDP, a substantial share of which serves overseas activities. It is also a major global wealth management center, with SGD3.4 trillion of assets under management (AUM) in 2018, and the growth rate has been much more rapid than global AUM (Figure A3.3). Singapore is also Asia's largest center for commodity trading, and has become Asia's largest foreign exchange trading center since 2014. In H1 2019, it accounted for 7.6 percent of global FX turnover, third largest in the world (Figure A3.4). According to the Industry Transformation Roadmap (ITM), MAS is targeting a value-add growth

rate of 4.3 percent for this sector, which is substantially higher than Singapore's overall growth rate.

5. **Today, Singapore continues to adjust its financial sector development strategy, including making necessary changes to its regulatory framework, so that it can keep on providing a comprehensive suite of financial services regionally and globally.**

- **The country continues to widen its spectrum of financial services.** From the early days of being largely a banking hub, the coverage now includes diverse activities ranging from corporate treasury operations, to equity and debt capital market activities, private equity, venture capital, infrastructure financing, green financing, and more recently, digital banking. Some activities are small, for example, Islamic banking, but they enable Singapore to provide a more complete and inclusive financial services.

- **MAS has not shied away from adjusting its regulatory framework to accommodate new types of useful financial activities when necessary**. For example, to encourage more funds to be domiciled in Singapore and enhance Singapore's value as an international fund management center, MAS recently introduced the Variable Capital Company (VCC) Framework and the Simplified Venture Capital Manager Regime. The VCC complements the existing suite of fund structures in Singapore, and encourage more fund managers to co-locate the domicile of their investment funds with their fund management activities in Singapore, instead of offshore centers, such as Cayman Island. Such initiatives will benefit both homegrown and foreign enterprises operating in Singapore, by widening the range of financing options. They will also further strengthen Singapore's status as a financial hub because the financial ecosystem has become more complete over time. Singapore is already a regional and global FDI hub (See Selected Issue 2), and these efforts would further strengthen this role.

- **There are many incentives to develop promising sectors, support start-ups and deepen human capital.** The sub-sectors covered include fund management, insurance business, fixed income market activities, and infrastructure finance. Working with the Ministry of Finance (MOF), MAS is providing sizeable funding through schemes such as: Financial Sector Incentive Scheme, Insurance Business Development Scheme, Financial Sector Development Fund, Grant for Equity Market Singapore Scheme**,** Asian Bond Grant and Sustainable Bond Grant, Infrastructure Finance Initiatives, Sustainable Finance Initiatives, Insurance & Risk Financing Initiatives.

Beyond Hosting Financial Activities in Singapore: Home-Grown Institutions Going Out

6. **As Singapore continues to host more foreign FIs in the country, Singapore banks have also expanded abroad in the fast-growing regional economies in recent years.** Singapore has a balanced mix of local banks (or banking groups) and foreign banks. Banks, including locally incorporated foreign banks, remained sound and profitable during the GFC. As a result, when European banks cut back on their presence here after the GFC, Singaporean

banks were able to step in to fill a portion of the gap. This has benefited the region by providing much needed financing to the regional economies. The strategy of venturing abroad has been long-standing. Rather than aiming to become global banks, Singapore banks have sought to leverage on their strengths, a key one being their understanding of local conditions and their networks in the region. They have been able to expand in ASEAN, China and India – while maintaining asset quality and strong capital and liquidity buffers.[30]

7. **Singapore has also rapidly become a fin-tech hub.** Fin-tech is not a segment in itself, but rather an enabler of all segments. Usage of technology in the financial sector has greatly accelerated in recent years and will continue. To grab the opportunities, MAS has employed a "sandbox" regulatory approach that encourages experimentation within boundaries while ensuring that sufficient risk management safeguards are in place and commensurate with the degree of risk taking. Authorities have also encouraged collaboration between traditional FIs and fin-tech companies, so that Singapore can leverage on the existing strengths of traditional financial institutions in risk management and anti-money laundering, while benefiting from innovations. Project Ubin is an example of collaborative efforts between MAS and the private sector to apply blockchain technology towards improving international clearing and settlements of payments and securities transactions. As of 2019, 40 percent of fin-tech firms in ASEAN are based in Singapore. Investments in fin-tech also quadrupled to USD453 million in 1H 2019 from 1H 2018.

8. **Financial sector cybersecurity risk management has been significantly enhanced in response to the rapid development of fin-tech and growing threats of cyber hacking.** MAS has put in place stringent cybersecurity standards, and FIs have ramped up their efforts. The MAS' 2019 Technology Risk Management Guidelines lays out the best practices for different areas. It also focuses on key emerging risks related to the development of virtualization, cloud activities, Application Programming Interface (API), and machine learning. In addition, focus on governance issues has been sharpened, with MAS and Singapore-based FIs collaborating with their regional and global counterparties.

Singapore has become a pioneer in financing for environmental, social, and governance (ESG) investment in the region and actively contributing to the global efforts. Singapore is poised to play a pivotal role in the region for fund screening or certification activities, and the listing of specific products complying with these ethics guidelines. To serve the region's needs in a practical manner, Singapore's green finance initiatives are targeted, taking into account regional countries' development priorities and financing needs – which can differ from other standards, for example, the European standards. The MAS has also launched a number of incentives to develop the green bond market in Singapore.

[30] DBS' multiyear efforts to enter Indian markets has been bearing fruits; UOB has been making progress in the low-income ASEAN economies, such as Vietnam and Myanmar; and OCBC made a major acquisition to increase its commitment in China's Peal delta and Yangtze delta regions

Continuing to strengthen competitive advantages and expanding into emerging areas

9. Singapore's strategy to develop the financial services sector continues to leverage on its strengths, capture opportunities arising from global trends, and serve the needs of the region. Singapore's vision is to connect global markets, support Asia's development and bolster Singapore's economy. To build its strengths further, Singapore has decided to continue developing: its wealth management industry, its status as an Asian hub for fund management and domiciliation, and its role as a global forex center. To seize opportunities related to Asia's further economic growth, Singapore has also decided to develop some segments of the financial sector which are promising though currently small. These include becoming: the Asian center for capital raising and enterprise financing, particular in private equity and venture capital, the premier Asian infrastructure financing hub, the leading center for Asian's fixed income business, and the global capital for Asian infrastructure and risk transfer.