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AMRO Annual Consultation Report

Singapore – 2023

ASEAN+3 Macroeconomic Research Office (AMRO)

July 2023

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 recommendations. This is being done in accordance with Article 3 (a) and (b) of the AMRO Agreement.

2. This Report is drafted on the basis of the Annual Consultation Visit (ACV) of AMRO to Singapore, which was conducted in Singapore from May 9 to June 5, 2023 (Article 5 (b) of the AMRO Agreement). The AMRO ACV team was headed by Dr Kevin Cheng, Group Head and Lead Economist. The ACV members were Dr Jade Vichyanond, Country Economist for Singapore; Mr Justin Lim, Back-up Economist for Singapore; Dr Ji Ke, Back-up Economist for Singapore; and Ms Catharine Tjing Yiing Kho, Senior Economist. AMRO Director Dr Kouqing Li and Chief Economist Dr Hoe Ee Khor participated in key policy meetings with the authorities. The AMRO Annual Consultation Report on Singapore for 2023 was peer-reviewed by a group of economists from AMRO's Country Surveillance, Financial Surveillance and Fiscal Surveillance teams; endorsed by the Policy and Review Group; and approved by Chief Economist Dr Khor.

3. The analysis in this Report is based on data and information available up to 16 June 2023.

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

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Executive Summary

Weighed by a weakening global economy, Singapore's economy is expected to grow at a moderate pace in 2023. With inflation moderating but still likely to be elevated in the near term, maintaining a tight monetary policy stance is critical in anchoring inflationary expectations. Continued fiscal consolidation is warranted in view of rising expenditure needs, while targeted fiscal support is beneficial for easing the increase in the cost of living.

1. Singapore's growth momentum has moderated in the face of strong external headwinds. After rebounding by 8.9 percent in 2021, Singapore's growth slowed to 3.6 percent in 2022 and 0.4 percent (yoy) in Q1 this year as external headwinds mounted. In particular, the manufacturing sector weakened sharply as goods exports fell. The service sector remained strong, thanks to the return of tourists as well as relatively resilient private consumption. The construction sector continued to recover as the return of foreign labor following the reopening eased the supply constraint.

2. Looking ahead, growth is expected to be subdued on the back of weaker global growth prospects. Non-trade-related services are expected to benefit from continued growth in inbound tourism and resilient domestic consumption while the construction sector will likely continue to recover towards pre-pandemic levels as manpower shortages continue to ease, and building material costs moderate. However, their positive impact on growth will likely be more than offset by a slumping manufacturing sector and lackluster performance in trade-related services, reflecting the slowdown in global trade.

3. Inflation stood at 6.1 percent in 2022, on the back of higher costs of private transport and accommodation, as well as elevated energy and food prices. Although inflation has moderated in the first half of 2023, it is expected to remain elevated in the near term, as service inflation remains firm, reflecting a relatively tight labor market.

4. After a robust recovery in 2021, growth in non-oil domestic exports slowed to 3 percent in 2022, following a slowdown in the growth of both electronics and non-electronics exports. Singapore's export performance remained anemic in the early part of 2023 owing to weak external demand. Exports of services, on the other hand, continued to grow robustly, boosted mainly by higher receipts from transport and travel services.

5. Amid heightened inflationary pressure and rising global interest rates, Singapore tightened monetary policy five consecutive times since October 2021 before deciding to maintain the prevailing rate of appreciation of the S$NEER policy band in April this year. The pause came amid the projected easing of inflation by end-2023 and concerns over the marked slowdown in domestic growth. Meanwhile, domestic interest rates have been trending upwards in tandem with global interest rates.

6. The revised FY2022 fiscal position improved slightly relative to the estimated position, mainly due to higher-than-expected revenue, while the FY2023 budget shows a tighter stance, reflecting continued commitment toward consolidation. Financial support for households was enhanced to help shoulder the higher cost of living and cushion the impact of the GST rate increase.

7. The overall balance of risks is tilted to the downside, with a gloomier global growth outlook being one of the major risks in the coming quarters. While the reopening of China had initially provided a much-needed boost to global demand, it will unlikely be sufficient to offset the impact of tighter financial conditions in major economies, which will weigh heavily on Singapore's manufacturing exports.

8. Elevated price pressure poses another challenge in the near term. A sharp rise in commodity prices remains as an external risk amid heightening geopolitical tensions and El Nino weather patterns, while car ownership fees, accommodation costs, wage pressure, and the impact of GST hikes warrant monitoring on the domestic front.

9. On the financial front, episodes of capital flow volatility are a key risk for Singapore. Considering recent turmoil in the U.S. and European financial systems, Singapore may also be susceptible to renewed upsurge in risk aversion in global financial markets, especially given the country's position as an international financial center. Meanwhile, most households and firms remain resilient to an increase in debt servicing costs, although risks for a small segment of highly leveraged households and firms have heightened amid higher interest rates.

10. The revenue measures in the FY2023 budget are commendable. AMRO also supports efforts to maintain fiscal progressivity on the revenue side, such as the increase in stamp duties for higher-value properties and in the registration fees for luxury cars. AMRO encourages the authorities to explore additional revenue sources to meet longer-term spending needs while adhering to the fiscal rule of running a balanced budget within each term of government.

11. AMRO supports MAS' tightening of monetary policy to maintain price stability. Looking ahead, inflationary pressure is expected to remain elevated in the near term with the tight domestic labor market and other supply constraints. Hence, monetary policy should remain tight, and MAS should be prepared for further tightening. Meanwhile, a concerted effort, involving monetary and other policy instruments, should be made to tame inflation, particularly when inflationary pressure is being driven by a wide range of supply and demand factors, including domestic policy measures.

12. In light of the recent banking turmoil in the U.S. and Europe, we commend the authorities' continued efforts in safeguarding Singapore's banking system. The MAS' regular conduct of stress tests against various types of risks, close monitoring of global financial markets, readiness to provide liquidity through various facilities, and clear communication with market participants, are crucial in helping ensure the country's banking system continues to remain resilient in the face of unexpected shocks.

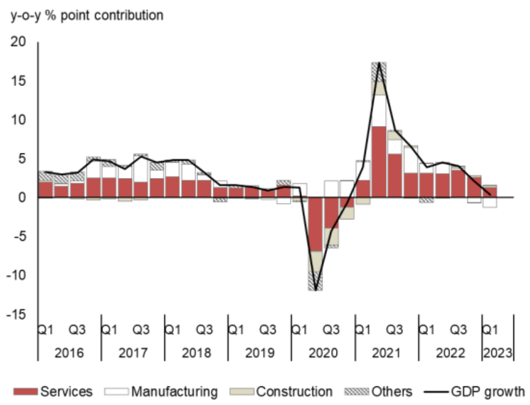
13. AMRO supports the current macroprudential measures to cool the property market. The recent rounds of cooling measures have reduced the risk of a destabilizing correction. Continued vigilance of property market developments is essential, as are efforts to boost private and public housing supply.

14. AMRO supports the authorities' continued efforts to develop a responsible and innovative digital asset ecosystem. The efforts to strengthen digital infrastructure will foster collaboration between fintech companies and other businesses, while facilitating greater interoperability across platforms and countries. AMRO also welcomes the authorities' initiatives to mobilize private capital to catalyze the region's transition towards a low carbon economy.

A. Recent Developments and Outlook

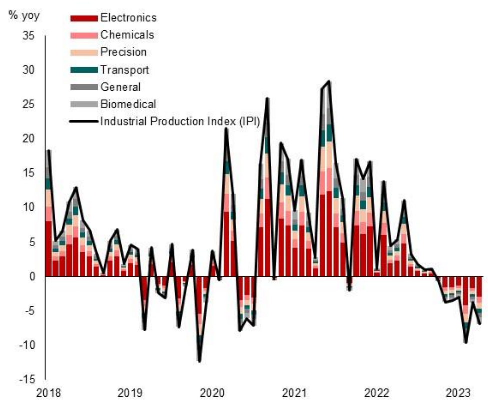
1. **Singapore's growth momentum has moderated as reopening tailwinds have subsided and external headwinds remain strong.** After having rebounded by 8.9 percent in 2021, Singapore's economic growth slowed to 3.6 percent in 2022 and 0.4 percent (yoy) in Q1 this year in the face of the weakening global growth momentum (Figure 1). The manufacturing sector's performance, in particular electronic products, weakened markedly, having grown by 2.5 percent in 2022 before contracting by 5.4 percent (yoy) in Q1 2023 amid slowing external demand and a cyclical downturn in the electronics cycle (Figure 2). The service sector has remained strong, expanding by 4.8 percent in 2022 and 1.9 percent (yoy) in Q1 this year, thanks to the return of tourists, largely from within the Asia-Pacific, as well as relatively resilient private consumption. The construction sector has continued to recover, growing by 6.7 percent in 2022 and 6.9 percent (yoy) in Q1 2023, as the return of foreign labor following the reopening eased supply constraints.

Figure 1. GDP



Source: Department of Statistics; CEIC; AMRO staff calculations

Figure 2. Industrial Production



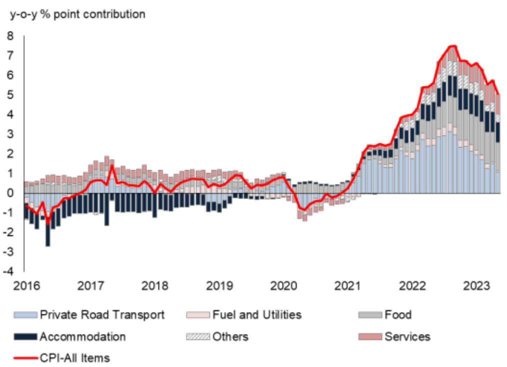
Source: Department of Statistics; CEIC; AMRO staff calculations

2. **Looking ahead, growth is forecast to be subdued on the back of weaker global growth prospects.** Non-trade-related services are expected to benefit from continued growth in inbound tourism and resilient domestic consumption—though the latter may be somewhat restrained by still-elevated consumer price inflation and the higher interest rate environment—while the construction sector will likely continue to recover towards pre-pandemic levels as manpower shortages continue to ease and building material costs moderate.[1] However, their positive impact on growth will likely be more than offset by a slumping manufacturing sector and lackluster performance in trade-related services, reflecting a slowdown in global trade amidst increasingly tighter monetary conditions in key global economies as well as the electronics down cycle. The boost from China's reopening may take some time to materialize, given that it has thus far benefited mainly the country's own domestic-oriented services sector. We expect Singapore's growth to moderate to around 1.3 percent in 2023.

[1] However, there is still shortage of high-skilled workers, which is expected to persist in the near term.

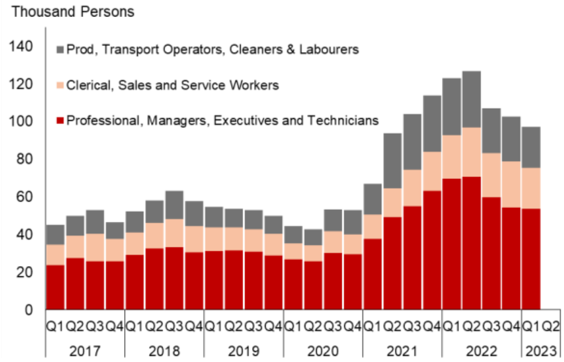
3. Inflation rose significantly, averaging around 6.1 percent in 2022, and is expected to remain elevated in the near term. Singapore's headline inflation rose from 4.0 percent (yoy) in December 2021 to a high of 7.5 percent in September 2022, before moderating to 4.5 percent in June 2023 (Figure 3). Two of the main drivers were car ownership costs and accommodation costs; in 2022, the prices of Certificates of Entitlement (COEs) rose by around 63 percent, while private residential rental costs rose by about 20 percent on average.[2] Furthermore, the contribution from service inflation gained momentum over H2 2022 and remained firm in H1 this year, reflecting a relatively tight labor market and the expansion in the coverage of the Progressive Wage Model.[3] We expect average headline inflation to register at around 5.8 percent in 2023, with average core inflation (excluding private transport and accommodation costs) hovering at an elevated 4.6 percent, largely on the back of higher labor costs.

Figure 3. Inflation



Source: Department of Statistics, MAS; AMRO staff calculations

Figure 4. Job Vacancies



Source: Manpower Research & Statistics Department, Ministry of Manpower; AMRO staff calculations

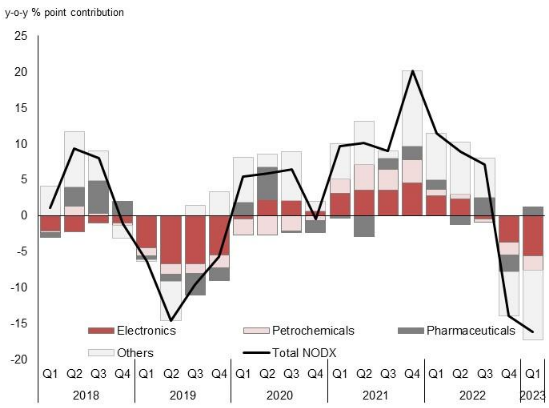
4. The labor market has been relatively tight, but labor demand may moderate in the near term amid moderating growth. The seasonally adjusted overall unemployment rate continued to decline, to 1.9 percent in June 2023 from a high of 3.5 percent in October 2020. Following the relaxation of border restrictions, employers backfilled vacancies that rely more on foreign workers, easing labor shortages to the extent that resident and non-resident employment exceeded their pre-pandemic levels by 4.9 percent and 1.7 percent, respectively, as of March 2023 (Figure 4). While there are signs that labor demand is cooling in some sectors, the ratio of job vacancies to unemployed persons is still relatively high, at 2.3 in March 2023, compared to the pre-pandemic level of 0.9 in December 2019.

5. Non-oil domestic exports (NODX) slowed, reflecting weakening demand in trading partners. After growing at 12.1 percent in 2021, NODX growth slowed to 3 percent in 2022, following a slowdown in the growth of both electronics and non-electronics exports (Figure 5). In terms of export markets, NODX to China and Hong Kong contracted in 2022 as stringent COVID-19 containment measures disrupted production in both economies.[4] Weak demand in these economies was compounded by weakening growth in the U.S. and E.U., and a protracted global semiconductor down cycle in the last quarter of 2022. NODX contracted

[2] Car prices and accommodation costs represent 7.4 percent and 22.0 percent of the CPI basket, respectively.
[3] Adding to the price pressure is the GST rate hike—to 8 percent from 7 percent—which took place at the beginning of 2023. We expect the hike to contribute about 0.4 percentage points to inflation.
[4] China and Hong Kong collectively accounted for 19.4 percent of NODX in 2022.

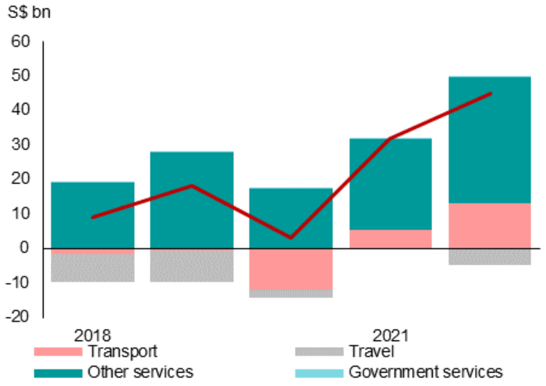
further in the first half of 2023, marking nine months of consecutive year-on-year decline. The anticipated turnaround in the global semiconductor cycle in the second half of 2023 should mitigate some of the weakness in NODX. Nonetheless, this lift to Singapore's NODX is expected to be offset by more moderate growth in the U.S., E.U., and most ASEAN+3 economies, with NODX consequently expected to remain weak in 2023.

Figure 5. Non-oil Domestic Exports



Source: Enterprise Singapore; CEIC; AMRO staff calculations

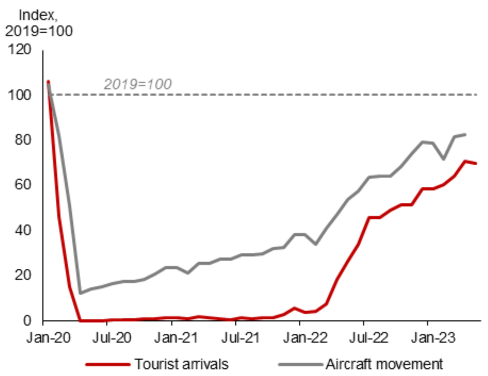
Figure 6. Services Trade Balance



Source: Department of Statistics; AMRO staff calculations

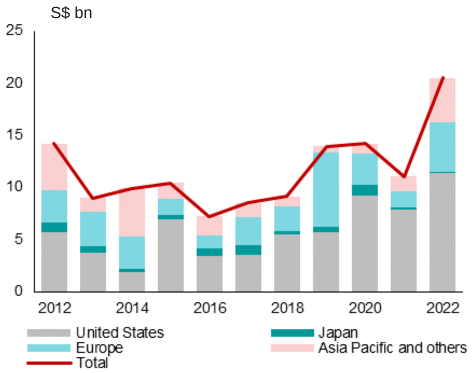
6. Services exports, on the other hand, continued to expand robustly, boosted mainly by higher receipts from transport and travel services (Figure 6). Exports of travel services increased almost three-fold following the full reopening of borders. As of May 2023, monthly tourist arrivals had recovered to around 70 percent of pre-pandemic level—the low number of inbound Chinese tourists thus far has been offset somewhat by more tourists from ASEAN (Figure 7). Passenger air traffic has also rebounded strongly, reaching more than 80 percent of pre-pandemic levels as of April 2023. Exports of modern services—financial services, ICT, intellectual property charges, and other business services—grew at a more moderate pace, in line with weaker external demand. Travel services are likely to continue expanding in 2023, driven primarily by the return of Chinese tourists, who accounted for almost one-fifth of total tourist arrivals in 2019.

Figure 7. Tourists Arrivals and Passenger Aircraft Arrivals



Source: Singapore Tourism Board; Civil Aviation Authority of Singapore; Department of Statistics; AMRO staff calculations

Figure 8. FDI Commitments



Source: Economic Development Board; AMRO staff calculations

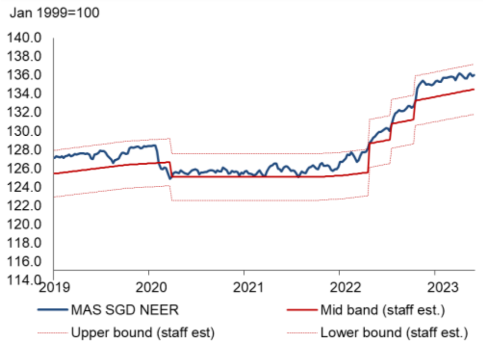
7. The financial account registered large outflows in 2022, leading to a deficit in the overall balance and a decline in foreign reserves. Outflows from portfolio investment and other investment amounted to 62 percent of GDP. The outflows in other investment primarily reflected the reduction of liabilities by deposit-taking corporations in view of the increasingly tighter financial market conditions as well as official outflows following the MAS' transfer of excess reserves to the GIC.[5] The portfolio outflows were due mainly to an uptick in residents' investment in foreign equity and investment funds. Meanwhile, foreign direct investment (FDI) inflows remained strong, with inward FDI continuing to outpace direct investment abroad (Figure 8). Despite the challenging external environment, FDI commitments in 2022 were at an all-time high, with investment pledges from the U.S., Europe, and from within Asia-Pacific. In large part because of the large fund transfer from MAS to GIC, the overall balance of payments was in deficit in 2022, with Official Foreign Reserves (OFR) at US$289.5 billion as of end-2022, compared with US$417.9 billion at the end of 2021. Since the beginning of 2023, however, the overall balance of payments turned positive in Q1 following a higher current account surplus and marginal net inflows in the financial account. The international investment position remained in a net asset position, at 171.8 percent of GDP as of end-2022 compared with 224.3 percent of GDP at the end of 2021.

8. Capital inflows into Singapore are expected to remain robust in the near to medium term. FDI prospects continue to be strong, particularly for semiconductor manufacturing, to the extent that Singapore is able to navigate geoeconomic fragmentation risks and remain an attractive destination for multinational companies seeking to diversify their supply chains. Moreover, non-FDI inflows will likely be sustained by the growth of assets and wealth management activities, from various investors including family offices, to Singapore.

9. The Singapore Dollar Nominal Effective Exchange Rate (S$NEER) rose by about 6.8 percent (yoy) as of end-2022, while domestic interest rates have been rising along with global interest rates. Amid heightened inflationary pressure and rising global interest rates, Singapore's monetary policy was on a tightening trajectory in 2022—MAS adjusted the slope of the S$NEER policy band upward twice, in January and April, and re-centered the band upward three times, in April, July, and October. In April 2023, MAS kept the monetary policy settings—including the positive rate of appreciation of the S$NEER policy band—unchanged amid concerns over the domestic growth slowdown and data showing inflation declining (Figure 9). Meanwhile, domestic interest rates have risen in tandem with global interest rates, with the Singapore Overnight Rate Average (SORA) rising to 2.55 percent by end-2022 from 0.22 percent as of end-2021 (Figure 10).

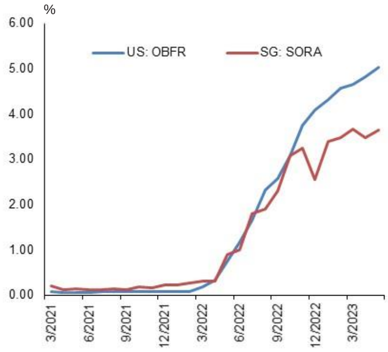
[5] The transfer was implemented as a result of the accumulation of foreign reserves, which reached about 106 percent of GDP as of end-2021, well above the MAS' estimated needs (for the conduct of monetary policy and financial stability) of 65-75 percent of GDP.

Figure 9. S$NEER



Source: MAS; CEIC; AMRO staff calculations

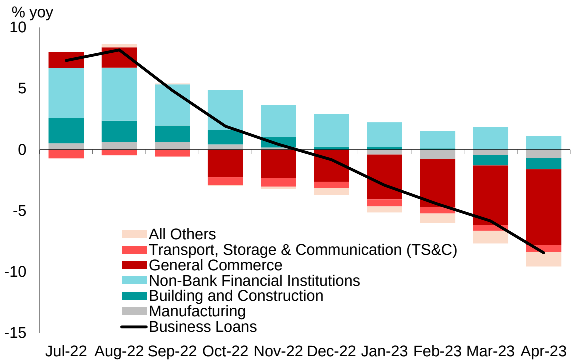
Figure 10. Singapore Overnight Rate Average and U.S. Overnight Bank Funding Rate



Source: Federal Reserve, MAS; CEIC; AMRO staff calculations

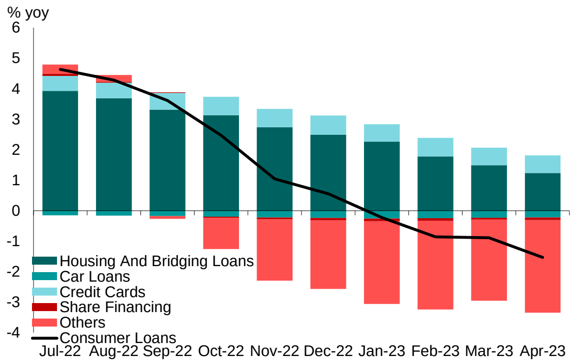
10. Resident non-bank lending contracted in the past few quarters on the back of weakening business sentiment and tighter financial market conditions. After expanding at a robust pace of 9.3 percent (yoy) in 2021, resident non-bank lending contracted by 0.3 percent in 2022 and shrank further in early 2023. The contraction was mainly driven by a fall in lending to businesses, particularly general commerce—reflecting deteriorating business sentiment and early loan repayments, and greater reliance on cash than on loans amid rising interest rates—while lending to non-bank financial institutions expanded (Figure 11). Lending to households also slowed, but was supported by steady expansion in housing and bridging loans and credit-card loans (Figure 12).

Figure 11. Loans to Businesses



Source: MAS; CEIC; AMRO staff calculations

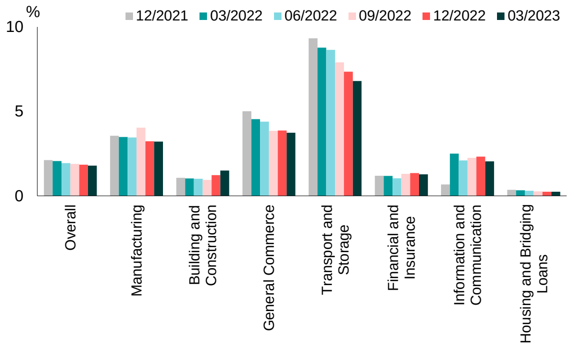
Figure 12. Loans to Households



Source: MAS; CEIC; AMRO staff calculations

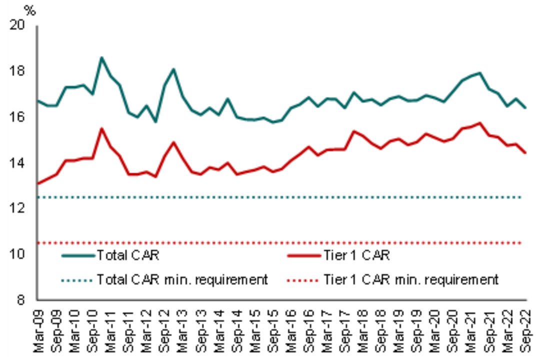
11. The banking sector remains sound thanks to effective macroprudential measures, strong capital buffers, adequate liquidity, and robust asset quality. The banking system's overall non-performing loan (NPL) ratio fell to 1.8 percent in Q1 2023 from 2.1 percent in Q4 2021, although the NPL ratios in construction and transport and storage segments were higher at 6.4 percent and 6.8 percent respectively, reflecting the greater impact of the pandemic on certain sectors (Figure 13). Capital and liquidity buffers remain strong and well above regulatory requirements (Figure 14). Meanwhile, the average LTV ratio of housing loans declined to 41.6 percent in Q1 2023 from 45.3 percent in Q4 2021, partly reflecting macroprudential measures put in place over the past decade.

Figure 13. NPL Ratios



Source: MAS; CEIC; AMRO staff calculations

Figure 14. Capital Adequacy Ratios



Source: MAS; CEIC; AMRO staff calculations

12. **Recent cooling measures and rising interest rates appear to have moderated transactions in the property market.** The Additional Buyer's Stamp Duty (ABSD) was raised for foreigners in December 2021, as well as Singaporeans and Permanent Residents purchasing a second, or more residential property, while the Total Debt Servicing Ratio (TDSR) on loans extended by Financial Institutions (FIs) and Loan-to-Value (LTV) ceiling for public housing loans were lowered. In September 2022, the authorities further tightened the TDSR on loans extended by FIs and the LTV ceiling for public housing loans, and introduced a 15-month wait-out period for private owners wishing to buy public flats. However, the overall impact of the measures remains to be seen, particularly amid tight housing supply. While previous rounds of cooling measures have had a moderating effect, private residential prices showed renewed signs of increase in Q1 2023, reflecting robust demand stemming from strong household balance sheets and sustained income growth, as well as investors from other countries, amid tight supply conditions.[6] More recently, in April 2023, the ABSD rates for some buyer groups were raised pre-emptively to manage investment demand by residents and non-residents amid the gradual easing of supply tightness.

13. **Going forward, increased housing supply will likely alleviate tightness in the property market.** Upward price pressure in the sales and rental markets is expected to ease, thanks to a spike in new homes completed. Residential rent increases should also ease in the coming quarters as the large demand-supply imbalance arising from the pandemic recedes, alongside the increase in housing supply. Over the longer term, however, the cumulative effect of macroprudential policy tightening over the years may deter investment-oriented purchases, limiting the supply of rental stock and pushing up rental costs, which are buoyed by robust local demand.

Authorities' Views: The authorities expect rental costs to stabilize over the longer term. The current imbalance in the rental market is transitory. They expect the stock of rental units to grow whilst rental demand by locals has shown signs of abating.

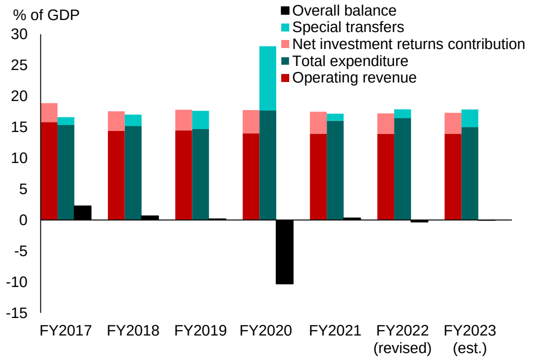
14. **Singapore's financial markets remain resilient despite heightened volatility in global markets.** The Straits Times Index (STI) declined in 2022, mainly in response to a sharp spike in risk aversion as a result of the Russia-Ukraine conflict and recession fears in advanced

[6] That said, public housing resale price growth slowed to 1 percent qoq in Q1 2023, the smallest increase in the past 10 quarters.

economies. It has recovered since and remains at pre-pandemic levels. While the Singapore dollar broadly depreciated against the US dollar in the first 10 months of 2022, it appreciated against the currencies of other major trading partners. Meanwhile, government bond yields have risen in tandem with those of the U.S. Treasury. The impact of the bank failures in the U.S. and E.U. on Singapore has been minimal, as the country's banking system has insignificant balance sheet exposure to the failed banks.

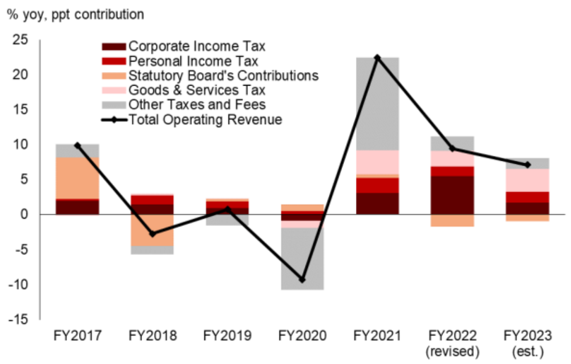
15. The revised FY2022 fiscal position improved slightly relative to the budgeted position, mainly due to higher-than-expected operating revenue. The FY2022 overall fiscal deficit was estimated at 0.3 percent of GDP, compared with the budgeted 0.5 percent of GDP (Figure 15). Operating revenue was higher than expected on the back of strong collection of corporate income tax, personal income tax, and GST, in line with the economic recovery (Figure 16). However, FY2022 expenditure and special transfers (including top-ups to endowment and trust funds) were also higher at the revised stage than the budgeted stage—albeit not as much as revenue—mainly reflecting higher development expenditure and additional disbursement in financial support for households, particularly lower- and middle-income groups, and businesses, to cope with the effects of higher inflation. A total of S$2.3 billion was capitalized under SINGA (Significant Infrastructure Government Loan Act), which allows for borrowing proceeds to only be used to finance nationally significant infrastructure.

Figure 15. Fiscal Position



Source: MOF; CEIC; AMRO staff calculations
Note: Overall balance refers to Overall Fiscal Position.

Figure 16. Operating Revenue



Source: MOF; CEIC; 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.

16. In the FY2023 budget, the deficit is expected to narrow to 0.1 percent of GDP, based on higher operating revenue and lower expenditure as compared to the revised FY2022 fiscal position. An increase in projected GST revenue due to the increase in the GST rate in January 2023, robust corporate and personal income tax collection, and higher asset taxes from the increased Buyer's Stamp Duty (BSD) rates for higher value properties, account for most of the rise in operating revenue. In addition to the higher BSD rates—expected to generate an additional S$0.5 billion—other revenue enhancement measures were also introduced. The higher Additional Registration Fee (ARF) targeted at luxury cars is estimated to bring in an additional S$0.2 billion, while higher tobacco taxes may generate an additional S$0.1 billion. On the expenditure side, to help Singaporean households shoulder the higher cost of living and cushion the impact of the GST rate increase, the Assurance Package was bolstered by another S$3.0 billion (bringing the total package size to S$9.6 billion), while the permanent GST Voucher Scheme was enhanced.[7] However, the enhancement in financial support to households is accompanied by a reduction in operating expenditure as well as lower outlays on development expenditure, leading to a decline in total expenditure.

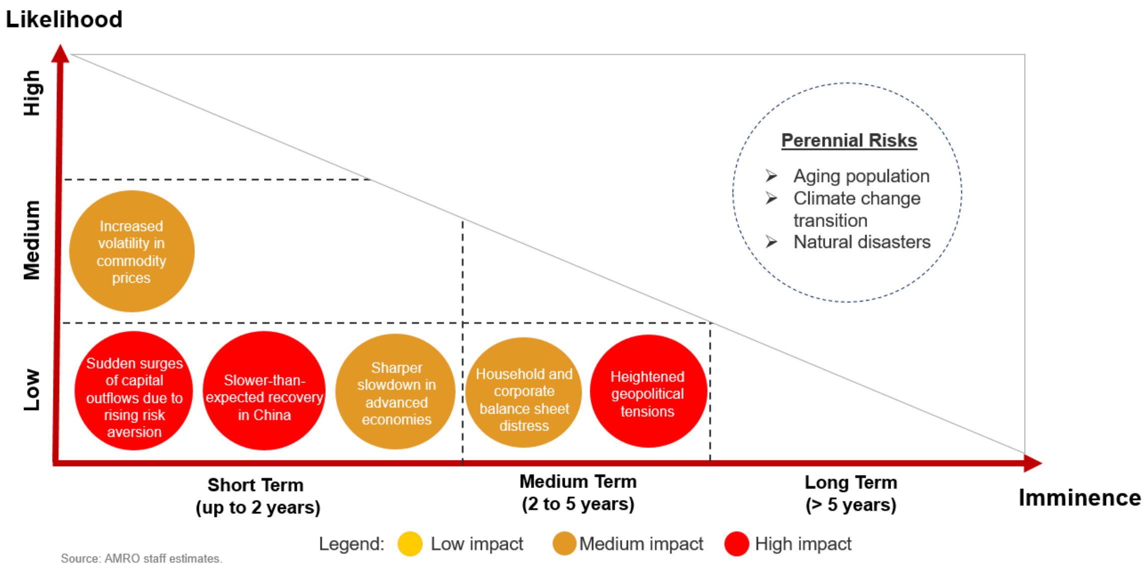
17. The FY2023 budget shows a tighter fiscal stance, reflecting the government's anticipation of growing expenditure needs in the medium to long term, amidst inflationary concerns and ageing population. While the FY2023 overall fiscal position is budgeted at a deficit of 0.1 percent of GDP, close to the estimated 0.3 percent of GDP in FY2022, the FY2023 basic budget balance (which does not include top-ups to endowment and trust funds, Net Investment Returns Contribution, and SINGA) indicates a tighter stance, a deficit of 1.5 percent of GDP compared with the revised FY2022 basic budget balance deficit of 3.0 percent of GDP. The consolidation mode reflects the government's attempt to raise revenue for longer-term priorities, in addition to concerns over elevated inflation, as shown in the tapering of broad fiscal assistance while maintaining targeted measures. In AMRO's assessment, the small negative fiscal impulse implies that the fiscal stance in the FY2023 budget is less expansionary than in FY2022.[8]

B. Risks, Vulnerabilities, and Challenges

18. The balance of risks is tilted to the downside, with a gloomier global growth outlook as one of the major risks for the coming quarters (Figure 17). While China's reopening had initially provided a much-needed boost to global demand, it will likely not be sufficient to offset the impact of the tighter financial conditions in major global economies and the recent banking sector turmoil in the U.S. and Europe on global growth, which will weigh heavily on Singapore's manufacturing exports. Moreover, the current down cycle in the global electronics market is expected to adversely impact Singapore's electronics sector in the near term, as suggested by anemic purchasing managers' indices for the sector and the overall economy.

[7] Announced at Budget 2020, the Assurance Package for GST is a support package aimed at cushioning the impact of the GST rate increase on household living costs. Comprising various types of assistance in the form of cash, vouchers, grants, among others, the package's original size was S$6.0 billion. It was enhanced to S$6.6 billion in at Budget 2022 and S$9.6 billion at Budget 2023.
[8] The fiscal stance in FY2022 is based on AMRO's estimates, the calculation of which includes AMRO's estimated disbursement from endowment and trust funds and excludes top-ups to endowment and trust funds, Net Investment Returns Contribution, and capitalization/depreciation of SINGA infrastructure investment.

Figure 17. Risk Map: Singapore



Source: AMRO

19. Elevated price pressure poses another key challenge. Inflationary pressure is likely to persist in the near term on the back of both external and domestic factors. Volatile commodity prices loom amid heightened geopolitical tensions, the effects of El Nino weather, and food export bans, while car ownership fees, accommodation costs, wage pressure, and GST hikes warrant monitoring on the domestic front. Furthermore, the increase in government-related fees and charges, such as education fees and public transportation fares, may constitute additional price pressure going forward. That said, over the longer term, inflation risk is expected to recede as weaker global growth brings down import prices and post-pandemic pent-up demand subsides further.

20. Episodes of capital flow volatility are another key risk facing Singapore. Sudden capital outflows may materialize to the extent that unexpected bouts of inflation emerge in key global economies prompting the Fed and ECB to raise policy rates. Moreover, considering recent turmoil in the U.S. and European financial systems, Singapore may be susceptible to renewed surges in risk aversion in global financial markets, especially given the country's position as an international financial center.

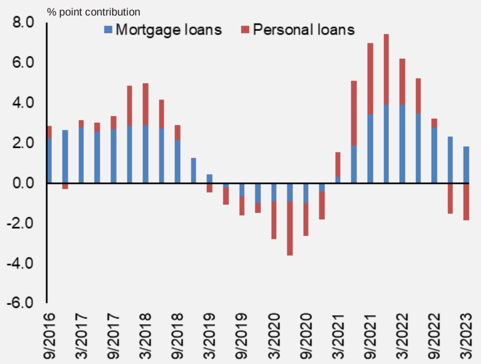
21. Most households and firms are expected to be resilient to financial stress, although risks for a small segment of highly leveraged households and firms have heightened (Box A). Highly leveraged households may find it more difficult to meet their debt obligations should interest rates remain elevated for a prolonged period.[9] Although corporate and SME NPL ratios have generally improved, rising interest rates could exert pressure on their profitability and debt-servicing capacity, especially in the currently weak business environment.

[9] As of August 2022, the median Total Debt Servicing Ratio (TDSR) stood at 43 percent for new mortgages issued over the past year, below the MAS' limit of 55 percent.

Box A. Household Balance Sheets[10]

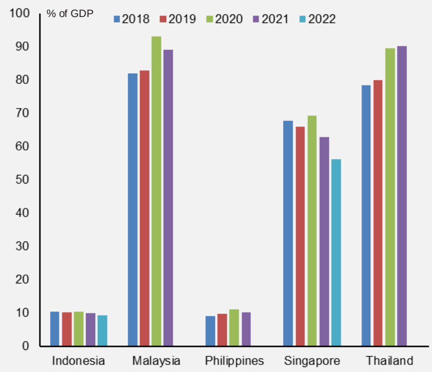
Growth in household debt has decelerated since peaking in Q4 2021, on the back of slower growth in mortgage loans (Figure A1). The slowdown in household debt accumulation has, to some extent, resulted from the tightening of macroprudential measures in December 2021, as reflected in the slower rise of mortgage loans in subsequent quarters. Relative to GDP, Singapore's household debt has decreased steadily from 69.4 percent of GDP in 2020 to 56.1 percent of GDP in 2022, higher than in Indonesia and the Philippines but considerably lower than in Malaysia and Thailand (Figure A2).

Figure A1. Growth in Household Debt



Source: Department of Statistics; CEIC; AMRO staff calculations

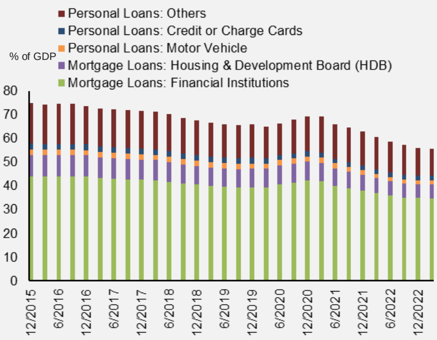
Figure A2. Household Debt in Selected ASEAN Economies



Source: CEIC; AMRO staff calculations

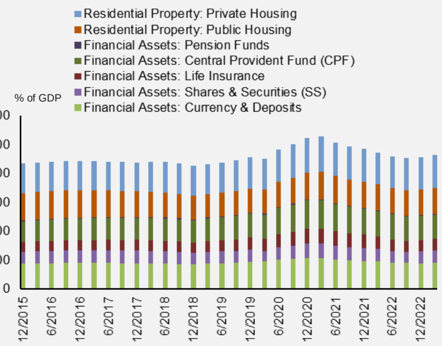
Singapore's household sector is relatively strong in terms of its balance sheets. Household debt stood at 55.7 percent of GDP as of Q1 2023, while household assets amounted to 464.9 percent of GDP (Figures A3 and A4).[11] Almost three-quarters of household debt are in the form of mortgage loans. Meanwhile, household assets are relatively diversified: residential property constituted around 40 percent of household assets, while financial savings in banks and the Central Provident Fund accounted for another 40 percent.

Figure A3. Household Debt



Source: Department of Statistics; CEIC; AMRO staff calculations

Figure A4. Household Assets

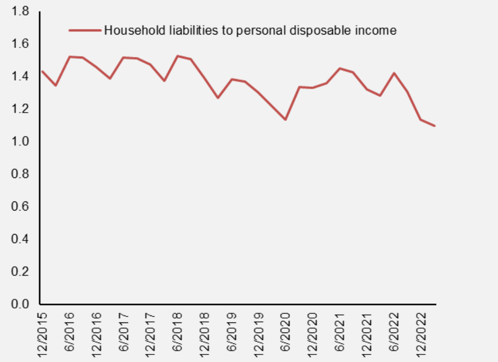


Source: Department of Statistics; CEIC; AMRO staff calculations

Relative to income, household debt has declined somewhat over the past several years on the back of strong income and savings. Despite the rise in the level of household debt, the ratio of household debt to personal disposable income has declined slightly to an average of 1.3 percent in 2020-2022 from an average of 1.5 percent in 2015-2019 (Figure A5). To some extent, this can be attributed to robust growth in household income and the relatively high personal savings rate, which stood at 36 percent as of end-2022. Meanwhile, as of August 2022, the median total debt servicing ratio (TDSR) stood at 43 percent for new mortgages issued over the past year, well below the MAS' limit of 55 percent.[12]

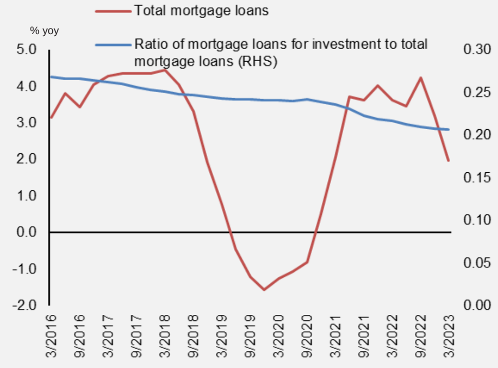
[10] Prepared by Jade Vichyanond.
[11] In comparison, household debt reached almost 90 percent of GDP in Thailand and 110 percent of GDP in Korea in the same period.
[12] Reply to Parliamentary Question on median debt-to-income ratio of Singaporeans and citizens living in top 10 cities by GDP. MAS Notice Paper 1254, August 2022.

Figure A5. Ratio of Household Debt to Personal Disposable Income



Source: Department of Statistics; CEIC; AMRO staff calculations

Figure A6. Mortgage Loans

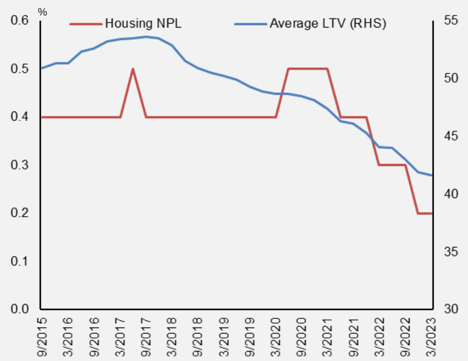


Source: MAS; CEIC; AMRO staff calculations

While growth in mortgage loans has fluctuated with economic growth, the share of mortgage loans for investment purposes has trended down amid tighter macroprudential policy. As of Q3 2022, mortgage loans for investment purposes constituted 21 percent of total mortgage loans, compared with 27 percent in 2015 (Figure A6). The decline has likely resulted from the tightening in macroprudential policy over the years.

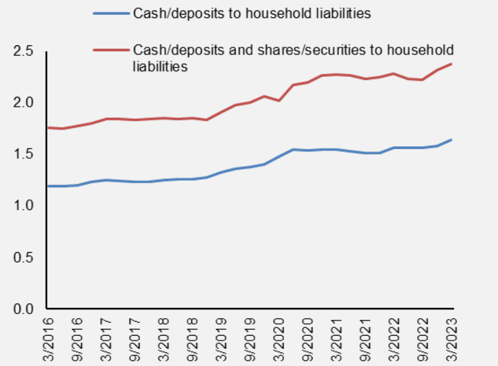
The relatively high credit quality of mortgage loans and decreasing mortgage leverage provide buffers to banks and households in the event of severe shocks. Thanks to a host of macroprudential instruments in place, the average NPL ratio of mortgage loans is relatively low, standing at 0.2 percent as of Q1 2023, compared to 1.8 percent for all loans (Figure A7). On the back of increasingly tighter macroprudential policy, mortgage leverage ratio has been declining, with an average LTV ratio of 41.6 percent as of Q1 2023 compared to 45.3 percent as of end-2021, providing banks and households with considerable cushion in the event of major property price corrections.

Figure A7. Mortgage NPL and LTV



Source: MAS; CEIC; AMRO staff calculations

Figure A8. Liquid Assets to Total Debt



Source: MAS; CEIC; AMRO staff calculations

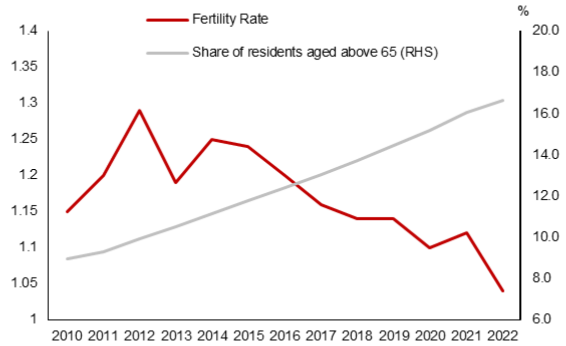
Moreover, relatively ample household financial savings provide a buffer against macroeconomic shocks, including the current rise in interest rates. Household financial savings has been steadily increasing over the past few years, with cash and deposits amounting to around 1.6 times household liabilities as of Q1 2023 (Figure A8). With shares and securities included, household financial assets stood at about 2.4 times household liabilities.[13]

22. Over the long term, Singapore will need to contend with an aging population. As with many other regional economies, with a decreasing fertility rate and increasing longevity, Singapore's population is aging rapidly, with the proportion of residents above the age of 65 rising to 16.6 percent in 2022 from 9.9 percent in 2012 (Figure 18). The rapid change in the demographic composition is putting considerable pressure on the government's healthcare

[13] In comparison, cash and deposits constituted about 98 percent of total liabilities for households in Korea as of end-2022.

spending, which—compounded by relatively high medical cost inflation and greater access to the latest advancements in healthcare—is set to increase significantly to 2.9-3.5 percent of GDP in the FY2026-FY2030 period from 2.5 percent in FY2023, based on authorities' estimates.

Figure 18. Fertility Rate and Elderly Population



Source: Department of Statistics; AMRO staff calculations

Figure 19. Physical Risks from Climate Change

Physical Risk	Trend
Higher temperature	Annual mean temperature increased from 26.9°C to 28.0°C from 1980 to 2020
Rising sea level	Average sea level is rising at a rate of 3-4 mm per year
More intense rainfall	Annual rainfall increased at an average rate of 67 mm per decade from 1980 to 2019

Source: National Climate Change Secretariat, Prime Minister's Office

23. Climate change presents another critical and long-term challenge to the economy, as Singapore is susceptible to both physical and transition risks. As a low-lying island, Singapore faces pressing physical threats from rising sea levels and extreme weather events (Figure 19). While the country has made commendable efforts to tackle climate change, challenges around ensuring a smooth transition to net zero, as well as safeguarding energy security while advancing its energy transition, remain. Meanwhile, as a small, open economy, Singapore will also face inflationary pressure during the transition given the massive scale of structural shifts on the supply side, including from the impact of a higher carbon tax on prices.

C. Policy Discussions and Recommendations

C.1 Charting a Path Towards Fiscal Sustainability

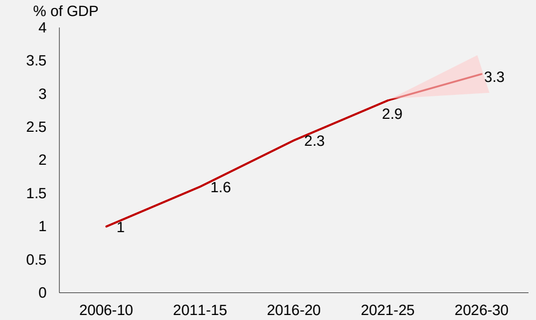
24. AMRO supports the fiscal tightening bias in FY2023 and in preparation for rising expenditure trend over the long term (Box B). The less expansionary stance in FY2023, compared to FY2022, is for the most part due to structural factors (for example, higher rates of GST and other taxes), a shift that is warranted as part of the government's preparation for the rising expenditure trend over the long term. Moreover, the strengthening of revenue streams will help the authorities maintain a cumulative budget over each term of government that is not in deficit, as required by the country's fiscal rule. With regard to fiscal support to households to cushion the impact of higher inflation and the GST rate increase, the government's provision of financial assistance is commendable as it avoids distorting price signals while remaining targeted and temporary, based on the principle that higher living costs should be shouldered by real wage growth over the longer term.

Box B. Budgetary Implications of Singapore's Longer-term Spending Needs[14]

Despite the authorities' longstanding fiscal prudence, government spending is set to increase steadily in the coming years. Singapore has long maintained a prudent and disciplined approach to managing its public finances due to its fiscal rule of running balanced budgets over each term of government. Nevertheless, government spending is expected to increase structurally in the medium to long term due the following structural trends:

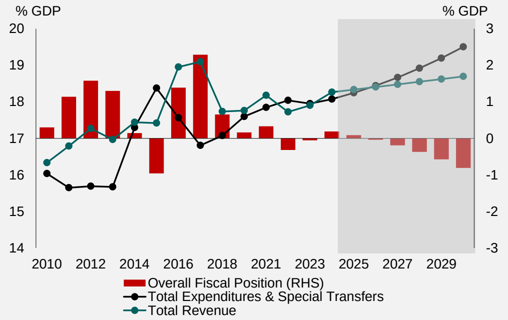
- **Government healthcare spending will be significantly higher in the long term due to demographic factors.** As a result of its rapidly aging society, Singapore's budgetary healthcare spending is projected to increase to 2.9-3.5 percent of GDP by FY2026-2030 from 1.0 percent of GDP in FY2006-FY2010 (Figure B1).[15] Based on AMRO's estimates, government healthcare spending may be as high as 3.8 percent of GDP given that Singapore's population will age at a faster pace than in the past, resulting in even higher medical expenditure. In addition, new and more advanced treatments tend to be more costly and accessible.

Figure B1. Government Healthcare Expenditure



Source: MOF estimates

Figure B2. Fiscal Position Projection



Source: MOF; AMRO staff estimates
Note: FY2020 is omitted from the figure for comparability purposes.

- **The authorities will continue setting aside resources to fund major and long-term infrastructure projects.** While the capital expenditure of qualifying large and long-term infrastructure projects will be financed via the Significant Infrastructure Government Loan Act (SINGA), the authorities will continue to allocate funds for top-ups to relevant endowment funds to cover future operating expenditure requirements for long-term developmental needs, including the expansion of the country's public transit system and the construction of tidal walls to protect against rising sea levels.

- **The impact of global tax reforms on corporate income tax collection is uncertain.** Singapore's intended response to Pillar II of the Base Erosion and Profit Shifting (BEPS 2.0) initiative involves introducing a domestic top-up tax from 2025. With Pillar II, there will be less scope to use tax incentives to attract investments. Therefore, more government spending will be needed to enhance Singapore's competitiveness. Under Pillar I, small economies such as Singapore will likely stand to lose out on corporate income tax revenue as MNEs that meet certain revenue and profitability thresholds reallocate a portion of their profits to the countries where they sell their products and provide their services, and where their consumers are. The overall budgetary impact is thus unclear, as it depends on factors like MNEs' investment decisions and global implementation of BEPS 2.0.

Additional revenue enhancement measures will likely to be needed to address the potential budget deficits in the future. Despite the series of revenue enhancement measures announced in in the FY2022 and FY2023 budgets, AMRO projects that the budget will be in deficit over the longer

[14] Prepared by Justin Lim.
[15] Ministry of Finance (2023), Occasional Paper on Medium-term Fiscal Projections.

term due to higher spending needs (Figure B2). Consequently, the authorities are encouraged to explore other measures, such as raising the dividend ratio of the Net Investment Returns Contribution, to address the potential budgetary shortfall.

25. The revenue enhancement measures in the FY2023 budget are commendable, and AMRO encourages the authorities to explore additional revenue sources to meet long-term fiscal spending needs. We support the authorities' gradual implementation of a multi-pronged approach to manage higher spending needs, whereby rising recurrent expenditures are being addressed with higher rates of the GST, asset tax, motor vehicle tax, and top marginal personal income tax, while large long-term infrastructure projects are financed via long-term bonds and top-ups to several infrastructure-related endowment funds. In addition, efforts to maintain fiscal progressivity on the revenue side, such as an increase in stamp duties for higher-value properties and in registration fees for luxury cars, are commendable. Nonetheless, AMRO staff assesses that these revenue enhancement measures may still be insufficient to meet rising healthcare spending needs over the long term, especially in light of the uncertain impact of the Base Erosion and Profit Shifting (BEPS) 2.0 on tax revenue in the medium term. Other revenue enhancement measures, such as raising the Net Investment Returns Contribution (NIRC), may be necessary to achieve a balanced budget in the long term.

Authorities' Views: The authorities do not prioritize any particular source of revenue enhancement to meet long term spending needs. All potential revenue enhancement measures are examined and reviewed on a regular basis.

26. AMRO supports the authorities' focus on growth-promoting fiscal policy through better allocation of public sector resources. As such, we welcome the bolstering of contributions to funds and initiatives aimed at improving the economy's productivity, such as National Productivity Fund and the Singapore Global Enterprises initiative. We commend the authorities' emphasis on continued enhancement of infrastructure with a view to fostering growth, as well as the spreading of major, long-term infrastructure expenditure more equitably across generations by relying on long-term bonds under the SINGA framework.[16]

C.2 Calibrating Monetary Policy Amid Heightened Inflation

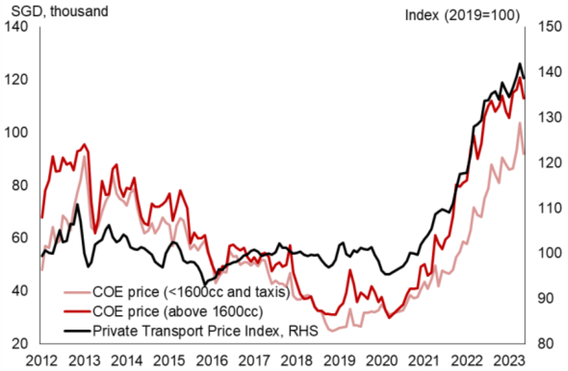
27. We support the MAS' tightening of monetary policy to maintain price stability. The tightening was aimed at tempering headline and core inflation, which are still high compared with historical levels. Looking ahead, inflationary pressure is expected to remain high in the near term, especially in view of the tight domestic labor market and other supply constraints in real estate and transportation. As such, the monetary policy stance should remain tight with a view to maintaining price stability.[17]

[16] Under this accounting framework, the costs of an infrastructure project have a neutral effect on the annual budget during the construction period, since such costs are completely offset by capitalization. Upon project completion, annual depreciation costs begin to be accounted for in the annual budget throughout the project's expected lifetime. As a result, generations that live during the construction period do not finance the welfare of future generations.

[17] The MAS does not have an explicit inflation target, but has concluded that an average core inflation rate of 2.0 percent is consistent with medium-term price stability in the economy.

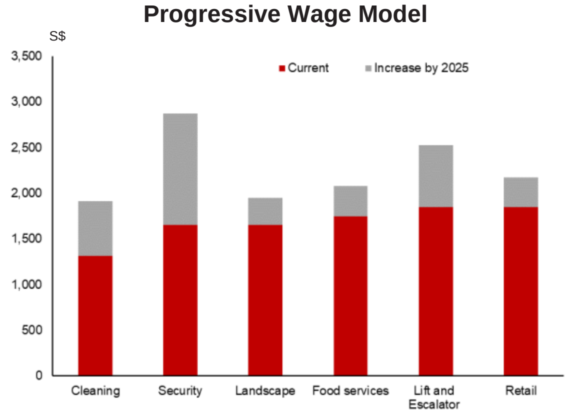
28. A concerted effort, involving monetary and other policy instruments, should be made to tame inflation. Policies that help boost the supply of housing and commercial properties have the potential to ease headline and core inflation, albeit with a lag. As far as car ownership costs are concerned, adjusting the supply of COEs, such as the recent one-off bringing forward of supply in May 2023, or continued upgrading of the public transport network to reduce demand for private transport, may be useful in moderating the upward pressure on COE prices.[18] Meanwhile, the formulation of labor market policy that promotes wage progressivity (such as the Progressive Wage Model) and foreign worker policy (such as the Dependency Ratio Ceiling and minimum salaries for Employment Pass and S Pass holders) should be carefully calibrated, taking into account the impact on the economy's overall wage pressure.[19,20] Similar considerations should also be given to other policies that may contribute to inflationary pressure.

Figure 20. Certificates of Entitlement



Source: Land Transport Authority; CEIC; AMRO staff calculations

Figure 21. Base Monthly Salaries Under the Progressive Wage Model



Source: Ministry of Manpower; AMRO staff calculations

C.3 Preserving Financial Stability in Uncertain Global Conditions

29. MAS' prudent regulatory and supervisory framework has been instrumental in maintaining the stability of Singapore's financial system. As a result, the banking system has emerged from the pandemic and spillovers from the war in Ukraine relatively unscathed, with improvement in asset quality and ample capital and liquidity buffers. As far as non-bank financial institutions are concerned, MAS' close supervision has allowed for orderly functioning among key market participants, who have adequate buffers to cover loss exposure in stressed episodes, in line with the MAS' regulatory requirements.

30. In light of the recent banking turmoil in the U.S. and Europe, we commend the authorities' enhanced efforts in safeguarding Singapore's banking system in an environment of heightened risk aversion. The MAS' regular conduct of stress tests against

[18] At present, COE prices are determined by bidding.
[19] Starting in 2014, the Progressive Wage Model is a wage structure program that aims to increase the salaries of low-wage workers in various sectors through skill enhancements along their career paths.
[20] A commendable example is the Progressive Wage Credit Scheme, a government co-funding program introduced in FY2022 to provide transitional wage support for employers as they increase wages in line with the Progressive Wage Model. The scheme was enhanced by S$2.4 billion in FY2023, a measure that could help reduce the pressure on employers to pass through higher labor costs to consumers.

various types of risks, close monitoring of global financial markets, readiness to provide liquidity through several facilities, and clear communication with market participants, are crucial in helping ensure the country's banking system continues to remain sound and resilient. Nevertheless, given the system's large holdings of USD deposits, it may be prudent to be prepared to reinstate liquidity facilities that serve as a USD liquidity backstop.[21]

31. AMRO supports the current macroprudential measures implemented to cool the property market. Recent rounds of cooling measures have reduced the risk of a destabilizing correction. Continued vigilance over property market developments is essential, as are efforts to boost private and public housing stock. Specifically, increasing housing supply slack through ramping up government land sales and recalibrating the Build-To-Order (BTO) system of public housing (e.g. offering more BTO flats with shorter waiting times) could help reduce price volatility in the event of an unexpected shock. Moderation in property and rental prices will help safeguard overall financial stability and also aid in reducing inflation.

C.4 Spearheading Structural Reforms to Boost Sustainable Growth

32. The authorities' efforts to assist firms in raising productivity are commendable. As the adoption of a global minimum tax under BEPS 2.0 has the potential to reduce the effectiveness of tax incentives to attract multinational companies and hence can make Singapore lose some competitiveness, AMRO welcomes the government's enhanced efforts in helping local companies become more competitive, such as the FY2023 budget's considerable financial contribution to the Singapore Global Enterprises initiative and the National Productivity Fund.[22] In addition, ensuring sufficient supply of foreign manpower in high-growth sectors such as technology and finance will enhance Singapore's competitiveness. As such, AMRO supports the enhancements to the work pass framework to attract global experts; the new Overseas Networks & Expertise Pass will help facilitate the acquisition and retention of top professionals in these sectors.

33. AMRO supports the authorities' continued efforts to develop a responsible and innovative digital asset ecosystem. The authorities' efforts to strengthen digital infrastructure will foster collaboration between fintech companies and other businesses, and help promote greater interoperability across platforms and countries. We commend the authorities' efforts in developing real-time bilateral cross-border payment networks, such as the recently launched linkage between Singapore's PayNow and India's Unified Payments Interface, and the QR code payment linkage between Singapore and Malaysia; the ongoing collaboration with the Bank for International Settlements on Project Nexus, which aims to provide a solution for real-time multilateral cross-border payments; and the participation in Project Ubin+, a global initiative on cross-border settlement solutions involving wholesale central bank digital currencies.

[21] The MAS USD Facility, which was established in March 2020 on the back of a swap arrangement with the US Federal Reserve to lessen strains in USD funding markets as the COVID-19 pandemic unfolded, expired on December 31, 2021 following a normalization of USD funding conditions in Singapore and the region. That said, MAS undertakes daily open market operations in the USDSGD swaps that may be used to mitigate incipient stresses in the domestic USD funding market, particularly given the relatively deep foreign currency swap market in Singapore.
[22] The scope of the National Productivity Fund will soon be expanded to include investment promotion.

34. AMRO welcomes the authorities' initiatives to mobilize private capital to catalyze the region's transition towards a low carbon economy. As an international financial center, Singapore has a crucial role to play as a marketplace in green finance for the region and globally as demand for green finance products continues to grow. We commend the country's development of the carbon services and trading ecosystem, which includes Climate Impact X, a global marketplace and exchange for high-quality carbon credits—which was established in 2021 and held its first auction of carbon credits in 2022—as well as the launch of Green Singapore Government Securities (Infrastructure), the country's inaugural sovereign green bond, which would be used to finance green infrastructure projects that qualify under the Singapore Green Bond Framework. In addition, the Singapore-domiciled Southeast Asia Disaster Risk Insurance Facility leverages Singapore's strength in insurance financing as it assists regional countries in coping with economic losses from natural disasters through the provision of climate and disaster risk financing solutions.

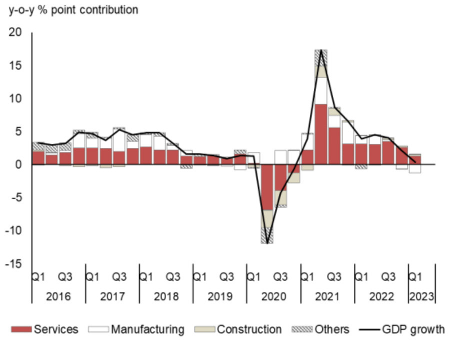
35. AMRO welcomes the authorities' efforts focus on greater sustainability. We commend the government's plan to increase solar energy deployment to 2 gigawatt-peak and to import 4 gigawatt of electricity from low-carbon sources by 2035, milestones that will help the economy achieve greater sustainability in the coming decades. We also support the authorities' collaboration with the financial sector on Project Greenprint, which seeks to enhance the collection, access, and use of climate and sustainability data with a view to fostering a data ecosystem for green finance.

Appendices

Appendix 1. Selected Charts

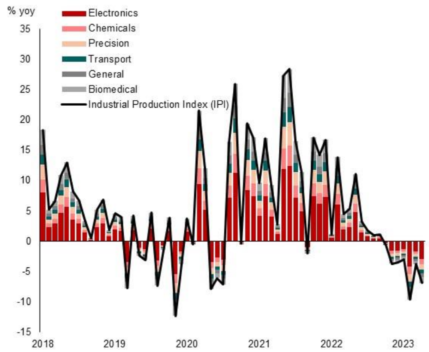
Figure 1.1. Real Sector

Singapore's growth momentum moderated as reopening tailwinds subsided and external demand weakened…



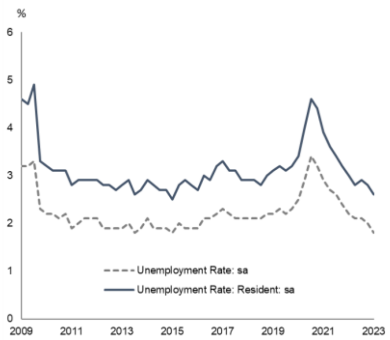
Source: Department of Statistics; CEIC; AMRO staff calculations

…as shown in the deceleration in industrial production.



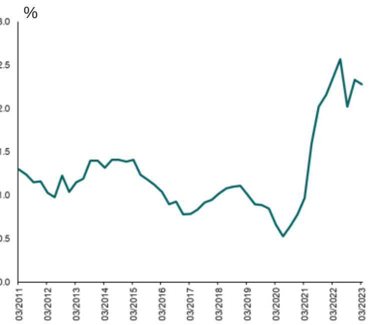
Source: Economic Development Board; Department of Statistics; CEIC; AMRO staff calculations

The labor market is considerably tight…



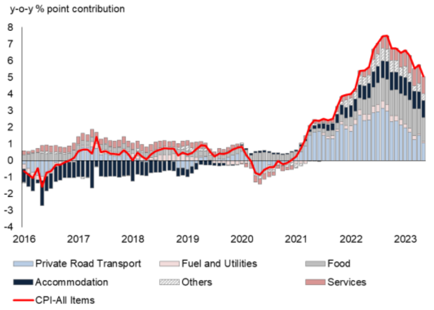
Source: Manpower Research & Statistics Department, Ministry of Manpower; CEIC; AMRO staff calculations

…as seen in the high job-vacancy-to-unemployment ratio.



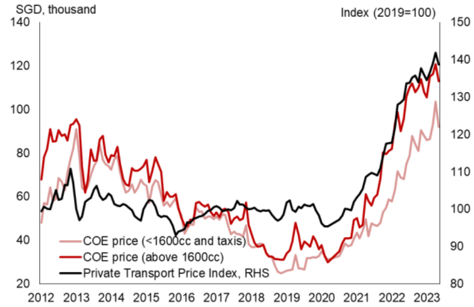
Source: Manpower Research & Statistics Department, Ministry of Manpower; CEIC; AMRO staff calculations

Inflation rose significantly in 2022, to a considerable degree due to domestic price pressure…



Source: Department of Statistics, MAS; CEIC; AMRO staff calculations

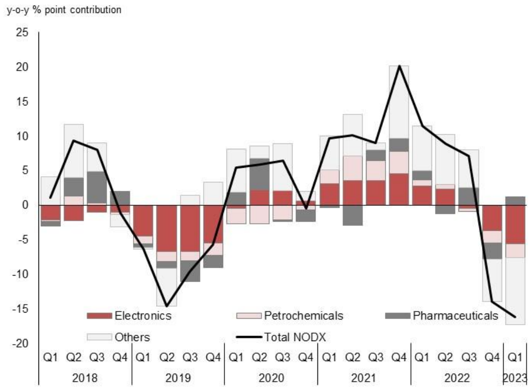
…such as the sharp increase in the cost of car ownership (Certificate of Entitlement).



Source: Land Transport Authority; Department of Statistics; CEIC; AMRO staff calculations

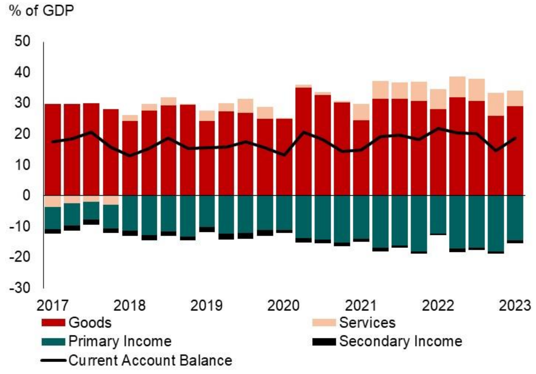
Figure 1.2. External Sector

Non-oil domestic exports (NODX) slowed considerably in 2022 and early 2023...



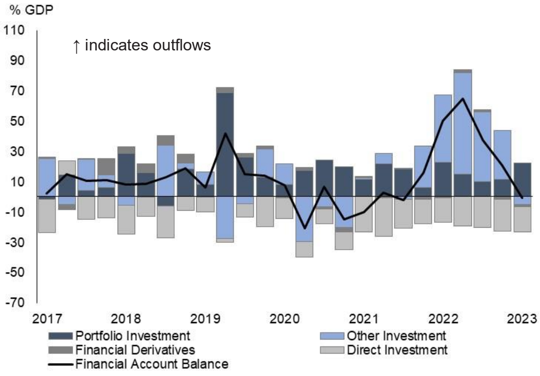
Source: Enterprise Singapore; CEIC; AMRO staff calculations

…but with imports also slowing, the current account balance remains broadly stable.



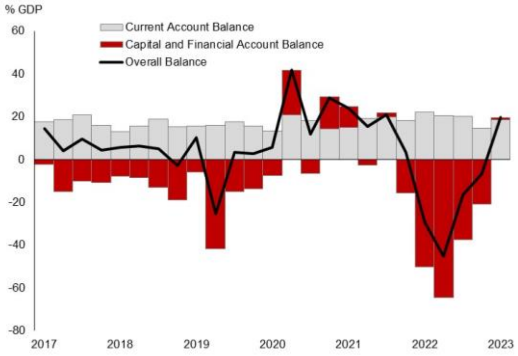
Source: Department of Statistics; CEIC; AMRO staff calculations

Other investment outflows in 2022 were, to a considerable degree, driven by the MAS' transfer of excess foreign reserves to GIC…



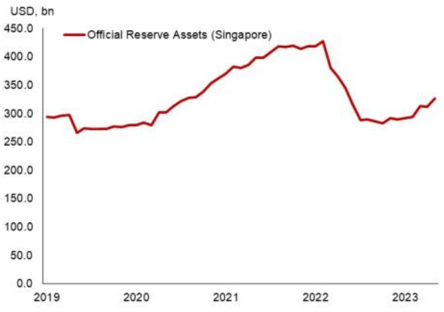
Source: Department of Statistics; CEIC; AMRO staff calculations

…temporarily pushing the overall balance of payments into deficit…



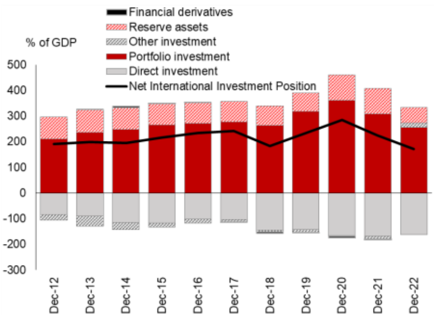
Source: Enterprise Singapore; CEIC; AMRO staff calculations

…and leading to a decline in official reserve assets.



Source: Department of Statistics; CEIC; AMRO staff calculations

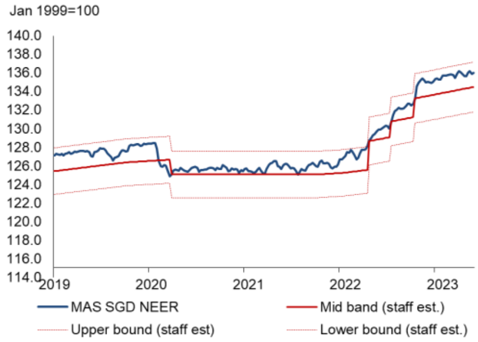
The net international investment position continues to remain strong.



Source: Department of Statistics; CEIC; AMRO staff calculations

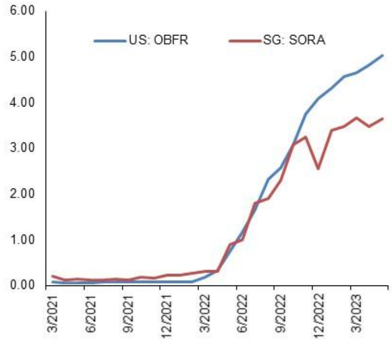
Figure 1.3. Monetary and Financial Sector[23]

In 2022, the slope of the SGD NEER policy band was adjusted upward twice, and the band was re-centered upwards three times.



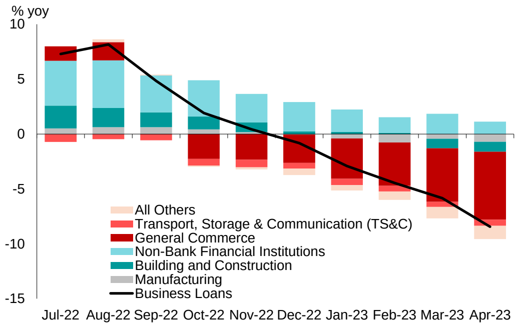
Source: MAS; CEIC; AMRO staff calculations

The Singapore Overnight Rate Average (SORA) has risen along with the Fed's Overnight Bank Funding Rate (OBFR).



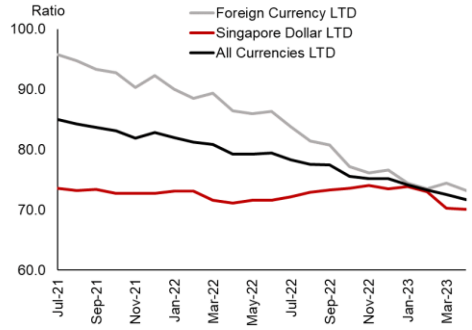
Source: Federal Reserve, MAS; CEIC; AMRO staff calculations

Lending to businesses has been slowing since Q4 2022, to some extent reflecting the paying down of loans and weaker economic prospects.



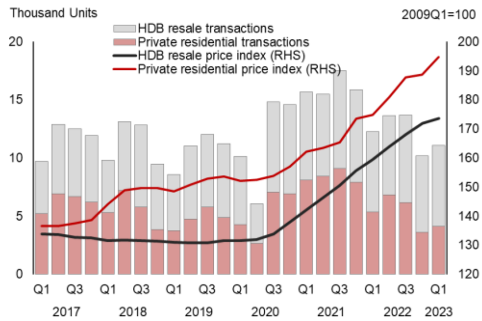
Source: MAS; CEIC; AMRO staff calculations

The foreign loan-to-deposit ratio declined on the back of slower lending activity in foreign currency.



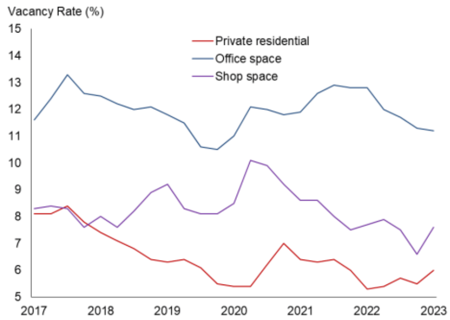
Source: MAS; CEIC; AMRO staff calculations

Transaction activity has slowed, although housing prices continue to rise…



Source: MAS; CEIC; AMRO staff calculations

…while vacancy rates have been declining amid post-pandemic normalization.

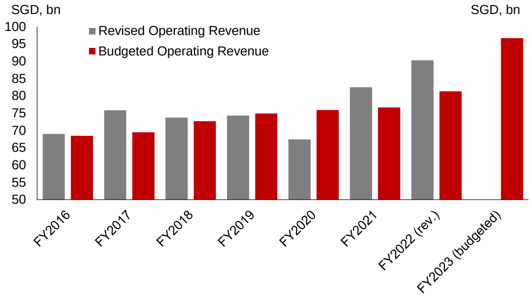


Source: URA; CEIC; AMRO staff calculations

[23] On 1 July 2021, two major changes in MAS' banking sector regulatory framework took effect, which led to changes in the way data are reported by financial institutions, including the removal of the DBU-ACU divide. The affected statistical releases now directly present data based on whether the counterparty to the banks' or merchant banks' transactions are resident or non-resident, and these transactions are reported in Singapore Dollars or in all currencies (including Singapore Dollars).

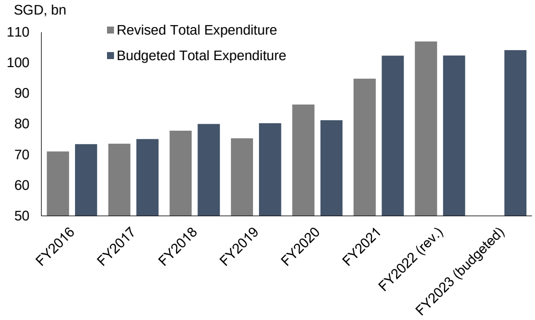
Figure 1.4. Fiscal Sector

Operating revenue is budgeted to increase…



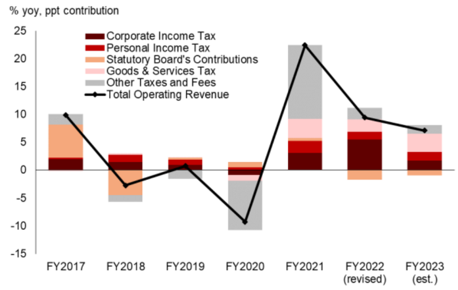
Source: Ministry of Finance; CEIC; AMRO staff calculations

…while the budgeted expenditure is lower than the revised FY2022 expenditure.



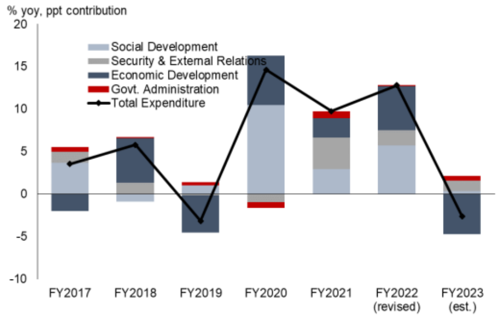
Source: Ministry of Finance; CEIC; AMRO staff calculations

Operating revenue is projected to rise on the back of the GST hike and favorable income tax collection…



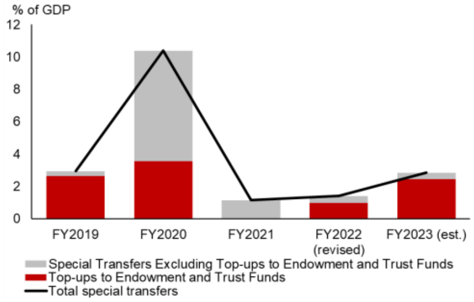
Source: Ministry of Finance; CEIC; AMRO staff calculations
Note: Other Taxes refer to Withholding Tax, Statutory Board's Contributions, Asset Taxes, Customs and Excise Taxes, Betting Taxes, Stamp Duty, Other Taxes, and Other Fees and Charges and Others.

…while expenditure is set to decline, driven by lower outlays on economic development (particularly transport and trade/industry).



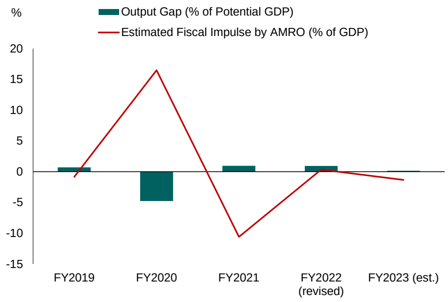
Source: Ministry of Finance; CEIC; AMRO staff calculations

Special Transfers are projected to increase in FY2023 as more resources are allocated towards endowment and trust funds.



Source: Ministry of Finance; CEIC; AMRO staff calculations

A small negative fiscal impulse is expected in FY2023 amid fiscal consolidation.



Source: Ministry of Finance; CEIC; AMRO staff calculations

Appendix 2. Selected Economic Indicators for Singapore

	2019	2020	2021	2022	Projections 2023	Projections 2024
Real sector	(in annual percentage change, unless otherwise indicated)					
Real GDP	1.3	-3.9	8.9	3.6	1.3	2.9
Private consumption	2.8	-13.1	6.6	9.7	7.9	7.0
Government consumption	3.2	13.0	3.7	-2.3	0.6	-1.2
Gross fixed capital formation	2.3	-14.8	18.0	1.6	1.4	1.4
Exports of goods & services	0.2	0.4	11.7	-1.3	4.1	1.3
Imports of goods & services	0.0	-1.1	12.0	-1.9	6.0	1.5
MAS core inflation	1.0	-0.2	0.9	4.1	4.5	1.6
Headline inflation	0.6	-0.2	2.3	6.1	5.3	3.6
Overall Unemployment rate, Annual Average	2.3	3.0	2.7	2.1	2.0	2.0
External sector	(in percent of GDP, unless otherwise indicated)					
Current account	16.2	16.5	18.0	19.3	14.9	15.4
Goods balance	26.0	30.5	29.7	29.2	24.0	23.8
Capital and Financial Account balance	19.1	-5.0	2.0	43.4	11.1	12.1
Direct investment (net)	-10.4	-11.5	-20.7	-19.3	-11.7	-11.9
Portfolio investment (net)	28.8	17.4	14.2	14.8	12.3	13.2
Other investment (net)	-1.1	-10.1	8.8	47.4	10.0	10.4
Derivatives (net)	1.8	-0.8	-0.3	0.5	0.5	0.4
Errors and omission	0.7	0.0	-0.4	-0.4	0.0	0.0
Overall Balance of Payments	-2.2	21.5	15.6	-24.5	3.9	3.3
Net Investment International Position	233.9	285.7	224.3	171.8	-	-
International Reserves (USD bn, end period)	279.5	362.3	417.9	289.5	-	-
Fiscal Sector	FY2019	FY2020	FY2021	FY2022	FY2023*	FY2024*
Operating Revenue (% GDP)	14.5	13.8	13.9	13.8	14.0	14.2
Total Expenditure (% GDP)	14.7	17.7	16.0	16.4	15.1	15.0
Primary Surplus / Deficit (% GDP)	-0.2	-3.9	-2.1	-2.6	-1.1	-0.8
Special Transfers (% GDP)	2.9	10.4	1.2	1.4	2.8	2.4
Net Investment Returns Contribution (% GDP)	3.3	3.7	3.4	3.3	3.4	3.4
Overall Budget Surplus / Deficit (% GDP)	0.2	-10.5	0.3	-0.3	-0.1	0.2
Monetary	(in annual percentage change, unless otherwise specified)					
3-month SGD Sibor (% end period)	1.77	0.41	0.44	4.25	-	-
Broad Money, M2	4.4	10.7	8.8	7.8	-	-
Narrow Money, M1	5.0	33.7	15.4	-13.0	-	-
Resident Non-Bank Loan Growth	2.4	1.1	9.3	-0.3	-	-
Non-Resident Non-Bank Loan Growth	5.9	-4.0	5.7	-6.4	-	-
Memorandum Items						
Straits Times Index (end period)	3223	2844	3124	3251	-	-
Nominal GDP (SGD, bn)	514.1	480.7	569.4	643.5	-	-
Nominal GDP (USD, bn)	376.8	348.4	423.8	466.8	-	-
Private Residential Property Index (2009Q1=100)	153.6	157.0	173.6	188.6	-	-
Exchange rate (in SGD/USD, period average)	1.3642	1.3792	1.3439	1.3789	-	-
Government debt (% GDP)	124.7	146.6	136.6	167.8	-	-

Source: Singaporean authorities; CEIC; AMRO staff calculations
Note: Fiscal sector figures for FY2024 reflect AMRO staff calculations.

Appendix 3. Balance of Payments

	2018	2019	2020	2021	2022
	(in percent of GDP, unless otherwise indicated)				
Current Account	15.7	16.2	16.5	18.0	19.3
Goods Balance	27.7	26.0	30.5	29.7	29.2
Exports	122.3	117.3	120.5	121.4	124.2
Imports	94.6	91.3	90.0	91.7	94.9
Services Balance	1.8	3.5	0.7	5.6	7.0
Exports	55.1	58.3	61.5	62.9	62.4
Imports	53.3	54.8	60.8	57.3	55.4
Primary Income Balance	-12.3	-11.4	-13.6	-16.4	-16.1
Secondary Income Balance	-1.5	-1.9	-1.2	-0.9	-0.8
Capital and Financial Account	12.3	19.1	-5.0	2.0	43.4
Direct Investment	-15.5	-10.4	-11.5	-20.7	-19.3
Assets	6.1	17.5	11.0	12.0	10.9
Liabilities	21.5	27.9	22.5	32.7	30.2
Portfolio Investment	14.1	28.8	17.4	14.2	14.8
Assets	10.3	30.3	16.3	18.7	19.4
Liabilities	-3.7	1.4	-1.1	4.5	4.6
Other Investments	8.2	-1.1	-10.1	8.8	47.4
Assets	28.1	12.6	17.6	25.9	45.2
Liabilities	19.9	13.7	27.7	17.2	-2.2
Financial Derivatives	5.5	1.8	-0.8	-0.3	0.5
Overall Balance	**3.3**	**-2.2**	**21.5**	**15.6**	**-24.5**
Net International Investment Position (SGD bn, end period)	928.6	1,202.4	1,373.3	1,277.3	1,105.4
External Assets	5,163.7	5,789.0	6,426.9	6,828.7	7,064.0
External Liabilities	4,235.1	4,586.6	5,053.6	5,551.4	5,958.6

Source: Singaporean authorities; CEIC; AMRO staff calculations

Appendix 4. General Government Budget

	FY2019	FY2020	FY2021 (actual)	FY2022 (revised)	FY2023 (estimated)
	(in billions of SGD, unless otherwise indicated)				
Operating Revenue	**74.3**	**67.4**	**82.5**	**90.3**	**96.7**
% of GDP	14.5	13.8	13.9	13.8	14.0
% yoy	0.7	-9.3	22.4	9.4	7.1
Tax Revenue	**67.6**	**61.4**	**74.8**	**82.0**	**88.3**
Income Tax	30.7	30.5	34.3	40.2	43.3
Corporate Income Tax	16.7	16.1	18.2	22.7	24.3
Personal Income Tax	12.4	12.7	14.2	15.4	16.8
Withholding Tax	1.6	1.6	1.9	2.1	2.2
Statutory Boards' Contributions	1.8	2.5	2.9	1.5	0.6
Assets Taxes	4.8	3.1	4.7	5.1	5.5
Customs, Excise and Carbon Taxes	3.3	3.6	3.7	3.5	3.7
Goods and Services Tax	11.2	10.3	12.6	14.5	17.4
Motor Vehicle Taxes	2.4	2.1	2.2	2.3	2.5
Betting Taxes	2.6	1.7	2.3	2.8	2.8
Stamp Duty	4.2	3.9	6.8	5.8	5.7
Other Taxes	6.7	3.6	5.3	6.4	6.6
Fees and Charges	**6.3**	**5.5**	**6.8**	**7.7**	**7.8**
Vehicle Quota Premiums	2.9	2.3	3.2	3.9	3.9
Other Fees and Charges	3.4	3.2	3.6	3.9	3.9
Other Receipts	**0.4**	**0.5**	**0.9**	**0.6**	**0.6**
Total Expenditure	**75.3**	**86.4**	**94.8**	**106.9**	**104.1**
% GDP	14.7	17.7	16.0	16.4	15.1
% yoy	-3.2	14.6	9.8	12.8	- 2.6
Social Development	36.6	44.5	47.0	52.4	52.8
Security and External Relations	21.3	20.5	23.7	25.5	26.8
Economic Development	14.4	18.7	20.7	25.6	20.6
Government Administration	3.1	2.6	3.3	3.4	4.0
Primary Surplus/Deficit	**-1.1**	**-19.0**	**-12.3**	**-16.7**	**-7.4**
% of GDP	-0.2	-3.9	-2.1	-2.6	-1.1
Less: Special Transfers Excluding Top-ups to Endowment and Trust Funds	**1.6**	**33.5**	**6.8**	**2.9**	**2.8**
Basic Surplus / Deficit	**-2.6**	**-52.5**	**-19.1**	**-19.6**	**-10.2**
% of GDP	-0.5	-10.7	-3.2	-3.0	-1.5
Less: Top-ups to Endowment and Trust Funds	**13.6**	**17.3**	**0.0**	**6.3**	**16.8**
Add: Net Investment Returns Contribution	**17.0**	**18.2**	**20.4**	**21.6**	**23.5**
Overall Budget Surplus / Deficit	**0.8**	**-51.6**	**1.2**	**-4.2**	**-3.6**
% GDP	0.2	-10.5	0.3	-0.3	-0.1
Capitalisation of Nationally Significant Infrastructure, net of Depreciaton			0.7	2.3	3.5
Overall Fiscal Position	0.8	-51.6	1.9	-1.9	-0.1
% GDP	0.2	-10.5	0.3	-0.3	-0.1

Source: MOF; CEIC; AMRO staff calculations

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

Criteria/ Key Indicators for Surveillance	Availability[1]	Reporting Frequency/ Timeliness[2]	Data Quality[3]	Consistency[4]	Others, if Any[5]
National Account	Available	Quarterly, no later than eight weeks after the end of the reference quarter for the "Preliminary Estimates"	-	-	-
Balance of Payments (BOP)	Available	Quarterly, no later than eight weeks after the end of the reference quarter	-	-	-
International Investment Position (IIP)	Available	Quarterly, no later than three months after the end of the reference quarter	-	-	-
External Debt	Available	Quarterly, no later than three 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[6]	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)	-	-	-

Source: AMRO staff compilation. This preliminary assessment will form the "Supplementary Data Adequacy Assessment" in the EPRD Matrix.
Notes:
[1] Data availability refers to whether the official data are available for public access by any means.
[2] Reporting frequency refers to the periodicity with which the available data are published. Timeliness refers to how up-to-date the published data are relative to the publication date.
[3] Data quality refers to the accuracy and reliability of the available data given the data methodologies,
[4] 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.
[5] Other criteria might also apply, if relevant. Examples include but are not limited to potential areas of improvement for data adequacy.
[6] This refers to government-linked companies, not SOEs.

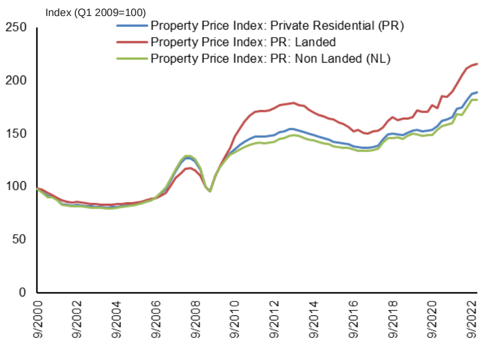
Annexes: Selected Issues

1. Singapore's Private Residential Property Market: Recent Developments and Policy Implications[24]

Recent Developments

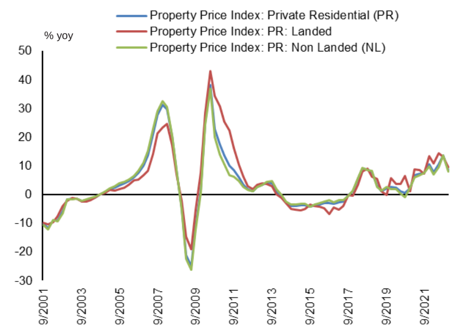
1. Since 2021, private residential prices in Singapore have been rising at a considerable pace. From end-2020 to end-2022, average private property prices rose by around 20.1 percent (Figure A1.1). Over a longer horizon, private property prices have surpassed the previous highs in the first half of the 2010s. However, the rate of price increase during the current market upturn is relatively modest compared with the spike during the 2006-2007 commodity price boom that was temporarily interrupted by the GFC (Figure A1.2).

Figure A1.1. Private Residential Price Indices



Source: URA; CEIC; AMRO staff calculations

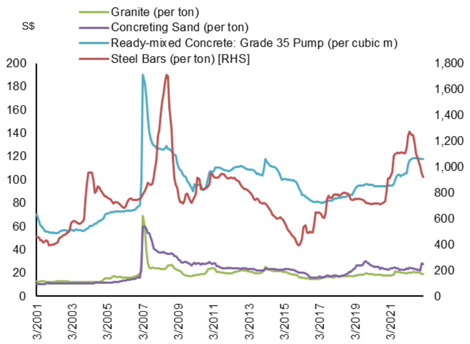
Figure A1.2. Private Residential Price Growth



Source: URA; CEIC; AMRO staff calculations

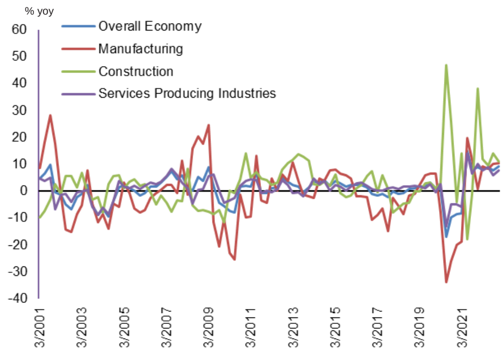
2. On the supply side, higher costs of materials were one of the drivers of the increase in housing prices. Supply chain disruptions caused by lockdowns and border restrictions globally following the COVID-19 outbreak led to a sharp increase in commodity prices in global markets, including prices of construction materials. In particular, the supply of concrete and steel bars was heavily affected, leading to price surges of over 25.6 percent and 73.8 percent respectively, between Q2 2020 and Q2 2022 (Figure A1.3).

Figure A1.3 Construction Material Prices



Source: BCA; CEIC; AMRO staff calculations

Figure A1.4. Unit Labor Costs



Source: URA; CEIC; AMRO staff calculations

[24] Prepared by Jade Vichyanond.

3. While spikes in construction prices have occurred in the past—at even steeper levels during the 2006-2008 commodity boom, for instance—they were not accompanied by surges in construction labor costs that affected Singapore during the COVID-19 outbreak. Unit labor costs in the construction sector rose by 47.1 percent from end-2019 to end-2022, compared with 13.0 percent in the service sector and a contraction of 11.1 percent in the manufacturing sector (Figure A1.4). The surge occurred on the back of a shortage in construction workers, which in turn was caused by coronavirus outbreaks and subsequent mobility restrictions in worker dormitories; repatriation of foreign workers and challenges in retaining existing workers and hiring new workers due to border restrictions, as the majority of construction workers are from India, Bangladesh, and China; and training costs for increasing numbers of newcomers, who are often younger and less skilled (Figure A1.5).

Figure A1.5. Foreign Workforce

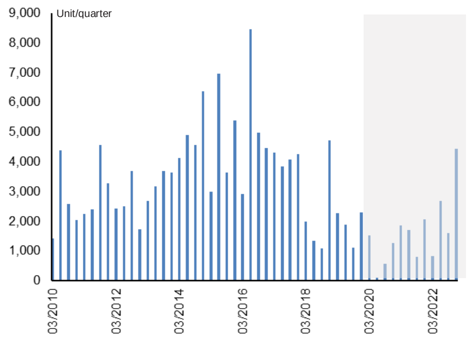
(% yoy)

Pass Type	Dec 2018	Dec 2019	Dec 2020	Dec 2021	Dec 2022
Employment Pass (EP)	-1.0	4.3	-8.6	-8.7	15.8
S Pass	6.0	2.3	-13.0	-7.0	10.0
Work Permit (Total)	0.8	2.7	-15.1	0.2	21.6
- Work Permit (Migrant Domestic Workers)	2.9	3.2	-5.5	-0.5	9.0
- Work Permit (Construction, Marine Shipyard and Process)	-1.4	4.0	-15.9	2.4	30.3
Total Foreign Workforce	1.3	3.0	-13.7	-2.5	18.6

Source: MOM; AMRO staff calculations

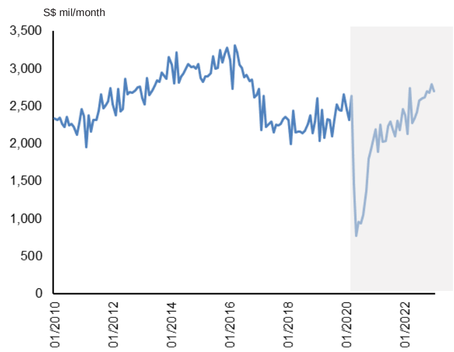
4. As a result of labor shortages and domestic mobility restrictions, construction activity came to an almost complete halt, reducing the supply of new residential properties. The number of new private residential units completed during 2020-2022 was 41.5 percent lower than during 2017-2019 (Figure A1.6). Construction progress payments (the value of all construction works done and certified for progress payment) fell by 8.1 percent over the same period (Figure A1.7).

Figure A1.6. Completion of New Private Residential Units



Source: URA; CEIC; AMRO staff calculations
Note: The shaded area denotes the pandemic period.

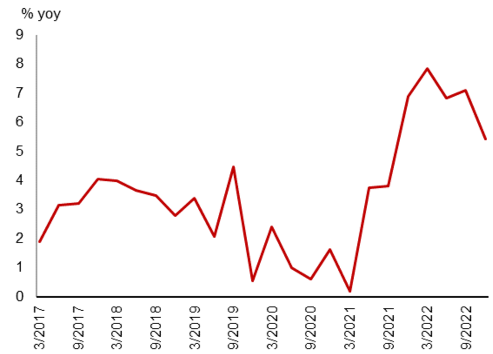
Figure A1.7. Construction Progress Payments



Source: BCA; CEIC; AMRO staff calculations
Note: The shaded area denotes the pandemic period.

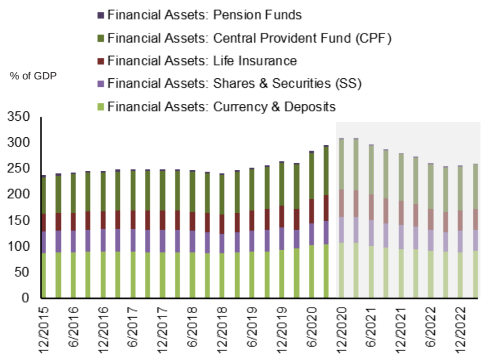
5. On the demand side, robust wage growth, high levels of household financial assets, and a large influx of Singaporeans living abroad, have been instrumental in supporting housing demand. The pandemic had temporarily flattened or reduced wages, which bounced back swiftly upon the easing—domestically and globally—of mobility restrictions, reaching up to 7.8 percent (yoy) in Q1 2022 (Figure A1.8). Meanwhile, household financial assets decreased slightly at the beginning of the pandemic, but were still well above 250 percent of GDP, supporting households' purchasing power (Figure A1.9). As far as foreign buyers are concerned, their influence on Singapore's housing market is limited, accounting for only around 3.5 percent of total transactions in 2022.[25] More recently, the impact of rising interest rates on real estate demand has not been significant largely due to Singapore's relatively low reliance on mortgage loans for private residential properties, which in turn is a reflection of strong household balance sheets (Box A).[26]

Figure A1.8. Average Monthly Earnings



Source:CEIC; AMRO staff calculations
Note: Derived based on data from Central Provident Fund Board

Figure A1.9. Household Financial Assets



Source: Department of Statistics; CEIC; AMRO staff calculations
Note: The shaded area denotes the pandemic period.

Policy Implications

7. To contain the upswing in private residential prices that started around the end of 2020, the government tightened macroprudential policy in December 2021. Additional Buyer's Stamp Duty (ABSD) rates were raised by 5-15 percentage points for purchases other than the first home by residents and 10 percentage points for purchases by foreigners, entities, and housing developers. The Total Debt Servicing Ratio (TDSR) threshold was lowered by 5 percentage points, to 55 percent from 60 percent. In addition, the Loan-to-Value (LTV) limit for public housing loans by the Housing Development Board (HDB) was lowered by 5 percentage points, to 85 percent from 90 percent.

8. While transaction volumes moderated slightly following measures implemented in December 2021, prices continued to rise thereafter, leading to two further rounds of cooling measures. The LTV limit for public housing loans by the HDB was further reduced by 5 percentage points in September 2022, to 80 percent from 85 percent. A 15-month wait-out period was introduced for private homeowners wishing to purchase a public flat in the resale market after the sale of their private home. Furthermore, with a view to encouraging prudent borrowing amid rising interest rates, the MAS also raised the interest rate floor used to compute the TDSR and the mortgage servicing ratio by 5 percentage points, effectively requiring a higher monthly income for the same level of debt servicing obligations. The ABSD

[25] Source: Return of China property buyers in bigger numbers unlikely to impact prices in Singapore: Analysts. https://www.channelnewsasia.com/singapore/china-nationals-buying-property-singapore-housing-prices-3216596.
[26] For public housing purchases, most mortgages are provided by the Housing Development Board at a fixed rate and hence are not affected by rising interest rates.

rates were then raised further in April 2023, by 3-5 percentage points for purchases other than the first home by residents and 30 percentage points for purchases by foreigners and entities.

9. As far as policy measures other than macroprudential ones are concerned, continued efforts to boost private and public housing supply are vital. Structurally, the sharp rise in private property prices since the pandemic can be attributed to the relatively low slack that makes the private property market vulnerable to unexpected shocks such as the recent pandemic, which led to a fall in construction activity and new housing supply. To a considerable degree, the limited slack resulted from both government land sales and the government's policy in the provisioning of public housing.

- With the government owning around 90 percent of land in Singapore, the current pace of government land sales may be well-calibrated for the country's long-term prospects under normal circumstances but may result in a level of land supply readily available for private development that is insufficient in coping with large, unforeseen shocks.
- The government's provisioning of public housing is mostly through the Build-To-Order (BTO) model, which for the most part functions efficiently and helps reduce excess supply of public housing. However, the backlog of BTO housing due to pandemic-induced construction delays likely then contributed to the increase in residential demand for temporary accommodation in the rental market.

Looking ahead, increasing the housing supply slack (i.e. excess supply) through ramping up government land sales and recalibrating the system of public housing provisioning could help reduce drastic price increases in the event of an unexpected shock.[27]

[27] That said, creating additional slack incurs a significant trade-off given the scarcity of land and resources in Singapore. It may also unwittingly aggravate downside risks during a property market downturn and destabilize both the property market and the financial system. As for public housing, supply overhang incurs holding costs, resources that could otherwise be used to fund other social programmes.

2. Challenges and Opportunities on the Green Transition Path[28]

Background

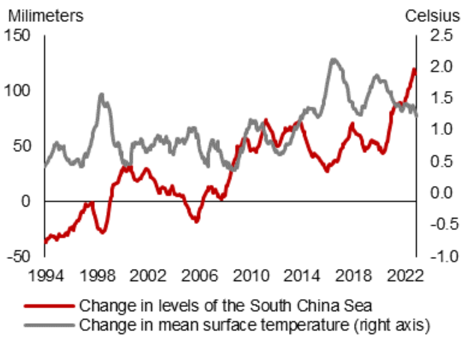
1. In October 2022, Singapore raised its national climate target to achieve net zero emissions by 2050. Greenhouse gas emissions are targeted to peak before 2030 and to decline to around 60 $MtCO_2e$ by 2030. Singapore has surpassed its earlier target in 2020 (Table A2.1). Achieving the net zero target, and thus, supporting the Paris Agreement target of capping the rise in global mean temperature to well below 2 degrees Celsius is crucial for a small low-lying island such as Singapore. Sea levels are rising at an average rate of 3 to 4 millimeters per year and surface temperature has increased by an average of 1.5 degree Celsius in 2019–2022 relative to the average during 1951–1980 (Figure A2.1). These changes pose significant physical and economic risks for Singapore. Climate change challenges could shave 4.9 percent off Singapore's GDP by 2048—compared to a counterfactual scenario of no climate change—if the Paris Agreement target is met. This impact could worsen to 46 percent of GDP under the severe scenario of temperature increase of 3.2 degrees Celsius by 2050.[29]

Table A2.1: Timeline of Singapore's Climate Change Targets

Year commitment was announced	GHG target ($MtCO_2e$)	Target year	Net zero target	Remarks
2009	To reduce emissions by 16 percent below Business-as-Usual (BAU) level	2020	-	Achieved 32 percent reduction below BAU levels in 2020
2016	68 *To reduce emissions intensity of GDP by 36% below 2005 levels and stabilizing emissions*	2030	-	
2020	65	Around 2030	"as soon as viable in the second half of the century"	
2022	60 after peaking emissions earlier	2030	2050	

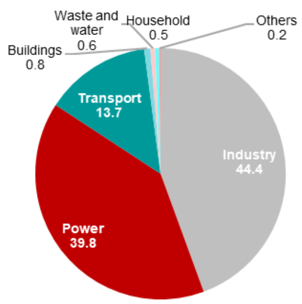
Source: National Climate Change Secretariat; AMRO staff compilation

Figure A2.1. Change in Sea Levels and Mean Surface Temperature



Source: Food and Agriculture Organization of the United Nations; National Oceanic and Atmospheric Administration; AMRO staff calculations

Figure A2.2. Percent Share of Singapore's Emissions by Source, 2020



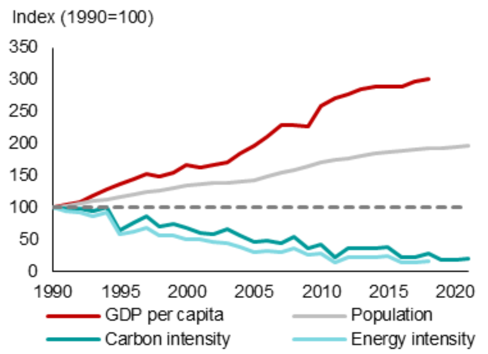
Source: Energy Market Authority of Singapore; AMRO staff calculations

[28] Prepared by Catharine Tjing Yiing Kho and Ke Ji.
[29] Swiss Re Institute (2021). The Economics of Climate Change: No Action Not An Option. The GDP loss is presented as relative to an alternative scenario of no climate change.

2. Singapore has a comprehensive plan to achieve the net zero target. Singapore's domestic and international policies and strategies to address climate change are spearheaded by the National Climate Change Secretariat in the Prime Minister's Office. Broadly, the low-carbon transition will be pursued through four key thrusts—catalyzing business transformation, investing in low carbon technologies, pursuing effective international cooperation, and adopting low carbon practices. The Singapore Green Plan 2030, released in February 2021, serves as a framework to coordinate, and mobilize a whole-of-nation approach towards decarbonization and sustainable development.

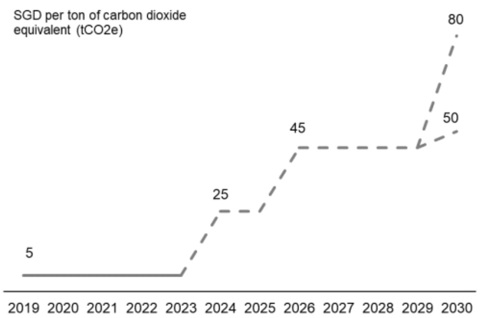
3. Further reducing carbon and energy intensity of the economy, particularly in power generation, will play a critical role in lowering emissions. Industrial activity, particularly from the crude oil refinery and petrochemical sector, and power generation contribute about 84 percent of total emissions (Figure A2.2). Given the nature of refinery and petrochemical industries, reducing the carbon intensity of power generation is the most efficient way to markedly lower emissions. Based on the Kaya identity—which breaks down carbon emissions into drivers such as population, per capita GDP, energy intensity of GDP, and carbon intensity of energy—Singapore's decarbonization efforts have resulted in a steady decline of both carbon and energy intensities (Figure A2.3).[30] Going forward, as income grows, increased consumption of energy-intensive goods and services, such as electricity and transportation, is expected to drive a rise in carbon emissions. There is therefore a need to continue reducing carbon and energy intensity in the economy.

Figure A2.3. Drivers of Carbon Dioxide Emissions



Source: Our World in Data; AMRO staff calculations
Note: Drivers of emissions are disaggregated using the 'Kaya Identity'. GDP per capita is measured in 2011 international-$ (PPP), which adjusts for inflation and cross-country price differences.

Figure A2.4 Carbon Tax in Singapore



Source: NEA; AMRO staff calculations

[30] Kaya, Yoichi (1990). Impact of Carbon Dioxide Emission Control on GNP Growth: Interpretation of Proposed Scenarios. Paper presented to the IPCC Energy and Industry Subgroup, Response Strategies Working Group, Paris.

Navigating the Challenges

4. **The transition to net zero is complex for Singapore as it is alternative-energy disadvantaged.** Singapore lacks fast-flowing rivers for hydroelectricity generation or conventional geothermal resources, and its wind speed and tidal range are too low to harness wind and tidal energy. The small land size and high urban density also render nuclear energy unviable. The incineration of waste currently provides about 2 percent of Singapore's electricity supply. Although solar power is the most promising option for Singapore, its scalability is constrained by limited viable surface area for deployment. Consequently, energy generation in Singapore remains highly dependent on fossil fuels for now—although natural gas is predominantly used, which is the cleanest type of fossil fuel.

5. **Although the supply gap for clean energy can be plugged via low-carbon electricity imports, Singapore could be affected by supply disruptions in source countries.** Singapore is planning to import up to 4GW of low-carbon electricity by 2035, which is expected to make up around 30 percent of Singapore's electricity supply. To pave the way for these electricity imports, the Energy Market Authority (EMA) has been working with various partners on electricity import trials to assess and refine the technical and regulatory frameworks for importing electricity. For instance, in June 2022, Singapore started importing renewable energy from existing hydropower plants in Lao PDR. The electricity will be channeled via Thailand and Malaysia under the Lao PDR-Thailand-Malaysia-Singapore Power Integration Project (LTMS-PIP)—the first multilateral cross-border electricity trade involving four ASEAN countries. As an energy importer, Singapore's energy supply could be affected by disruptions in energy production or transmission in source countries or intermediary economies.

6. **Incentivizing green transition via a carbon tax could have inflation implications.** A carbon tax was introduced in Singapore in January 2019 at SGD5 per ton of CO_2 emissions. The tax rate will be raised to SGD25 per ton in 2024, to SGD45 per ton in 2026, and with a view to reaching SGD50–80 per ton by 2030 (Figure A2.4). While recent studies find that an orderly and well-communicated carbon tax policy can have moderate impact on inflation, the actual implementation of a higher carbon tax could be complicated by concurrent shocks in global energy prices on top of the uncertainty in reducing reliance on fossil fuel energy sources.[31] Notwithstanding implementation challenges, the proposed carbon tax level could also need to be raised substantially in the longer run to meet net-zero targets. One of the scenarios posited by the Network of Central Banks and Supervisors for Greening the Financial System (NGFS) suggests that a carbon tax of at least USD200 per ton (SGD268) would be required in the next decade to achieve net zero emissions globally by 2050.[32] A carbon tax hike at this pace is likely to lead to higher utility costs for households—a further increase in carbon tax from SGD80 to SGD268 per ton could raise electricity tariffs by 38 percent, and also push up the production costs of many goods and services.[33]

[31] Konradt, Maximilian, and Beatrice Weder di Mauro (2023). Carbon taxation and greenflation: Evidence from Europe and Canada. Journal of the European Economic Association.
[32] NGFS (2022). Scenarios for Central Banks and Supervisors. The required tax level also depends on the pace of technological change such as the reduction in the marginal cost of renewable energy generation.
[33] According to NCCS, every SGD5 increase in the carbon tax could drive up electricity tariffs by 1 percent on average. See https://www.nccs.gov.sg/singapores-climate-action/mitigation-efforts/carbontax/

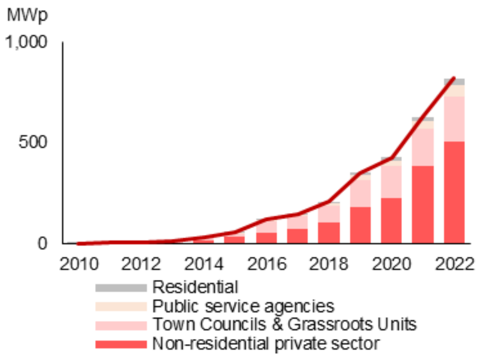
7. **Persistent increases in the costs of raw materials and energy due to a global green transition—dubbed "greenflation"—is another potential inflationary shock**. The green transition entails large scale capital investment and significant structural changes to economies globally. A worldwide surge in the demand for critical materials for renewable energy equipment, electric vehicles (EV), and batteries will drive up the prices of critical metals and minerals. IEA (2021) estimates that the world will need six times more critical minerals than it uses today in order to achieve its net zero goal by 2050, however, current mineral supply and investment plans fall short of future demand.[34] For instance, an uptick in EV prices due to higher material costs will likely have a strong pass-through in Singapore as it seeks to replace all internal combustion engine vehicles with EVs. New registration of internal combustion engine vehicles will be ceased from 2030, and the use of these vehicles will be completely phased out by 2040.[35] Separately, disparity in the progress and policy approaches of major economies could exacerbate imbalances in energy supply and demand. Uncertainty surrounding future government policies and regulatory shifts in individual economies can impact market sentiments, leading to price fluctuations and volatility in energy markets. As a price taker, persistent increases in energy prices could exert inflationary pressure for Singapore. For example, a 10 percent oil price shock could raise CPI inflation in Singapore by around 0.2 percentage point within a year.[36]

Seizing Opportunities

8. **Alternative-energy disadvantaged conditions have led to innovative solutions.** As its small land area limits the deployment of conventional solar energy infrastructure, Singapore has created one of the world's largest floating solar farms that has a capacity of 60 megawatt-peak. The solar farm is estimated to reduce carbon emissions by 32 kilotons annually, and will be used to power Singapore's five local water treatment plants, making Singapore one of the few countries worldwide to operate a 100 percent green waterworks system. Solar energy capacity has increased significantly in Singapore—its current solar deployment of about 900MWp is more than 50 times higher than what it was ten years ago (Figure A2.5). Further investment is needed in cutting-edge solutions for Singapore to meet its target of generating at least 2 gigawatt-peak of energy from solar photovoltaic sources by 2030. To manage solar intermittency, Singapore has commenced operations of a battery energy storage system—the largest in Southeast Asia—with a capacity of 285-megawatt hour in a single discharge, in December 2022.

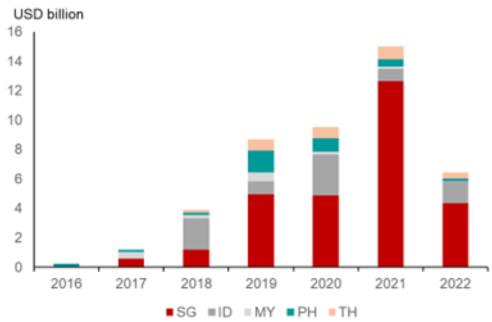
[34] IEA (2021). The Role of Critical Minerals in Clean Energy Transitions.
[35] The surge in mineral prices in 2022, particularly lithium, reversed the cost reduction trend and translated into higher EV prices.
[36] Kho and Zhao. (2022). Fueling Inflation in ASEAN+3: The Rising Price of Energy. AMRO Analytical Note.

Figure A2.5. Installed Capacity of Grid-connected Solar Photovoltaic Systems by User



Source: Energy Market Authority of Singapore; AMRO staff calculations

Figure A2.6. Green Bond Issuance



Source: Climate Bonds Initiative; AMRO staff calculations

9. **Energy security can be enhanced by the diversification of clean energy sources.** For its low-carbon electricity imports, Singapore aims to diversify its sources to strengthen energy supply resilience. Singapore is also actively exploring emerging low-carbon technologies such as hydrogen, carbon capture utilization and storage (CCUS), and advanced geothermal systems as possible paths to decarbonize the power sector and ensure the availability of backup supply to mitigate potential disruptions in the energy market. For instance, Singapore is encouraging innovation in low-carbon alternatives and has been supporting research and development for projects on hydrogen and CCUS. Singapore is also embarking on studies to better assess its deep geothermal resource potential to determine the viability of deploying advanced or enhanced geothermal systems that utilize deep geothermal heat.

10. **Singapore has created a holistic ecosystem for green investment.** Singapore has identified the clean energy industry as one of its strategic growth areas. To facilitate the commercialization of new technologies, the country has also marketed itself as a "living laboratory" to attract firms seeking to develop, test and validate clean-energy technologies in real-world setting. The floating solar photovoltaic system is a product of this approach. There are currently test beds to facilitate the adoption of electric vehicles and to improve the energy efficiency of buildings.

11. **Singapore can mobilize financing to catalyze the green transition in ASEAN as an international finance center.** ADB estimates that ASEAN will require total infrastructure investment of at least SGD3.7 trillion in the next 7 years to sustain economic growth and respond to climate change.[37] Blended financing, or public-private partnerships, has the potential to support this level of infrastructure development. Singapore is presently the largest green bond issuer in the region (Figure A2.6). In addition to financing new green projects, facilitating the green transition for emission-intensive sectors could be a growth opportunity for Singapore's financial sector. For example, ASEAN is still heavily reliant on coal for electricity generation—40 percent of electricity in the region is generated using coal.[38] Beyond

[37] ADB (2023). Reinvigorating Financing Approaches for Sustainable and Resilient Infrastructure in ASEAN+3.
[38] IEA (2022). Southeast Asia Energy Outlook 2022.

transition financing, MAS' updated action plan, which was launched in April 2023, will support the development of carbon services and carbon credit markets in Singapore to channel financing towards carbon abatement and removal projects in Asia.

Policy Considerations

12. Fiscal policy will play an important role in supporting vulnerable groups during the green transition. The implementation of carbon pricing can raise inflation by increasing costs for carbon-intensive industries, which may be passed on to consumers in the form of higher prices. This impact would disproportionately affect low-income households as the bulk of their spending is on essential goods and services, such as food, energy, and transportation. Programs such as the Climate Friendly Households Programme in 2020—which subsidizes eligible households' purchase of energy efficient products—could be expanded. Fiscal support will also be key in providing upskilling and reskilling training support for workers to tap on job opportunities in a green economy.

13. Green budgeting—the incorporation of climate and environmental goals into the planning of public finance—underscores the government's net zero commitment and could catalyze private sector participation. The Singapore Government announced the issuance of up to SGD35 billion of green bonds by 2030 to finance green infrastructure projects following the launch of the Singapore Green Bond Framework in June 2022. This measure will complement the existing SGD3 billion Multicurrency Medium Term Note Programme announced in August 2021, and help deepen Singapore's green finance market. Thus far, financial sector industry players have supported the government's green transition call, with the three largest domestic banks announcing the cessation of financing for oil and gas sectors by May 2023, after stopping financing for new coal-fired power plants in 2019. Going forward, green budgeting needs to be the mainstay of public finance planning to further crowd in private sector investment.

14. The conduct of monetary policy could be complicated by mixed signals arising from the price effects of climate change policies. Changes in consumer preferences towards sustainable products can impact prices, with potential short-term inflationary effects. Separately, supply chain disruptions due to climate-related events can further disrupt production and increase costs. Regulatory policies and initial investments in renewable energy infrastructure and clean technologies may lead to higher costs as well, potentially contributing to price increases of energy in the short term. However, as these technologies mature and achieve economies of scale, the costs could decrease, thereby stabilizing or even reducing energy prices in the long run. Overall, the impact of climate change transition on inflation is complex and can vary depending on specific circumstances, policy choices, and the duration of the transition. Distinguishing between the structural costs associated with transitioning to a greener economy and cyclical fluctuations is crucial to ensure that monetary policy strikes the right balance between supporting the green transition and maintaining overall price stability.

Address: 10 Shenton Way, #15-08
MAS Building, Singapore 079117
Website: www.amro-asia.org
Tel: +65 6323 9844
Email: enquiry@amro-asia.org

LinkedIn | Twitter | Facebook | YouTube

AMRO
ASEAN +3 MACROECONOMIC RESEARCH OFFICE