AMRO Country Report
ACR/22-05

AMRO Annual Consultation Report

China – 2021

ASEAN+3 Macroeconomic Research Office (AMRO)

July 2022

Acknowledgments

1. This Annual Consultation Report on China has been prepared in accordance with the functions of AMRO to monitor, assess and report its members' macroeconomic status and financial soundness, to identify relevant risks and vulnerabilities, and to assist them in the timely formulation of policy to mitigate such risks (Article 3 (a) and (b) of the AMRO Agreement).
2. This Report is drafted on the basis of AMRO's Annual Consultation Visit to China from 8 to 30 November 2021 (Article 5 (b) of AMRO Agreement). The AMRO Mission team was headed by Dr Chaipat Poonpatpibul. Members include Mr Suan Yong Foo; Dr Fan Zhai; Dr Zhiwen Jiao; Dr Xianguo (Jerry) Huang; and Dr Longgang Wang. AMRO Director Mr Toshinori Doi and Chief Economist Dr Hoe Ee Khor also participated in key policy meetings with the authorities. This AMRO Annual Consultation Report on China for 2021 was peer reviewed by Dr Siu Fung (Matthew) Yiu and Dr Heung Chun (Andrew) Tsang; and approved by Dr Khor.
3. The analysis in this Report is based on information available up to 31 December 2021.
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 Mission team wishes to thank the China authorities for their comments on this Report, as well as their excellent meeting arrangements and warm engagement during this annual consultation, which was conducted online.

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Executive Summary

1. China has strong economic foundations to pursue and achieve sustained high-quality growth. The key growth drivers are digitalization, technological advancement and innovation, the uplift of the middle class and further development of the services sector. However, challenges in achieving the goals are also significant, and these need to be skilfully addressed. Policies which come with realistic targets and timelines and also address the challenges, close coordination among government agencies, and strengthened policy communication, are crucial for keeping China on the path to robust and inclusive growth, and resilience.

2. The recovery from the 2020 downturn remained intact in 2021 despite a slowdown in 2H. GDP growth was a strong 8.1 percent in 2021, with the two-year average for 2020-2021 at 5.1 percent. However, the upturn in different economic activities was uneven. Overall growth momentum weakened quite significantly in 2H 2021 due to various factors including supply-side disruptions, sporadic virus outbreaks, and the effects of regulatory reforms.

3. Labor market conditions improved markedly in 2021. The surveyed urban unemployment rate was 5.1 percent on average in 2021, with job creation reaching 12.69 million. As the recovery was still uneven and relatively slow in MSMEs, some groups such as fresh graduates still faced difficulties in finding jobs.

4. CPI inflation was contained, although PPI inflation surged. CPI inflation rose in the later period of 2021, coming in at 0.9 percent for the year, and was expected to continue rising moderately in 2022, with limited pass-through from the high PPI inflation to CPI inflation.

5. China's external position remained strong, with a healthy current account surplus and large foreign reserves. The 2021 balance of payments (BOP) recorded a surplus on the back of strong net exports. Cross-border capital reversed to net inflows in 2021, driven by strong FDI and portfolio inflows, reflecting a further opening up of the domestic economy and financial markets. Foreign currency reserves have remained stable, at USD3.25 trillion in December 2021. Reflecting the strong external performance, the RMB generally appreciated in 2021.

6. With the banking system remaining sound overall, credit growth was supportive and financial conditions were generally accommodative. The banking sector's capital and liquidity buffers are adequate overall, although there are pockets of weaknesses among city and rural commercial banks. Total social financing (TSF) growth eased to 10.3 percent in 2021 from 13.3 percent in 2020. Looking ahead, credit growth should remain supportive of economic growth and development, with the People's Bank of China (PBC) providing guidance to banks, cutting the required reserve ratio (RRR) and relending rate, and keeping liquidity conditions adequate.

7. Real estate prices and activities slowed significantly. The slowdown was caused by a tightening of macro-prudential measures, setting stricter limits on leverage ratios of property developers, which led to financial difficulties for one of the largest and some smaller property developers. With property markets cooling in recent months, the authorities have recalibrated policy settings, to help keep the property sector across different cities on an even keel, and facilitate orderly adjustments. The authorities also emphasized that firm actions were taken for a few highly leveraged property developers which had run into financial difficulties; developers must firmly adhere to the principle that "houses are for living in, not for speculation"; and continuous efforts are made to promote the healthy development of the real

estate market – consistent with the strategy of pursuing high-quality economic growth and reducing financial risks.

8. China's fiscal deficit narrowed, reflecting a strong rebound in revenue collection and a modest increase in spending. As the revenue in the general public budgetary account (general account) increased by 10.7 percent in 2021 while expenditure rose by only 0.3 percent, the general public budgetary account deficit is estimated to narrow from 6.2 percent of GDP in 2020 to 3.8 percent of GDP in 2021. The authorities expect the official fiscal deficit in this account, based on China's accounting method, to narrow from 3.7 percent of GDP in 2020 to 3.1 in 2021.

9. Looking ahead, China's 2022 growth outlook is reasonable. Despite a marked slowdown in 1H 2022, GDP growth in 2022 is projected at a still-firm 4.8 percent. Sequential momentum should pick up in the second half of the year. Consumption should remain the main driver, underpinned by strong labor market conditions, while investment will play an important support role. Exports, meanwhile, should hold up well but will likely grow at a more moderate pace.

10. Risks will still be elevated in 2022. The pandemic remains a key risk to the global and Chinese economies. Significant uncertainty still hangs over the strength and sustainability of external demand. The recovery of China's domestic economy and labor market could remain uneven. Meanwhile, U.S.-China technology tensions are likely to remain heightened. Pockets of vulnerabilities in the financial and property sectors persist too. Some policy measures to reduce vulnerabilities and boost the sustainability of economic growth could have unintended effects in the near term.

11. While China's dynamic zero Covid policy has been very successful thus far in containing the virus outbreaks, it may be timely to recalibrate the policy to allow for a gradual reopening of the borders to facilitate international travel while protecting its population from infection. In the past year, vaccination rates in China and the rest of the world have been ramped up and have reached immunity levels in many countries while effective anti-viral treatments have become available. Hence a calibrated easing of border controls, with protocols to protect the domestic population from infection, would allow for greater international travel and facilitate the revival of the tourism industry.

12. Fiscal policy should continue to support economic growth and job creation in the short term. Some key growth drivers have not returned to their pre-pandemic pace of expansion. Certain sectors of the economy, many micro, small and medium-sized enterprises (MSMEs), and some segments of the workforce, are still lagging behind in the recovery. Therefore, it is appropriate for authorities to retain some targeted policy support measures to promote recovery in these areas, while phasing out other policy measures.

13. Given significant headwinds to the economic recovery, it is appropriate that several measures to ensure that liquidity was adequate and to support credit growth were carried over from 2020 to 2021. Short-term liquidity was kept adequate through regular open market operations. The PBC cut the RRR twice, by a cumulative 100 basis points, and also the 1-year and over 5-year loan prime rate (LPR), as well as the medium-term lending facility (MLF) rate. Efforts to improve the composition of credit flows and effectiveness of monetary transmission were stepped up as well. The use of structural facilities—including targeted relending and rediscounting—and new targeted facilities introduced in 2020, to support MSMEs and financial inclusion, were further strengthened.

14. The elevated debt level, especially in the corporate sector, underscores the continued urgency of further deleveraging in China – though macro leverage was lowered steadily through 2021 with the government committed to implementing policies in a steady and effective manner. Looking ahead, given the extensive and often-intricate linkages across sectors of the economy, further deleveraging measures need to take into account the spillovers and impact.

15. Weak banks should be strengthened without delay. Concrete steps are needed to improve the credit quality of weak banks' loan books and increase their capital buffers – in addition to the current approach which is heavily reliant on bad loan disposal by banks and asset management companies (AMCs). Possible channels of contagion should be identified. Continuing efforts to enhance prudential standards and resolution tools for the financial sector is crucial.

16. Significant progress has been made in developing e-CNY, the Chinese version of a central bank digital currency (CBDC); such efforts should continue, with domestic and global benefits in mind. e-CNY will provide a digital payment service as a public good. In the medium term, it could spur further digital innovation, enhance financial inclusion, and improve the payment system's efficiency. At this juncture, pilot programs are helping the PBC to gather feedback prior to its official launch. The PBC's participation in the m-Bridge project, a cross-border CBDC initiative, is welcome. Such cross-border collaboration can help facilitate cross-border payments in local currencies between economies and promote regional trade through improvements in efficiency, transparency, and reduction in transaction costs.

17. With greater capital account openness under consideration, managing capital flows will be more challenging and hence, the financial system needs to be strengthened, and policy tools further developed. China's cautious approach to capital account liberalization is prudent. As the pro-cyclicality of capital flows often leads to financial market and exchange rate volatility, it is important to develop effective frameworks, systems and procedures for monitoring capital flows. It is also important to retain options for retightening capital flows management measures when there is excessive volatility.

18. The full cost of comprehensive climate change mitigation measures over the long term is huge, and measures to mitigate climate change risks could affect economic growth in the short to medium term. Estimates suggest China will need to spend or invest RMB100-200 trillion through 2050, to fulfil its commitment to the global target of limiting temperature increases to no more than 1.5°C, a figure equivalent to 2-4 percent of cumulative GDP. Power generation from fossil fuel, especially coal, has great impact on the economy. As a result, related economic activities could be disrupted from time to time, during the transition period when measures are taken to reduce fossil fuel consumption, as was the case during 2H 2021.

19. In addressing climate change, China needs comprehensive action plans and careful mitigation of risks.

- The recent publication of the national action plan for peaking carbon emissions before 2030 is a welcome policy move. A similar plan is needed for the 2060 carbon neutrality target. The national emissions trading scheme (ETS) can be strengthened. Carbon taxes should also be considered as an important pricing instrument to complement the ETS. Targeted measures for supporting technology development and innovation will be very helpful.
- Adverse transitional effects of climate change efforts need to be identified and addressed fairly. There is a need to effect income transfers to the poorer regions which

are adversely affected; boost safety nets for the vulnerable, and mitigate financial risks from asset stranding and green investment.

20. Productivity improvements, technological advancements, and enhanced resilience to supply chain shocks are crucial for robust growth in the long term. China's approach for technology self-strengthening should include both domestic capacity building and cross-border collaboration deepening, through both bilateral and multilateral channels. To sustain high productivity gains, training programs to reskill and upskill different segments of the labor force should be established to enable workers to take on new jobs in the evolving economy, especially in areas that are high priority for Dual Circulation.

21. Dual Circulation is a key overarching strategy in China's pursuit of high-quality and economically inclusive growth. With care in the design and execution of policy measures, intended outcomes can be achieved and unintended adverse effects addressed. This calls for a systematic approach for the implementation of policy decisions, monitoring of results, assessment of trade-offs, and adjustment of policies. AMRO encourages the authorities to take into consideration the implications of its development strategy for the ASEAN+3 region and the rest of the world, when developing plans for implementing them.

22. Authorities' efforts to safeguard fiscal sustainability must continue for the long term. In terms of expenditure, challenges could arise from the need to strengthen social safety nets and increase healthcare and social services spending. It is essential to boost fiscal spending efficiency and reallocate expenditure to priority areas. Making further progress on tax administration reform, broadening the tax base, and introducing new taxes and making the income tax system more progressive, will help boost revenues. Strengthening debt management, especially at the local level, continues to be crucial.

A. Recent Developments and Outlook

A.1 Setting the Context

1. China could achieve sustained high-quality and inclusive growth, by seizing rich opportunities in the long term and addressing several challenges along the way.

- Having come a long way in its economic development, China's GNI per capita is close to the World Bank's lower threshold for high-income economies. The prospects for new drivers to propel the next phase of its growth and development—such as digitalization, technological advancement and innovation, the expansion of the middle class and deepening of the services sector—are favorable.

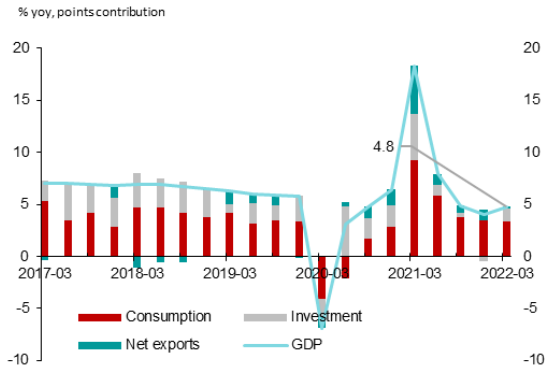
- However, risks and challenges for moving up the income ladder and securing sustainable and inclusive growth are also significant. These include population aging, climate change, socioeconomic inequalities, impediments to technological advancement and some macro/financial imbalances. Chinese authorities have implemented several well-considered policies to address them. However, new risks could emerge, and transitional risks could become more pronounced.

- Policies which come with realistic targets and timelines and address the challenges and trade-offs; tight coordination among the many government bodies; and strengthened policy communication will be needed to contain these risks, address structural and cyclical challenges, and keep China on the path to robust growth and resilience.

A.2 Real Sector Developments

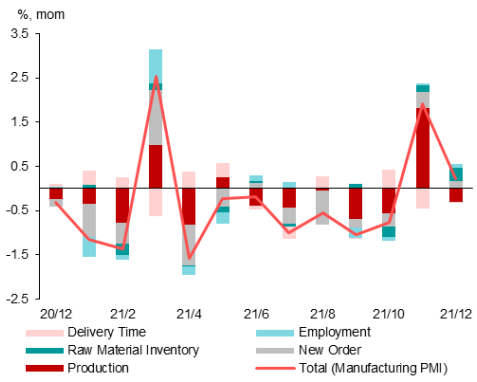
2. China's economic recovery from the 2020 downturn remained steady in 2021, although momentum slowed in 2H. GDP growth was 2.2 percent for 2020, and a firm 8.1 percent in 2021, with the two-year average at 5.1 percent. (Figure 1) In Q3 2021 and, to a lesser extent, Q4 2021, the recovery momentum was affected by various disruptions. These included sporadic COVID-19 outbreaks, financing problems of Evergrande and other real estate developers, adverse market sentiment following regulatory adjustments for some other sectors – including anti-monopoly measures, and intermittent power shortages.

Figure 1. China GDP Growth



Source: China National Bureau of Statistics (NBS); Wind

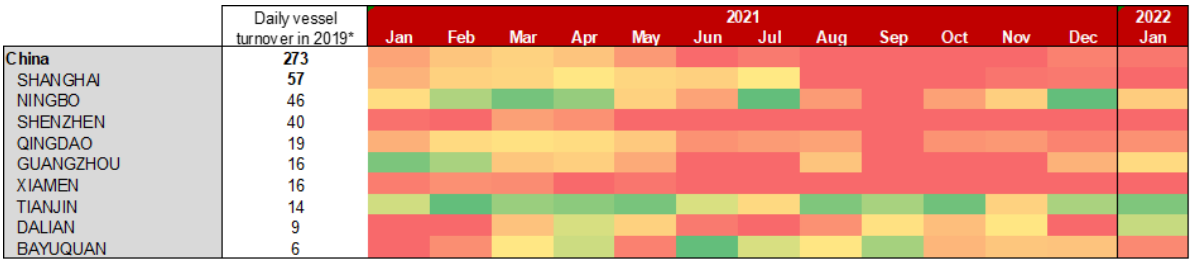
Figure 2. Official Manufacturing PMI: Contributions to Change (mom)



Source: China NBS; Wind

3. Higher-frequency data suggest some stabilization in Q4, but production activities remain sensitive to disruptions. For example, the official manufacturing purchasing manager's index (PMI) rebounded in November, with production picking up markedly, led by high-tech manufacturing, but production declined slightly in December. (Figure 2). The services sector as a whole continued to recover. In 1H 2022, there may still be some disruptions, including those related to virus outbreaks; examples being port congestion (Figure 3), and intermittent power shortages. Sequential growth momentum should pick up gradually.

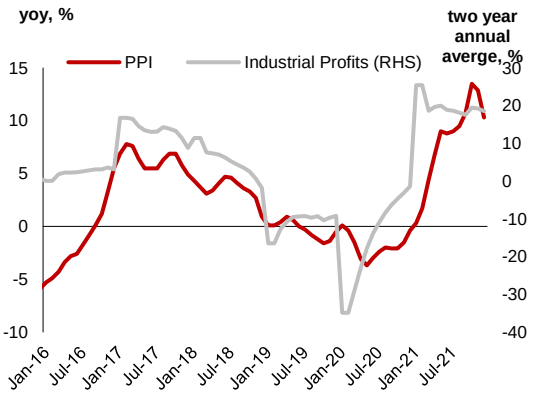
Figure 3. Port Congestion Heat Map: China



Source: MarineTraffic; AMRO staff calculations
Note: *Refers to the average number of container vessels that arrive and depart the said port within a day from January 2019–December 2019 (as at 11 January 2021). For the above heatmap, we have included only container ships with a carrying capacity of more than 2,000 TEUs, which tend to be involved in international trade. Red, Yellow, and Green refer to the 90th, 50th, and 10th percentiles, respectively, of the vessel turnaround time (in 2019=100) for the major ports in China for the 2019-2021 period. Shenzhen (China) port comprises Da Chan Bay, Zhujian Kou, Chiwan, Shekou, and Yantian ports; Guangzhou (China) comprises Huangpu, MCID, Nansha, and Xinsha.

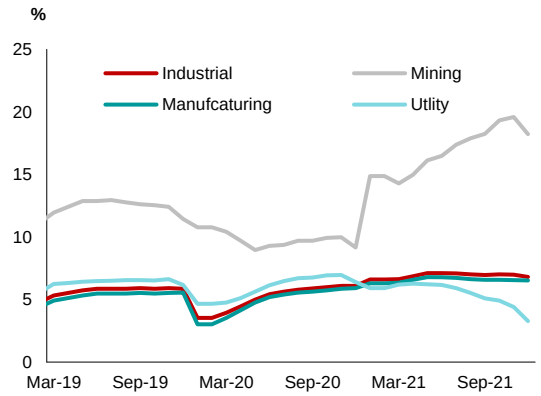
4. Upstream industrial profitability improved along with the rapid rise in PPI inflation. The industrial profits of firms above a designated size rose by 34.3 percent in 2021 and by 18.2 percent on the 2020-2021 average basis (Figure 4). The elevated commodity and raw material prices lifted profitability of the upstream sectors such as mining, with their profit margin almost doubling to 18.2 percent at the end of 2021 from 9.2 percent in 2020 (Figure 5). Meanwhile, the profit margins of the manufacturing sector and utility sector were stable and narrowed in 2021, respectively. Although the debt-to-asset ratio of Chinese industrial sector remained stable in 2021, their financial expenses declined, partly contributing to the rise in industrial profits (Figure 6). Return of asset (ROA) and return to equity (ROE) started to reverse from the downward trends in the past decade (Figure 7).

Figure 4. Industrial Profits and PPI Inflation



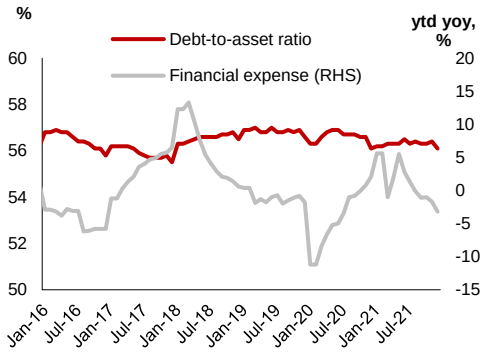
Source: China NBS; Wind

Figure 5. Industrial Profit Margins by Sector



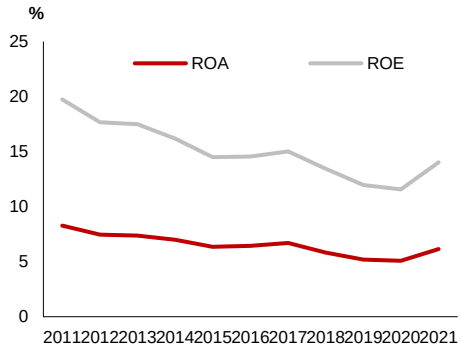
Source: China NBS; Wind

Figure 6. Debt-to-asset Ratio and Financial Expense of Industrial Sector



Source: China NBS; Wind

Figure 7. Profitability of Industrial Sector



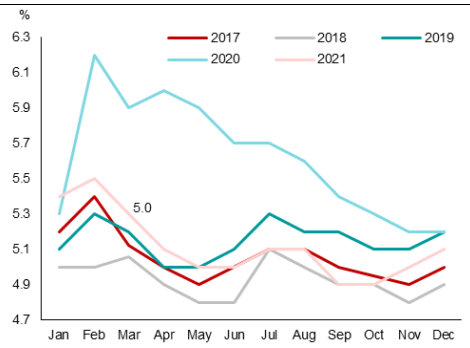
Source: China NBS; Wind

5. Unevenness, in the extent and speed of recoveries of different types of economic activities across sectors, has persisted. Consumption and exports have been key GDP growth drivers (Figure 1), reflecting brisk job creation, coupled with significant wage increases, and the strong recovery in advanced economies. Exports have rebounded strongly, although shipments have been affected by disruptions in shipping and port congestions in the U.S. and other major trading partners from time to time. Investment has slowed, affected by caution over the impact of regulatory adjustments in various sectors, as well as disruptions related to sporadic COVID-19 outbreaks and severe flooding. The surge in commodity prices has benefited upstream industries but imposed strains on downstream industries. As a result, profits and employment conditions have diverged across industries. And within industries, larger companies have generally performed better than smaller ones.

6. Labor market conditions have improved significantly, although there are still pockets of weaknesses. The surveyed urban unemployment rate, which peaked at 6.2 percent in February 2020, has trended down (Figure 8) to reach pre-crisis levels, while wage growth has been firm (Figure 9). Urban job creation reached 12.69 million, surpassing the full-year target of 11 million (Figure 10). Yet, the recovery remains uneven. MSMEs have recovered more slowly. Meanwhile, some groups such as new university graduates still face difficulties in securing jobs in different parts of the country. Migrant workers have benefited from strong government policies.[1] There are indications that job openings remain aplenty (Figure 11).

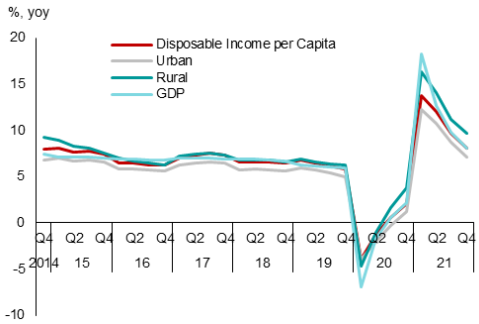
[1] The government has acted to lift restrictions on migrant workers' access to social welfare benefits, including basic pension insurance and basic healthcare insurance where they work, as well as services such as job introduction and guidance schemes, which have improved and will continue to significantly improve migrant workers' access to social welfare benefits regardless of where their Hukou belongs to.

Figure 8. Surveyed Urban Unemployment Rate



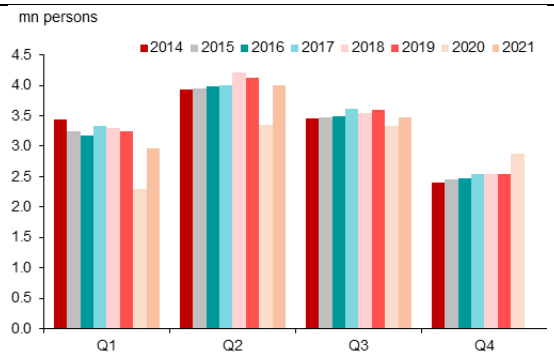
Source: China NBS; Wind

Figure 9. Real Disposable Income and Real GDP: Year-to-Date Growth



Source: China NBS; Wind

Figure 10. Increase in Number of Urban Jobs



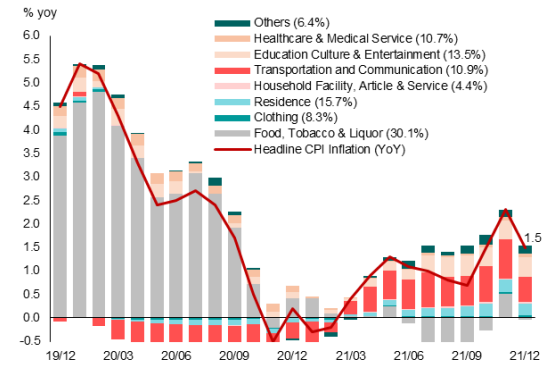
Source: China Ministry of Human Resource and Social Security (CHRSS); CEIC

Figure 11. Ratio of Job Positions to Applicants

Source: CEIR

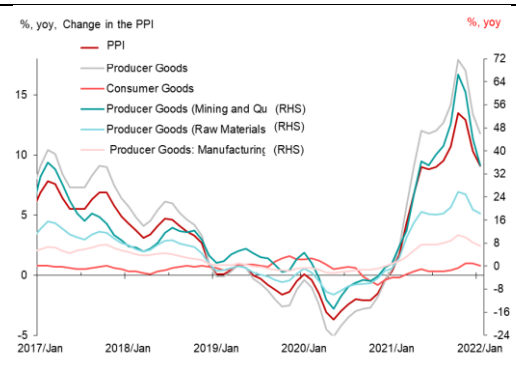
7. CPI inflation has remained contained although PPI inflation has surged. CPI inflation, that was negative at the beginning of 2021, rose gradually towards the middle of the year, and eased in 2H. (Figure 12) Base effects related to high pork prices in 2020 were a key factor for this trend. CPI inflation rose in Q4, coming in at 1.5 percent yoy in December despite the PPI coming in at a high 10.3 percent yoy. (Figure 13) Non-food CPI inflation has been higher than overall CPI inflation, reflecting moderate pass-through from the commodities-induced PPI surge (See Box A: The CPI-PPI Divergence: Some Observations and Explanations). In 2022, CPI is expected to increase to 2.5 percent due to the base effect, increases in pork prices, rising consumption and some lagged pass-through from PPI.

Figure 12. CPI Inflation



Source: China NBS; Wind

Figure 13. PPI Inflation



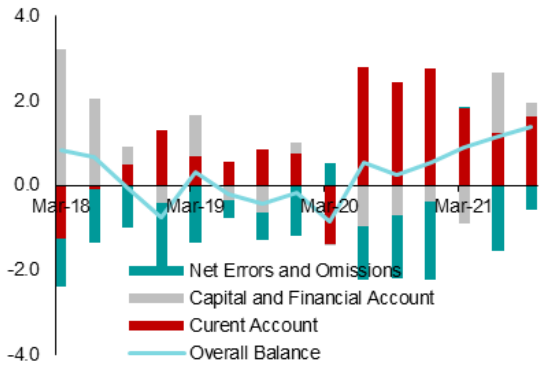
Source: China NBS; Wind

A.3 External Sector and the Balance of Payments

8. China's external position remains strong largely due to a higher trade surplus. (Figure 14) The balance of payments (BOP) has been in surplus, driven by the sharp increase of the trade surplus in 2021 to USD676.4 billion. Exports have grown strongly, but forward-looking indicators suggest some easing ahead. Imports have also been strong, due to firm domestic demand and production activities.

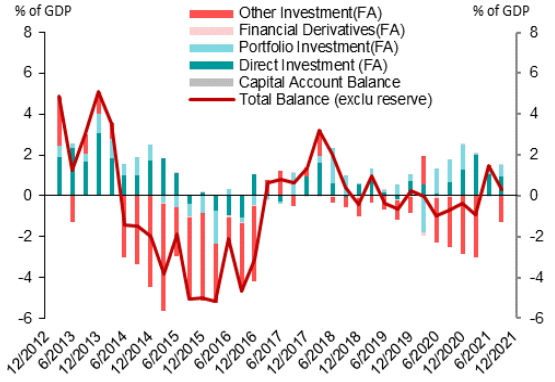
9. Cross-border capital flows reversed to net inflows in 2021 and foreign reserves continued to be large. The financial account (excluding reserves and errors and omissions) turned positive in Q2 2021 and recorded small net inflows of USD28.9 billion in 1H 2021 (Figure 15). This was mainly contributed by strong FDI inflows of USD121.3 billion, supported by the further opening up of domestic markets. Meanwhile, portfolio investment continued to register net inflows as more global investors increased their holdings of Chinese assets (Figure 16). However, there was an outflow of USD113.8 billion through other investments, due to increased cross-border lending to non-residents. Foreign currency reserves, meanwhile, have remained stable, at USD3.222 trillion in November 2021 (Figure 17). Reflecting strong external performance, the RMB exchange rate generally strengthened in 2021.

Figure 14. Balance of Payments (BOP)



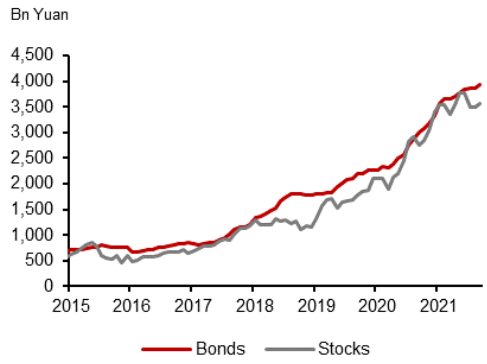
Source: China NBS; CEIC

Figure 15. BOP Financial Account



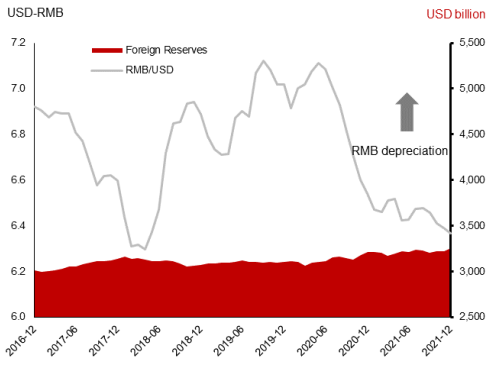
Source: Wind; AMRO staff calculations

Figure 16. Non-resident Holding of China's Bonds and Stocks



Source: Wind; AMRO staff calculations

Figure 17. USD-RMB Exchange Rate and Stock of Foreign Reserves

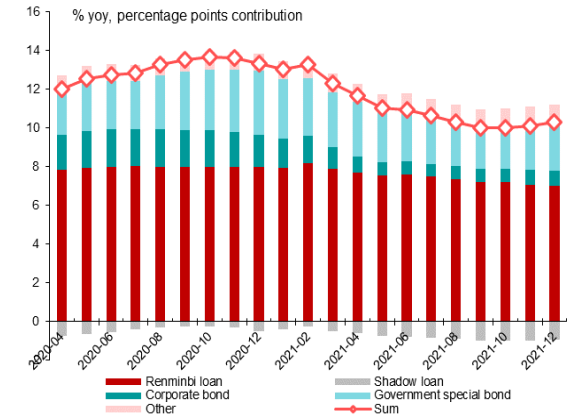


Source: People's Bank of China (PBC); CEIC

A.4 Monetary Conditions and Financial Sector

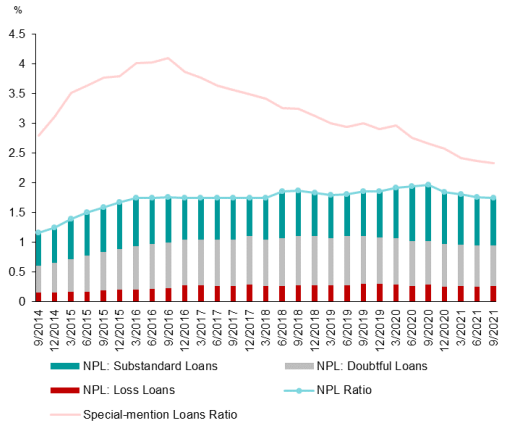
10. Credit growth has trended down, as the deleveraging policy remains in place. TSF growth eased to 10.3 percent in 2021 from 13.3 percent in 2020. (Figure 18) The issuance of central government and local government bonds have slowed. Meanwhile, the lingering effects of bond defaults in late 2020 and the recent tightening of financial conditions due to concerns related to a few property developers, have weighed on the corporate bond market. Separately, shadow banking lending has continued to contract amid the continuous improvement of regulatory systems. However, bank loans have held up well, partly offsetting the deceleration in other components of TSF, with lending to households being particularly strong. Looking ahead, credit growth should remain supportive of economic growth and development, with the PBC providing forward guidance, cutting the RRR and relending rate in December 2021, and then the 1-year and over 5-year Loan Prime Rate (LPR) in January 2022.

Figure 18. Total Social Financing (TSF) Growth



Source: PBC; Wind

Figure 19. Non-Performing Loan (NPL) Ratios



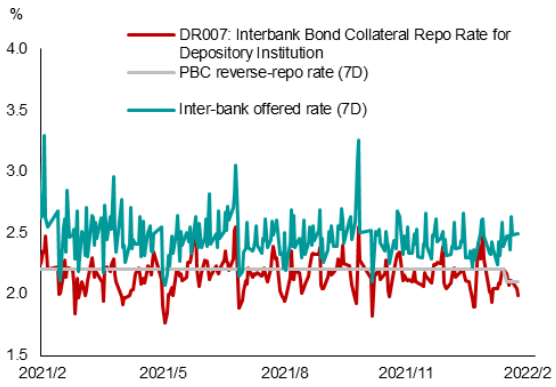
Source: People's Bank of China (PBC); CEIC

11. The banking sector remains sound overall, but there are some pockets of weaknesses among city and rural commercial banks. As a result of sizeable non-performing loan (NPL) write-offs, and postponement in NPL recognition due to deferral of principal and interest payments, the commercial banking system's NPL ratio fell from 1.84 percent at end-2020 to 1.75 percent at end-Q3 2021 (Figure 19). Rural commercial banks' NPL ratios fell the most, but were still quite high at 3.59 percent. With some regulatory forbearance measures expiring in the coming months, NPL ratios are expected to rise. The capital adequacy ratios (CARs) of different types of banks have risen significantly since mid-2020, except for small banks. According to Chinese authorities' assessment, as of Q2 2021, the assets of high-risk institutions accounted for a very small 1.4 percent of total banking institution assets.[2]

[2] The PBC conducts quarterly rating for financial institutions, covering 4400 banking financial institutions. There are 11 rating categories and the institutions in the bottom four categories are considered as being at high risk.

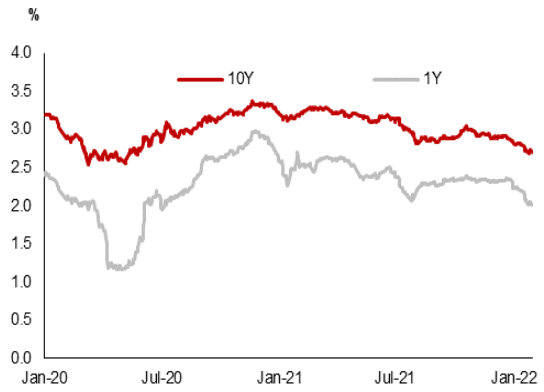
Figure 20.

Figure 21. Key Market Interest Rates



Source: PBC; CEIC

Figure 22. Government Bond Yields



Source: CEIC

12. Financial conditions have been generally accommodative in 2021. The PBC has kept liquidity conditions adequate, and cut the RRR for banks twice during the year. Interest rates in money markets have been anchored around the PBC reverse repo rate of 2.2 percent (Figure 20). Government bond interest rates have fallen since March 2021 (Figure 21). Open market operations (OMOs) have been calibrated to ensure that liquidity conditions remain adequate. Corporate credit spreads narrowed from their end-2020 peaks until mid-September, before widening again due to concerns related to the implications of more moderate growth for the credit standing of weaker property developers and other lower-rated corporate entities. Meanwhile, funding conditions for local government financing vehicles (LGFVs) have been generally tight; these are in line with central authorities' policy intention of instilling greater fiscal discipline at local government levels.

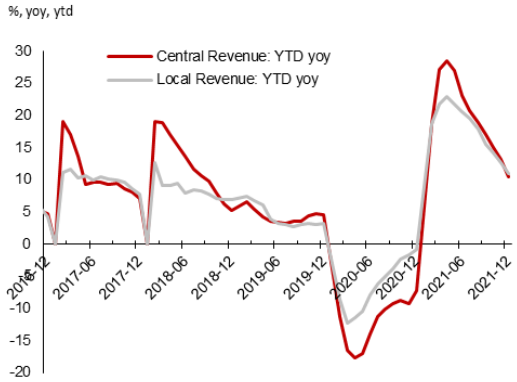
A.5 Property Sector

13. Real estate prices and activities have slowed significantly. Property prices have stabilized or fallen, and transaction volumes have decreased in several cities. This, and more circumspect sentiment related to authorities' commitment to making housing more affordable in China, have led to a slowdown in real estate investment. The authorities have taken firm actions to address risks posed by developers which over-leveraged and ran into financial difficulties, and whose troubles have adversely affected market sentiment and slowed property sector activities including sales and financing (See Selected Issue 1: Coping with Real Estate Sector Downturn amid Rising Risks).

A.6 Fiscal Sector

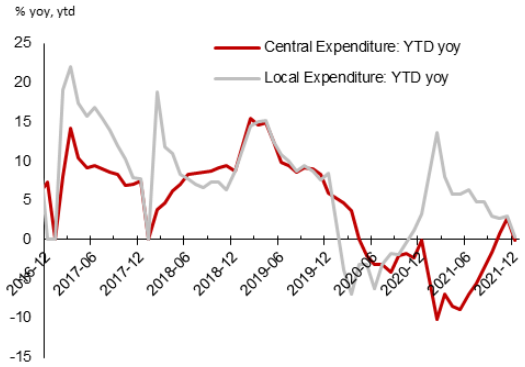
14. The fiscal deficit has narrowed, with strong rebound in revenue collections and modest spending growth (Figures 22 and 23). In 2021, revenue in the general public budgetary account (general account)—rose 10.7 percent, while the expenditure in this account rose 0.3 percent. By AMRO's projections, the deficit in the general account is expected to narrow from 6.2 percent of GDP in 2020 to 3.8 percent of GDP in 2021. Authorities expect the official fiscal deficit in this account to narrow from 3.7 percent of GDP in 2020 to 3.1 in 2021.

Figure 23. Central and Local Government Revenue



Source: China Ministry of Finance (CMOF); CEIC

Figure 24. Central and Local Government Spending



Source: CMOF; CEIC

A.7 Growth Outlook

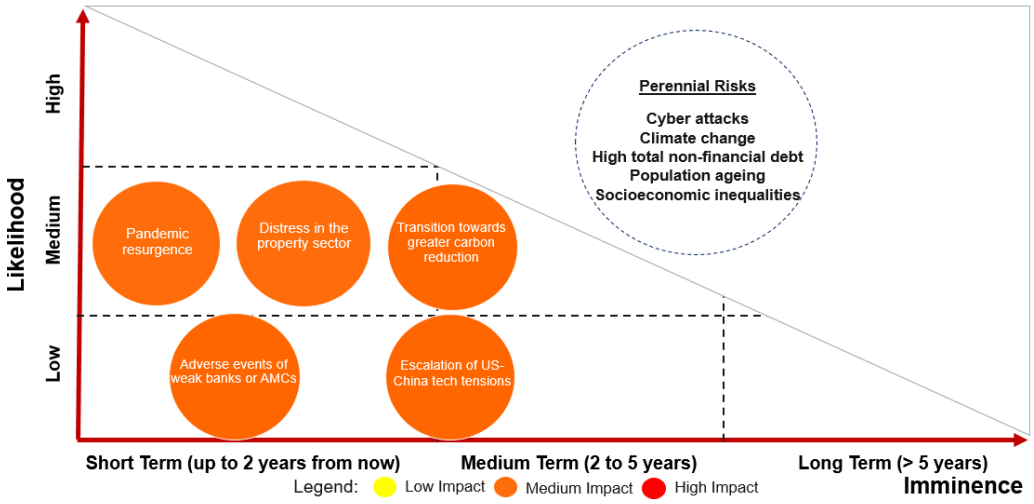
15. Overall, China's economy is expected to remain resilient in 2022 – with strong policy measures helping the economy to rebound in 2H following a marked slowdown in 1H due to various factors including the implementation of strict pandemic control measures**.** GDP growth came in at 8.1 percent in 2021, partly due to the low base effect of 2020. Following the slowdown in 2H 2021 and 1H 2022, sequential momentum should pick up firmly in 2H 2022, with full-year growth at about 4.8 percent. Consumption will likely remain the main driver, with investment playing an increasingly important role and exports growing at a more moderate pace.

B. Risks, Vulnerabilities and Challenges

B.1 Near-term Risks to the Macro Outlook

16. Risks will remain relatively high in 2022. The pandemic remains a major threat to further economic recovery globally and in China. This is evidenced by China's marked growth slowdown in 1H 2022, as the implementation of strict pandemic control measures to safeguard public health brought about significant though temporary disruptions to production and consumption activities. At the same time, uncertainty continues to hang over the strength and sustainability of external demand and resilience of global supply chains – not least due to disruptions brought about by the war in Ukraine, and the recovery of China's domestic economy and labor market remains uneven. In addition, U.S.-China technology tensions are likely to be prolonged. Pockets of vulnerabilities in the financial and property sectors persist. Lastly, some policy measures to reduce imbalances and enhance the sustainability of economic growth and development could have some effects during the transition (Figure 24).

Figure 25. China Risk Map



Source: AMRO staff

17. Further waves of the pandemic could occur, possibly due to new variants of the virus, posing downside risks to China's economic outlook. Nearly two years after the start of the global pandemic, recurrent waves of infection by more contagious variants of the virus continue to disrupt economic activities around the world. If this pattern worsens, it could jeopardize the global economic recovery. This would weigh on China's external-oriented sectors, and possibly have adverse knock-on effects on domestic-oriented sectors. Although China's strict containment measures have been effective in stemming sporadic outbreaks in the country, if more frequent and severe outbreaks occur, its growth momentum could slow significantly.

18. Some Chinese property developers could come under financial pressure, and this could spill over to the broader property sector to some extent. The financial situation of weak property developers has gradually stabilized, and spillovers have been relatively contained as the government and financial regulators have adjusted policies selectively in

response to changes in conditions facing real estate developers since late 2021.[3] However, the liquidity pressure and concerns over the financial health of Chinese developers may persist in 2022. The amount of offshore bonds of Chinese developers maturing in 2022 remains large, and debt rollover could be challenging because borrowing costs remain elevated and may even increase. The property sector slowdown could, in turn, exert pressures on weak property developers. (See Selected Issue 1: Coping with Real Estate Sector Downturn amid Rising Risks).

19. Although banking sector risks are under control and capital adequacy is sound, banks with thin capital buffers could come under stress if the quality of their loan portfolios worsens markedly. A possible trigger would be faltering economic growth**.** Small banks with sizable exposures to MSMEs, corporate borrowers from backward sectors, and weak property developers would face some risks. Adverse credit events could lead to spillover effects among small banks and some LGFVs. This could lead to some banks coming under stress, requiring intervention by the regulators.

20. Although U.S.-China technology tensions may not escalate markedly, these tensions may well be prolonged and have the effect of slowing down China's technological advancement and weakening its medium-term growth. While trade tensions could lessen moving forward, tensions over technology are unlikely to abate. For example, China is the world's largest net importer of semiconductors, and it accounts for a modest share in memory chip and second-generation logic chip production (See Selected Issue 2: Supply Chain Challenges: the Case of Semiconductors). It also relies on other countries to provide equipment and software to design and fabricate chips. While China has stepped up efforts to develop indigenous capability, making significant progress or breakthroughs will take time. In this context, if technology tensions escalate, some critical technology advancements which depend on the use of advanced semiconductors, could stall and weaken China's medium-term growth.

21. In the short to medium term, climate change mitigation measures can affect economic growth. Achieving lower energy intensity and carbon reduction targets in the short term is very challenging. Changing the economy's heavy dependence on coal for power generation and supply will take time. China has adjusted the implementation pace of carbon reduction measures, and the risk of problems such as large-scale power shortages has decreased significantly. However, in the short term or even medium term, economic activities may be disrupted from time to time, until the shift towards cleaner energy becomes more advanced.

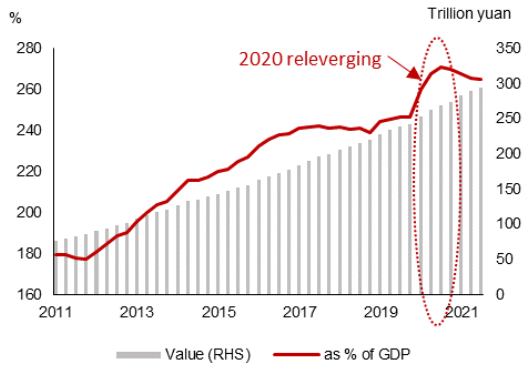
B.2 Longer-term Challenges and Vulnerabilities

22. China's aggregate debt is still very high, although it has peaked and declined moderately recently. The ratio of non-financial aggregate debt to GDP climbed quickly from 246.5 percent in Q4 2019 to peak at 271.2 percent in Q3 2020. It declined to 264.8 percent of GDP in Q3 2021 due to the unwinding of COVID-19-related economic stimulus measures and rapid growth in nominal GDP (Figure 25). The deleveraging was largely driven by the corporate sector, whose debt-to-GDP ratio dropped by 5.1 percentage points in the first three quarters of 2021 (Figure 26). However, China's total non-financial debt-to-GDP ratio is still 20 percentage points higher than before the pandemic. Very high indebtedness could hinder further efforts to channel financial resources away from loss-making parts of the economy to

[3] Some examples include encouraging banks to ensure reasonable funding needs of the real estate sector and relaxing some transaction-related measures at the city level.

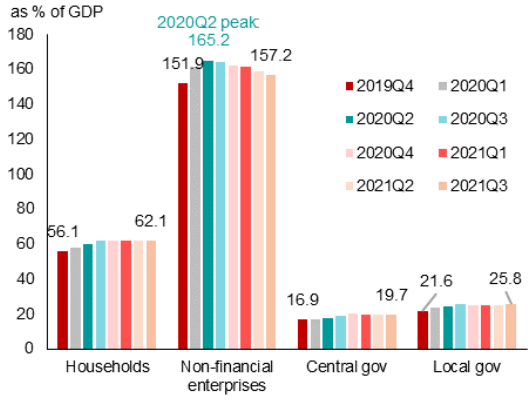
the most viable sectors, impairing allocation efficiency and undermining sustained growth and financial stability.

Figure 26. China's Total Non-Financial Debt



Source: CASS; Wind

Figure 27. China's Leverage Ratio by Sector



Source: CASS; Wind

23. China will also have to incur large costs over many years to address climate change.

- The damages and losses caused by climate change for China will not be trivial. The changes in climate conditions will increase the frequency and intensity of extreme weather events such as heat waves, wildfires, typhoons, heavy rainfall, and flooding. Sea levels will continue rising, threatening China's populous and highly developed coastal areas. Climate changes will also speed up the melting of the Himalayan glaciers, leading to adverse consequences for China and surrounding countries. Additionally, ocean currents could reverse and precipitation patterns could change, leading to higher probability of extreme drought in China's northern and western regions. Crop yields could decrease with increases in temperature and lower rainfall levels, especially in the country's southern regions. All these changes could bring about serious long-term social and economic consequences for China.
- Estimates of the total cost for China's climate change mitigation initiatives are around RMB100-200 trillion through 2050, if it is to meet its commitment to the global target of limiting temperature increases to 1.5°C between now and 2050. This sum would be equivalent to about 2-4 percent of China's cumulative GDP over the reference period.[4]

24. Socioeconomic and income disparities are pronounced across China, and addressing these will be very challenging. China successfully eliminated absolute poverty in 2021. On the income inequality front, the Gini coefficient declined from the peak of 0.491 in 2008 but was still at a high level of 0.465 in 2019. As the economy grew rapidly, large segments of the population have become affluent and joined the middle class. This is also the case across different regions. If the benefits of economic growth are not seen to be shared equitably, it could lead to increased social tension and undermine sustained growth.

B.3 Authorities' Views

25. The authorities share similar views of the risks facing China, but are confident that risks pertaining to the property sector, supply-side strains, and bank NPLs will be contained. In the authorities' opinion, risks facing and related to the property sector are well-contained. The effects of possible strains on property developers—or effects of the ongoing

[4] See China's Long-Term Low-Carbon Development Strategies and Pathways: Comprehensive Report, Institute of Climate Change and Sustainable Development of Tsinghua University: https://link.springer.com/book/10.1007/978-981-16-2524-4.

decline in property prices and transactions on the financial system and the real economy—will be limited. Supply-side strains will ease markedly, with the government taking measures to address power shortages and boost supply-chain resilience. As for bank NPLs, the authorities were of the view that the overall NPL ratio could trend down slightly. This is because China emerged strongly from the 2020 downturn and banks have earmarked ample provisions.

C. Policy Discussions and Recommendations

C.1 The Pandemic: Safeguarding China's Recovery, Preparing for Reopening

26. With new variants of the virus appearing worldwide, including in the ASEAN+3 region and at home, China needs to strike a judicious balance between adjusting its control measures as conditions change, and devising a concrete plan for the eventual reopening of its borders.

- China's strict pandemic control measures have thus far been very successful in containing domestic outbreaks effectively. Although outbreaks have become more frequent, rapid detection, testing, treatment, and reopening of locked-down areas have kept case counts under control, averted runaway increases in domestically-transmitted cases, and minimized disruptions to economic activity.
- Strict border control measures have played a key role in mitigating the risk of large numbers of imported cases, leading to the formation of large domestic clusters and infection chains in different provinces and cities across the country.
- However, China's dynamic zero Covid policy has meant that its borders remain relatively closed to international travel, two years after the start of the pandemic. This has significant near-term and even longer-term implications for its own economy as well as other economies in the ASEAN+3 region. ASEAN+3 economies, that depend substantially on inbound tourism and cross-border trade to drive growth and employment, are being severely affected by China's zero-COVID policy. For China itself, a prolonged period of very tight border controls may prompt some trading partners and countries--in the same cross-border production networks as China--to seek ways to reduce their linkages with China, to boost their own growth and resilience.
- As soon as it is feasible, China should review its cross-border policy to assess how it can establish protocols to facilitate international travel and trade, especially with countries that have achieved high rates of vaccination and have low rates of infections. Meanwhile, it must safeguard the health and wellbeing of its people, and minimize the risk of runaway infections within its own borders that threaten to derail its economic recovery.

C.2 Fiscal and Monetary Policy: Supporting the Recovery, Containing Risks

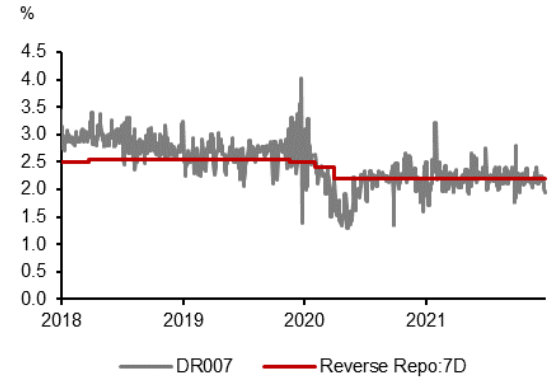
27. Fiscal policy in the short term should prioritize sustaining economic growth and continued robust job creation. Although most sectors have been largely on track towards a full recovery, some key growth drivers have yet to return to their pre-pandemic pace of expansion. In certain sectors of the economy, many MSMEs, and some segments of the large workforce, are still lagging behind in the recovery. Therefore, it is appropriate for authorities to retain some targeted policy support measures that can promote recovery in these areas. These include selected tax and fee cuts or reliefs, while phasing out most other policy measures that have served their purpose. For example, certain types of subsidies that were

intended to cushion the impact of the earlier stages of the pandemic can now be phased out. Such an approach would help broaden the economic recovery and safeguard fiscal prudence.

28. Given the significant headwinds to economic recovery, it is appropriate that several measures to ensure ample liquidity and support credit growth have continued in 2021.

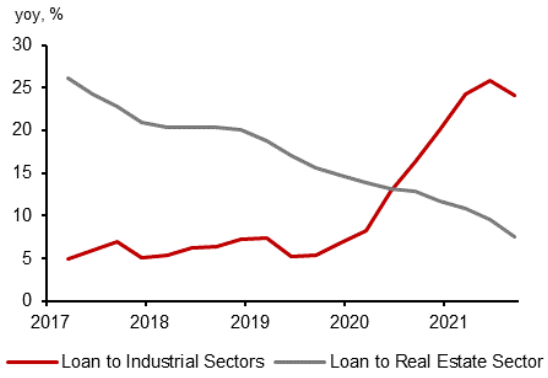
- Short-term liquidity was kept at adequate levels in 2021 through regular open market operations (Figure 27), while greater efforts were directed towards improving the structure of credit flows and effectiveness of monetary transmission.
- The central bank cut the RRR twice by a cumulative 100 basis points to partially replace the maturing medium-term lending facility with more stable and cheaper funds for the banking system to better support credit expansion.
- The use of structural tools—including targeted relending and rediscounting and new targeted tools introduced in 2020 to support MSMEs and financial inclusion— has been further strengthened. Key sectors such as manufacturing have received more credit support, whereas lending to the real estate sector was constrained during the year (Figure 28).
- Furthermore, under the guidance of the central bank, the rules for banks to set the upper limits of the deposit rate were improved and the functioning of the new loan pricing mechanism based on the loan prime rate was further enhanced, helping improve monetary policy transmission.

Figure 28. China's Policy Rate and Market Interest Rate



Source: Wind; AMRO staff calculations

Figure 29. Bank Loan Growth: Industrial Sectors and Real Estate Sector



Source: Wind; AMRO staff calculations

C.3 Mitigating Debt Risks: Leverage, Real Estate Sector, Weak Banks

29. Elevated though steadily decreasing debt levels underscore the need for further deleveraging in China. Balance sheet deleveraging in heavily indebted sectors should continue. Achieving orderly deleveraging outcomes requires a balance between averting financial contagion and maintaining market discipline. Given the extensive and often-intricate linkages across sectors of the economy, a cautious approach to deleveraging would be prudent.

30. For the real estate sector, while tight macroprudential measures are appropriate, some flexibility in implementation could be considered. The fund monitoring and financing management system of key real estate enterprises has been established, which has effectively curbed the disorderly expansion and blind borrowing of some real estate enterprises. These policies will help strengthen the sector by further improving developers' balance sheets.

Refraining from bailing out large troubled property developers at the first sign of stress will help reduce moral hazard. However, taking timely measures to effect an orderly resolution will be needed to contain spillover and knock-on effects. At this juncture, given the pressures China's economy is faced with, macroprudential measures for the property sector should be implemented flexibly to avoid unintended effects. Some local governments may need to fine-tune the details of policy measures that affect market conditions, to avoid excessive strains on the local property sectors.[5]

31. Although China's banking system is systemically sound, it is important to strengthen weak banks without undue delay. Concrete steps are needed to improve the credit quality of banks' loan books – including by strengthening their credit assessment and risk management capacity, and increasing their capital buffers. These will be needed to complement the current approach that relies heavily on bad loan disposal by banks themselves and by AMCs. Possible channels of contagion among weak banks and spillovers to other banks should be identified, and approaches to minimizing contagion should be developed by taking into account learning points from authorities' past experiences.

C.4 Strengthening the Financial Sector: Standards and Bank Resolution, e-CNY

32. Continuing efforts to enhance the standards of internal operations and quality of services provided by the financial sector will help support economic development, safeguard stability, and protect stakeholders' interests. An important policy move is the PBC's issuance in October 2021 of new standards to guide the development of the fast-evolving financial sector in an orderly manner. The standards cover a wide range of financial activities, including product and service offerings, data management, cyber security, clearing and settlement, fintech, supervision and green finance. This is a welcome policy move as it will enable the financial sector to support China's pursuit of high-quality and inclusive growth.

33. Early intervention in distressed banks and rapid disposal of bad assets are vital for minimizing contagion and costs to public finance (See Selected Issue 3: Enhancing China's Financial Rescue System). The early discovery of problems in weak banks and decisive interventions can help avert further balance sheet deterioration and limit contagion risks. It is important to vest the supervisory and resolution authorities with clear mandates and adequate powers to resolve troubled banks. A clearer institutional arrangement specifying the responsibilities and bank resolution functions among the central bank, supervisory authority and deposit insurer will ensure that critical actions are taken in a timely manner without delays. The clear division of responsibilities and powers between supervisory and resolution authorities, and local governments, is also important. The recent regulatory move to require large banks and insurers to create recovery and resolution plans is also useful to facilitate rapid resolution. Separately, clear communication about the anticipated path of the resolution process to key stakeholders, investors and financial market participants is crucial towards preventing contagion risks.

C.5 Digital Currency Developments: e-CNY

34. On the developmental front, significant progress has been made in developing e-CNY, China's version of a CBDC. Such efforts should continue, with domestic and global benefits in mind (See Box B: Central Bank Digital Currency: e-CNY: Developments and Future Potential). The e-CNY aims to supplement physical cash as part of narrow money

[5] Such details could span different areas, including the tightness of rules for calculating debt-servicing ratios for mortgages, the pace at which land is sold for managing the supply of residential properties, and even micro-prudential rules for banks' loans to property developers and firms in property-related sectors.

M0, and is designed to minimize the impact on the existing monetary and financial system. The e-CNY will provide digital payment service as a public good, and its potentially wide-spread use in the medium-term could spur further digital innovation, enhance financial inclusion, and improve the payment system's resilience. Importantly, the e-CNY is designed to minimize adverse effects on the intermediation role of financial institutions (FI) and bolster payment systems and financial stability. Pilot programs are being run, helping the PBC gather feedback prior to the launch. PBC's participation in the m-Bridge project, a cross-border CBDC initiative, is also welcome. Such cross-border collaboration can help facilitate cross-border payments in local currencies between economies and promote regional trade through improvements in efficiency, transparency, and reduction in transaction costs.

C.6 Financial Sector Liberalization and Capital Account Opening-Up

35. Despite China's rapid economic growth and domestic financial sector development, its financial integration with the world lags that for trade in goods and services and direct investment. China has achieved rapid economic growth and made solid progress in domestic financial sector development, with remarkable results following the opening-up measures of financial services. However, compared with the globalization of trade in goods and services as well as direct investment, there is still room for further liberalization in specific areas of the financial sector. This is mainly reflected in the cautious approach to financial and capital account liberalization. By design, the recent wave of financial opening-up has focused more on liberalizing financial services than opening up the capital account. Within the capital account, there has been more relaxation of controls on capital inflows than outflows. This approach is prudent since international experience shows that capital account liberalization can pose serious risks if the domestic financial system is not fully ready.

36. Recent efforts to liberalize capital outflows have focused mainly on the facilitation of two-way portfolio flows by institutional investors, while capital outflows from China's corporate and household sector are still controlled. The authorities took more steps towards liberalizing capital outflows in 2021. The Wealth Management Connect, which allows residents in the Guangdong-Hong Kong-Macao Greater Bay Area (GBA) to purchase wealth management products offered by Hong Kong-based providers, was rolled out in September 2021. The Southbound Bond Connect scheme was also launched recently. Foreign FIs continue to enter and set up operations in China. Given this development, further relaxation of control over FIs' cross-border capital flows, supported by macro-prudential measures to limit risk-taking, could be considered as the next step towards capital account liberalization. However, capital outflows from households and retail investors should be liberalized cautiously over a longer timeframe to avoid very large and destabilizing outflows.

37. Policy experimentation in pilot free trade zones (FTZs) is useful for guiding further capital account liberalization; this approach could become bolder. Financial opening up and innovation are among the key objectives in establishing FTZs such as Lingang Special Area of Shanghai FTZs and the Hainan Free Trade Port. Authorities have made efforts to relax some capital account management tools such as expanding the qualified domestic limited partnership (QDLP) and qualified foreign limited partnership (QFLP) programs, and establishing free trade accounts in PFTZs in Shanghai, Tianjin, and Guangdong, as well as Hainan Free Trade Port. However, the opening up of the financial sector and capital account must factor in the stability of the country's financial system, which makes policy design and execution more challenging. Early piloting and stress testing of national financial opening up in PFTZs and Hainan Free Trade Port will take advantage of the openness of their platform and policies, so as to guide capital account liberalization going forward.

38. With greater capital account openness over time, enhancing the resilience of the financial system and developing policy tools to manage capital flow volatility will be vital. Continuous progress in financial reform and enhancing the resilience of the financial system will pave the way for further opening up the financial sector and capital account. However, the pro-cyclical nature of cross border capital flows often leads to financial market and exchange rate volatility for emerging markets, with an important risk in the near term coming from the impending tightening of U.S. monetary policy. Enhancing the frameworks, systems and procedures for monitoring capital flows, and earmarking tools for tightening capital flows management during times of excessive capital flow volatility, will enable authorities to cope with risks promptly and effectively.

C.7 Boosting Tech Capacity, Productivity and Supply Chain Resilience

39. Improvements in productivity gains and technological advancements, and strong resilience to supply chain shocks are crucial for sustaining robust growth in the long term. China's economic development has long passed the stage where it can rely on ramping up physical capital accumulation and labor for incremental growth. Moreover, pursuing the former is likely to detract from deleveraging efforts, while ramping up labor is likely to yield limited results given the workforce shrinkage that comes with demographic changes. Importantly, efforts to improve the functioning of domestic markets should involve greater responsiveness of resource (re)allocation from lower-productivity/ lower-potential sectors to higher-productivity/ higher-potential sectors. Likewise, fixed asset investment (FAI) should also be more geared towards supporting the development of these sectors in ways that boost labor productivity and overall economic competitiveness, as well as reverse the trend of a marked rise in China's overall incremental capital-output ratio in recent years.

40. To be most effective, China's approach to technology self-strengthening should involve both domestic capacity building and cross-border collaboration, via bilateral and multilateral channels – with strong basic research as a key foundation for developing applied solutions**.** There are three key reasons. (Khor and Foo, 2021) First, openness has boosted growth and welfare immensely. Second, no country can turn away from globalization and be sure of (always) holding lead positions in all high-tech products, having secure supplies of critical components, and having the capacity to operate intricate production processes. Semiconductors are again a prime example – production chains are complex, the R&D needed to even gain a foothold in the industry is huge, and the lead time is long. Third, the costs involved in reducing vulnerability to external shocks by looking inward will be immense. Therefore, China's drive to accelerate the strengthening of its technological capacity—through domestic-focused efforts—should go along with collaboration among countries in the ASEAN+3 region and beyond.

C.8 Climate Change: Forceful Policies and Mitigation of Transitional Risks

41. The case for China to play a leading role in climate change is compelling. First, the damages and losses China faces from climate are nontrivial over the short- and long-term. Second, the type of high-quality growth envisioned by China's leaders involves having a markedly cleaner and greener environment. Third, as one of the world's largest economies and emitters of annual global carbon emissions, China's carbon emission reduction measures will have significant impact on mitigating global climate change in the coming decades.[6]

[6] The large amount of greenhouse gases emitted during the industrialization process of developed countries for more than 200 years is the main cause of global climate issues.

42. China needs forceful and concerted policies to reach its carbon neutrality goal (See Selected Issue 4: Carbon Neutrality: Policy Challenges). The recent publication of the national action plan for peaking carbon emissions before 2030 is a welcome step. A similar plan for the 2060 carbon neutrality target needs to be developed. A detailed action plan will enhance the credibility of the government's climate commitment and result in greater public confidence, and be a policy anchor to guide the expectations of economic agents in their planning and decision making. The national emissions trading scheme (ETS), which offers an opportunity to establish a robust carbon pricing scheme in China, can be strengthened through tightening emissions allowances and expanding sectoral coverage. Targeted policy measures for supporting technology development and innovation—such as subsides, feed-in tariffs and standards—are needed to spur the development and adoption of low-carbon technologies.

43. Adverse transitional effects of climate change efforts need to be managed carefully. Making progress towards carbon neutrality involves massive structural transformation of many parts of China's economy – with some industries, regions and groups bearing a disproportionately large share of the costs of decarbonization. Regions that rely heavily on carbon-based economic activities but have low per capita income, such as the major coal-producing provinces in northern China, need help through income transfers. Strengthening social safety nets will be vital in protecting vulnerable socioeconomic groups, including those harshly hit by the regressive effects of higher energy prices. There is also a need to address financial risks arising from both asset stranding and large green investments.

C.9 High-Quality Inclusive Growth: Dual Circulation and Common Prosperity

44. Dual Circulation is a key overarching strategy in China's pursuit of high-quality and socioeconomically inclusive growth, which seeks to strengthen domestic growth drivers, especially household consumption (see Selected Issue 5: How Can China Boost Household Consumption?) and resilience to external shocks, improving the country's capacity for innovation while continuing to be open to the outside world.

45. Dual Circulation is work in progress for the long term; there is a need for careful observations of its effects across different areas at different stages of this strategy, and careful adjustment of measures to keep growth and development on the intended track. At this juncture, many specific elements of this broad overarching strategy still need more concrete plans and effective coordination among relevant governmental bodies. Key elements include bringing about further technology self-strengthening, achieving greater supply chain resilience, improving the functioning of domestic markets, and committing to rules-based multilateral trade. A systematic approach is needed for the implementation of policy decisions, monitoring of results, assessment of trade-offs, and adjustments of policies. AMRO encourages the authorities to also carefully consider the implications of the strategy for the ASEAN+3 region, when further developing plans and implementing them.

C.10 Safeguarding Fiscal Soundness

46. Authorities need to be mindful of fiscal constraints on both the revenue and expenditure sides, which will become more pronounced over time. On the revenue side, the property market slowdown will affect fiscal revenue deriving from transfer of land use rights in the short to medium term. Additionally, making progress towards achieving carbon neutrality might involve higher costs and lower profits for some sectors of the economy. Population aging will also narrow the personal income tax base. On the expenditure side, challenges could arise from the need to further strengthen social safety nets, as well as to increase spending on healthcare and social services amid population ageing and the need to further address

economic inequalities. Uncertainty over the amount of public spending towards climate change efforts is high. Contingent liabilities related to the rising LGFV debt will also lead to higher pressure on local government financing (See Box C: Fiscal Developments and Projections).

47. In the medium to long term, efforts to safeguard fiscal sustainability must continue. With multiple policy objectives competing for limited fiscal resources, the authorities should find ways to boost fiscal spending efficiency and reallocate expenditure to priority areas. This could include reallocating expenditure from traditional physical infrastructure to social infrastructure such as social security and social safety nets. Concurrently, it is important to boost revenue by making further progress on tax administration reform, broadening the tax base, and potentially introducing new taxes in alignment with China's changing economic structure. In simple terms, the income tax system should become more progressive, but this must be done in a measured way so that the increased tax burden does not inadvertently affect incentives to work. Separately, strengthening debt management remains critical, and it is important to further restrain local governments' reliance on LGFV financing and mitigate repayment risks.

C.11 Authorities' Views

48. While the authorities' and AMRO's views regarding policy priorities and options are largely aligned, they emphasize two notable points regarding pandemic control and carbon neutrality. With regard to pandemic control, authorities continue to hold a very firm view that given the threat posed by the Omicron variant, China needs to persist with its very strict border control measures and also its dynamic zero Covid policy in terms of domestically-transmitted cases. On carbon neutrality, authorities opine that the prospects of more advanced and cost-effective technologies approaching fruition, in the not-too-distant future, are promising. This, together, with the investment and business remodelling opportunities arising from carbon neutrality efforts, can help economic growth, not just in the long-term, but even over the short-term.

Box A. The CPI-PPI Divergence: Some Observations and Explanations[7]

China's PPI and CPI inflation diverged again in 2021. PPI inflation began to pick up in June 2020, accelerated in 1H 2021 and surged to a historical high of 13.5 percent in October. However, the pass-through to consumer prices has been muted so far. Headline CPI inflation has remained low, staying below 1 percent for most months in 2021. Why has this divergence happened, and will high PPI inflation transmit to higher CPI inflation in 2022?

The different trajectories of PPI inflation and CPI inflation could come from two sources: the compositions and weights of items in the two baskets, and the different dynamics of the items.

Our estimates show that the compositions of PPI and CPI in China differ significantly.[8] The PPI basket does not include services but services account for over one-third of the weight in the CPI basket. Consumer goods, which are the broadly overlapping items, only account for around a quarter of the weight in the PPI basket, but about 63 percent of the weight in the CPI basket (Table A1).

Table A1. Estimates of Compositions of CPI and PPI Baskets in China

CPI weights	2015 base	PPI weights	2015 base
Goods	62.9	Goods for consumption	25.4
Services	37.3	Food	9.7
Food (incl.tobacco and liquor)	30.0	Clothing	3.2
Clothing	8.5	Daily-use articles	6.0
Housing	20.0	Durable goods	6.4
Household articles and services	4.7	Goods for production	74.6
Transportation and Communication	10.4	Mining and quarrying	3.8
Education, culture and recreation	14.2	Raw materials	19.7
Health and medical care	10.3	Manufactured goods	51.0
Other articles and services	1.9		

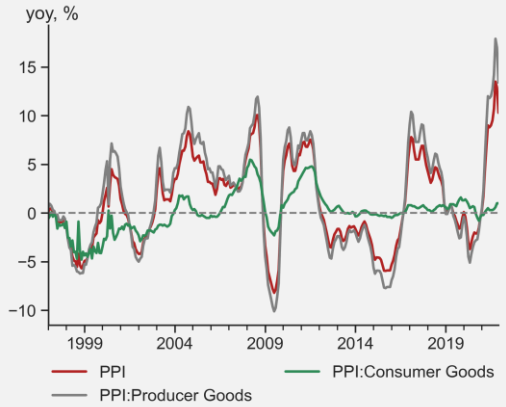
Source: Wind; AMRO staff estimation
Note: 1/ as PPI and CPI weights are based on estimates, the sum of main components is not exactly equal but close to 100.

Trends in both PPI inflation and CPI inflation are often dominated by highly volatile items. Large price swings in goods for production, especially mining and quarrying and raw materials, contribute to nearly all the fluctuation in PPI inflation (Figure A2). CPI inflation is still largely driven by food prices, which are more dependent on weather and other idiosyncratic shocks such as outbreak of swine fever in 2020 which wiped out almost 50 percent of the total pig population (Figure A3). The divergence of China's PPI and CPI inflation in 2021 largely reflects the diverging trends of prices of services and goods for production and pork, respectively.

The currently high PPI inflation in China is a result of growing domestic and overseas demand, and constrained supply. On the demand side, China has been catering to the surge in production orders from overseas, as most countries have struggled to normalize production in 2021 to meet rising demand resulting from unprecedented fiscal and monetary stimuli in advanced economies and the subsequent economic recoveries. Domestically, real estate developers also accelerated construction work in the first half of 2021 to expedite recycling of cash flows to meet new regulatory requirements. On the supply side, the global supply of oil and gas did not adjust adequately to meet rising demand on the back of the global economic recovery.

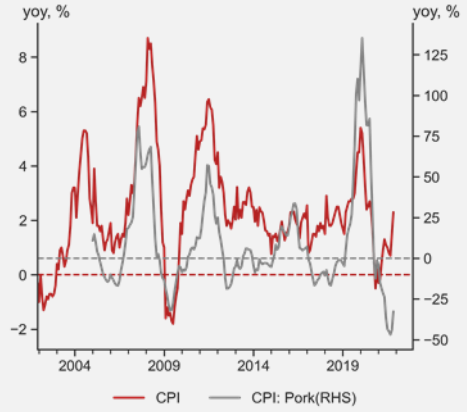
[7] Prepared by Zhiwen Jiao.
[8] The National Statistics Bureau of China (NBS) does not release the weights of items in the CPI and PPI baskets. In order to obtain estimates for the weights of the main components, we regress the aggregate index on its component indices. The NBS has changed the base year to 2020 for both CPI and PPI. However, we still use monthly data from 2016 to 2020, whereby 2015 is used as the base year, to minimize estimation errors from the small sample. The NBS calculates the weight of CPI based on the survey of consumption expenditures and the weight of PPI based on the industrial production for the large-scale enterprises.

Figure A2. PPI and Its Main` Categories



Source: Wind; AMRO staff calculations

Figure A3. CPI Inflation and Pork Inflation



Source: Wind; AMRO staff calculations

The increase in PPI inflation has become more broad-based, but further transmission to downstream industries and CPI inflation is likely to be limited. As of October 2021, the percentage of industries with PPI inflation above one and two standard deviations over the past five years' average increased to 54 percent and 36 percent respectively, from zero percent in January 2021. However, the increase among downstream industries has remained much lower than in upstream industries, implying the latter have absorbed a significant part of the higher cost so far. Based on our Structural VAR estimation, which shows that the transmission from PPI inflation to CPI inflation has been small on average, and not persistent in the past 10 years,[9] we assess that an increase in the pass-through of the higher cost to consumers will continue to be limited in 2022.

The gap between PPI inflation and CPI inflation will likely narrow in 2022. Inflationary pressures on PPI will subside with a pick-up in production capacities in other countries once the COVID infections come under control, fiscal and monetary stimuli in advanced economies are withdrawn, real estate activity in China have moderated, and supply shortages of key commodities such as coal are met. On the other hand, CPI inflation will rise due to the base effect, an increase in pork prices from their trough, a further recovery in consumption, and some lagged pass-through of certain producer prices such as food items and other essential goods for daily use.

Box B. Central Bank Digital Currency: e-CNY: Developments and Future Potential[10]

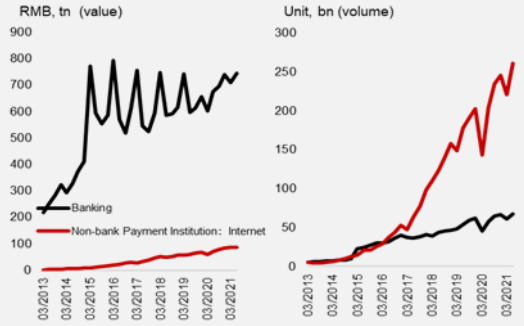
China has been spearheading the development of e-CNY—its version of a Central Bank Digital Currency (CBDC)—that aims to enhance the existing payment system's efficiency and resilience by providing a digital version of physical cash. This box takes stock of the retail e-CNY's progress and discusses how its design features could help address concerns over risks to the payments and financial systems.

The development of e-CNY is in the context of a rising trend of cashless payment in China. China has had rapid growth in online and mobile payments over the past decade, especially non-cash payments catering to small-value transactions, provided typically by non-bank private providers. Although the transactions through these providers account for only 8 percent of total non-cash payments in terms of value, they made up more than 80 percent of non-cash payments in terms of the number of transactions as of Q3 2021, reflecting a major shift in consumers' payment behavior (Figure B1). In contrast, cash has become less competitive in terms of efficiency and cost as a

[9] We estimated a SVAR model with CPI and PPI inflation as dependent variables and the CRB Commodity Index and nominal effective exchange rate as control variables. The impulse response results show that a one percentage point increase in PPI inflation will, on average, lead to about a 0.2 percentage points increase in CPI inflation over about a year.
[10] Prepared by Xianguo Huang

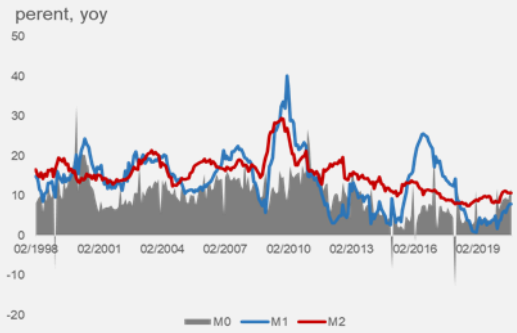
medium of exchange due to its physical form and associated costs of handling, storage and transport (Figure B2).[11]

Figure B1: Electronic Payment



Source: PBC

Figure B2: Money Growth



Source: PBC

The development of retail e-CNY has been progressive. In April 2014, the PBC formed a research group to study the feasibility of CBDC. The PBC officially revealed its plan to develop a CBDC in January 2016, and stepped up efforts in this area by establishing the Digital Currency Institute in July 2017. This step helped synergize resources for research and development related to e-CNY. After two years of in-house development and calibration, e-CNY pilots were conducted in various cities and applied to different use cases since later 2019. While such pilots are still ongoing, the upcoming Beijing Winter Olympics is expected to provide another avenue to test the use of e-CNY, including allowing non-residents to use e-CNY wallets for payments.[12] Meanwhile, the PBC has also been conducting research on cross-border payments and settlements through collaborative efforts, as a partner of multiple Central Bank Digital Currencies (mCBDCs) bridge projects.[13]

The e-CNY has been designed to minimize adverse impacts on the intermediation role of financial institutions and to bolster payment systems and financial stability. First, it is built upon a two-tier system with selected commercial banks acting as Tier-2 operating distributors and user interfaces, while the PBC acts as Tier-1 issuer and supervisor.[14] As a result, the-CNY distribution channel resembles the existing channel for distributing physical cash through banks, with each operator assuming the responsibility of developing its own version of an e-CNY wallet and interacting with its wallet holders.[15] Second, the e-CNY bears no interest rate, and the flow between e-CNY wallets and bank deposits is managed with caps on both transactions and balances for different tiers of wallets. Therefore, a mass exodus of bank deposits into e-CNY wallets is not possible, and the effect of a large-scale adoption of e-CNY on narrow and broad money supply and monetary policy's effectiveness should be limited. Third, as e-CNY enables big data tools and real-time monitoring, earlier detection of risks and timely intervention is feasible.

Design features that allow for anonymity for small-value holders and enable programmability should help incentivize usage and support useful digital applications in the future, respectively. The e-CNY needs to be held using the real name of the account holder" once the holding value surpasses a certain threshold, requiring Know-Your-Customer (KYC) process for verification. On the other hand, small-value holders do not need to have real-name transactions. This feature should help boost usage for daily economic activities by households and small firms. Smart-contract programmability will help foster additional digital applications down the road. For instance, in

[11] The PBC has highlighted that no corporate or individual can refuse to accept cash as a payment means and has enforced the rule through various round of penalties. In the first three quarters of 2021, 39 entities received financial penalties for refusing to accept cash.
[12] The official full-scale launch is not announced as of December 2021.
[13] The mCBDC bridge is a collaboration among the BIS Innovation Hub Hong Kong Centre, the Hong Kong Monetary Authority, the Bank of Thailand, the Digital Currency Institute of the People's Bank of China and the Central Bank of the United Arab Emirates.
[14] Other non-operating banks could also partner with selected banks in distributing e-CNY and provide related services at the current pilot stage.
[15] Rather than being based on blockchain technology, e-CNY leverages a hybrid of technologies—including trusted computing and special encryption—to achieve efficiency and security.

recent pilot projects, e-CNY has been used by some of the local governments to distribute fiscal allowances to targeted groups based on smart-contract functionality.

The development of e-CNY could help achieve other goals in addition to achieving a more efficient form of cash. The new e-CNY-based retail payment system will enhance the resilience of the overall payment system by providing an alternative to existing digital payment system developed by the private sector. Importantly, a new ecosystem built upon e-CNY could improve financial inclusion and help provide services to unbanked individuals. It could also help address demand among foreign visitors who want to use digital payments for small-value transactions but do not have a bank account. Moreover, an open e-CNY design and digital wallet ecosystem will help enhance market competition and create a more level playing field for new market entrants in payments.

The medium-term benefits of e-CNY and its impacts will still depend on how the system evolves and is calibrated further. More feedback from ongoing pilots and pilots scheduled in 2022 could provide additional information on decisions around the timing of a potential launch of the e-CNY and design adjustments. While the e-CNY has been designed to reduce impact on the existing financial system, how the financial sector responds to the competition—introduced by e-CNY—remains to be seen. On the external front, using e-CNY for cross-border retail payments could improve efficiency and reduce transaction costs significantly. The challenges to establishing such a system will likely relate more to institutional arrangements with other jurisdictions and will have less to do with technological capabilities.

Box C. Fiscal Developments and Projections[16]

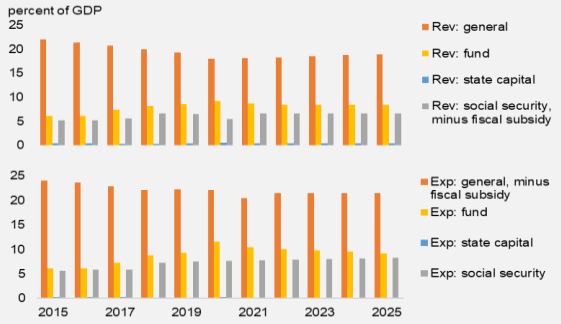
This box discusses recent trends in fiscal revenue and expenditure, and sheds light on the medium-term fiscal projection together with its underlying factors and associated risks.

Revenue measures were used to cushion the economy against the external headwinds associated with US-China trade friction and the COVID-19 pandemic. Unlike the spending-centric stimulus package during the global financial crisis in 2008-2009**,** since 2018, the authorities have largely focused on tax and fee cuts to stimulate the economy. Valued Added Tax (VAT) was cut during 2018 and 2019.[17] For individual Income Tax (IIT), the basic deduction was raised in 2018 and more special deduction items were added in 2019. Fees have been cut for several sectors.[18] Importantly, the authorities also temporarily reduced or waived the social security contributions for many enterprises in 2020, and reduced corporate income tax for the targeted service sectors and enterprises that were heavily affected by the pandemic. Additionally, VAT cut measures were also implemented to support SMEs in 2020 and 2021. As a result, the ratio of fiscal revenue to GDP declined from 20.0 percent in 2018 to 18.0 in 2020 (Figure C1).

Expansionary fiscal spending during 2018 to 2020 also played an important role in mitigating the economic downturn. Excluding fiscal subsidies to the social security fund, the ratio of expenditure in the general account to GDP was stable. However, expansionary fiscal spending was reflected in the government's fund account, which rose significantly from 8.8 percent of GDP in 2018 to 11.6 percent of GDP in 2020 (Figure C1). While a further breakdown in terms of current vs capital expenditure in this account is not available, anecdotal evidence indicates that a majority of the fund account's expenditure went to investment. Social security-related expenditure also rose steadily during the same period.

[16] Prepared by Xianguo Huang
[17] This includes a reduction of the VAT rate and targeted tax wavier for advanced manufacturing and SMEs.
[18] These range from a reduction or cancellation of payments charged by ports, railways, highways and airports to a reduction in various administration fees related to real estate registration, trademarks and patents, and travel documents.

Figure C1: Revenue and Expenditure (by Type of Fiscal Account)



Note: The carryover and forward, inter-account transfers, and bond issuances are adjusted and treated as financing in each fiscal account.
Source: CMOF; AMRO staff projections

Figure C2: Tax Revenue Growth

Note: Monthly data for January and February 2020 and 2021 are not available.
Source: CMOF

Fiscal policy in 2021 is expected to embody significant consolidation. The authorities had recovered revenue growth and achieved moderate spending growth in the 2021 Budget compared to 2020. Given the information as of Q3 2021, the fiscal deficit is likely to have declined significantly from 2020 but remain relatively sizeable. Tax revenue increased more sharply than the budgeted amount in 2021 on the back of strong GDP growth in 1H, but the increase moderated in 2H 2021 (Figure C2).[19] Expenditure in the general account grew moderately, while the fund account's expenditure slowed in terms of disbursement and contracted by 5 percent in the first 11 months.

In the medium term, the consolidated fiscal deficit is projected to decline slowly, however, fiscal policy will remain supportive of the economy by targeting individual sectors (Figure 3). The official general budgetary account's fiscal deficit, will decline moderately rise from 3.1 percent of GDP in 2021 to 2.8 percent in 2022. According to AMRO's projections, the overall fiscal deficit, including all fiscal accounts, will rise from 5.1 percent of GDP in 2021 to 6.0 percent in 2022, which will help stabilize economic growth, before gradually narrowing afterwards. The focus on quality of growth over quantity in the longer term, will affect both revenue and expenditure trajectories. Tax administration and increased tax revenue from the digital economy are expected to help stabilize fiscal revenue, although targeted sectors such as SMEs will continue to obtain support from revenue measures. Meanwhile, the authorities are expected to exercise prudence on the spending front, although spending in key areas to facilitate the economic transition and address social security needs will increase quite significantly.

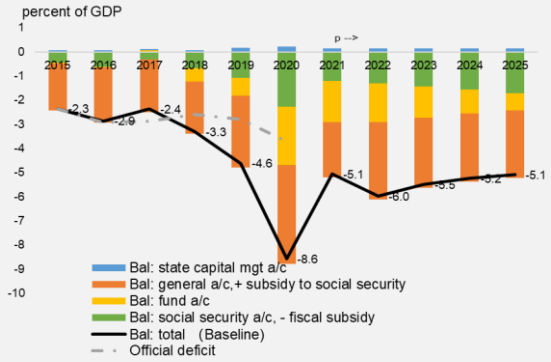
Risks are tilted to the downside. There could be downside risks to the baseline scenario on many fronts. The slowing property sector could significantly affect fiscal revenue from land use rights transfer in the next few years. Moreover, expenditure could be higher than in the baseline should a further need for enhanced social security and social safety nets be higher than expected. As highlighted in 14th Five-Year Plan (2021-25), China will focus on improving technological capacity in key areas such as next-generation artificial intelligence, semiconductors, and deep space, deep sea and polar exploration. All these efforts require significant long-term investment going forward, while population ageing further increases the fiscal burden.

Public debt is projected to rise further. The public debt to GDP ratio reached 47.0 percent at end-2021 and is expected to increase further to 57.1 percent by 2025 in the baseline scenario (Figure C4). The trajectory is sensitive to assumptions with regard to future real GDP growth, inflation and interest rate. Under the assumption that real GDP growth is half of the rate in the baseline case during 2022-2025, the public debt-to-GDP ratio will rise to 61.7 percent in 2025. This projection does

[19] The size of tax and fee cuts in 2021 was estimated to be around RMB1.1 trillion in 2021 by the State Taxation Administration. In comparison, the size of tax and fee cuts reached around RMB1.3 trillion in 2018 and RMB2.36 trillion in 2019, and increased further to RMB2.6 trillion in 2020.

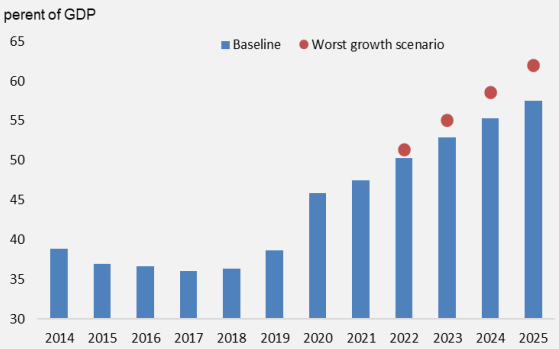
not include the additional public debt due to the government's efforts to further recognize part of LGFV debt as official debt through a debt swap.[20]

Figure C3: Revenue and Expenditure (by Fiscal Account)



Source: CMOF; AMRO staff projections

Figure C4: Public Debt



Note: Real GDP and the GDP deflator are assumed to grow by 5 and 3.5 percent respectively during 2022-2025. The worst growth scenario assumes real growth is halved compared to the baseline.
Source: CMOF; AMRO staff projections

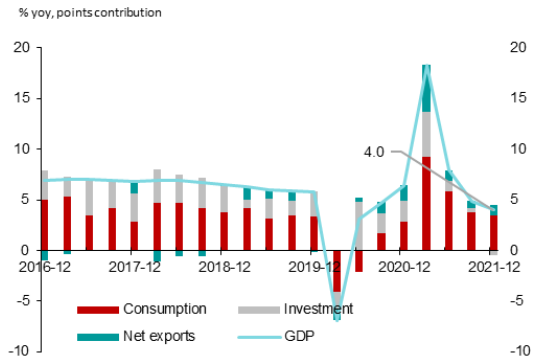
[20] The LGFV debt and debt tied to special construction and government guided funds that could be recognized as public debt were estimated to be RMB55.6 trillion, according to the IMF estimates in its staff report for the 2020 Article IV consultation. Strengthened efforts on this front to turn implicit debt to explicit debt will help enhance fiscal prudence and transparency. However, public debt will rise as a result. For example, if an additional 10 percent of LGFV is recognized as public debt annually, official public debt will rise by an additional 5-6 percentage points by 2025, assuming there is no new LGFV debt in this period.

Appendices

Appendix 1. Selected Figures for Major Economic Indicators

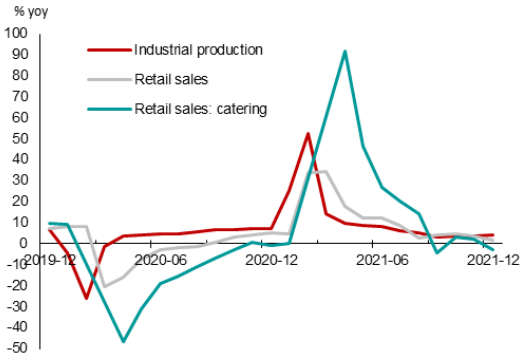
Figure 1.1. Real Sector

China's recovery from the 2020 downturn has stayed intact in 2H.
[GDP Growth]



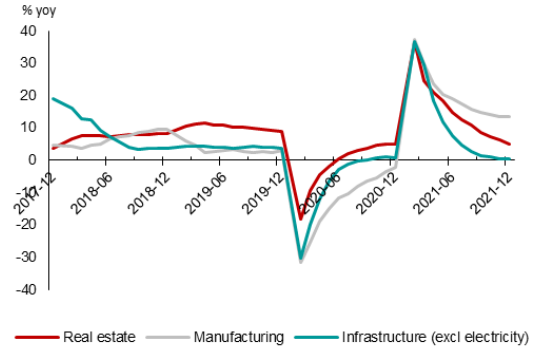
Source: Wind.

By broad types of economic activities, there has been more convergence recently.
[Industrial Production and Retail Sales]



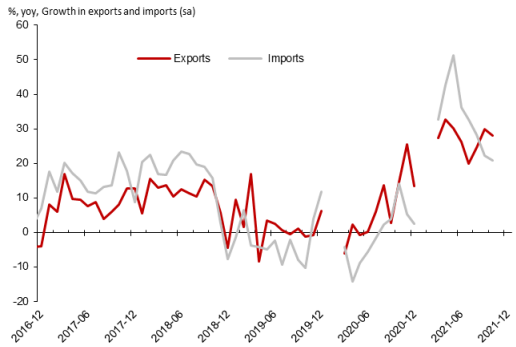
Source: Wind.

Investment has moderated overall, due to slowing infrastructure and real estate investments.
[Investment Growth]



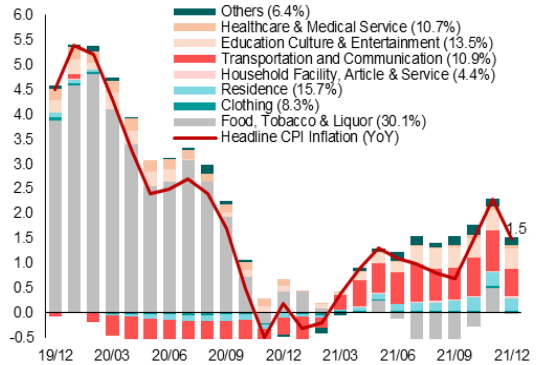
Source: Wind.

External trade has been strong in 2021, despite disruptions to shipments from time to time.
[Export and Import Growth]



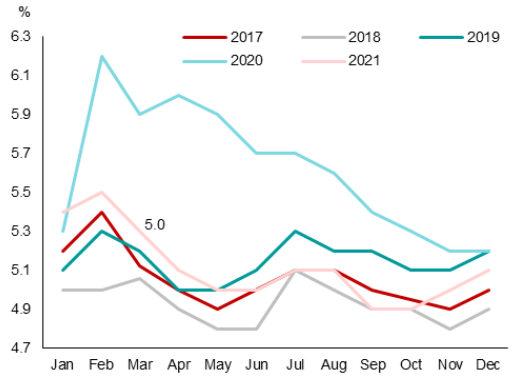
Source: Wind.

CPI inflation has stayed low, with modest pass-through from the PPI surge.
[CPI Inflation]



Source: Wind.

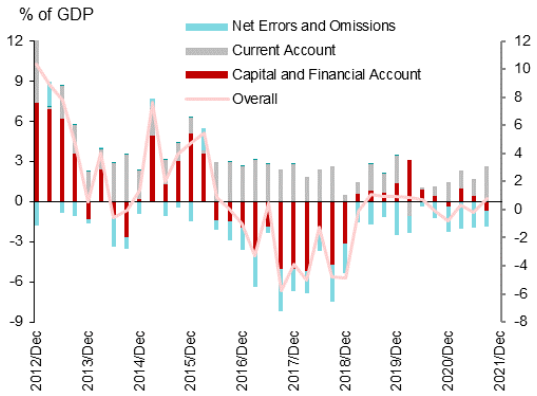
The surveyed urban unemployment rate has fallen steadily since peaking in February 2020.
[Surveyed Urban Unemployment Rate]



Source: Wind.

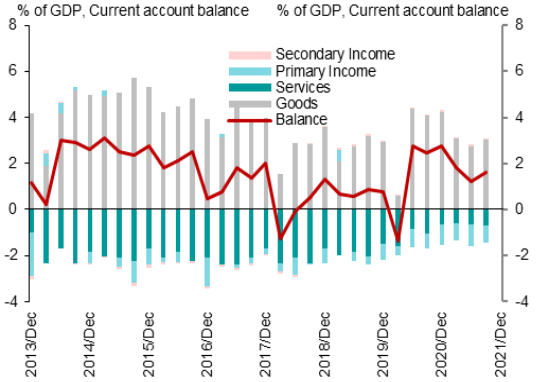
Figure 1.2. External Sector

The overall BOP position has been healthy, with the current account surplus being a key factor.
[Balance of Payment (BOP)]



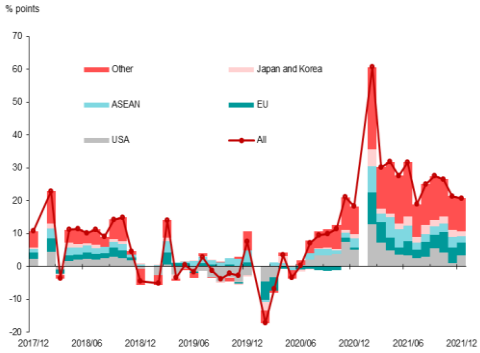
Source: Wind

The goods account surplus has held up well despite some external demand softening recently.
[Current Account Balance]



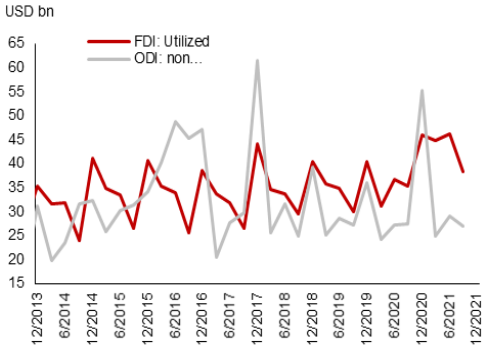
Source: Wind

Export growth was strong in 2021.
[Export Growth]



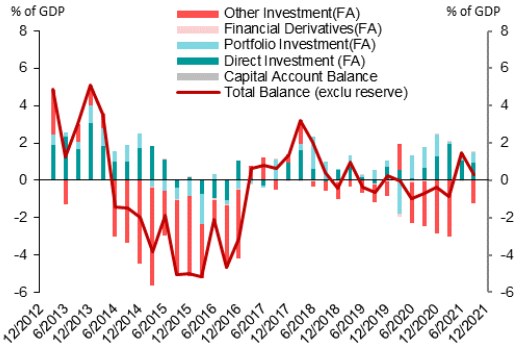
Source: Wind

Inward FDI has been resilient despite downward pressure globally.
[FDI and ODI]



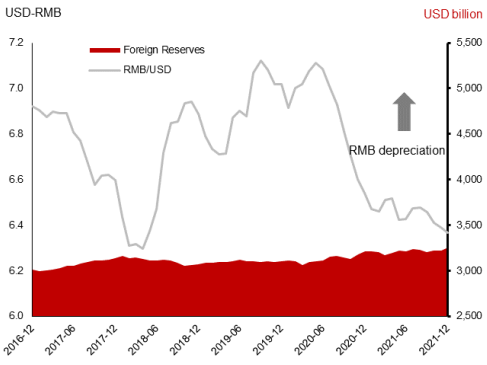
Source: Wind

Capital flows have been moderately positive.
[Capital Flows]



Source: Wind

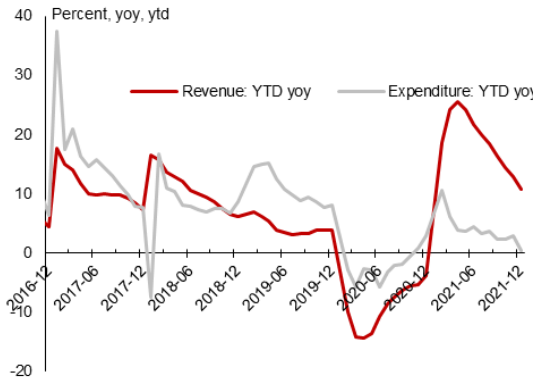
FX reserves have trended up slightly to reach USD3.25 trillion in December 2021.
[FX Reserves and USD-RMB Exchange Rate]



Source: Wind

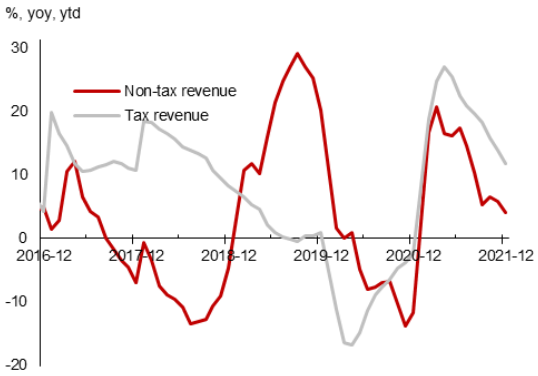
Figure 1.3. Fiscal Sector

Fiscal revenue growth slowed in 2H while spending was restrained through 2021.
[Fiscal Revenue and Expenditure]



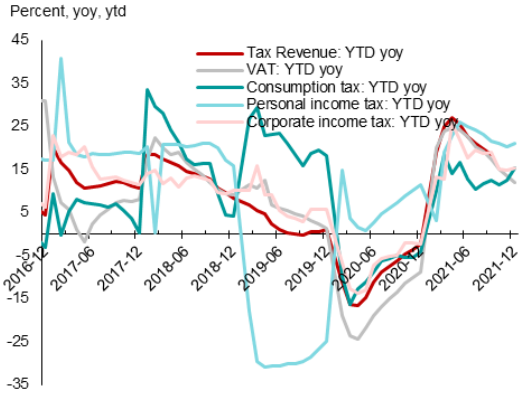
Source: Wind

Both tax and non-tax revenues have recovered in 2021, with the y-o-y dip in 2H due to base effects.
[Tax and Non-Tax Revenue]



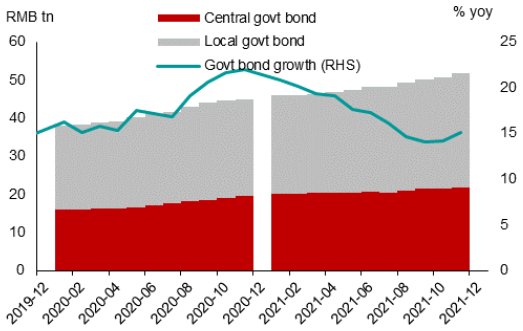
Source: Wind

Within tax revenue, personal income tax has been the most resilient in recent months.
[Tax Revenue: Breakdown]



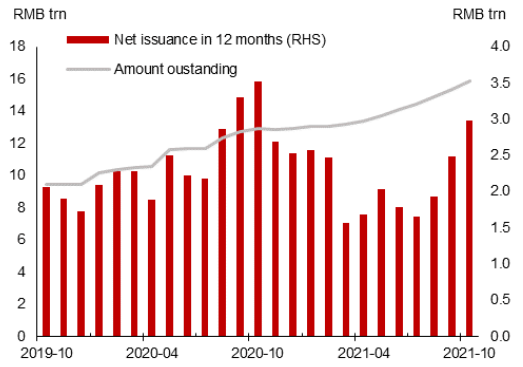
Source: Wind

Government debt increased markedly in 2020, to fund the deficit, ahead of the tight 2021 budget.
[Government Debt]



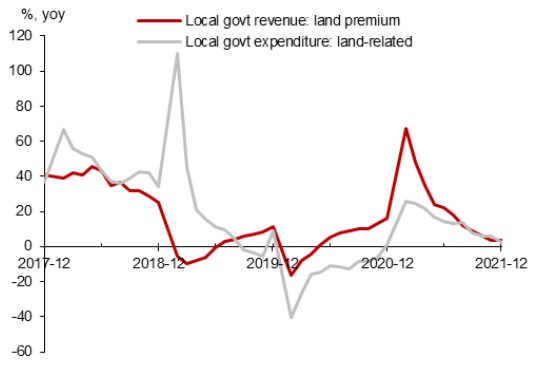
Source: Wind

Local governments have continued to issue sizeable amounts of special bonds for infrastructure spending, though less than in 2019
[Local Government Special Bonds]



Source: Wind

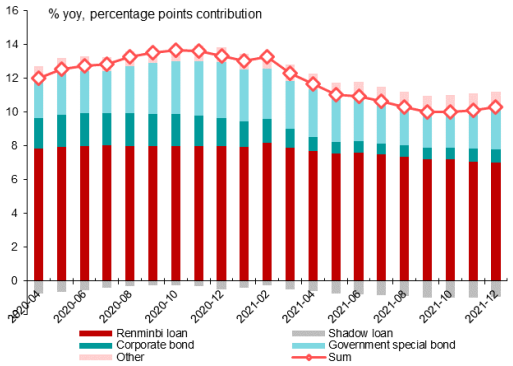
Land premium has decreased recently, as property markets have cooled across cities.
[Land Premium]



Source: Wind

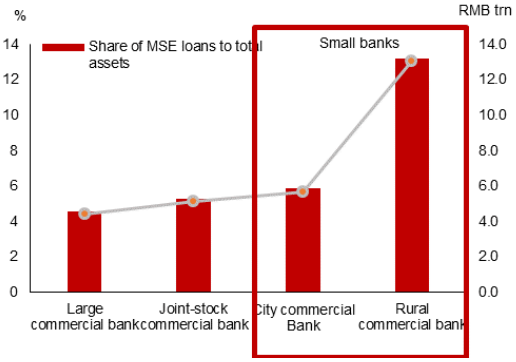
Figure 1.4. Monetary and Financial Sectors

Total social financing growth has slowed gradually, with the deleveraging policy in place.
[Total Social Financing (TSF) Growth]



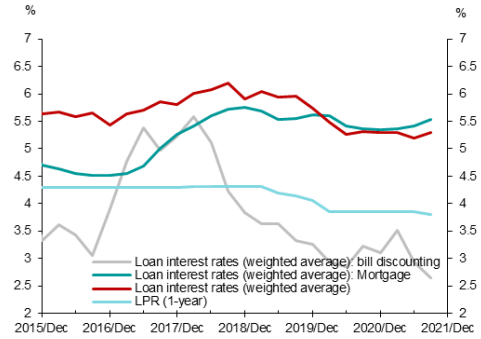
Source: Wind

Rural commercial banks have played a key role in providing credit to MSMEs.
[Share of MSME Loans in Total Assets: Banks]



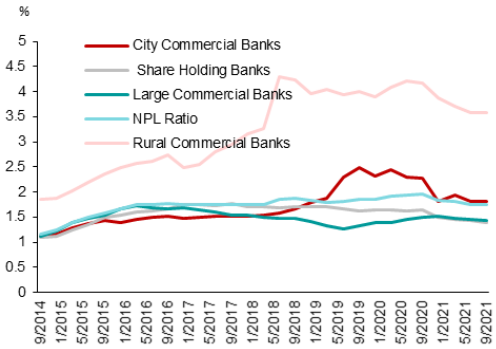
Source: Wind

Lending interest rates have stabilized, after falling during the earlier phase of the pandemic.
[Lending Rates]



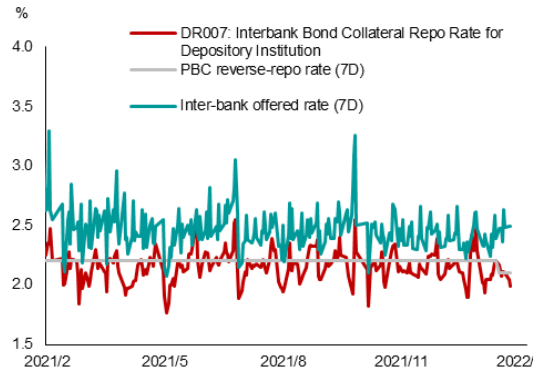
Source: Wind

With NPL disposal and economic recovery, banks' capital ratios have risen since mid-2020.
[Banks' Capital Adequacy Ratios (CARs)]



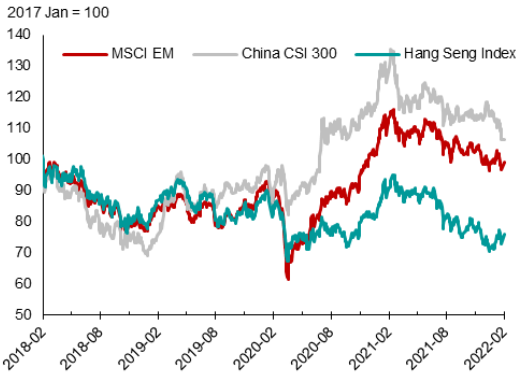
Source: Wind

Short-term market interest rates have stayed low.
[Market Interest Rates]



Source: Wind

Stocks markets have seen recurrent sell-offs due to concerns about growth, producer prices, regulatory adjustments, and credit risks.
[Stock Market Performance]



Source: Wind

Appendix 2. Selected Economic Indicators for China

	2018	2019	2020	2021	Projections 2022	Projections 2023
Real Sector	(In percent change unless specified)					
Nominal GDP (RMB trillion)	91.9	98.7	101.4	114.4	122.9	133.0
Nominal GDP (USD trillion)	13.9	14.3	14.7	17.7	19.1	20.6
Real GDP	6.7	6.0	2.2	8.1	4.8	5.7
Consumption	7.9	6.3	-0.3	9.8	4.6	6.1
Gross Capital Formation	6.8	4.0	4.3	2.6	6.2	4.9
PMI (Mfg)	50.9	49.7	49.9	50.5	…	…
PMI (non-Mfg)	54.4	54.0	52.6	52.9	..	…
Labor Market						
Newly-hired Urban Workers (Person mn)	13.6	13.5	11.9	12.7	10.2	11.0
Average Surveyed Unemployment Rate: Urban, %)	4.9	5.2	5.6	5.1	5.4	5.2
Average Wages of Workers Employed in Urban Non-Private Establishments (RMB. thousand)	82.4	90.5	97.4	108.1	115.7	126.1
Average Wages of Workers Employed in Urban Non-Private Establishments	10.9	9.8	7.6	11.0	7.0	9.0
External Sector						
Exports (% yoy, USD)	9.9	0.5	3.6	29.9	5.2	5.3
Imports (% yoy, USD)	15.8	-2.7	-0.6	30.1	7.0	7.2
Trade Balance (% of GDP)	2.7	2.7	3.5	3.0	2.5	2.2
Current Account (% of GDP)	0.2	0.7	1.9	1.8	1.1	1.2
Financial and Capital Balance (% of GDP)	1.3	0.1	-0.4	-0.8	0.2	0.3
FDI (% of GDP)	0.7	0.4	0.7	1.2	1.0	0.8
ODI (% of GDP)	1.0	-0.7	-0.7	0.7	0.6	0.8
External Debt, Gross (% of GDP)	14.3	14.4	16.1	16.5	16.8	17.0
Foreign Reserves (USD bn)	3,168.0	3,223.0	3,357.0	3,250.0	3,200.0	3250.0
Exchange Rate (Against USD, Period Average)	6.62	6.91	6.90	6.45	6.45	6.45
Monetary sector						
M2	8.1	8.7	10.1	9.0	9.0	8.5
Total Social Financing	10.3	10.7	13.3	10.3	10.2	10.0
Total Loan	12.9	11.9	12.5	11.0	10.7	10.3
Lending Rate (1y, Period End, %) for 2018; 1y Loan Prime Rate (Period End, %) for 2019 and after	4.35	4.15	3.85	3.80	…	
CPI (Period Average, % yoy)	2.1	2.9	2.5	0.9	2.2	2.0
Core CPI (Period Average, % yoy)	1.9	1.6	0.8	0.8	2.0	1.8
Producer Price Index (Period Average, % yoy)	3.5	-0.3	-1.8	8.1	5.0	4.2
Fiscal Sector						
Revenue (% y-o-y)	6.2	3.8	-3.9	10.7	6.9	9.1
Expenditure (% y-o-y)	8.7	8.1	2.8	0.3	12.3	9.7
Revenue (% of GDP)	19.9	19.3	18.0	17.7	17.6	17.5
Expenditure (% of GDP)	24.1	24.3	24.2	21.5	22.5	22.5
Deficit (% of GDP)	4.1	4.9	6.2	3.8	4.9	5.0
Deficit (% of GDP) Official	2.6	2.8	3.6	3.2	…	…
Government Debt (% of GDP)*	36.2	38.3	45.9	47.0	48.4	52.2
Financial Sector and Property Markets						
Shanghai Stock Exchange Composite Index	2,493.9	3,050.1	3,473.1	3,640.0	…	…
Shanghai Interbank Offered Rate, Overnight (%)	2.6	1.7	1.1	2.1	…	…
10 Year Treasury Bond Yield (%)	3.6	3.2	2.9	2.9	3.0	3.0
Banking Capital Adequacy Ratio (%)	14.2	14.6	14.7	15.1	14.7	14.9
NPL Ratio (%)	1.8	1.9	2.0	1.8	2.2	2.0

Note: (i) The data is as of 31 Dec 2021
(ii) Government debt includes both central and local government debt.
Source: National Bureau of Statistics, Ministry of Finance, People's Bank of China, Ministry of Commerce, Ministry of Human Resources and Social Security, China Customs, China Banking Regulatory Commission, State Administration of Foreign Exchange, AMRO.

Appendix 3. Balance of Payments

	2017	2018	2019	2020	2021
	(In percent of GDP)				
Current account	**1.5**	**0.2**	**0.7**	**1.9**	**1.8**
Trade balance	**1.8**	**0.6**	**0.9**	**2.5**	**2.6**
Goods	3.9	2.7	2.8	3.5	3.1
Exports	18.0	17.4	16.7	16.9	18.2
Imports	14.1	14.7	14.0	13.5	15.0
Services	-2.1	-2.1	-1.8	-1.0	-0.6
Exports	1.7	1.7	1.7	1.6	1.9
Imports	3.8	3.8	3.5	2.6	2.5
Primary income	-0.1	-0.4	-0.3	-0.7	-0.9
Credit	2.3	1.9	1.9	1.6	1.6
Debit	2.5	2.4	2.2	2.4	2.4
Secondary income	-0.1	0.0	0.1	0.1	0.1
Capital and financial account	**0.1**	**1.1**	**0.2**	**-0.7**	**-1.3**
Financial account	0.9	1.2	0.1	-0.5	-0.2
Direct investment, net	0.2	0.7	0.4	0.7	1.2
FDI	1.3	1.7	1.3	1.4	1.9
ODI	1.1	1.0	1.0	0.7	0.7
Portfolio investment, net	0.2	0.8	0.4	0.6	…
Liabilities (net inflow)	1.0	1.2	1.0	1.7	…
Assets (net outflow)	0.8	0.4	0.6	1.1	…
Other investment, net	0.4	-0.1	-0.7	-1.7	…
Liabilities (net inflow)	1.2	0.9	-0.3	0.4	…
Liabilities (Currency and deposits)	0.9	0.4	-0.4	0.5	…
Liabilities (Loans)	0.4	0.2	0.3	-0.2	…
Liabilities (Trade credit)	0.0	0.3	-0.2	0.1	…
Assets (net outflow)	0.8	1.0	0.4	2.1	…
Reserve assets	-0.7	-0.1	0.1	-0.2	-1.1
Net errors and omissions	**-1.7**	**-1.3**	**-0.9**	**-1.1**	**-0.5**
Overall Balance of Payments	**2.4**	**1.4**	**0.8**	**1.3**	**1.6**
Memorandum Items:					
Export growth (in USD, percentage change)	**10.5**	**9.1**	**-0.8**	**3.9**	**30.3**
Goods (contribution)	10.3	8.3	-1.2	4.2	26.5
Services (contribution)	0.2	0.8	0.4	-0.3	3.8
Import growth (in USD, percentage change)	**13.9**	**15.9**	**-2.5**	**-5.5**	**31.4**
Goods (contribution)	12.3	13.4	-1.7	-0.5	29.0
Services (contribution)	1.6	2.4	-0.8	-5.0	2.4
External debt (percentage of GDP)	**14.3**	**14.3**	**14.5**	**16.3**	
International reserves (in USD billion, end of period)	3,139.9	3,072.7	3,107.9	3,216.5	3,250.2

Appendix 4. Statement of Central/General Government Operations

	2017	2018	2019	2020	2021
			(In RMB trillion)		
Revenue: General Budgetary	**17.3**	**18.3**	**19.0**	**18.3**	**20.3**
yoy	*7.4*	*6.2*	*3.8*	*-3.9*	*10.7*
Tax Revenue	14.4	15.6	15.8	15.4	17.3
Consumption	1.0	1.1	1.3	1.2	1.4
VAT	5.6	6.2	6.2	5.7	6.4
Corporate Income	3.2	3.5	3.7	3.6	4.2
Personal Income	1.2	1.4	1.0	1.2	1.4
Others	3.4	3.5	3.5	3.7	3.9
Non-Tax Revenue	2.8	2.7	3.2	2.9	3.0
Carry Over Balances and Transfer Funds	1.0	1.5	2.0	3.0	3.0
Expenditure: General Budgetary	**20.3**	**22.1**	**23.9**	**24.6**	**24.6**
yoy	*7.6*	*8.7*	*8.1*	*2.9*	*0.3*
General Public Services	1.7	1.8	2.0	2.0	…
National Defense	1.0	1.1	1.2	1.3	…
Public Safety	1.2	1.4	1.4	1.4	…
Education	3.0	3.2	3.5	3.6	…
Science and Technology	0.7	0.8	0.9	0.9	…
Social Security and Employment	2.5	2.7	2.9	3.3	…
Health Care and Family Planning	1.4	1.6	1.7	1.9	…
Urban and Rural Community Affairs	2.1	2.2	2.5	2.0	…
Transportation	1.1	1.1	1.2	1.2	…
Others	5.6	6.1	6.5	7.0	…
Balance	**-3.0**	**-3.8**	**-4.8**	**-6.3**	**-4.4**
			(In percent of GDP)		
Revenue: General Budgetary	**20.7**	**19.9**	**19.3**	**18.0**	**17.7**
Tax Revenue	17.4	17.0	16.0	15.2	15.1
Consumption	1.2	1.2	1.3	1.2	1.2
VAT	6.8	6.7	6.3	5.6	5.6
Corporate Income	3.9	3.8	3.8	3.6	3.7
Personal Income	1.4	1.5	1.1	1.1	1.2
Others	4.0	3.8	3.6	3.7	3.4
Non-Tax Revenue	3.4	2.9	3.3	2.8	0.0
Expenditure: General Budgetary	**24.4**	**24.0**	**24.2**	**24.2**	**21.5**
General Public Services	2.0	2.0	2.1	2.0	…
National Defense	1.3	1.2	1.2	1.3	…
Public Safety	1.5	1.5	1.4	1.4	…
Education	3.6	3.5	3.5	3.6	…
Science and Technology	0.9	0.9	1.0	0.9	…
Social Security and Employment	3.0	2.9	3.0	3.2	…
Health Care and Family Planning	1.7	1.7	1.7	1.9	…
Urban and Rural Community Affairs	2.5	2.4	2.5	2.0	…
Transportation	1.3	1.2	1.2	1.2	…
Others	6.7	6.6	6.6	6.9	21.5
Balance	**-3.7**	**-4.1**	**-4.9**	**-6.2**	**-3.8**
Official deficit (balance after tranfer adjustments)	**-2.9**	**-2.6**	**-2.8**	**-3.6**	**-3.2**

Appendix 5. Monetary Survey

	2017	2018	2019	2020	2021
Money supply	nual percentage change, unless otherwise specif				
Broad money (M2) (percent of GDP)	406.3	397.4	402.7	431.5	416.7
Broad money (M2)	8.1	8.1	8.7	10.1	9.0
M1	21.4	11.8	1.5	4.4	8.6
M0	8.1	3.4	3.6	5.4	9.2
Money multiplier (times)	5.2	5.5	6.1	6.6	7.2
Reserve requirement ratio (RRR) (percentage of deposit liabilities)					
Large banks	17.0	17.0	14.5	13.0	12.5
Small and medium-sized banks	15.0	15.0	12.5	11.0	9.5
Total social financing	nual percentage change, unless otherwise specif				
Total social financing (percent of GDP)	247.5	247.0	254.7	281.0	274.7
Total social financing	32.0	10.3	10.7	13.3	10.3
Bank loans (contribution)	8.9	7.6	7.4	8.0	7.0
Shadow banking (contribution)	2.2	-1.4	-0.8	-0.5	-0.9
Net corporate bond financing (contribution)	0.6	0.9	1.2	1.7	0.8
Net government bond (contribution)	NA	2.4	2.1	3.3	2.5
Banks	(Annual percentage change)				
Deposits	9.0	8.2	8.7	10.2	9.3
Loans	12.7	13.5	12.3	12.8	11.5
Small and Micro Enterprise Loans	15.1	8.9	10.2	15.7	17.1
Real estate (RMB loan)	20.7	20.2	14.8	11.6	5.2
Mortgage (RMB loan)	14.4	17.6	16.8	14.5	11.3
Manufacturing (all currency)	5.1	6.0	6.9	19.9	22.5
Infrastructure (all currency)					
Water conservancy, environment and public facilities	25.9	6.1	11.1	…	…
Transportation, warehousing and postal services	10.3	10.5	12.6	…	…
Banking sector soundness indicators	(In percentage, unless otherwise specified)				
Non-performing loan ratio	1.7	1.8	1.9	1.8	1.7
Special-mention loan ratio	3.5	3.1	2.9	2.6	2.3
Provision coverage ratio (provisions/NPLs)	181.4	186.3	186.1	184.5	196.9
Loan-to-deposit ratio	70.6	74.3	75.4	76.8	79.7
Liquidity coverage ratio	123.3	138.0	146.6	146.5	145.3
Net interest margin	2.1	2.2	2.2	2.1	2.1
Return on assets	0.9	0.9	0.9	0.8	0.8
Return on equity	12.6	11.7	11.0	9.5	9.6
Capital Adequacy Ratio	13.7	14.2	14.6	14.7	15.1
Tier 1 capital adequacy ratio	11.4	11.6	12.0	12.0	12.4
Core Tier 1 Capital Adequacy Ratio	10.8	11.0	10.9	10.7	10.8
Interbank lending: weighted average interest rate: 7 days: current month value	3.5	3.6	3.0	2.5	2.4

Appendix 6. Data Adequacy for Surveillance Purposes: a Preliminary Assessment

Key Indicators for Surveillance	Data Availability[i]	Reporting Frequency/ Timeliness[ii]	Data Quality[iii]	Consistency[iv]	Others, if any[v]
National Accounts	Available	Quarterly GDP, monthly CPI and PPI, monthly industrial production, monthly fixed asset investment, monthly retail trade	China has implemented a new quarterly GDP accounting measure since 2015.	-	More data for expenditure side data for real GDP would be welcomed.
Labor market	Available	Quarterly data for newly-hired workers and unemployment Quarterly data for new jobs and unemployment in urban areas	-	-	There is room to improve accuracy.
Balance of Payments (BOP) and External Position	Available	Quarterly BOP data released within 3 months after the quarter ends, monthly trade data within 3-4 weeks after the month ends.	Errors and omissions can sometimes be large.	-	Earlier release would be welcomed.
State Budget and Government/ External Debt	Available	Monthly fiscal data released within 3-4 weeks after the month ends. Quarterly foreign debt data released within 3 months after the quarter ends. Yearly government outstanding debt data released within 6 months after the year ends.	-	-	
Money Supply and Credit Growth	Available	Monthly data release within 2-4 weeks after the month ends	-	-	-
Financial Sector Soundness Indicators	Available	Quarterly data release within 3 months after the quarter ends.	-	-	Earlier release would be welcomed.
SOE Statistics	Some key data available	Monthly data release within 2 months after the month ends	-	-	More detailed data would be welcomed.

Annexes: Selected Issues

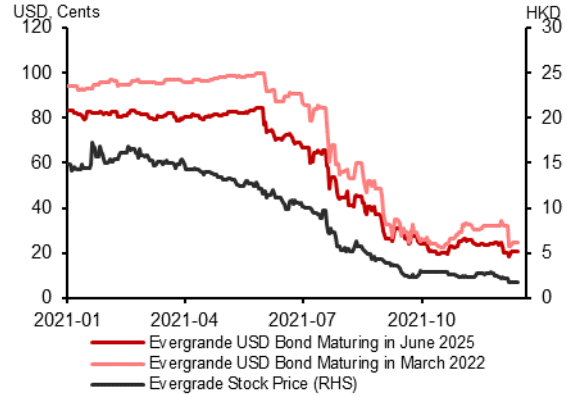
1. Coping with Real Estate Sector Transformation Amid Emerging Risks[21]

China's real estate sector risk came into the spotlight in 2021

1. Financial distress at Evergrande has led to a series of risk events in the real estate sector since mid-2021.[22] A series of negative news about the company's financial situation since June 2021, including delayed interest payment, missed payments to contractors, successive downgrades of credit ratings and suspension of projects, have significantly intensified market concerns about the default risk of weak real estate developers, potential contagion and the financial health of the real estate sector in China

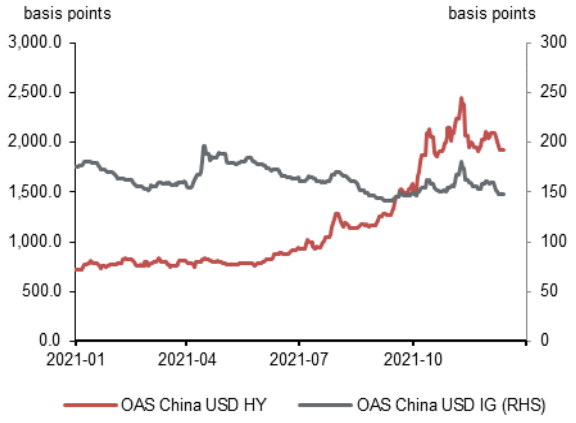
2. These events initially led to a sharp repricing in the financial markets. Since end-May 2021, Evergrande's U.S. dollar bond and stock prices have declined sharply by close to 80 percent (Figure A1.1). The share prices of several other developers with weak balance sheets also experienced strong selloffs. The negative impact was most pronounced in the offshore high yield bond market, with the spreads of China's U.S. dollar high yield corporate bonds shooting up to around 2500 basis points in early November 2021(Figure A1.2). However, there has been little sign of spillovers to investment-grade bonds so far.

Figure A1.1. Bond and Stock Prices of Evergrande



Sources: Bloomberg Finance L.P.; AMRO staff calculations

Figure A1.2. China: Credit Spread of U.S. Dollar Corporate Bonds



Sources: Bloomberg Finance L.P.; AMRO staff calculations

3. The situation seems to have stabilized in recent months. The fluctuations in equity and bond prices of developers in financial distress have become more moderate from mid-October. The equity index of the overall real estate sector was generally stable. Meanwhile, the credit spread of China's high yield U.S. dollar corporate bonds has stabilized, albeit at a still high level at around 2000 basis points. The quieter market reaction implies the default risk may have been mostly priced in. However, the very wide credit spreads in the offshore high yield bond market indicate that the concerns over credit risk of financially weak Chinese developers remain significant.[23]

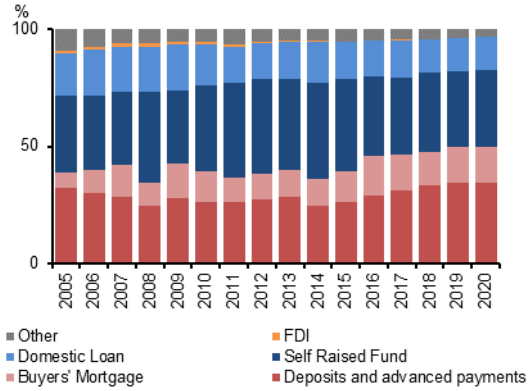
[21] Prepared by Zhiwen Jiao
[22] According to news reports, there is a series of credit events concerning several Chinese developers including Evergrande Group, Fantasia Holdings, Xinli Holding, and Kaisa Group.
[23] For an analysis of potential credit risk from Chinese real estate developers, please see Li Lian Ong and Chaipat Poonpatpibul (2021), https://www.amro-asia.org/wp-content/uploads/2021/11/AMRO-Analytical-Note_Evergrande-and-Chinas-Real-Estate-Sector_Nov-3-2021.pdf.

The liquidity crunch is a result of developers' inherent fragility and an unfavorable operating environment

4. The liquidity problem among Chinese developers has its roots in their business models. Some developers have adopted the so called "high leverage and high turnover" strategy – aggressive borrowing, fast project construction and rapid sales. For example, Evergrande's total liabilities more than quadrupled in a matter of three years, from CNY 362.1 billion in 2014 to CNY 1,519.5 billion in 2017, resulting in its leverage ratio increasing from 76.3 percent to 86.3 percent in this period. The strategy worked well during the upcycle and the period of increased profitability. However, liquidity pressures started to build up quickly once the property market cooled.

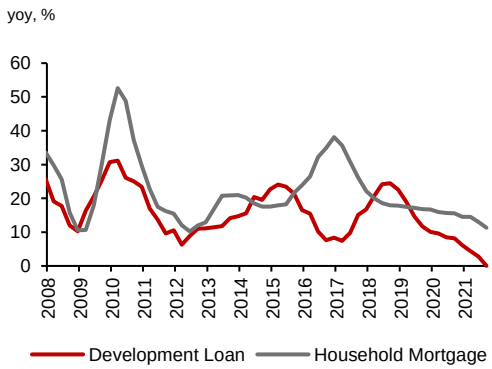
5. Highly-leveraged developers are under liquidity pressure.[24] The aim of policy measures is to foster healthy development of the property sector and safeguard financial stability, and to improve the profile of their sources of funding (Figure A1.3). The growth rate of bank loans for real estate development declined from 6.1 percent in 2020 to 0.9 percent in 2021, while household mortgage loan growth decelerated from 14.6 percent in 2020 to 11.3 percent in 2021. (Figure A1.4). If we take into account other borrowings from the financial sector through non-traditional loans, developers' total funding from the domestic financial sector contracted by about 12.7 percent in 2021.

Figure A1.3. Sources of Funding for Real Estate Developers in China



Sources: Wind; AMRO staff calculations
Note: Domestic loan refers to borrowings of various forms borrowed by investing units from banks and nonbank financial institutions during the reference period for the purpose of investment in fixed assets.

Figure A1.4. China: Growth in Development Loans and Household Mortgage



Sources: Wind, AMRO staff calculations.

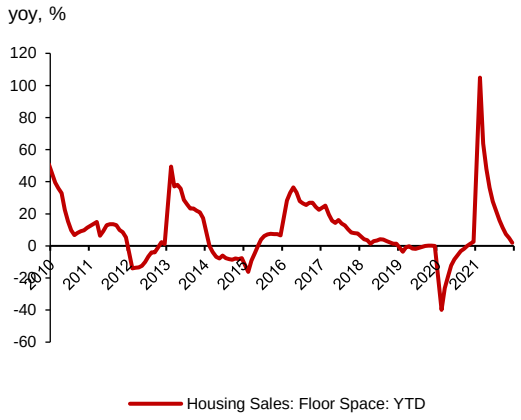
6. Slowing housing sales added additional financial pressure on developers that relied significantly on presales as a source of financing. Although housing sales were strong in the first half of 2021, news reports of financial difficulties facing several developers including Evergrande, combined with tighter regulations on housing transactions, led to a sharp slowdown in the second half of 2021. Year-to-date growth of housing sales, by value, decelerated sharply from 38.9 percent in June to 4.8 percent in December 2021.

[24] The Chinese authorities rolled out rules in August 2020 to cap the leverage ratio of developers and improve their debt repayment capacity. This policy targets selected developers, wherein their financial positions are assessed against three criteria: (1) liability-to-asset ratio (excluding advance receipts) of less than 70 percent; (2) net gearing ratio of less than 100 percent; (3) cash-to-short-term debt ratio of more than one. Regulations on developers' financing were further tightened in the second half of 2020 and the first half of 2021. Investment in real estate development through trust products has also been restricted and trust companies are required to further decrease their outstanding amount to real estate development. Concentration ratios for bank loans concerning real estate development and household mortgage were introduced as well. Additionally, the government tightened regulations related to housing transactions to temper rising prices in the first half of 2021.

Downward pressure on China's housing market has been increasing amid worsening liquidity among developers

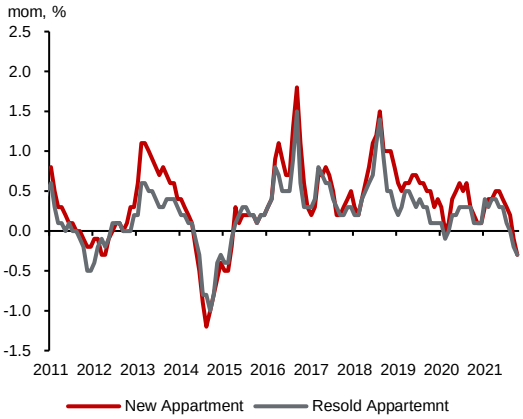
7. Housing transactions continued to weaken markedly. The year-to-date growth rate of housing sales by floor space declined sharply from 27.7 percent in June to 1.9 percent in December 2021 (Figure A1.5). Meanwhile, more cities have started to witness declines in housing prices. Sequentially, both prices of new and resale apartments in the 70 large cities have started to contract in recent months (Figure A1.6).

Figure A1.5. Growth of Housing Sales by Floor Space



Sources: Wind; AMRO staff calculations

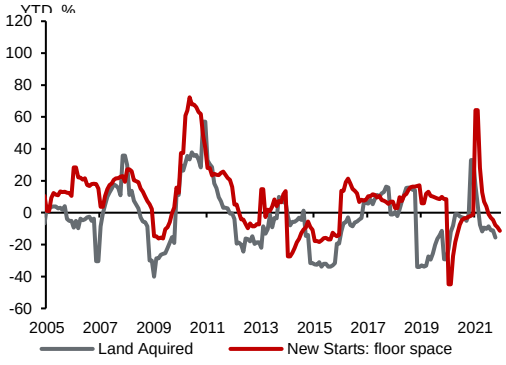
Figure A1.6. Prices of New and Resale Apartments in China



Sources: Wind; AMRO staff calculations

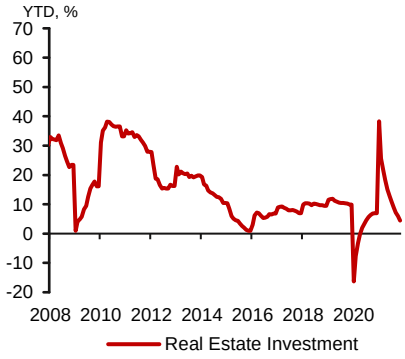
8. Activities related to housing development also decelerated significantly. Year-to-date housing new starts by floor space has started to contract since July, and the contraction deepened further to 11.4 percent in December 2021. Meanwhile, the land area acquired by developers declined by 15.5 percent in 2021 (Figure A1.7), leading to lower land price premium. The significant impact on the land market also reflected the high failure rate of land auctions than in the past. The year-to-date growth rate of overall real estate investment fell from 15 percent in June to 4.4 percent in December 2021 (Figure A1.8).

Figure A1.7. Housing New Starts and Land Acquired in China



Sources: Wind; AMRO staff calculations

Figure A1.8. Growth in Real Estate Investment

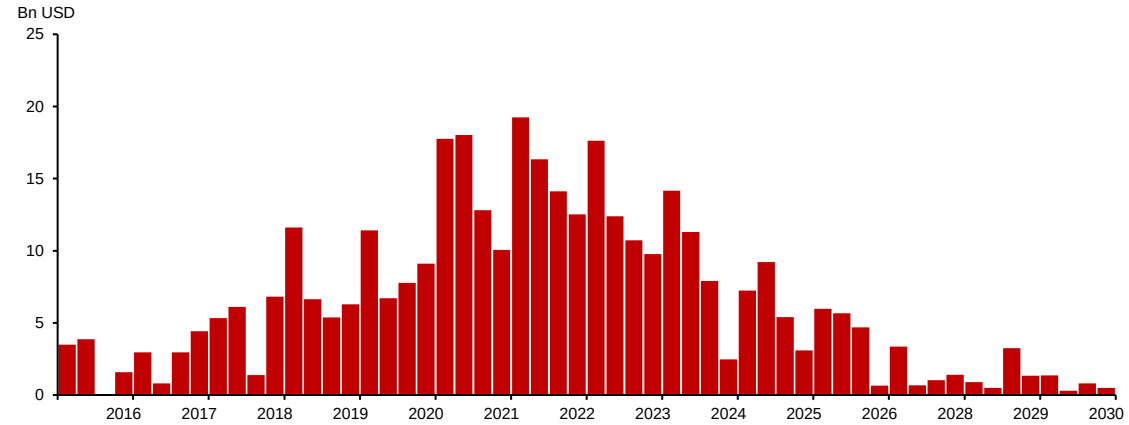


Sources: Wind; AMRO staff calculations

Liquidity pressure could persist well into 2022

9. The amount of offshore bonds of Chinese developers maturing in 2022 and 2023 remains large. According to data from Wind, USD62.2 billion and USD 50.5 billion offshore bonds of real estate companies will be maturing in 2022 and 2023, respectively (Figure A1.9). It could be challenging for some overstretched Chinese developers to rollover their debt, especially those which have thin cash buffers and rely on sales or installment payments from clients in order to sustain their debt repayment capacity. Although the credit spread has stopped widening recently, the credit risk premium charged by offshore investors is still very high. Significant improvements in the real estate sector may be needed before Chinese developers can obtain substantial funding in the offshore primary market again. Some financially weak developers may be completely shut out of the market.

Figure A1.9. Maturity Profile of Offshore Bonds of Chinese Real Estate Companies



Sources: Wind; AMRO staff calculations

10. The direction of policies to ensure healthier balance sheets of real estate developers is firm, although some policy adjustments have been made to provide some support to the market. Chinese financial regulators have provided guidance and clarifications on existing policy measures to banks to encourage them to meet the reasonable funding needs of real estate developers. The National Association of Financial Market Institutional Investors (NAFMII) will also prioritize bond issuance for some qualified developers in domestic bond market. More city-level-based measures could also be deployed to stabilize the housing markets in their regions.[25] These measures will help mitigate liquidity pressure to a certain extent, but they will not change the direction of the Chinese government's deleveraging efforts. Developers will have to continue to strive to meet the regulatory requirements.

The growth impact from the property market downturn could be significant

11. A slowdown in the real estate sector could affect economic growth in 2022. The impact from a slowing down real estate sector will not only be on the sector itself, but also on upstream sectors that provide the main inputs for construction activities such as raw materials, and also downstream sectors such as furniture and home appliances. Recent research shows that the size of the real estate and related sectors is in the range of one-fifth to one-third of

[25] According to some news report, there are already 11 cities in China that have announced policy measures to support housing market as of 20 December 2021.

China's GDP.[26] As the real estate sector is also a very important source of revenue for local governments, a significant slowdown could severely constrain local governments' capacity to support their economies. If the depth of the downturn this time around is relatively mild like during the 2012 episode, and we only consider the sector's direct impact on construction (7.1 percent of GDP in 2020) and real estate services (7.2 percent of GDP in 2020), then the slowdown in the real estate sector may reduce GDP growth by around one percentage point in GDP growth in 2022.[27] If the downturn turns out to be deeper than assumed, the drag on GDP growth will be bigger.

12. It is important for policymakers to closely monitor and assess the development of risks in the sector, and adjust policies to prevent significant impact on economic growth. The recent Politburo meeting and Central Economic Working Conference in December 2021 has appropriately underscored the policy focus on stabilizing the real estate sector in 2022. Such stabilization will not only provide support to economic growth, but also make room for real estate companies to adjust their business models and for the government and stakeholders to resolve companies that are facing serious financial difficulties.

[26] Rogoff, Kenneth and Yuanchen Yang (2020) estimated that the size of China's real estate sector including construction and other related industries accounts for 29 percent of GDP. Goldman Sachs estimated that the size is 23.3 percent of GDP. New reports often cite a wide range of numbers up to thirty some percent.

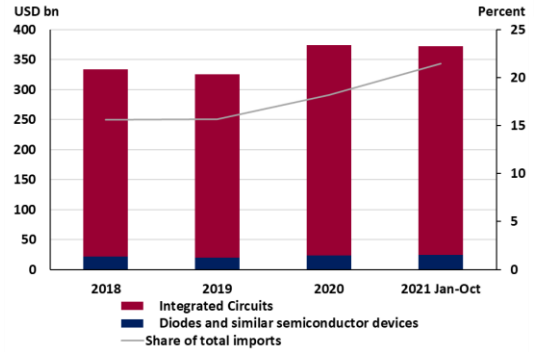
[27] However, this estimate does not consider the impact from the indirection connections to other industries and second round effects. It also does not take into account the impact on private consumption due to weakening confidence and the adverse wealth effect. In addition, the policy support this time has been more measured and targeted to achieve stabilization while avoiding overstimulation.

2. Supply Chain Challenges: The Case of Semiconductors[28]

1. This Selected Issue examines the challenges facing China in its efforts to build up domestic capability and capacity to produce advanced semi-conductors, and provides some policy suggestions. The analysis focuses on (a) the extent to which China is dependent on global supply chains (GSCs) for producing semiconductors; (b) the extent to which various sectors of the economy make intensive use of semiconductors; (c) the ways in which and the extent to which China is ramping up efforts at mitigating these vulnerabilities and (d) the prospects of China becoming more self-sufficient in semi-conductors.

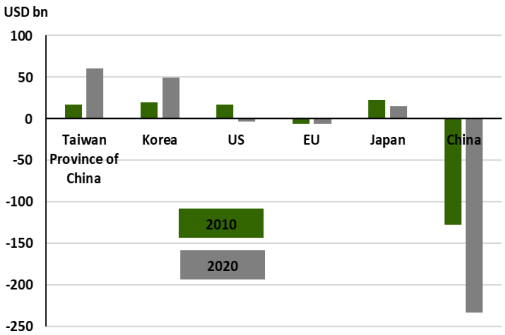
2. As China continues to play key roles in GSCs for high-tech products and as cross-border production and trade continue to expand, its demand for semiconductors will rise steeply for many years to come. By value, semiconductors' share of China's imports rose from about 16 percent in 2019 to about 18 percent in 2020 and likely about 22 percent in 2021 despite a pronounced global supply crunch (Figure A3.1). These imports feed into China's production of automobiles, smartphones, and other electronic products such as personal computers – constituting critical parts of the supply chains of these Chinese exports. China is the only large net importer of semiconductors among all key economies. (Figure A3.2)

Figure A3.1 China's Imports of Semiconductors and Share of Total Imports



Source: China General Administration of Customs

Figure A3.2 Net Semiconductor Exports by Country/ Region in 2020



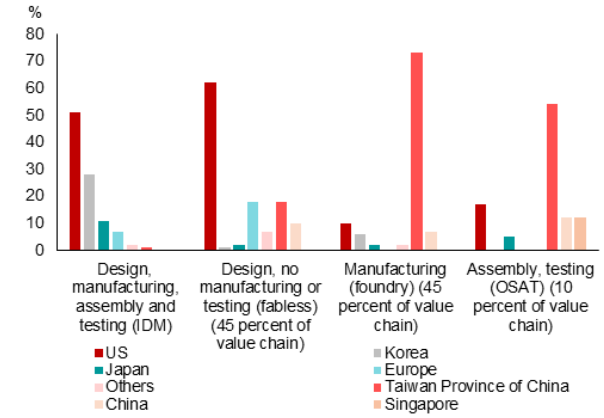
Sources: CEIC; Eurostat

3. On the supply side, countries' roles across the semiconductor supply chain and production process reflect their technological capabilities – and China's limitations[29] are quite pronounced in several areas. Among the common business models of semiconductor production within the supply chain are: design, manufacturing, assembly, and testing,[30] design (fabless);[31] manufacturing (foundry)[32] is the one which is most challenging

[28] Prepared by Suan Yong Foo and Fan Zhai
[29] From hereon, China refers to mainland China.
[30] Design exacts the highest requirements in terms of technological advancement. Only a few companies can design and manufacture the most advanced chips with node sizes of 14nm and 7nm, because of the skills and large investment required for design, R&D, scaling, and other activities (McKinsey, 2020). Estimates suggest that Design accounts for 53 percent of industry R&D, 13 percent of industry capex, and 50 percent of value added (Boston Consulting Group (BCG) and Semiconductor Industry Association (SIA)).
[31] Fabless companies design devices themselves but contract the manufacturing to third parties. The benefits of this business/ operating model include lower fixed costs and capital investment requirements, more consistent margins and better earnings predictability. Key fabless vendors include Broadcom, Qualcomm, Marvell, Xilinx, NVIDIA, Mediatek, and PMC-Sierra.
[32] Manufacturing cutting-edge semiconductors also requires strong capabilities in research, supply chain, talent, and intellectual-property (IP) protection. Deep knowhow is also required, even if the companies do not design chips themselves. Estimates suggest that wafer fabrication accounts for 13 percent of industry R&D, 64 percent of industry capex, and 24 percent of value added. (BCG and SIA). Foundries are specialized third-party manufacturers which perform wafer fabrication for others on a contract basis. Foundries do not design any devices themselves. Key players include Taiwan Semiconductor (TSMC) and United Microelectronics (UMC) in Taiwan, GlobalFoundries in the US, DongbuAnam in Korea, Semiconductor Manufacturing International Corp (SMIC) in China, and IBM Microelectronics in the US.

technologically. By location of semiconductor firms, China currently has a moderate share of firms which are engaged in assembly-and-testing,[33] the least difficult area to develop and operate. For the other business models which involve higher level of technical difficulties, China's shares are even smaller.

Figure A3.3 Location of Semiconductor Companies, by Stage in Production, in GSCs



Source: Natixis; worldviewstratford.com.

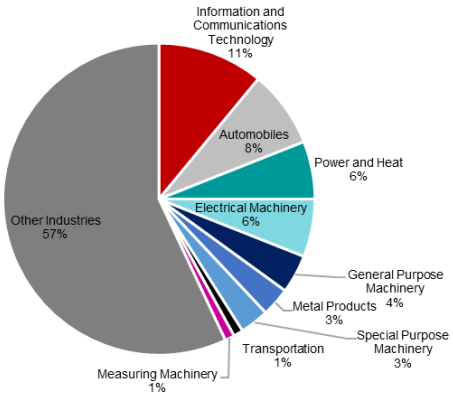
4. Developing leading-edge, end-to-end design and manufacturing capabilities has become a key objective for some industry players and countries recently, due to vulnerabilities exposed by supply chain disruptions, semiconductor shortages and technology tensions. First, the gap between semiconductors orders and deliveries increased markedly in 2021 – partly due to an unexpectedly strong rebound of demand for products which make heavy use of semiconductors and partly due to greater adoption of technologies which require semiconductors (such as in the auto industry). Leading chip producers—including Taiwan Semiconductor Manufacturing Company (TSMC), Samsung (Korea) and Intel (US)—expect the current chip shortage to last until 2022. Major chip customers in the automotive and electronics industries also share this view (EIU, 2021). Second, the shortage adversely affects several sectors such as consumer electronics (including phones, laptops and entertainment systems); automotives (including electric vehicles); and home appliances (although most of them do not require cutting-edge chips). Third, the suddenness of the supply shock and its wide sectoral reach could have significant implications for countries' industrial development, control of costs for factor inputs, and growth.

5. As China's share is quite limited in most parts of GSCs for producing semiconductors, the sectors that use semiconductors intensively are vulnerable to shocks to the GSCs. China's large and increasing import of semiconductors (as shown in Figure A3.1) owes to the fact that many important industries in China are critically dependent on the external supply of these key components. Semiconductor-related industries—including telecommunications, computing, automobiles, healthcare and agriculture equipment—made up more than 43 percent of the operational revenue of industrial firms above a designated size

[33] Test functions are often conducted in the same facility as packaging and assembly. Many fabless companies do perform testing in-house, to allow them to identify design flaws more quickly. However, the outsourced assembly-and-test market is quite large too, and less consolidated than the foundry market. Key vendors include ASE Test, Amkor Technology, Siliconware Precision, and STATS-ChipPAC. Almost all test activity is conducted in Asia, as it is more labor-intensive than front-end processes and has less stringent clean room requirements. (Oppenheimer, 2017). Estimates suggest that assembly-and-testing (sometimes called back-end manufacturing) accounts for 3 percent of industry R&D, 13 percent of industry capex, and 6 percent of value added. (BCG and SIA).

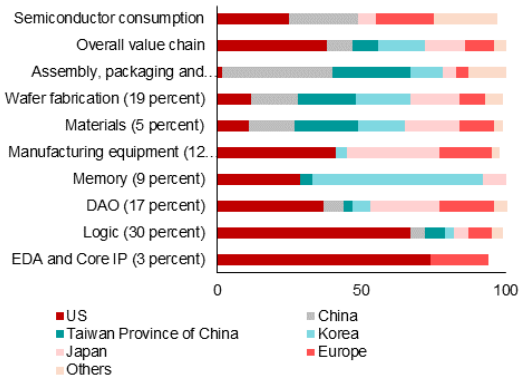
in 2020 (Figure A3.4). This, in turn, reflects the lead that several other advanced economies have over China in the most R&D-intensive activities such as electronic design automation, core intellectual property, chip design, and advanced manufacturing equipment.

Figure A3.4 Output by Sector Relative to China's Total industrial Sales



Source: Moody's

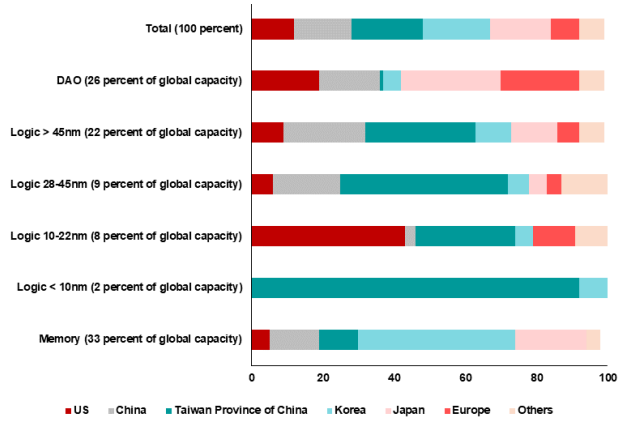
Figure A3.5 Semiconductor Industry Value-added by Activity and Region, 2019 (Percent)



Source: Boston Consulting Group (BCG); Semiconductor Industry Association (SIA).

6. China's catch-up challenge over the medium and long term is formidable. The key challenges for at least a decade lie mainly in how to get closer to the technological frontier in a wide range of R&D-intensive activities; and concurrently catch up with Asian powerhouses Japan, Korea and Taiwan Province of China in advanced wafer fabrication, which requires large capital investment supported by government incentives and access to high-quality infrastructure, high tech engineers and scientists, and skilled workers. In particular, for the more R&D-intensive part of supply chains for semiconductors, China's share of VA is small, both in absolute terms as well as relative to its share in capex-intensive and labor-intensive parts of the supply chain (Figure A3.5). Its high-tech production capacity is especially limited – in terms of wafer fabrication capacity, the most technologically-advanced rungs are dominated by just one or two players (Figure A3.6).

Figure A3.6 Breakdown of Global Wafer Fabrication Capacity by Region



Sources: BCG; SIA

7. China's drive to mitigate these vulnerabilities has seen government authorities, SOEs and private sector enterprises ramp up efforts, focusing on technological knowhow and ability to produce at scale. To plug near-term gaps and boost long-term resilience, there have been strong efforts covering support for enterprises, cross-border trade, investment

facilitation, R&D, human capital, intellectual property, and international collaboration. (Figure A3.8)

Figure A3.8 Efforts by China to Strengthen Semiconductor Capacity

Source: AMRO; various

8. There is a need for circumspection in assessing China's prospects of achieving markedly stronger resilience, although China has demonstrated capacity for rapid technological advancements and is making a strong push. Current literature, expert opinions and industry views strongly suggest that full self-sufficiency is practically impossible for any country even in the long term, and would be very costly even if achieved. First, the manufacturing chain for any semiconductor is very complex and relies on hundreds of different inputs, all processed by many types of high-technology tools. Second, most of the equipment used in semiconductor manufacturing relies on complex supply chains involving many companies delivering different parts. Third, the R&D needed to gain even a small foothold in semiconductors is significant, and the lead time is very long. According to one estimate, hypothetical self-sufficiency would cost USD1 trillion upfront and USD100 billion annually (Figure A3.9).[34]

[34] Significant investments have been made so far in catching up: the China Integrated Circuit Industry Investment Fund (CICIIF) has ploughed about RMB350 billion into various projects and firms for this purpose.

Figure A3.9 Financial Costs of Hypothetical Semiconductor Self-sufficiency: An Estimate

Activity	Upfront investment (USD billion)	Incremental annual cost (USD billion)
EDA and Core IP	10-30	3-10
Design	30-95	10-35
Equipment	90-275	20-60
Materials	15-40	5-10
Manufacturing	755-785	7-10
Total	900-1255	45-125

Sources: BCG; SIA

9. China's approach to pursuing self-reliance should include both capacity building and deepening collaboration, through bilateral as well as multilateral channels. Efforts to accelerate the strengthening of domestic capacity should go hand in hand with collaboration with countries in the ASEAN+3 region and beyond to make cross-border supply chains more flexible and resilient to shocks. Japan, Korea and Singapore are among the countries which will have key roles to play in this. Likewise for intellectual property protection, for which bilateral and multilateral cooperation in standards-setting and enforcement is very important. This means: (i) stepping up efforts by China and partner countries to intensify R&D: (ii) devising ways for large-scale commercialization; (iii) recruiting and nurturing talent; (iv) supporting enterprises' upgrading; and (v) sharing information on a timely basis to improve the operational aspects of supply chains.

3. Enhancing China's Financial Rescue System[35]

1. Chinese authorities have gained more experience in financial rescue from handling several troubled financial institutions in the past years. In 2018, the regulators took over the insolvent Anbang Insurance Group, for instance. After handing over its insurance and asset management business to the newly created Dajia Insurance Group in 2019, Anbang Group applied for dissolution and liquidation in 2020. In 2019, three banks were in operational difficulties. Baoshang Bank was taken over by the government in May, which was China's first bank seizure in more than two decades. The takeover of Baoshang raised market concerns over indebted small banks, posing significant rollover risk to them as the interbank market in negotiated certificate of deposit (NCD) was nearly frozen for some of the most troubled city commercial banks. Subsequently, in July and August, the regulatory authorities resolved the risks of Jinzhou Bank through financial restructuring, and dealt with the risks of Heng Feng Bank by "local government capital injection plus introduction of strategic investors for restructuring.

2. The regulators took different approaches to rescue the three banks based on their different levels of distress. Bank of Jinzhou was initially recapitalized by state-owned strategic investors and received further support from the central bank; Hengfeng Bank was recapitalized by Central Huijin and local governments; and Baoshang bank was forced into bankruptcy after transferring its assets and liabilities to Mengshang Bank and Huishang Bank for businesses inside and outside of Inner Mongolia. The restructuring of Baoshang Bank was the first time that regulators allowed some large creditors to bear losses, suggesting their intention to dispel some of the perceived implicit guarantees underpinning China's financial system.

3. The building up of the national financial safety net, including the deposit insurance fund, the insurance protection fund, and the central bank liquidity assistance, has helped to reduce adverse spillovers from bank failures. During the risk resolution process of Baoshang Bank, the Deposit Insurance Fund, in accordance with the Deposit Insurance Regulations, provided funding support to Mengshang Bank and Huishang Bank to facilitate their purchase and assumption of Baoshang Bank's assets and liabilities. The central bank injected liquidity to calm the interbank market, keeping the bank failures from triggering system-wide financial stress. Without these instruments at hand, it would be significantly more difficult for the government to contain and manage these crisis incidents.

4. Early intervention and rapid disposal are important for minimizing rescue costs. The early discovery of problems in weak financial institutions and decisions to address them could help arrest further financial deterioration and limit the risk of contagion. Delays in this process can only result in higher resolution costs. The problems of Anbang Group and the three troubled banks were known for quite a while. If effective supervisory actions were taken before their financial conditions were significantly impaired, the possibility of their failures and potential costs of rescue would have reduced. Establishing a comprehensive, rule-based framework of crisis management and resolution and endowing the resolution authorities with a clear mandate and power to carry out their functions, will lead to quicker recognition and resolution of troubled institutions. Moreover, enhanced preparedness can be achieved through a deep understanding about the channels and size of any potential spillover.

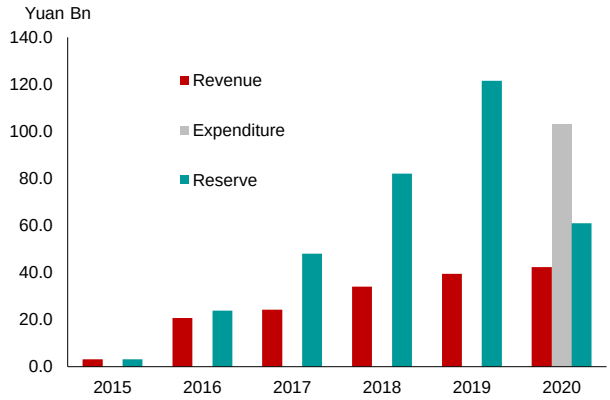
5. A comprehensive, rule-based and transparent framework of crisis management and resolution can also serve the purpose of guiding the expectation of financial

[35] Prepared by Fan Zhai

institutions, depositors and creditors. In the bail out of Baoshang Bank, the authorities guaranteed corporate and interbank deposits, valued at up to RMB50 million, and personal deposits were fully guaranteed. In handling idiosyncratic bank distress, authorities are encouraged to use a set of transparent and predefined policy rules on bailout and resolution to reduce market expectations on implicit guarantee. However, a certain level of policy discretion may still be necessary for dealing with systemic crisis.

6. The authorities need to secure more financial resources to prepare for further waves of financial rescue. The China Insurance Security Fund Co Ltd (CISFC) injected RMB60.8 billion—around half of its total reserves then—to take over a 98.23 percent stake in the troubled Anbang Insurance Group in 2018. CISFC is now seeking to exit its entire shareholding after bearing certain losses. During the risk resolution process of Baoshang Bank, the deposit insurance fund and the central bank provided financial support to maintain Baoshang Bank's business continuity through purchase and assumption, and protect the legitimate rights and interests of depositors and other clients to greatest possible. [36] These bailout actions significantly eroded the reserve ratios of the insurance security fund and the deposit insurance fund (Figure A3.1).

Figure A3.1 Income, Expenditure and Reserve of Deposit Insurance Fund



Source: PBC

7. To safeguard the confidence of depositors and policyholders, the insurance security fund and deposit insurance fund need to consider raising premium levels and establishing a back-up credit line from the government. Furthermore, as the use of fiscal resources—including funding from the central government and local governments—may become more frequent, a thought-through mechanism for providing necessary public funding, which lays out the sources, functions, potential sizes and repayment plans of different public funds, should be established to ensure the timely resolution of failing financial institutions and to minimize the costs borne by taxpayers.

8. In addition to the banking sector, the need to rescue non-bank financial institutions (NBFIs) may also rise in the future along with the development of the financial sector. Overall, the risk exposure of China's NBFIs is much smaller compared to that of banks. This is because NBFIs are less interconnected by nature and have larger capital buffers to bear losses in comparison with banks. In addition, the clampdown on shadow banking in recent

[36] A financial damage of RMB220 billion was found in its books due to large-scale fund misappropriation.

years has significantly reduced the systemic risks associated with NBFIs such as trust firms, peer-to-peer lending firms, money market funds and securities firms. That notwithstanding, the rescue of Anbang Insurance Group in 2018 highlighted the problem of “too-big-to-fail” in certain NBFIs.

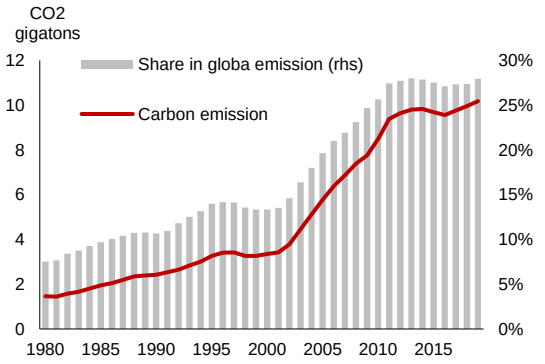
9. Some NBFIs may still be systemically important and need to be covered under a comprehensive financial resolution mechanism. The 2008-09 Global Financial Crisis has demonstrated the role of non-bank financial intermediaries such as money market funds in transmitting and amplifying financial risks. Even in the absence of financial intermediaries, some large NBFIs can negatively affect financial stability through asset fire sales or debt default. The sheer size of China Huarong’s outstanding bonds—around RMB350 billion worth in onshore and offshore markets implies that any credit events of Huarong may lead to large repercussions in other parts of China’s economy, ranging from onshore repo markets to offshore funding costs of China’s investment-grade firms. NBFIs with large retail client bases also often deserve particular regulatory attention and should be part of the broad financial resolution scheme.

4. Carbon Neutrality: Policy Challenges[37]

1. China's race towards reaching carbon neutrality target by 2060 will make a critical contribution to global climate change efforts. As the largest emitter of carbon dioxide in the world annually (Figure A4.1), China's 2060 carbon neutrality pledge is expected to curb global warming by 0.2-0.3°C by 2100 in comparison with its previous commitment under the Paris Agreement **(**Höhne et al, 2021**)**. This will help move the international community closer to the Paris Agreement goal of containing global warming to 1.5°C or less by 2100, relative to pre-industrial levels.[38]

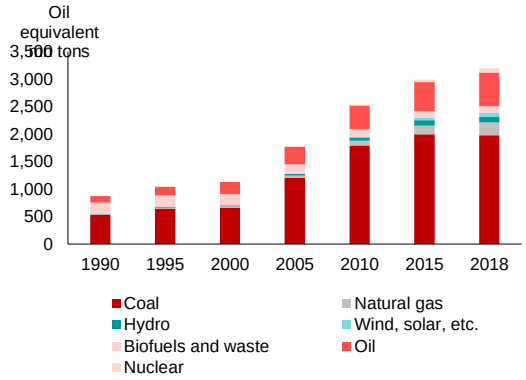
2. China needs a concerted national effort to transform its economy and energy system to meet its net zero target. The country's remarkable economic success in the past 40 years has left a huge carbon footprint. With abundant coal supplies, coal-based power generation was ramped up to meet rapidly-growing electricity demand, leading to a coal-dominated energy mix in China (Figure A4.2). China's climate pledge sets the path for peaking its absolute carbon emission level before 2030 and aims to reduce its net carbon emissions from peak to zero within 30 years. This stands in contrast to the U.S. and E.U., which have observed their carbon emission peaks at a much higher level of per capita GDP and are aiming to achieve the transition from peak to zero at a more gradual pace (Figure A4.3). Achieving the 2060 carbon neutrality target requires China to reduce the proportion of fossil-fuel energy consumption gradually.

Figure A4.1 China's Carbon Emission



Sources: Our World in Data; authors' calculation

Figure A4.2 China's Energy Mix



Sources: IEA World Energy Balances

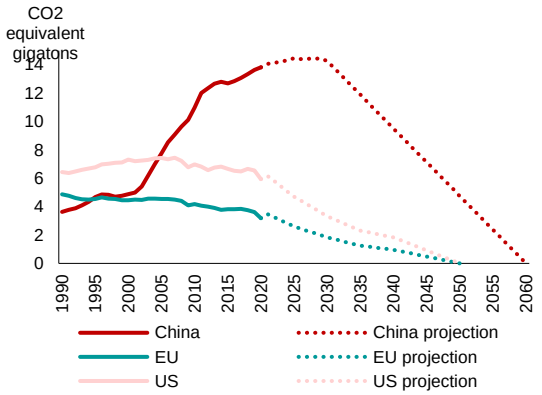
3. A clear roadmap is important to turn this net zero emission vision into reality. The roadmap should define plausible pathways to decarbonize the Chinese economy, lay out a mitigation policy framework, set sectoral targets and strategies, assess the economic and social impacts of different net zero paths, and identify important constraints and challenges that may arise. By linking long-term pledges with shorter-term targets and policy actions, the detailed roadmap will not only enhance the credibility of the Chinese government's climate change commitment, but also serve as a policy anchor to guide the expectations of different economic agents – enterprises, consumers and local governments. The roadmap should be updated periodically to reflect evolving economic realities and technological development, and new unexpected challenges. The authorities have released a national action plan for carbon

[37] Prepared by Fan Zhai and Suan Yong Foo
[38] The UNEP's 2021 annual Emissions Gap Report estimates that the current Nationally Determined Contributions (NDCs) under the Paris Agreement would put the world on the path towards a temperature increase of at least 2.7°C by 2100. If everything else remains constant, China's new commitment for carbon neutrality would represent one fourth of the effort needed to limit the global warming to the 1.5°C target.

emissions to peak before 2030. This is a welcome step, and an extension of the plan for meeting the 2060 carbon neutrality target should be pursued.

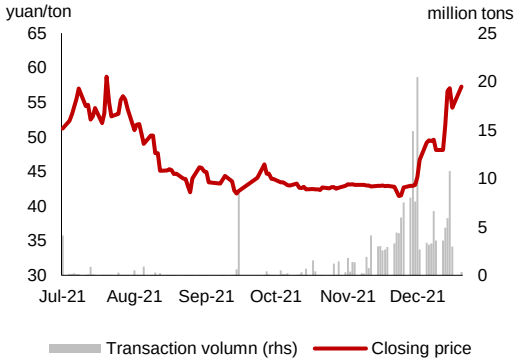
4. The recent rollout of the national emissions trading scheme (ETS) offers an opportunity to establish a robust carbon pricing scheme in China. Carbon pricing, which imposes a price on carbon emissions, is widely regarded as a cornerstone of the climate mitigation policy framework. Building on the experience of the eight provincial pilot ETS, China launched a national ETS in July 2021. In the initial phase, instead of setting an absolute cap and one single sector-wide benchmark, China's national ETS uses an intensity-based allocation of carbon allowances and sets four benchmarks based on the size and fuel type of power generators. As a result of this cautious approach, the price of carbon allowance has been modest – less than USD7 per ton of CO2 compared to EUR80 per ton in the E.U. ETS in December 2021 (Figure A4.4). To turn the ETS into a genuine cap-and-trade system, absolute carbon emission caps will need to be adopted, and the emission allowances will need to be reduced markedly over time to align the ETS with the nation's long-term net zero target. A transition to a single benchmark is also necessary to encourage entities to shift away from carbon-intensive fuel sources.

Figure A4.3 Historical and Target GHGs Emission



Sources: Climate Action Tracker; authors' estimation

Figure A4.4 Trading Volume and Prices in China's National ETS



Sources: WIND

5. Strong public support for technological developments and innovation is essential to make low-carbon transition a success. Without major green technological progress and innovation, achieving carbon neutrality will require extremely high carbon prices, and the transition could be prohibitively costly. However, the long-term horizon of investment and high degree of uncertainty often constrain the development and diffusion of green technologies. Building on past experiences and lessons, China's authorities could ramp up its technology support and innovation policies – such as subsidies for R&D and deployment, technological standards and public investment. Due to the potential information asymmetry between the public and private sectors, green industrial policies need to be well-targeted and carefully designed to minimize the risk of government capture and rent-seeking. Broad and effective public participation, clear and transparent performance evaluation, as well as conditionality and sunset clauses, should be included as important ingredients of the government's green industrial policy (Altenburg and Rodrik, 2017).

6. Authorities are encouraged to complement their regulatory efforts with a more economy-wide, market-based mechanism. Policy instruments such as energy intensity regulations, compulsory standards and technological performance requirements have been

widely used by the Chinese authorities to reduce carbon intensity in the economy. In addition, national energy and carbon intensity targets have often been broken down into sectoral-level or provincial-level targets to ensure their enforcement. The regulatory approach taken by China's authorities often yields quick results and can better address sectoral and regional specificities. To complement the current approach, a more holistic, economy-wide carbon pricing can be adopted to lay a stronger micro-foundation for China's low carbon transition. The market-based approach will likely incentivize households and firms to adopt greener behavior. It will also equalize the marginal cost of decarbonization across usages, eliminating potential incoherence across sectoral policies and regional policies.

7. However, the green and low-carbon transition of energy may have shocks on the economy in both short term and long term, putting pressure on the existing macroeconomic policy system. Before key technologies such as the production, storage and transportation of clean energy are widely used, if the energy transition process is carried out too abruptly, it could lead to energy shortages and sharp price increases, with spillover effects on other sectors. The challenges of energy transition will accelerate the supply-side adjustment of energy. Some forward-looking producers may take the initiative to cut the investment in coal power and reduce the remaining production capacity in the fossil energy field. Coal power enterprises in operation may face adverse factors such as declining coal power demand, price competition of new energy and rising carbon price. Meanwhile, a significant increase in green investment will boost demand for new energy, partially offsetting the impact of high carbon prices on production. However, it may adversely affect public debt sustainability if policy support relies heavily on fiscal subsidies.

8. Potential financial risks of asset depreciation and excessive green investment need to be assessed and addressed. Without significant breakthrough in negative emission technologies, a large proportion of carbon-intensive capital investment and fossil fuel reserve assets would be at the risk of falling in value in the future. In China, it is the power generation sector that faces most risk of asset depreciation. The average age of coal power generation units in China is 12 years, which is generally short compared with the average life of coal-fired power plants of 40 years. Once the units are shut down, become idle or retire in advance, the asset value may be stranded during the remaining life, which may bring great losses to banking institutions. Financial institutions should strengthen their capacity to manage, identify, assess and monitor credit risks in industries with high energy consumption and emissions such as coal power, promote clean and efficient use of coal, and ensure energy and power security and supply. Risks in the transition may also come from excessive investment in clean and renewable energy, which may lead to over valuation of green financial assets.

9. Complementary structural reform is important in supporting the transition. Carbon neutrality implies a massive structural transformation of the Chinese economy. Flexible and adaptable labor and product markets, as well as efficient financial markets, can facilitate the reallocation of resources from high- to low-carbon activities. In addition, as network infrastructure is especially important for certain clean technologies such as hydrogen, renewable energy, electrification, and carbon storage, public investment in infrastructure can act as a catalyst for industrial firms to undertake low-carbon investments. Complementary reform in China's power pricing and distribution would also be necessary to make ETS an effective tool to cut emissions.

10. Ensuring social inclusiveness and equitable burden sharing is key to increasing the acceptance of and support for net zero carbon emission. Some industries, regions and groups will bear disproportionally large economic losses from decarbonization, leading to an

uneven distribution of transition costs. At a regional level, the large industrial provinces such as Jiangsu, Shandong and Hebei and the major coal-producing provinces—Shanxi, Inner Mongolia and Shaanxi—will likely face the most difficulties. An income transfer scheme among the provinces and between the central and local governments may be needed to compensate provinces with low per capita GDPs but a high dependence on carbon-based industries. Protection for vulnerable groups—such as displaced workers, MSMEs and low-income households—is important to mitigate the social inequity of a clean energy transition. In addition, improved and affordable access to clean public transportation and utility facilities (for example, for residential heating) can also help reduce the energy burden of low-income households and alleviate regressive impacts of carbon pricing.

11. China's active participation in international cooperation and global coordination will help the country boost the effectiveness of its carbon reduction and climate mitigation actions. As a global public good, climate change mitigation should be achieved through globally-coordinated policy actions. The uneven pace of climate change mitigation across countries has caused concern over the free-rider problem and unfair competition, and a unilaterally imposed border carbon adjustment (BCA) tax has been proposed to address the problem in Europe. Due to its limited coverage and scope, the current EU BCA proposal is likely to have only minimal impact on China's exports. However, if more and more advanced countries adopt BCA measures and form a de facto "Climate Club", the economic costs in terms of falling exports, manufacturing exodus and shrinking income, could be significant for China and other developing countries. International cooperation and trade in clean technologies should be included in China's climate change strategy.

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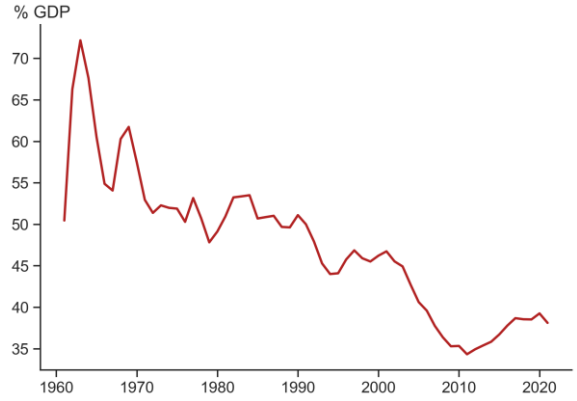
5. How Can China Boost Household Consumption? [39]

1. The importance of boosting household consumption in achieving sustained growth in China in the long term has been well recognized and further highlighted. In March 2021, the 14th Five-Year Plan (2021-2025) for National Economic and Social Development and the Long-Range Objectives Through the Year 2035 (14th FYP) specified that consumption should be boosted in a comprehensive manner and its fundamental role in driving economic development should be further strengthened in the following five-year period. This study investigates the key drivers behind household consumption and discusses policy suggestions based on the findings.

Recent trends in household consumption in China

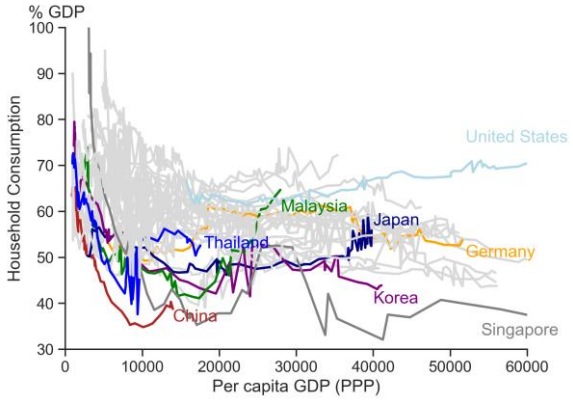
2. The share of household consumption in the economy is still low in China, although it has trended up since 2010. China's household consumption as a percentage of GDP declined sharply for over four decades and reached a low of 34.6 percent in 2010 (Figure A5.1). It then increased gradually and steadily to 39.1 percent in 2019 before declining to 37.8 percent in 2020 due to the impact of COVID-19. It is also lower than in many countries at a similar stage of economic development (Figure A5.2). This indicates that there is room for China's ratio of household consumption to GDP to increase further.

Figure A5.1. Household Consumption in China



Source: Haver; AMRO staff calculations

Figure A5.2. Cross-country Household Consumption Comparison:1950-2019

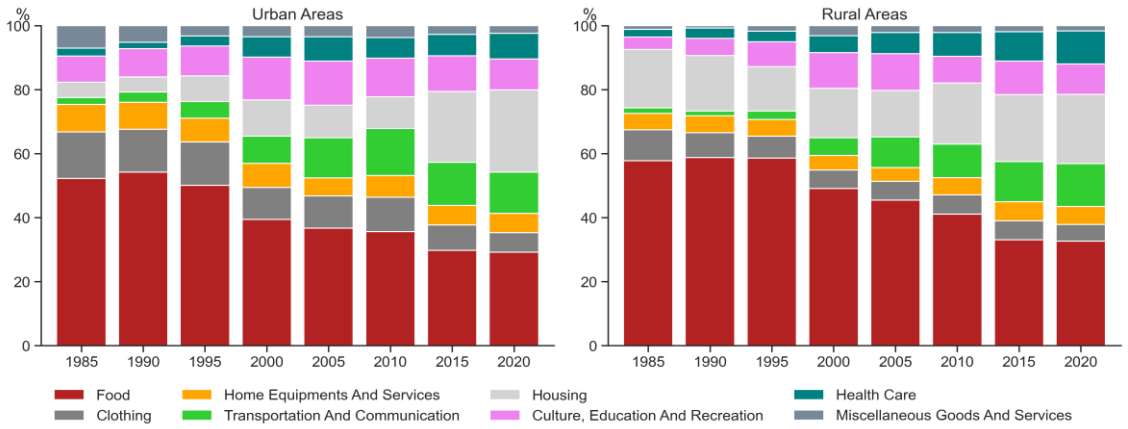


Source: Haver; Penn World Table version 10.0; AMRO staff calculations
Note: There are 39 countries in the chart, including both emerging and advanced economies from Asia, America, Europe, and Africa.

3. **There is an ongoing consumption upgrading trend in China.** Supported by many years of solid income growth, Chinese households have been shifting consumption more toward services and durable goods. The share of household expenditure on housing, healthcare, and culture, education and recreation increased from 28.4 percent in 2010 to 43.4 percent in 2020 in urban areas, and from 34.9 percent to 41.5 percent in rural areas. The share of spending on consumer staples declined steadily over the same period (Figure A5.3). Anecdotal evidence shows that the consumption upgrading trend has taken the form of greater personalization of services and more varieties and higher quality of goods and services. [40]

[39] Prepared by Zhiwen Jiao
[40] https://www2.deloitte.com/content/dam/Deloitte/cn/Documents/consumer-business/deloitte-cn-consumer-china-import-consumer-market-research-report-en-191119.pdf.

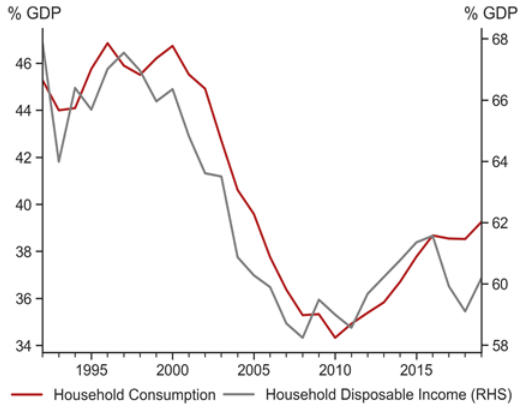
Figure A5.3. China's Household Consumption Structure



Sources: Wind; AMRO staff calculations
Note: China National Bureau of Statistics harmonized household survey methods for both urban and rural areas in 2012, so data after 2012 may not be strictly comparable with data in previous years.

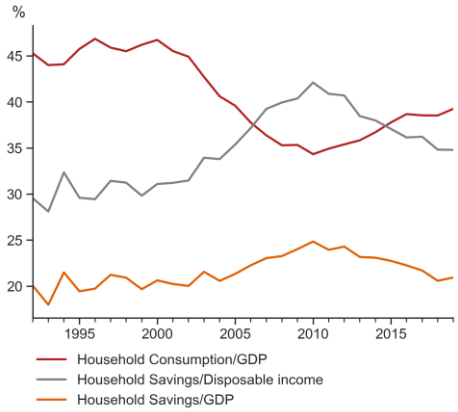
4. T**he increase in household consumption to GDP reflects both the increasing share of household disposable income in GDP and decreasing savings rate.** The reversed trend of the share of household disposable income in GDP since the early 2010s has been the result of a faster slowdown in GDP growth than income, which has been underpinned by a steady increase in wages (Figure A5.4). Household savings, both as percent of disposable income as well as a percent of GDP have declined over the same period (Figure A5.5), which imply a declining propensity to save among Chinese households.

Figure A5.4. China's Household Consumption and Disposable income



Source: Haver; AMRO staff calculations

Figure A5.5. Household Consumption and Savings Rate



Source: Haver; AMRO staff calculations

How do different determinants affect household consumption?

5. **To better understand the dynamics of household consumption in China, we use China's provincial data to assess the impact of changes in household income and other factors on household consumption.** Key determinants in the study, including household disposable income, inflation and real interest rate, are included in the model. Furthermore, we also include per capita GDP and real GDP growth rate to capture the savings behavior at different stages of development (Modigliani, 1966), housing price and stock market index as

proxies for the wealth effect, and government consumption, old age dependency ratio and the share of service sector in the economy to capture the impact of government expenditure, demographic profile and economic structure respectively.

6. **The functional form of the model follows Guo et al (2010) to capture the potential for a nonlinear relationship between household consumption and explanatory variables as follows**:[41]

$$cons^h = 1 - \exp\{b_1 hinco + + b_2 rate + b_3 (gdppc)^{b_4} + b_5 g + b_6 cons^g + b_7 hp + b_8 stc + b_9 dpdc + b_{10} serv\} + \varepsilon^h$$

7. **The model is estimated using the Generalized Method of Moments estimator with available panel data from 28 provinces from 1992 to 2019.**[42] Lagged values of the explanatory variables are used as instruments to deal with potential simultaneity problem. The real interest rates, the old-age dependency ratio and the share of service sector are treated as exogenous variables. The instrument set also includes provincial dummies.[43]

8. **The results indicate that all the explanatory variables except old age dependency ratio and housing prices have a statistically significant impact on household consumption (Table A5.6).** [44]

- **Household Income.** The positive impact of household disposable income is consistent with theory, as depicted in Figure A5.4, and many other countries' experiences.

- **Development stage**. The negative coefficients of per capita GDP and economic growth are consistent with the life cycle theory. As the country progresses from the lower middle-income to the upper middle-income stage, the additional increase in consumption from a further increase in income diminishes, and higher growth would tend to lead to higher savings.

- **Real interest rate and inflation.** The negative coefficient of the interest rate shows that the substitution effect from the higher interest rate is generally larger than the income effect. This may reflect the high propensity to save among Chinese households.

- **Government consumption spending.** Government consumption spending is found to have a dampening effect on household consumption in China. This may reflect the Ricardian equivalence proposition. An increase in government consumption would require higher taxes/charges in the future. Given that households are forward looking,

[41] For some provinces, data for some indicators are not available in certain periods. The variables in the regression are as follows: $cons^h$is household consumption as percentage of GDP, $hinco$ is household disposable income as percentage of GDP, $rate$ is real interest rate (deflated by inflation), $gdppc$ is real per capita GDP, g is real GDP growth rate, $cons^g$is government consumption as a percentage of GDP, hp is change in real housing price, stc is real stock market return, $dpdc$ is old age dependency ratio, $serv$ is the service sector's share in the economy.
[42] Xizang, Chongqing, and Sichuan are excluded due to discontinuity in data.
[43] No provincial dummies are included in the regression itself.
[44] For robustness, we estimated three models with different sets of explanatory variables, model (3) is the final model used for discussion.

they will lower their current consumption in anticipation of the reduction in future disposable household income.

Table A5.6. Estimation Results

	Models		
	(1)	(2)	(3)
Household Disposable Income	0.0064*** (0.0007)	0.0069*** (0.0007)	0.0060*** (0.0007)
Per Capita GDP			
Intercept	-4.2263*** (0.05890)	-4.2305*** (0.0614)	-4.2272*** (0.0562)
Curvature	-0.01366*** (0.0015)	-0.0136*** (0.0015)	-0.0189*** (0.0019)
Real GDP growth rate	-0.0157*** (0.0019)	-0.0168*** (0.0020)	-0.0144*** (0.0020)
Real Interest Rate	-0.0105*** (0.0029)	-0.0098*** (0.0028)	-0.0088*** (0.0026)
Government Consumption	-0.0019* (0.0009)	-0.0026 (0.0009)	-0.0057*** (0.0011)
Old Age Dependency Ratio	0.0068*** (0.0019)	0.0053*** (0.0019)	0.0017 (0.0017)
Housing Price Change		0.0022*** (0.0008)	-0.0007 (0.0008)
Stock Market Return		0.0001 (0.0002)	0.0002* (0.0002)
Service Sector Share			0.0037*** (0.0006)
Ratio of urban household income per capita to national average			

- **Demographic profile.** The coefficient of old age dependency ratio becomes statistically insignificant after taking into account the share of the services sector. This seems to indicate that the age profile of demographics in China on average has not produced a significant impact on household consumption so far, when the impact from other major factors is taken into account. However, this may not mean that aging will not significantly affect China's household consumption in the future.[45] China's elderly population will increase rapidly in the next decade, and its impact on household savings and thus consumption could become significant and more visible.
- **Wealth effect.** The results show that higher housing prices and higher returns from the stock market generally boost household consumption. However, the coefficient on housing price is statistically insignificant. This may need further investigation, particular for the recent decade. Some recent research has found that high housing prices have a dampening effect on household consumption (Cheng Li, Ying Zhang, 2021).
- **Economic structure.** A higher share of the services sector in the economy is found to coincide with a higher share of household consumption in the economy. The impact of

[45] China's old age dependency ratio started to increase markedly after 2010, but the model data sample covers much longer periods, so it is possible the impact of the rising old age dependency ratio may not be fully captured. The coefficient should be interpreted with caution.

the share of the services sector in GDP on consumption could be through two channels. On the one hand, the service sector tends to be more labor-intensive, thus providing more jobs and increasing the share of labor income in the economy. On the other hand, a more developed service sector expands the variety of choices for consumer.

Policy options to boost household consumption

9. **The results from the above analysis suggest the government's efforts in several areas could boost the level of household consumption going forward.** Continued policy efforts can be made to further increase households' income, promote the development of the service sector and minimize regional disparities, including implementing city cluster strategy. Further developing the capital markets, including expanding the set of investment vehicles and dividend payment will also support household consumption. Finally, government consumption spending should focus more on areas that will help boost household consumption, education, healthcare and social security.

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