



**HKU  
BUSINESS  
SCHOOL**  
港大經管學院

**ICE**

Institute of China Economy  
中國經濟研究所

# Chinese Economy: Analysis and Prospects 2023



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# PREFACE

In the midst of a century-long unprecedented transformation, the global political and economic landscape has been constantly changing, with technological advances at an incredible pace. Enormous challenges and opportunities are intertwined, and the future of the global economy is unpredictable. As the world's second-largest economy, China has long been a major contributor to the growth of global economy, and it remains crucial to the stability and growth of the global economy. However, after reaching the middle-income level, the complexity of the Chinese economy has been increasing constantly, and China faces more arduous challenges than ever before to maintain a sustainable economic growth. In such a context, it is particularly urgent for the academic community to conduct in-depth and meticulous research on the Chinese economy, to systematically understand its growth trends, and to comprehend its challenges and potential.

HKU Business School is committed to becoming a world-class academic centre for research on the Chinese economy. It has always adhered to an academic-oriented philosophy, has established a faculty team with a level of international academic standards, and continuously seeks to expand and develop further. In 2022, the "HKU Institute of China Economy" was established to provide a platform for experts around the world to exchange ideas on Chinese economy in order to promote in-depth research on the Chinese economy. The institute will support various academic research, organize various academic exchanges, and plan to hold the annual "Conference on China and Global Economy" and the "HKU Forum on Chinese Economy". In addition, the institute will publish the annual report "Chinese Economy: Analysis and Prospects", which will compile research results on important issues facing the Chinese economy each year. The annual report is not intended to make a comprehensive outlook or forecast on the Chinese economy for that year, nor is it intended to cover all important issues in the

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Chinese economy. The report aims to provide new perspectives and understanding of important issues in the Chinese economy through rigorous academic analysis and independent judgment.

"Chinese Economy: Analysis and Prospects - 2023" is the first issue of this annual report. In 2022, the Chinese economy faced unprecedented pressure, due to reasons such as the COVID-19 pandemic, the Russia-Ukraine conflict, and the Fed rate hikes. In the midst of the continued uncertainty of the global economic and financial situation, the new government in China has just established this year's economic policy priorities at the 2023 Two Sessions, striving to achieve stable economic growth. The goal is clear and ambitious, but the challenges and problems are obviously very difficult. This report collects research results from several professors at HKU Business School, analyzing key issues related to macroeconomics, finance, growth, employment, environmental protection, investment, and entrepreneur confidence. The aim is to bring inspiration and reflection to understanding the current situation of the Chinese economy as well as its future prospects.

In Chapter 1 of the report, Professor Zhenhua Mao analyzes the current situation and future prospects of China's macroeconomy after the COVID pandemic. The article first analyzes the reasons why in 2022 China's economic recovery was twice hindered, resulting in a lower GDP growth than expected. Then, it reviews the multiple domestic and international challenges that China's economy will face in 2023. In particular, it emphasizes the need to monitor the evolution of the balance sheet in the non-financial sector, beware of the risk of balance sheet recession, and give high priority to policies that help maintain sustainable growth in the context of declining potential growth rate.

In Chapter 2, Professor Shusong Ba and Dr. Bokun Niu summarized the challenges and progress that the Chinese financial system has made since 2022 in areas such as exchange rate fluctuations, credit, real estate finance, stock market registration system reform, and RMB internationalization. They analyzed the main issues

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facing the Chinese financial system in 2023 and the direction for reforms. They particularly pointed out that the J-curve effect after the pandemic is expected to trend towards relative calm, and credit growth will still be constrained by the impact of the adjusting pandemic policy on the supply side. They also emphasize that we should not ignore the mid-term expectation of slow recovery and other scar effects.

In Chapter 3, Professor Xiaodong Zhu explored the evolution of China's long-term economic growth rate. China's GDP growth rate has been in a downward trend for the past 15 years. It has fallen all the way to less than 6% in 2019, from a high growth rate of over 13% in 2007. The article analyzed the reasons for the decline in China's economic growth rate by exploring the driving forces behind China's long-term economic growth over the past 15 years and predicted the trend of economic growth in the next decade. The article argues that raising productivity growth is crucial for China's future growth, and more decentralization and bottom-up policy changes are the key to raising China's productivity growth.

The COVID-19 pandemic has lasted for three years and has had a significant negative impact on youth employment. This impact will have a more lasting effect on their future career development and income through its influence on human capital accumulation. In Chapter 4, Professor Jin Li and Dr. Jie Gong focused on post-pandemic youth employment and career development issues. They search for effective policy measures to promote human capital accumulation and improve labour market matching, in order to promote young workers' post-pandemic career development.

In Chapter 5, Dr. Guojun He reviewed China's achievements in pollution control since 2013 and discussed potential future environmental protection policies. The article believes that China's future environmental regulation intensity will be relaxed at the margin. Meanwhile, pollution control measures will also shift from end-of-pipe treatment (air pollutants) to source control (carbon reduction) that is mainly based on industrial structure upgrading and energy structure adjustment.

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The article also made five recommendations for China's future environmental policy.

In Chapter 6, Dr. Hongsong Zhang analyzed the impact of the COVID-19 pandemic on China's fixed asset investment and economic growth. The article attempted to analyze the short- and long-term impact of the COVID pandemic on China's fixed asset investment and economic growth, by comparing the impact of the 2008 global financial crisis on China's economy. The article aims to provide a reference for effective policy responses to mitigate the negative impact of COVID pandemic. The article suggests that the key to recover the growth of fixed asset investment is to restore the confidence of consumers and investors, as well as reducing investment frictions in the economy.

The key to restarting the economy in the post-pandemic era is to restore confidence in the private sector. What are the obstacles to the recovery of entrepreneur confidence currently? In the final chapter of this report, Dr. Heng Chen conducted a large-scale survey of entrepreneurial confidence and living status, and conducted an in-depth analysis of the factors affecting entrepreneur confidence. One inspiring finding is that China's foreign relations are an important factor in determining entrepreneurs' confidence in China's economic prospects.

Hongbin Cai  
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## Expected improvement in the Chinese economy and the importance of balance sheet evolution

# Expected improvement in the Chinese economy and the importance of balance sheet evolution: A review of China's macro economy in 2022 and its prospects in 2023

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The COVID-19 pandemic hampered China's economic recovery in 2022, resulting in an annual GDP growth of only 3%, lower than the annual target. With the adjustment of China's pandemic prevention and control policy, the momentum of China's economic recovery has strengthened significantly since the first quarter of 2023. However, the Chinese economy still faces multiple internal and external challenges. In particular, the evolution of the non-financial sector's balance sheet must be monitored to guard against the risk of balance sheet recession. China's GDP growth rate is expected to rise to more than 5% in 2023. However, against the backdrop of slowing potential growth, China must further enhance the resilience of its economic and social development and realise economic growth potential through structural reform.

## **I. Review of 2022 Chinese economy: Pandemic effects on recovery**

In 2022, due to the increased infectivity of SARS-CoV-2, mainland China experienced a resurgence of the COVID-19 pandemic. As a result, the economic recovery was hampered twice, in the second and fourth quarters, limiting economic growth over the entire year. By adjusting its pandemic prevention and control policy by the end of 2022 and implementing the 'Class B and B management' of SARS-CoV-2 infections, China fully opened its doors to the outside world and has enjoyed enhanced momentum of its economic recovery since the first half of 2023, when the constraints imposed by the pandemic on

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China's economy weakened significantly. However, it remains important to pay attention to the pressure brought by the impact of the 3-year pandemic on micro entities.

### **Effect of the COVID-19 pandemic on China's economic recovery in 2022**

The outbreak of the pandemic in 2020 has had a sustained impact on China's economy. From 2020 to 2021, when the infectivity of SARS-CoV-2 was relatively weak, China's strict pandemic prevention and control measures were relatively effective, enabling the Chinese economy to recover quickly from the initial impact of the pandemic. In 2020 and 2021, China's GDP grew by 2.2% and 8.4% year-on-year, respectively, outpacing other major economies globally and maintaining a certain advantage in off-peak growth despite the global economic downturn. However, since 2022, SARS-CoV-2 has become less virulent but more contagious. Overseas economies have gradually lifted their pandemic controls and recovered their production. Consequently, China no longer enjoys the advantage of 'off-peak growth'. Instead, the continuous spread of SARS-CoV-2 and strict pandemic prevention and control measures have disrupted industrial and supply chains. Together with the weakening of real estate support for the economy and the impact of external emergencies such as the Russia-Ukraine conflict, this disruption has had a material adverse impact on the pace and strength of China's economic recovery.

In 2022, China's economic recovery was hampered twice. In the second quarter, due to outbreaks of COVID-19 in Shanghai, Beijing, Jiangsu, Zhejiang and other major economic centres, the GDP reached the bottom for the second time since 2020, with a year-on-year growth of only 0.4%. The economy recovered somewhat in the third quarter, but strict pandemic prevention and control measures imposed in the early days of the fourth quarter and the nationwide immunisation peak following the lifting of these measures caused a great disturbance to the economy, such that the year-on-year growth of the economy in the quarter dropped again, to 2.9%. The GDP for the year grew by only 3% year on year, much lower than the expected growth rate of approximately 5.5%.

However, the pandemic prevention and control policy was adjusted, significantly weakening the impact of the pandemic on the economy in the first quarter of 2023 and accelerating the pace of China's economic recovery. Moreover, while the

other major economies have all adopted large-scale, quantitative easing policies since the pandemic, China's economic stimulus policies have remained relatively restrained. These policies, together with weak domestic demand and other factors, have led to a low inflation level and controllable inflationary pressure in China, in contrast to the large inflationary pressure faced by Western economies such as the United States and Europe in 2022.

Fig. 1: Pandemic recurrence impact on China's economic recovery

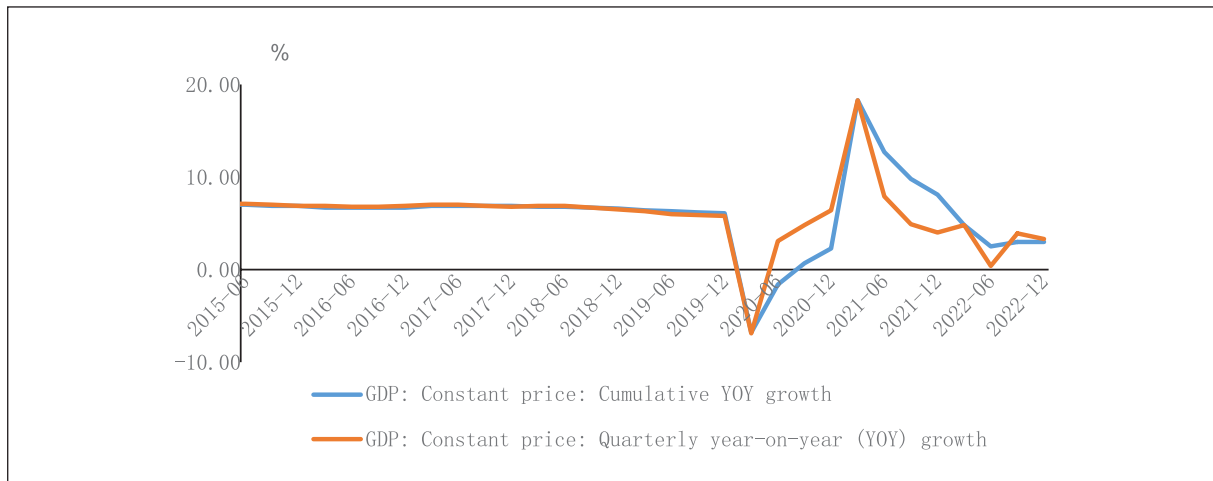
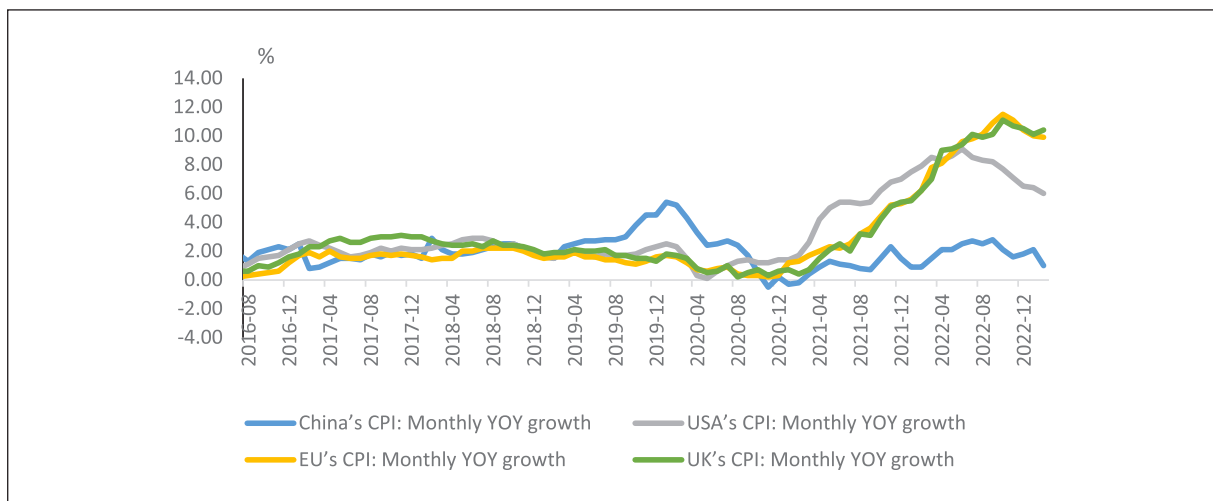


Fig. 2: Chinese inflation pressure



Source: Wind

### Impact of the COVID-19 pandemic on micro entities

While we focus on the impact of the pandemic on China's macro economy, we must also pay close attention to its impact on the operation of micro entities. The 3-year pandemic has intensified the difficulties faced by enterprises, especially

small and medium-sized enterprises (SMEs). Many SMEs have withdrawn from the market, and those still in operation are facing significantly more pressure than before the pandemic. In 2022, the profits of industrial enterprises fell by 4% year-on-year and the number and amount of losses of industrial enterprises above designated size remained higher than the previous year.

Enterprises, especially SMEs, are the main carriers of employment. With the enterprise sector facing prominent production and operational pressures, the pressure on the residential sector has also increased. As of the end of 2022, the urban unemployment rate was 5.5%, significantly higher than the 5.1% rate of a year earlier. Specifically, a survey determined that the unemployment rate for young people (aged 16–24) remained at a high of over 16% throughout the year, much higher than that of previous years. Furthermore, because leading companies in the Internet, education, real estate sectors and others cut jobs on a large scale, the quality of employment for those aged 25–59 was also expected to decline. Micro entities compose the basis of macro-economic operation. Thus, the deterioration of micro entities has adverse effects on the expansion of production and consumption and on economic repair, leading to negative circulation. If enterprises and other micro entities are the capillaries of the macro economy, many capillaries have been blocked or even become necrotic under the effects of the pandemic over the past 3 years. These capillaries cannot be unblocked and healed overnight; such a task requires continuous efforts.

Fig. 3: Loss of industrial enterprises expanded

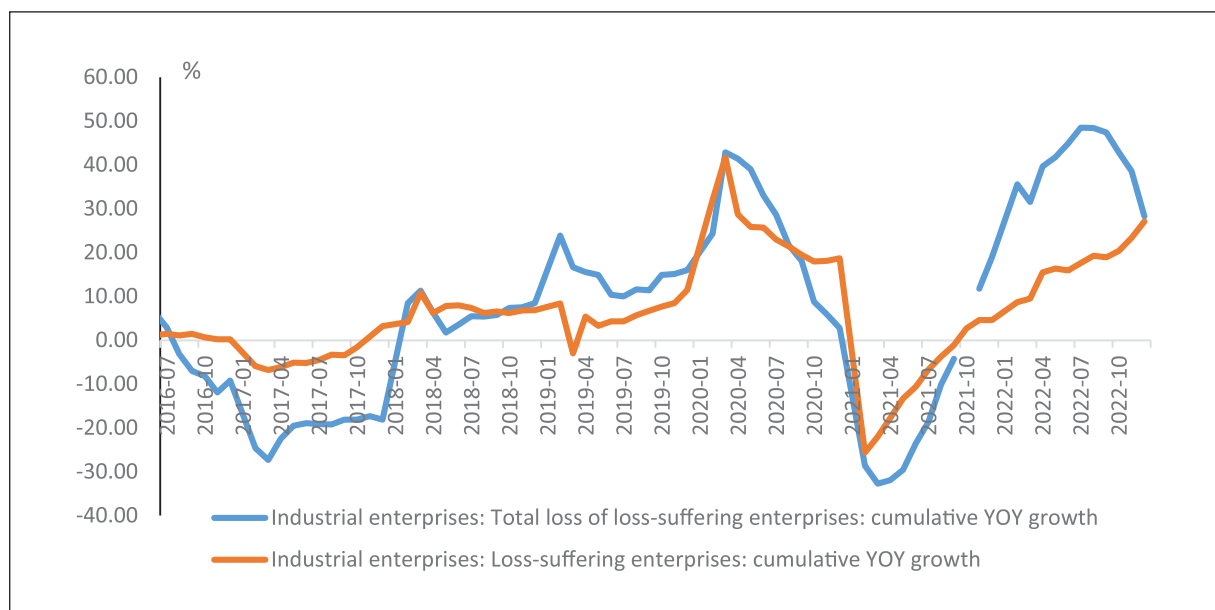
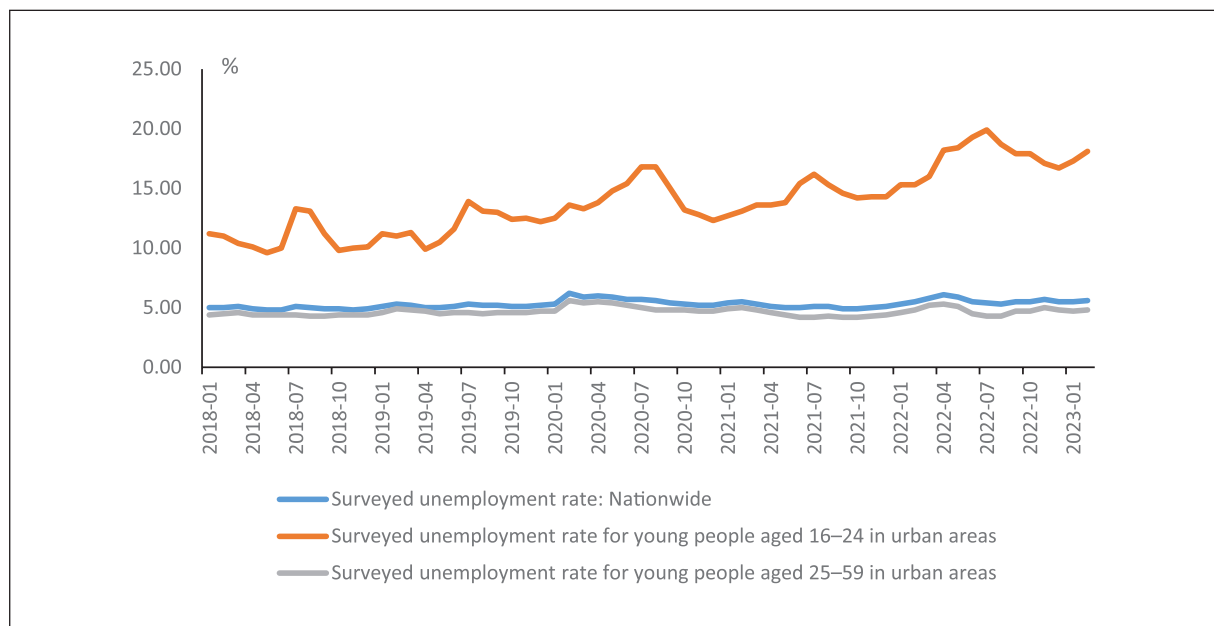


Fig. 4: Employment pressure on the residential sector in China



Source: Wind

## II. Current Chinese economy challenges

With the adjustment of pandemic prevention policies and the continued strengthening of policies to stabilise growth, the Chinese economy is expected to recover from the negative effects of the pandemic. However, there remain multiple internal and external risks and challenges, such as geopolitics and the ‘ebb tide’ risk of globalisation under unprecedented global changes, the challenges faced by the transformation and development of the real estate industry and the uncertainties faced by the demand side of restoration. Moreover, China has accumulated a huge amount of debt over the course of its long development. In recent years, against the backdrop of increasing downward economic pressure and weakening expectations caused by the pandemic, all of the nation’s non-financial sectors are facing the pressure of balance sheet contraction. Moving forward, it will be necessary to keep an eye on the balance sheet evolution under the pressure of high debt and to guard against the risk of balance sheet recession.

### Persistent external uncertainties and instability

Changes in the global political and economic landscapes have accelerated since the conflict between Russia and Ukraine began. At present, this conflict persists

and is expected to continue in the long term. Geopolitical conflict will remain one of the major global threats to the economy for the next 2 to 3 years. Furthermore, the tone of China-US relations remains unchanged, global trade protectionism is intensifying, and the ‘ebb tide’ of globalisation is increasing. China’s economy continues to face a grim and complex external environment. In particular, Hong Kong is China’s window to the outside world, and Hong Kong’s status as a centre of trade and finance has been challenged by these great changes. This will generate obstacles to the in-depth participation of the Chinese economy in economic globalisation.

Fig. 5: Downturn of traditional pillar industries in Hong Kong due to the resonance effect

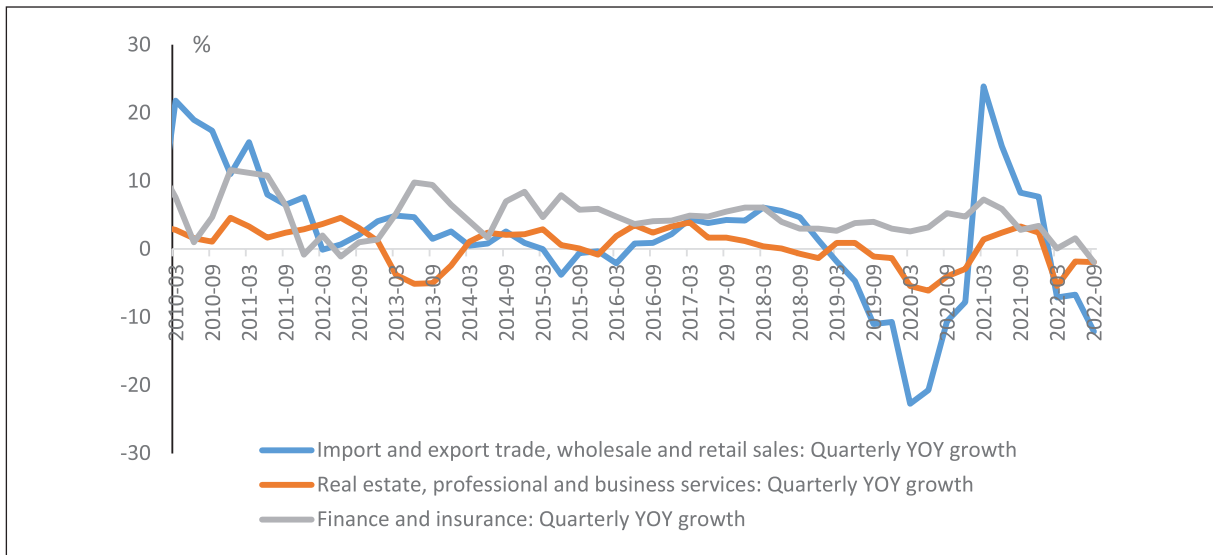
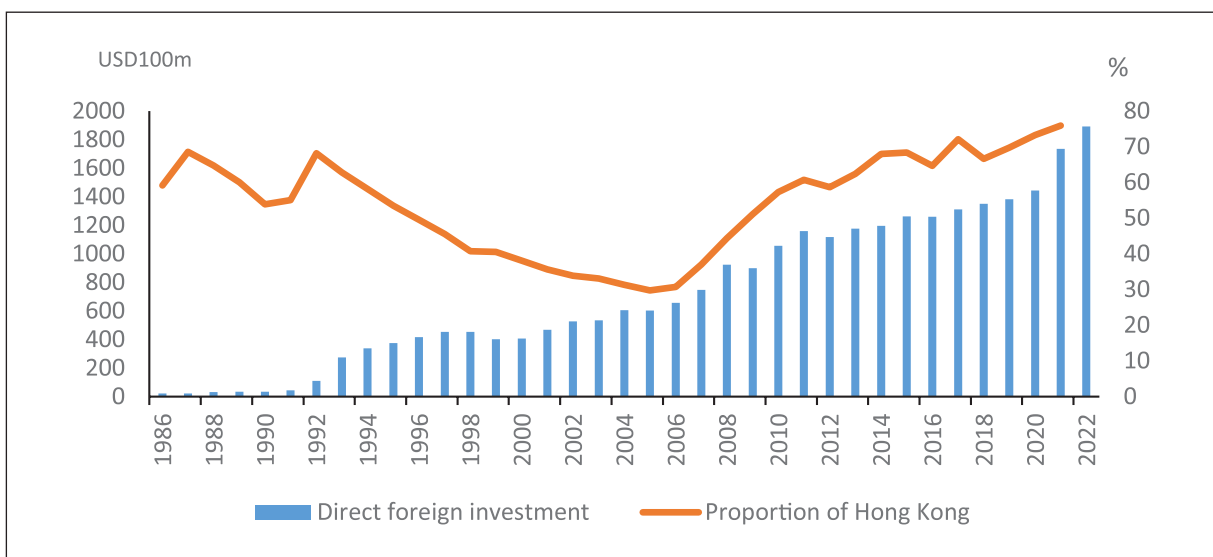


Fig. 6: Inflow of foreign capital into mainland China through Hong Kong



Source: Wind

## Risk of balance sheet recession

Since the outbreak of the pandemic, China's debt has been on the rise as a result of its efforts to hedge against the impact of the pandemic and to stabilise growth. According to CCXI, the total debt of the non-financial sector in mainland China was RMB 355.5 trillion by the end of 2022, with a leverage ratio of 293.8%. At this level of debt, if the average cost of financing is 3%, annual interest payments equate to about 9% of the GDP, and if the average cost of financing is 5%, annual interest payments will equate to more than 14% of the GDP, resulting in increased debt vulnerability.

High debt pressure will also increase the risk of a balance-sheet recession during the current economic downturn. According to the theory of balance sheet recession, after the bursting of the asset price bubble, the asset end of an indebted enterprise shrinks substantially, while the value of the debt end remains unchanged, rendering the enterprise insolvent. The enterprise's production and operational goals thus change from profit maximisation to debt minimisation. Homogeneous expectations can lead to a 'fallacy of composition', resulting in a prolonged recession, or 'balance sheet recession'. Although there has not been a significant drop in asset prices in China, the cash flow of enterprises has deteriorated due to the 3-year pandemic. In particular, the lack of confidence has led to changes in the behaviour of micro-entities. Enterprises have taken the initiative to reduce debt, and asset prices face downward pressure, with balance sheet recession pressure looming. According to the Research Institute of CCXI, by the end of 2022, the leverage ratio of the non-financial corporations was 171.98%, 8.3 percentage points lower than the record high in 2016. In addition, due to the sluggish real estate market, the growth of household mortgage loans slowed and residents' precautionary motives were enhanced under the impact of the pandemic. The leverage ratio of the households fell for two consecutive years, starting in 2021, for the first time since the financial crisis.

Under the pressure of stabilising growth, government departments are motivated to expand their balance sheets, but in the past 3 years, the conflict between local fiscal revenue and expenditure has intensified due to pandemic recurrence and the weakening of land finance, and local governments' balance sheet expansion



has been restricted. Given that economic recovery still faces multiple challenges and overall expectations are weak, it is important to monitor the balance sheet evolution of the real sector and guard against the risk of balance sheet recession.

Fig. 7: Leverage ratio of non-financial corporations and households

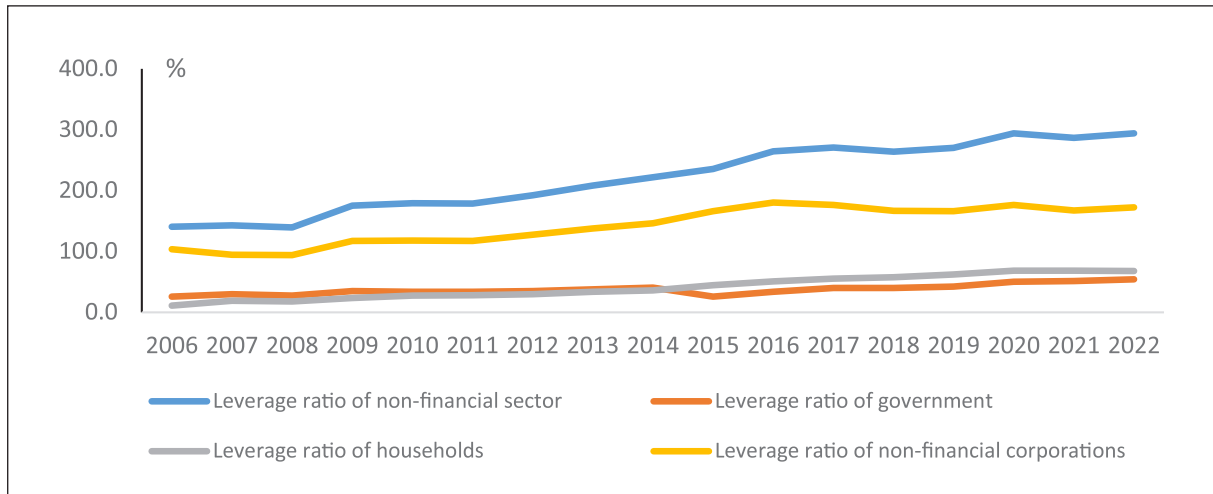
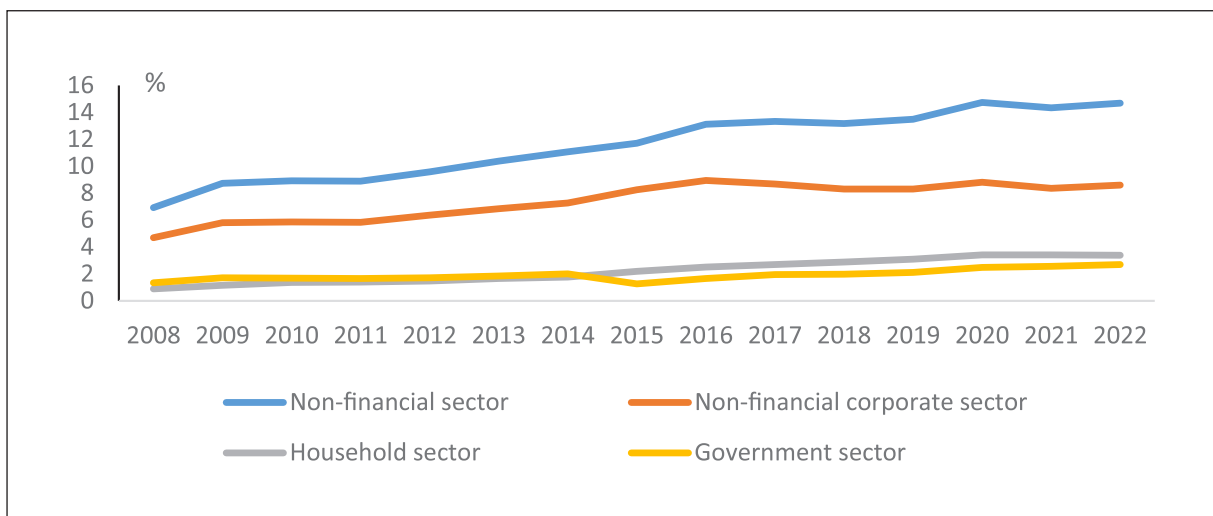


Fig. 8: Proportion of interest payments by various departments in terms of GDP (calculated at 5%)



Sources: Wind, BIS, Macro Debt Risk Database of CCXI Research Institute

### Transition to new real estate development model: Potential risks

Since the second half of 2020, the promulgation of the ‘three red lines’, ‘two concentrations’ and other strict real estate regulation policies, together with the industry cycle downturn, have significantly weakened real estate investment and consumption, dragging down economic growth. Since the fourth quarter of 2021, to stabilise land prices, housing prices and expectations, marginal adjustments

have been made to real estate regulation policies and several policies have been introduced to stabilise the real estate market to support both supply and demand. Thus, the drag on the economy from the real estate sector is expected to ease in 2023.

However, from the perspective of economic structural adjustment and long-term industrial development, factors such as changes in the population structure and the deceleration of urbanisation speed all indicate that the real estate industry has shifted from a stage of short supply to a stage of structural adjustment of supply and demand. The adjustment of real estate regulation policy will not change this medium- to long-term trend. Therefore, throughout the adjustment process, it is necessary to pay constant attention to the potential risks in the real estate sector. First, due to the large debt of the real estate sector, we should guard against its risk transmission. According to the Research Institute of CCXI, by the end of 2022, the total amount of debt (including loans, trusts and bond financing) undertaken by the real estate sector was approximately RMB58.8 trillion, equating to nearly 50% (48.6%) of GDP. Excluding mortgage loans undertaken by the resident sector, the total debt undertaken by real estate enterprises was approximately RMB20 trillion. Real estate has quasi-financial attributes, a long industrial chain and a wide range of coverage. Therefore, if it is improperly handled, it is easy to cause risk spillover; consequently, avoiding disposal risks is crucial. Second, it is necessary to monitor the weakening of economic growth momentum in the process of reducing economic dependence on real estate. In addition, revenue from the sale of state-owned land-use rights is the main source of revenue for local government-managed funds (90.6% in 2022), and revenue from government-managed funds accounts for more than 27% of broad fiscal revenue (27.66% in 2022) and is an important source of funds used by local governments to develop the economy.<sup>2</sup> The weakening of real estate will thus lead to the weakening of land finance, which may further intensify the pressure on local fiscal revenue and expenditure.

Fourth, there remain uncertainties regarding the recovery of demand; domestic demand recovery faces multiple constraints, and external demand is under considerable pressure from the weak global economy. On the one hand, with the overall recovery of the macro-economy, micro-economic entities' circumstances

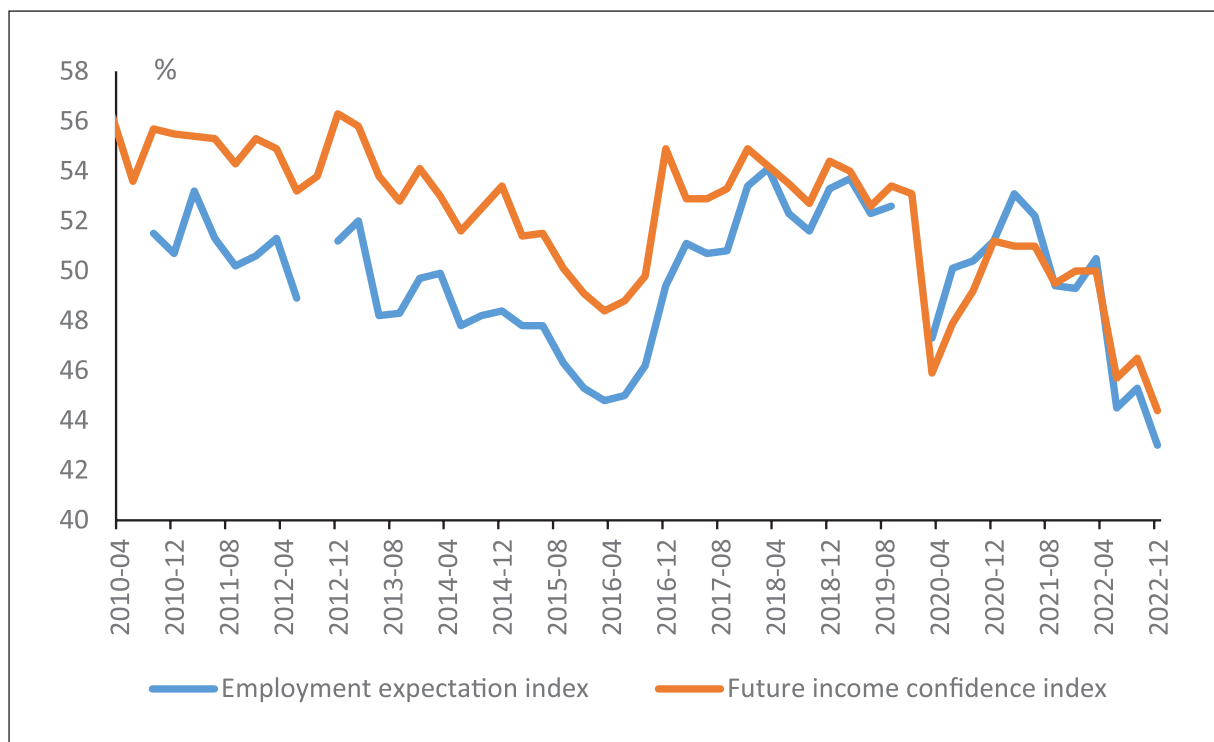
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2. The sum of revenue from general public budgets and revenue from government-managed funds.

may improve marginally in 2023, although the current expectations of residents and enterprises remain weak. Moreover, it is difficult to rapidly reverse changes to micro-entities' behaviour brought about by the 3-year pandemic. Enterprises tend to operate conservatively, and their investment tends to be cautious, as citizens' pessimistic expectations of future employment and income are also difficult to change in the short term. Thus, their propensity to consume is low,<sup>3</sup> which will affect the pace of domestic demand recovery.

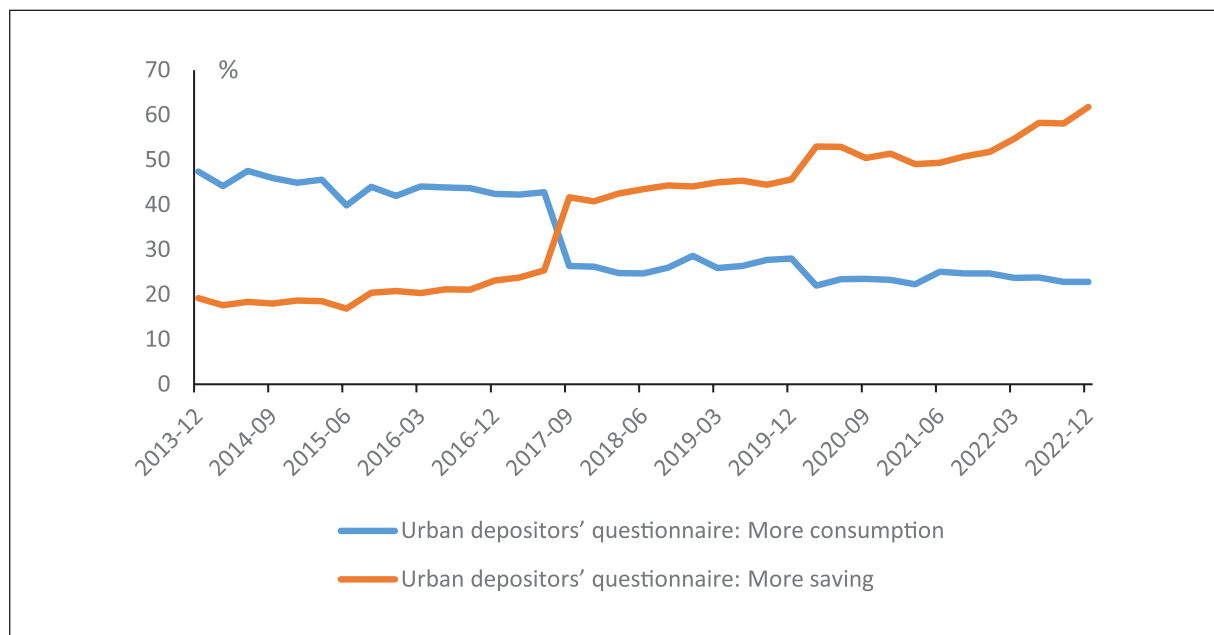
On the other hand, in the context of China's lifting of pandemic control policies, marginal easing of global inflation pressure and improved global financial environment, the International Monetary Fund's (IMF's) latest forecast of global economic growth for 2022 and 2023, released in January 2023, is slightly higher than that released in October 2022. However, the global slowdown has not turned, with the IMF expecting growth to fall back to 2.9% in 2023 (3.4% in 2022). Amid the weakening global economy and slowing demand, China's external demand remains under pressure, and the driving role of exports in economic growth is weakening.

Fig. 9: Citizens' employment and income expectations



3. The index of future employment expectations of urban savers in the fourth quarter of 2022 fell to the lowest point since statistics became available. The proportion of 'more consumption' has also been at a low level in recent years, while the proportion of 'more savings' has hit a record high.

Fig.10: Citizens' propensity to consume



Sources: Wind, urban depositors questionnaire of People's Bank of China

### III.2023 economic recovery: Positive outlook and potential for growth rate decline

The impact of the pandemic has amplified the volatility of China's economy since 2020. Together with the real estate market adjustment and complex and severe international geopolitical and economic environment, this has led to a compound GDP growth rate of approximately 4.4% from 2020 to 2022, much lower than that before the pandemic. With the increase of supporting factors, China's economic recovery in 2023 is expected to strengthen. However, with the decreasing marginal efficiency of capital and labour, and due to the impact of the pandemic, China's potential economic growth rate may decline to some extent. On the whole, however, China's economy remains resilient in the medium to long term, provided that it continues to realise its growth potential.

With more positive factors in China's economic performance in 2023, the GDP growth for the year is expected to surpass 5%. Although the 'scarring effect' of the pandemic, downward pressure on export growth, risks of real estate sector transformation and high debt levels will continue to constrain China's economic performance, there are more positive factors supporting economic recovery in

2023. First, the drag on the economy caused by both the pandemic and measures for its prevention and control has subsided rapidly, and economic and social life has basically returned to normal. Second, the consumption and service industries have ushered in a period of repair. After the lifting of the pandemic prevention and control policy in December 2022, the decline in the growth rate of the service industry production index and social retail narrowed significantly (by 1.1 percentage points and 4.1 percentage points, respectively) compared with in November. In 2023, the year-on-year growth rate of the service industry production index and social retail may recover, climbing from -0.1% in 2022 to more than 6%.

Third, due to changes brought by the political cycle, development has returned as the nation's top priority, with local governments' being increasingly active in developing the economy. The macro-policy focus has returned to stable growth, and the growth rate of infrastructure investment may be maintained at a high level, of over 8%. Fourth, with the enhanced policy support of real estate financing and the loosening of purchase and sale restrictions, the drag of real estate investment on the economy is expected to ease.

On the whole, considering the timing of peak of pandemic immunity, the pace of economic repair and the influence of the base effect, when estimated using the trend decomposition method, economic recovery may exhibit an 'N-shaped' trajectory in 2023. That is, macro growth may be low in the first quarter and high in the second quarter. The average growth rate for the entire year is likely to reach 5.3%, significantly higher than the repair forecast in 2022.

Fig. 11: Production and consumption of service industry in 2023

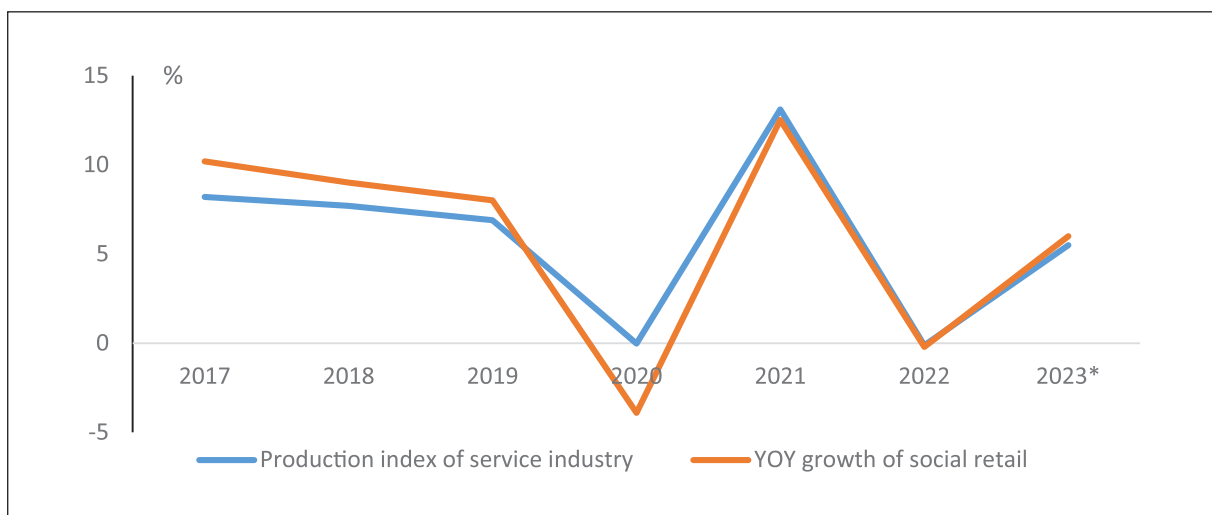
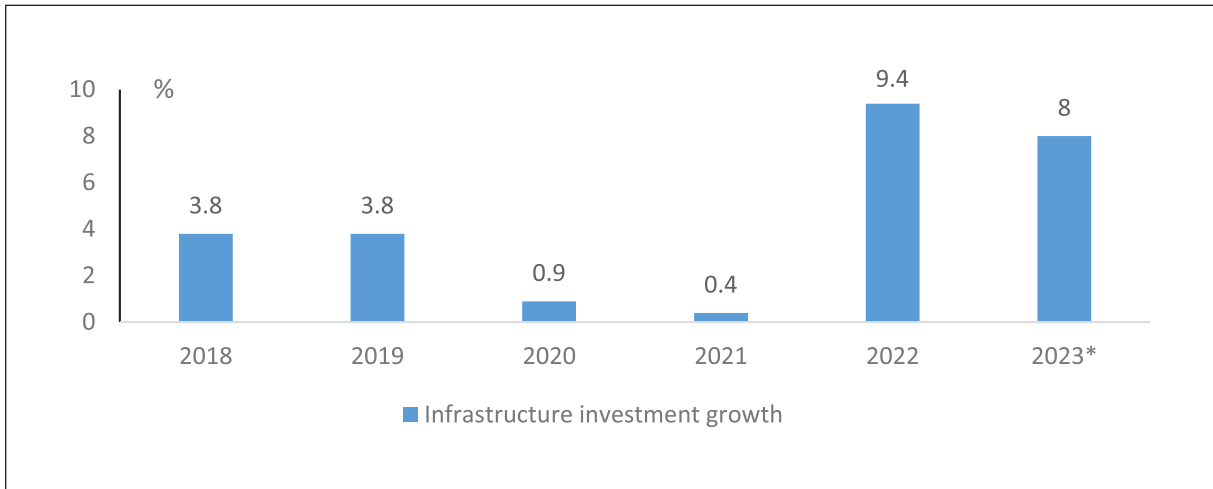


Fig. 12: Infrastructural investment growth in 2023



Sources: Wind, estimation of CXXI Research Institute

Fig. 13: Projected economic trajectory of 2023

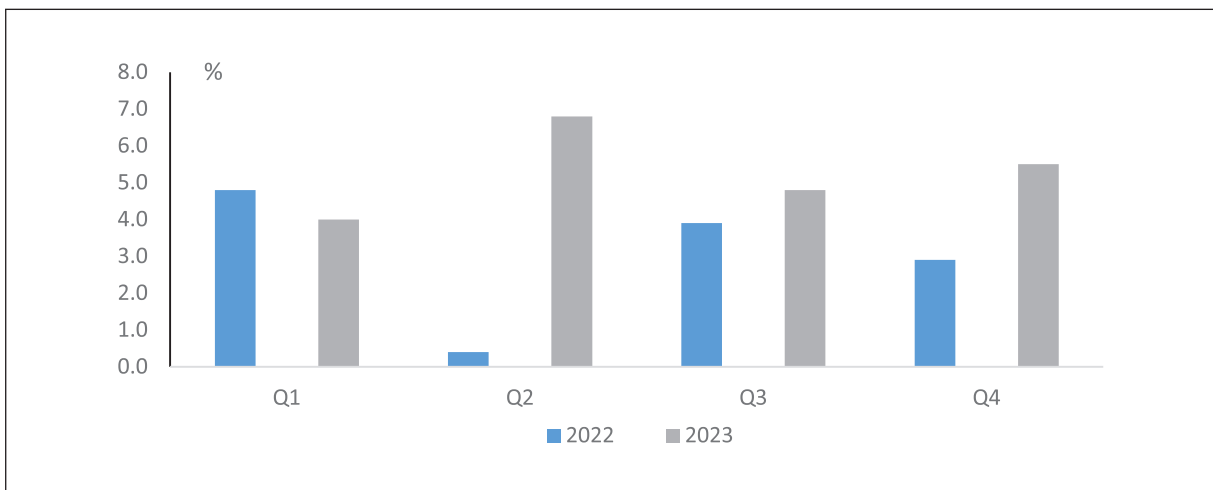
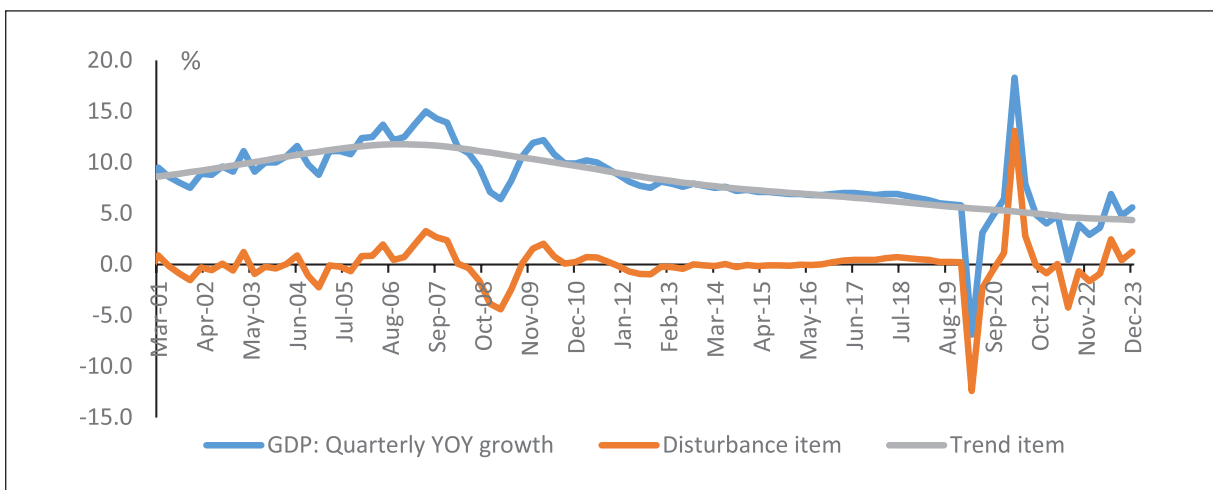


Fig. 14: GDP growth estimated using the trend decomposition method



Sources: Wind, estimation of CXXI Research Institute

In the medium and long term, downward pressure on China's potential growth rate must be monitored. According to Samuelson et al., 'potential economic growth' refers to the economic growth that is achievable under the condition that economic resources and production factors are fully utilised. In the Solow model and other economic growth models, economic growth can be generally decomposed into the contributions of capital, labour and technological progress to growth, where technological contribution is generally measured by total factor productivity, which includes both technological progress and institutional change.

Assuming that there are no changes in science and technology and in institutions, the potential growth rate generally presents a downward trend. From the perspective of capital factors, the marginal return of capital input is decreasing and the growth rate of fixed asset investment in major economies is also declining. From the perspective of labour factors, all of the major economies show slowing population growth, population aging, declining labour participation rates and declining labour productivity growth. In China, after 2010, the return on capital and the growth rate of fixed asset investment both showed a downward trend, and the marginal increase of output value driven by additional capital investment decreased. The return on capital fell from 10.5% in 2010 to approximately 5.1% in 2020. In terms of labour factors, the aging population and declining birth rate may bring about a decrease in the proportion of working-age population. Moreover, China's labour force participation rate has continued to decline since 2011, accelerating after the outbreak of the pandemic and dropping from 71.1% in 2011 to 68.1% in 2021, indicating a rise in the number of working-age people dropping out of economic activity. In addition, the growth rate of labour productivity is also slowing down, with the year-on-year growth rate of total labour productivity in China dropping from 10.2% in 2010 to 6.2% in 2019 before the pandemic. Data calculated using a filtering method shows that during the 14th Five-Year Plan period, China's potential GDP growth rate may average 4.8%, while in 2025, the potential GDP growth rate may decline to 4.4%. In the medium to long term, the support line of China's economic growth may also drop to 4%, down from 5.5% before the pandemic.

Fig.15: China's return on capital has continued to fall in recent years

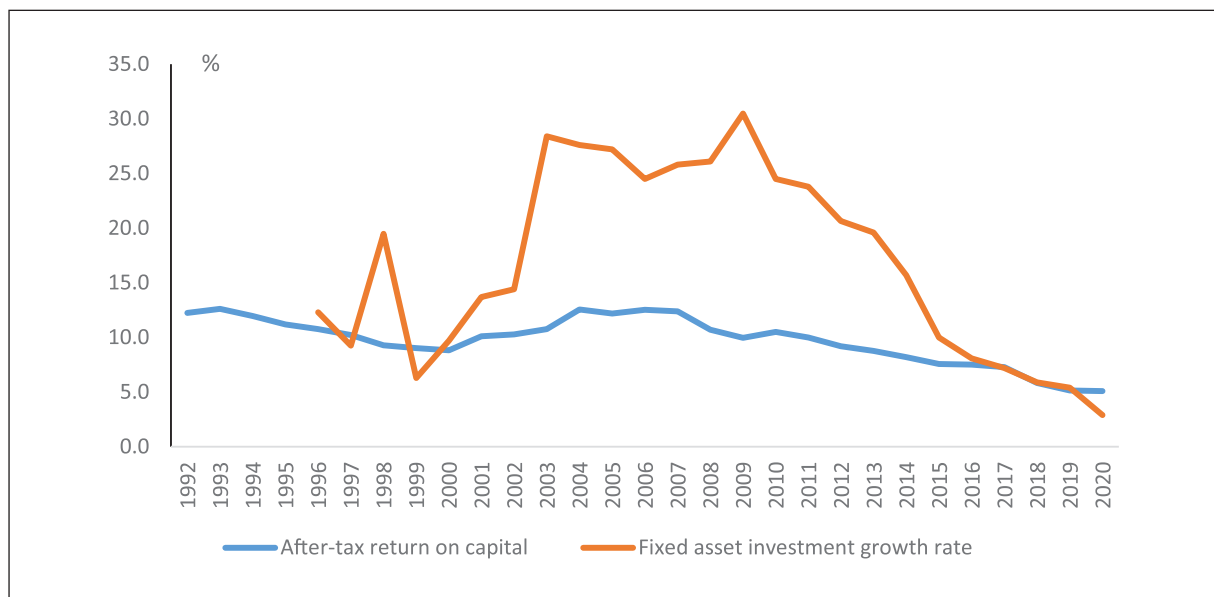
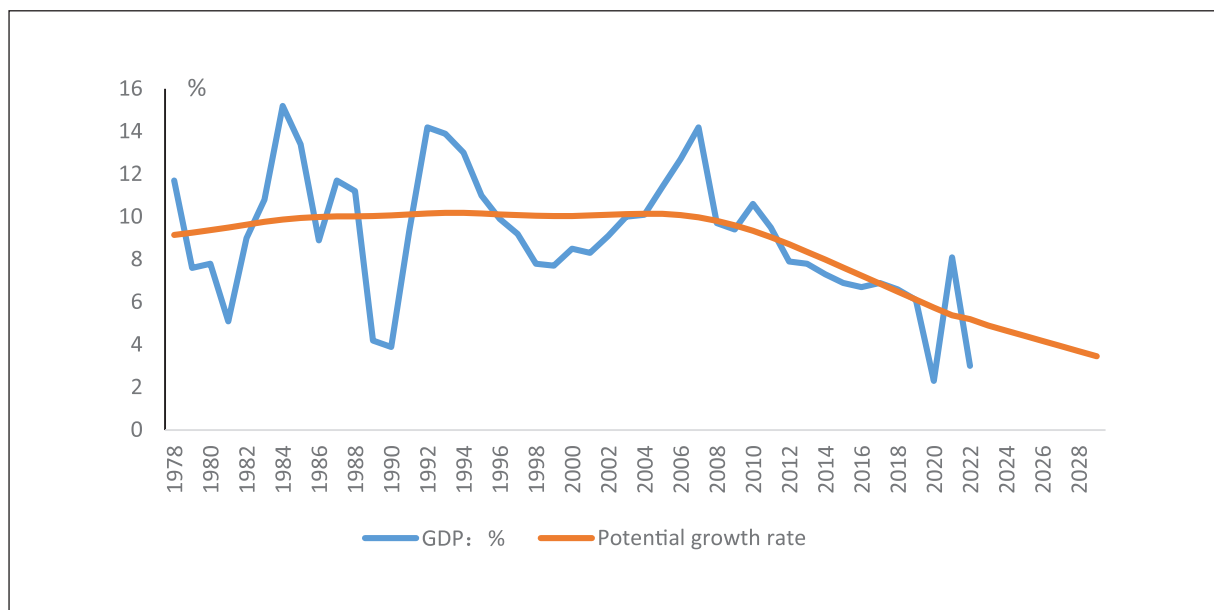


Fig. 16: Potential growth rate calculated with HP filtering method



Sources: Wind, CCXI Research Institute, estimation of the author

## Chinese economy: Resilience and growth potential

Despite the downward pressure on economic growth, the Chinese economy will remain resilient in the middle and long term. First, it has the advantage of a very large-scale market. On the demand side, it has the consumption demand of more than 1.4 billion people, with the middle-income group (about 400 million people)



displaying a strong demand for consumption upgrading. On the supply side, there is a large and comprehensive industrial system and stable production capacity accounting for 30% of the global manufacturing value added.

Second, China maintains the potential and space to develop a large domestic economic cycle. The average consumption multiplier of China's economy in 2018–2022 was 3.5, significantly higher than its investment multiplier (1.6). Expanding consumption will provide stable support for the economy.

Third, economic transformation and industrial upgrading will further release the driving role of high-tech manufacturing. For example, China has become the world's largest market for and largest producer of new energy vehicles, meaning that industries such as batteries, motors and electronic control systems in new energy vehicles and autonomous driving will further expand.

Fourth, the regional growth poles, such as the Beijing–Tianjin–Hebei region, the Yangtze River Delta, Guangdong, Hong Kong and Macao, the middle reaches of the Yangtze River and the Chengdu–Chongqing metropolitan area, have strong economic vitality, creating development engines in eastern, western, southern, northern and central China. China has become the world's second largest economy in terms of total volume; however, it still lags far behind developed countries in terms of volume per capita. China's per-capita GDP may easily reach the level of high-income countries' GDP by 2025. However, to achieve the goal set by the 20th CPC National Congress of reaching the GDP level of moderately developed countries (that is, a per-capita GDP of approximately USD 30,000) by 2035, China's long-term average economic growth must be maintained at a rate above 5.1%.

Furthermore, the Chinese economy still varies widely among its population, between urban and rural areas and between regions. The problems involved in the process of economic and social development must be solved through rapid expansion of the 'cake'. In this context, macro policies should adhere to the principle of development as the top priority and avoid excessive politicisation of social operations. With the given economic downward pressure, it is especially necessary to reiterate the principle of taking economic development as the central task and continue to position GDP growth as the most important assessment index

of government departments, to enhance government departments' enthusiasm for developing the economy. Moreover, macro policies should focus on helping people recover from the pandemic, in view of the fact that micro entities have been severely harmed by the pandemic. China should increase spending on projects to improve its people's well-being, to support and encourage private investment and business operations, to strengthen the micro foundation for steady and sustained economic growth and to unleash the potential for economic growth.

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**Review of China's Financial System  
and its Prospects for 2023**

# Review of China's Financial System and its Prospects for 2023

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2022 was a difficult year for China's financial system, with external and internal pressures, such as interest rate hikes by the Federal Reserve (Fed), capital outflows, and credit contraction caused by deep adjustments in corporate and household balance sheets. In 2023, the J-curve effect after the pandemic is expected to be relatively flat, but credit growth will be subject to the impact of the post-pandemic policy adjustments on the supply side and the expected slow recovery in the medium term. In the long term, the rise in the real estate cycle is expected to lead to a profound adjustment in financial expansion, urbanisation, and industrialisation models, which will be an important factor in China's financial volatility in the future.

## I.2022: Multiple pressures on China's financial system

**The multiple interest rate hikes by the Fed and the regulatory policy adjustments in some industries created an external liquidity gap, while fluctuations in the RMB exchange rate partly absorbed the external shock pressure.** In 2022, emerging markets across the world suffered the consequences of seven consecutive Fed rate hikes of 425 basis points. The federal funds rate range was raised to 4.25%–4.50%, the highest in the last 15 years. The sharp rise in the USD risk-free yield pushed the USD index to a 20-year high. In 2022, the RMB's central parity rate against the USD depreciated by over 9% with an amplitude of 16%, hitting a 14-year low. However, the flexibility and resilience

of the RMB exchange rate improved under such exchange rate fluctuations, and two-way fluctuations have now become normal. In addition, the reconfiguring of global industrial supply and value chains due to the Russia–Ukraine war and drastic adjustments in the regulatory policies for the Internet and other industries in China have resulted in foreign investors becoming wary of China's financial system in the short term. As of 28 December 2022, the cumulative net inflow of A-share northbound funds in 2022 was RMB91.036 billion, approximately 20% of the total annual net inflow in 2021. There was a considerable contraction in USD-denominated funds that invest in the mobile Internet, with fundraising down by approximately 60% in the first half of 2022, according to PEDATA.

Fig. 1: Depreciation rate of the RMB, the Yen, and the Euro against the USD (taking 1 January 2022 as the base period)

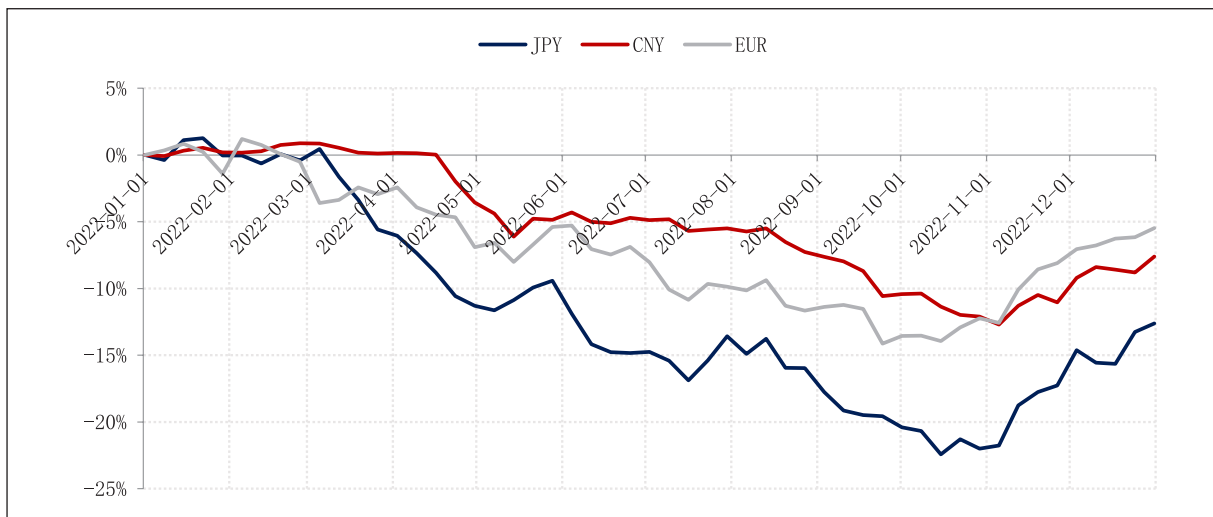
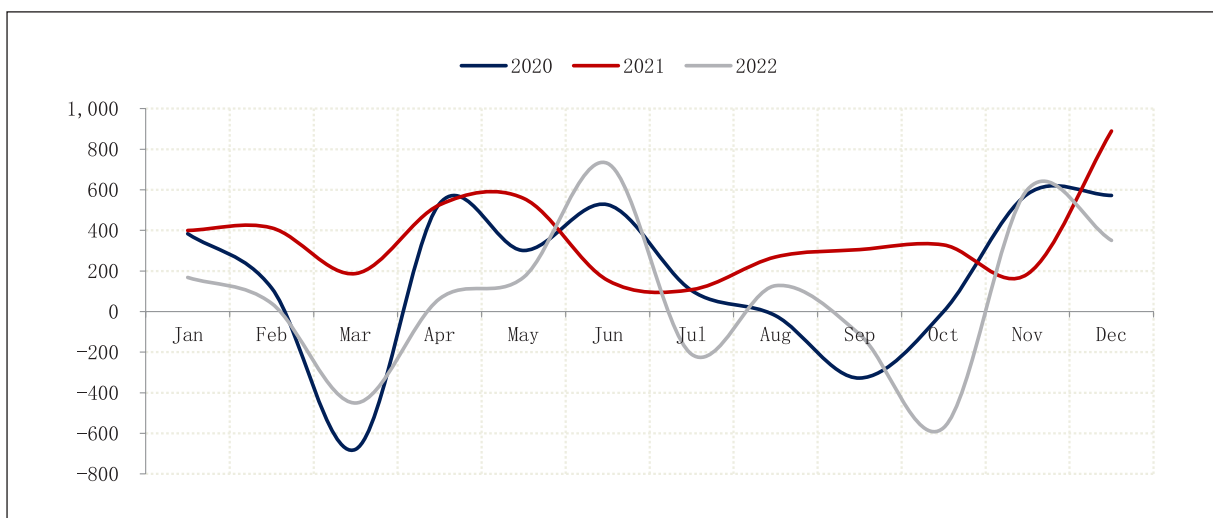


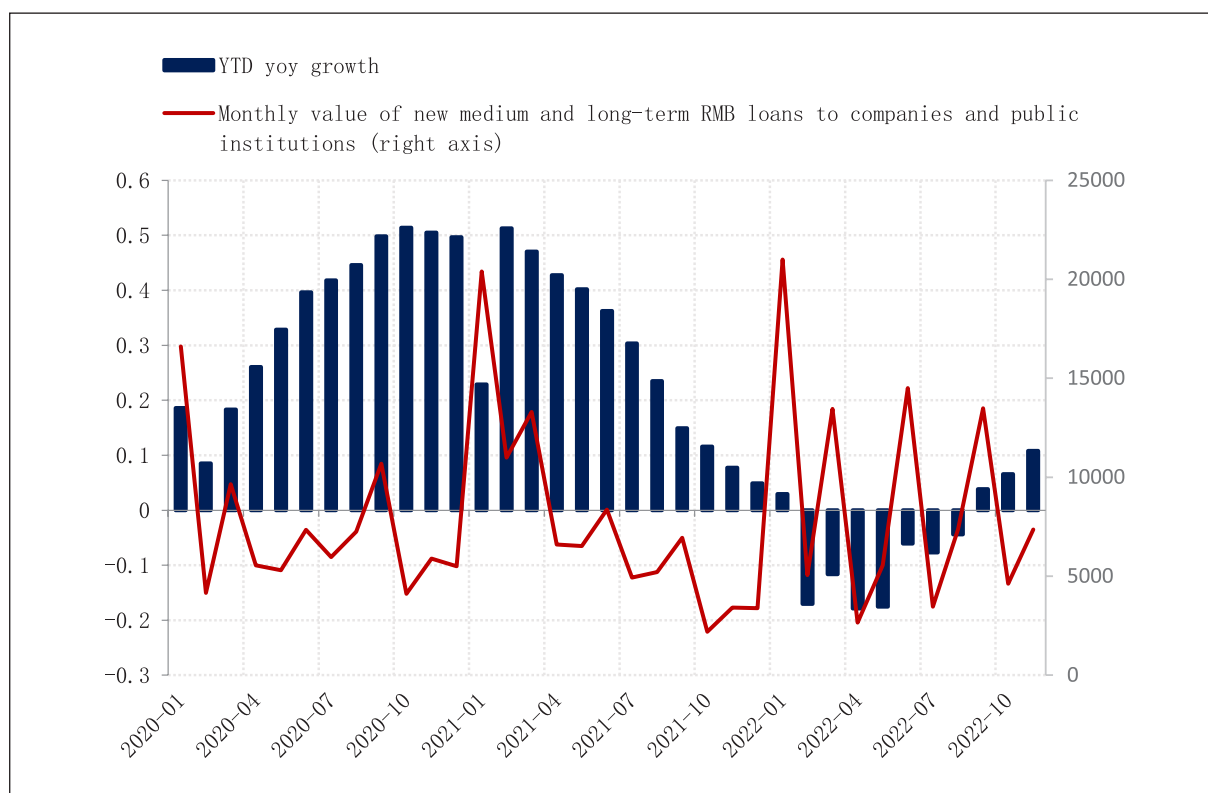
Fig. 2: Inflow of northbound funds in 2020–2022 (RMB100 m)



Source: Wind database

**The strict pandemic control policy adopted by China had a substantial effect on the credit demand of companies, making credit growth more dependent on policy stimulus.** There were many more large-scale lockdowns in 2022 than in the previous 2 years of the pandemic, which contained the spread of the virus but also objectively weakened the stability of the industrial supply chain. The uncertainty of the pandemic severely affected business expectations and reduced the willingness of companies to expand production capacity, leading to a sharp contraction in the demand for credit and other financial services. The credit data shows that the medium and long-term financing demands of companies in terms of medium and long-term loans and trust and entrusted loans decreased by approximately 1.3% year-on-year from January to June 2022. Later in the year, monetary policy-based financial instruments led to a slight recovery in medium and long-term corporate loans, but this was followed closely by special debt, which shows that the recovery was related to infrastructure projects.

Fig. 3: Medium and long-term corporate loans (RMB100 m) and year-on-year growth in corporate loans in 2022



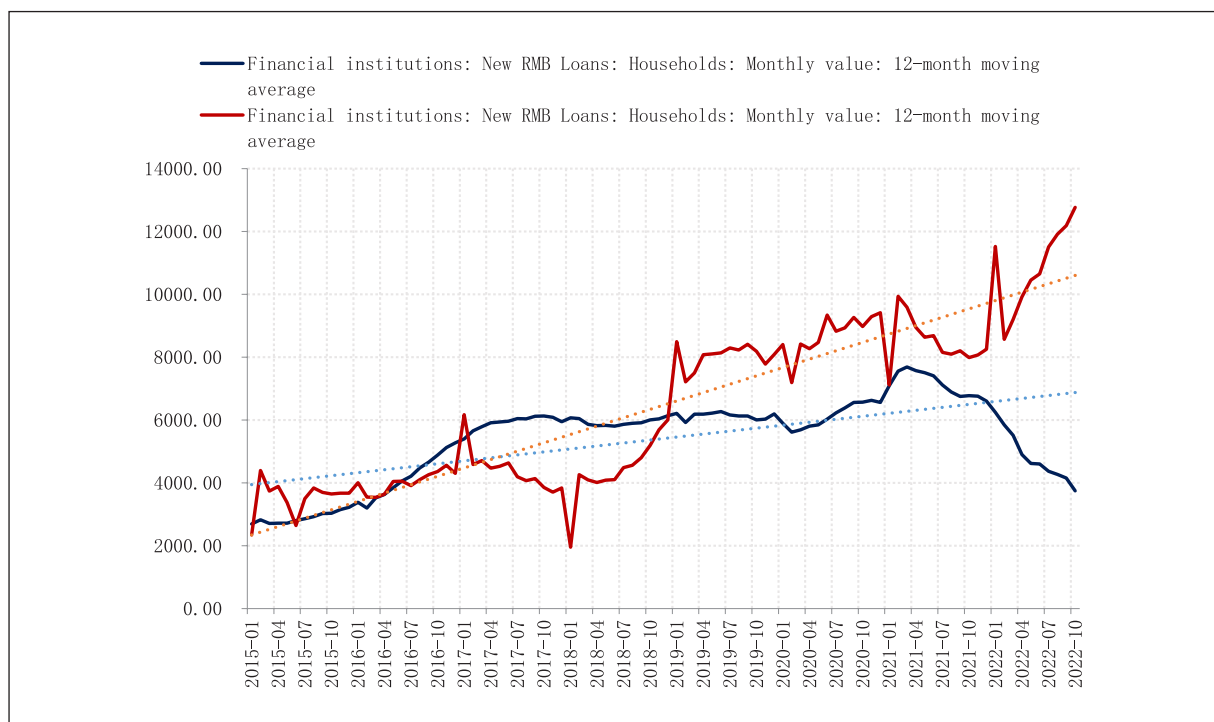
Source: Wind database

**The shrinking balance sheet of the household sector and the damaged balance sheet of the real estate industry resulted in considerable adjustment**

### pressure in real estate financing and knock-on effects on the financial system.

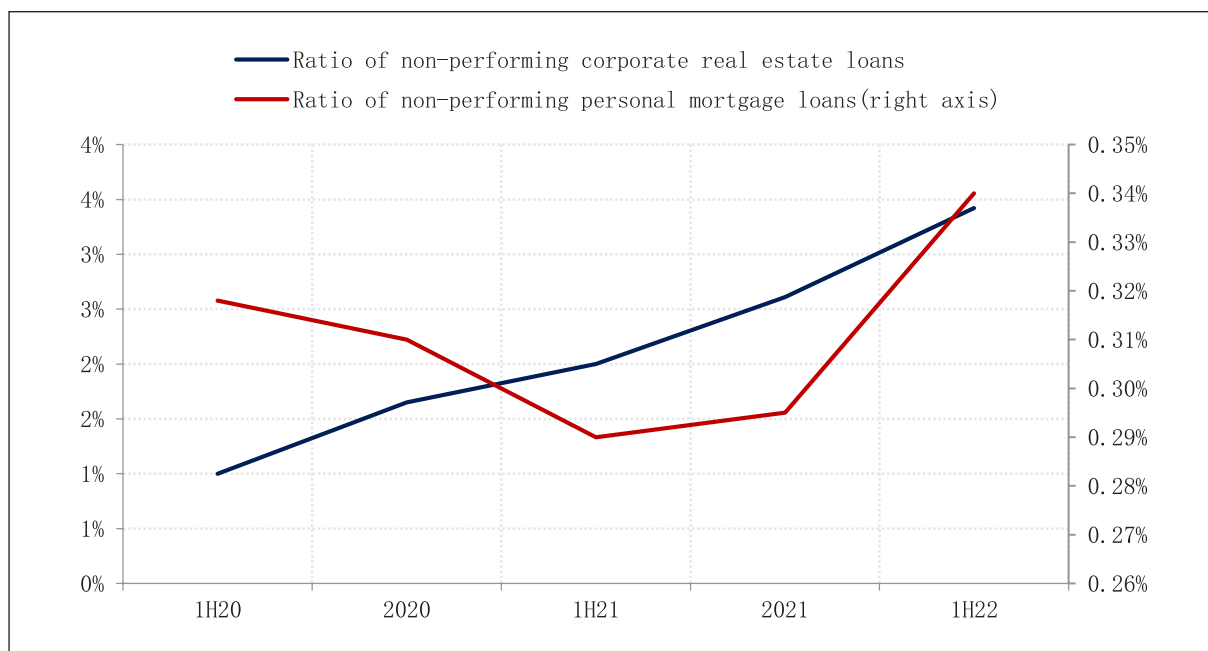
The downward cycle in the real estate industry and strict real-estate regulation led to a significant adjustment in China's real estate market in 2022, which resulted in a negative cash flow cycle for real estate companies: under-construction houses could not be delivered on schedule, so households had to wait indefinitely, leading to a worsening of the cash flow of real estate companies. This was reflected in the financial system in the following ways. First, the debt financing speed of the Chinese household sector declined. The growth rate of China's household sector debt in 2021–2022 was 5.4%, a decrease of 70.9 percentage points from 2015–2020 (when it was 18.5%), while the growth rate of household savings increased from 11.1% to 17.4% during the same period. Second, the asset quality of the financial system deteriorated. According to the data of listed banks, the ratio of non-performing personal mortgage loans increased considerably in the first half of 2022, and the ratio of non-performing corporate real estate loans, which had been increasing for three consecutive years, was 3.42%. Moreover, real estate bonds and urban investment bonds, which are closely related to land transfer income, also faced varying degrees of downward pressure. The risk sentiment of the market did not ease until August 2022, when the authorities introduced a new policy to boost real estate financing, dubbed the 'three arrows' policy.

Fig. 4: Expansion of the balance sheet of China's household sector



Source: Wind database

Fig. 5: Listed banks' ratio of non-performing personal mortgage loans and non-performing corporate real estate loans to total loans



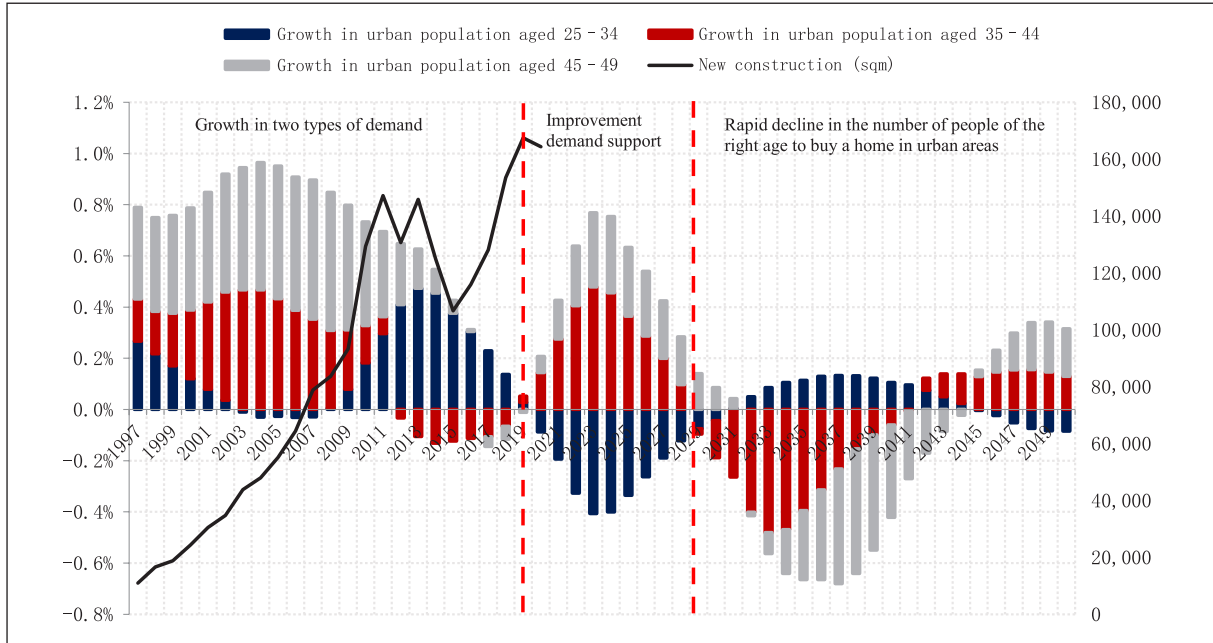
Source: Financial reports of companies

**Due to the threatened transformation of the financing demand model, weak real estate financing demand and market-oriented credit demand, several monetary policy-oriented stimulus measures played a major role in credit expansion in 2022.** The rise and fall in China's real estate cycle mean that the rapid property-driven financial expansion of the past is coming to an end. However, in 2022, a combination of multiple policies, such as the 'three red lines' and 'centralized land purchase' policies, led to an abrupt decrease in the growth rate of China's real estate investment to approximately -10%, which is much lower than the average growth rate of approximately 2–3% in major developed countries that have completed the urbanization process. Furthermore, the commercial banking system, which was used to the credit growth model driven by real estate expansion, was at risk of stalling. Due to real estate regulation policies, credit grew by 11.1% in 2022, which was more driven by policy than based on real market-based financing demand. In the second half of 2022, special bonds, monetary policy-based financial instruments, and medium and long-term manufacturing loans reversed the negative growth trend in medium and long-term corporate loans. The People's Bank of China (PBoC) introduced more than 10 structural monetary policy instruments, such as carbon emissions reduction support refinancing, scientific and technological innovation refinancing, and refinancing



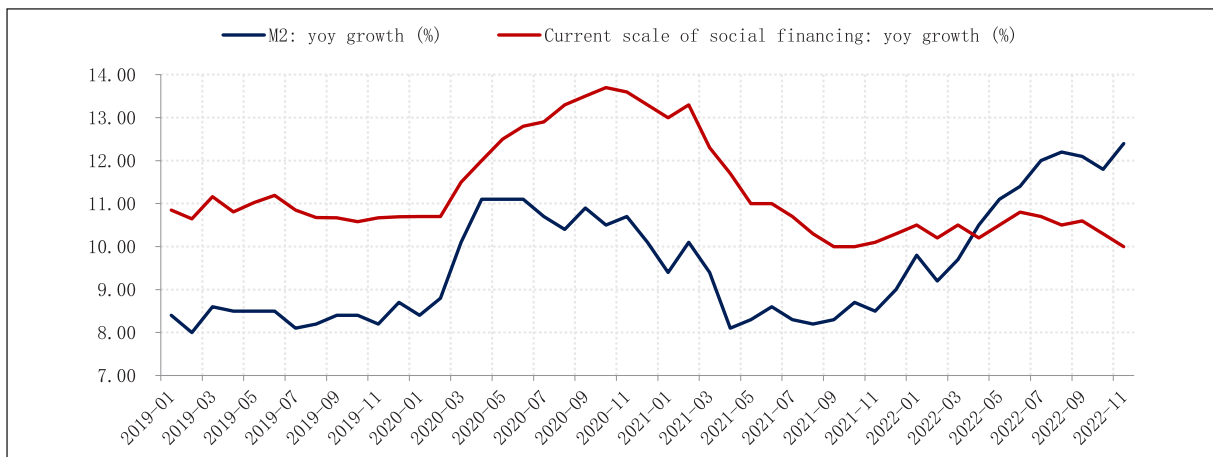
for ensuring building delivery. However, the sustainability and asset quality of non-market credit could be a concern. In addition, with the rise and fall in China's real estate industry, it is worth focusing on constructing a future money and credit growth model that is driven by the financial market.

Fig. 6: The rise in China's real estate cycle



Source: UN, Choice

Fig. 7: Growth rate of M2 and social finance during 2019–2022

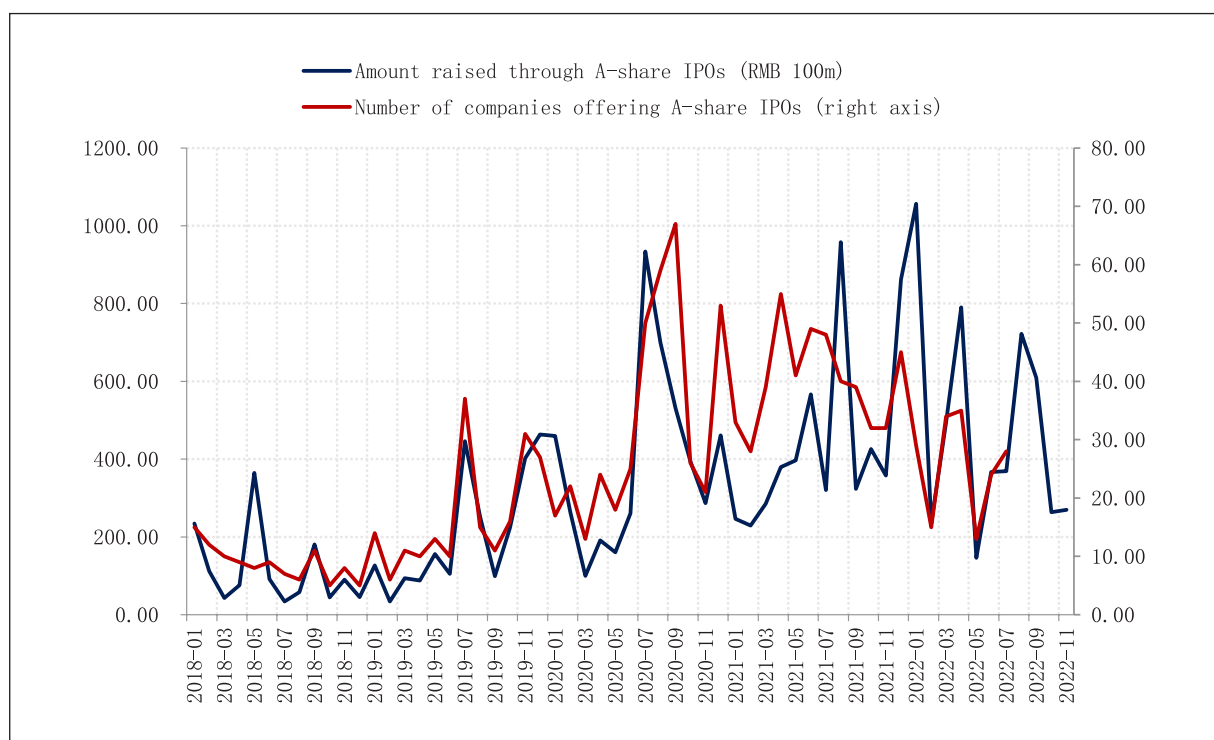


Source: Wind database

**The reform of the stock market registration system has continued and the rapid development of local capital markets reflects the strong growth trend in China's financing structure adjustment and direct financing development.** In 2022, China continued the process of capital market reform with its registration

system reform, aimed at making the capital market more inclusive and adaptable than before. The STAR Market, ChiNext stock market, and Beijing Stock Exchange, which have implemented the registration system, became the main venues for initial public offering (IPO) listings in the A-share markets. Against a backdrop of lacklustre IPO performance globally, the success of China's domestic IPOs – 428 companies were listed and achieved record-high annual fundraising – was a rare bright spot in global capital market financing. At the same time, US listings by Chinese companies continued to reduce due to falling valuations of China concepts stocks and audit disputes. According to the Wind database, as of 28 December 2022, Chinese companies had raised \$582 million in US listings, approximately 96% less than what they had raised in 2021. The improvement in the listing system through the registration system and the increased allocation of financial assets by local residents partly offset the effect of the external liquidity gap in China's capital markets. The primary market also showed a similar pattern, with a sharp contraction in USD-denominated funds in the short term. However, local government-backed industrial funds were highly active and local governments actively guided industrial upgrading through customized funds. In the first half of 2022, 2,050 government-guided funds were established.

Fig. 8: Amount raised through and number of companies offering A-share IPOs from 2018 to 2022



Source: Wind database

**The turbulence in the international financial environment will provide a new impetus for the internationalization of the RMB. China's financial opening-up has begun to emphasize the main characteristics of high level institutional opening, such as rules and standards.** According to the latest survey by the Bank for International Settlements, the RMB's share of the global foreign exchange market increased from 4.3% to 7% and its ranking increased from the eighth most traded currency to the fifth most traded currency in the last 3 years, such that it has become the fastest rising currency in the world. In 2022, the PBoC further optimised the overseas deployment of RMB clearing banks to promote bilateral currency cooperation and entered into bilateral currency swap agreements with the central banks or monetary authorities of 40 countries and regions. In May 2022, the International Monetary Fund (IMF) conducted the first review of the Special Drawing Rights (SDR) basket currencies since the inclusion of the RMB in the basket, unanimously agreed to maintain the composition of SDR basket currencies, and increased the weight of the RMB in the basket from 10.92% to 12.28%. In July 2020, the Office of the Financial Stability and Development Committee of the State Council announced several policy measures to further open up the financial sector, such as allowing foreign institutions to rate all types of bonds in the interbank bond and exchange bond markets when conducting credit rating business in China, and permitting foreign institutions to obtain Class A lead underwriting licenses in the interbank bond market, thus further facilitating foreign institutional investment in the interbank bond market. In December 2022, Hong Kong announced that its securities market would launch the HKD-RMB Dual Counter Model and the dual counter dealer mechanism to further support the trading of a wide range of RMB-denominated stocks in the offshore market and create a new space for the internationalisation of the RMB.

China's bond market has become increasingly internationalised since the launch of the 'Northbound Bond Connect'. By the end of December 2022, foreign institutions held bonds valued at RMB3.39 trillion in the interbank bond market, which accounted for approximately 2.7% of the total custody volume in the interbank bond market. In 2022, the Chinese regulatory authorities issued several regulations, such as the Matters Concerning Further Facilitating Overseas Institutional Investors' Investment in China's Bond Market, to further unify and streamline the institutional framework, fund management rules, and financing

rules required for opening up China's bond market to the outside world. On 4 July 2022, the regulatory authorities of Hong Kong and mainland China jointly announced cooperation on establishing interest-rate swap-market connectivity between Hong Kong and the mainland. This will facilitate domestic and foreign investor participation in the financial derivatives markets in Hong Kong and the mainland through the Swap Connect and support the launch of government bond futures in Hong Kong, which is a new policy milestone in the development of Hong Kong as a risk management centre for RMB-denominated assets.

The Shanghai–Shenzhen–Hong Kong Stock Connect mechanism has steadily improved. On 24 June 2022, the China Securities Regulatory Commission (CSRC) issued the Announcement on the Arrangements for the Inclusion of Exchange-traded Funds in Stock Connect, further deepening the connectivity mechanism between the mainland and Hong Kong stock markets. On 4 July, exchange-traded funds were officially included in Stock Connect. On 19 December, the CSRC and the Securities and Futures Commission (SFC) jointly announced that they had agreed in principle to further expand the target range of Stock Connect between the exchanges in Hong Kong and the mainland, including on the inclusion of international companies in Hong Kong Stock Connect. This will provide convenient access for mainland China investors to a wide range of international assets through Hong Kong Stock Connect and further strengthen Hong Kong's unique position as an international financial centre connecting China and the rest of the world.

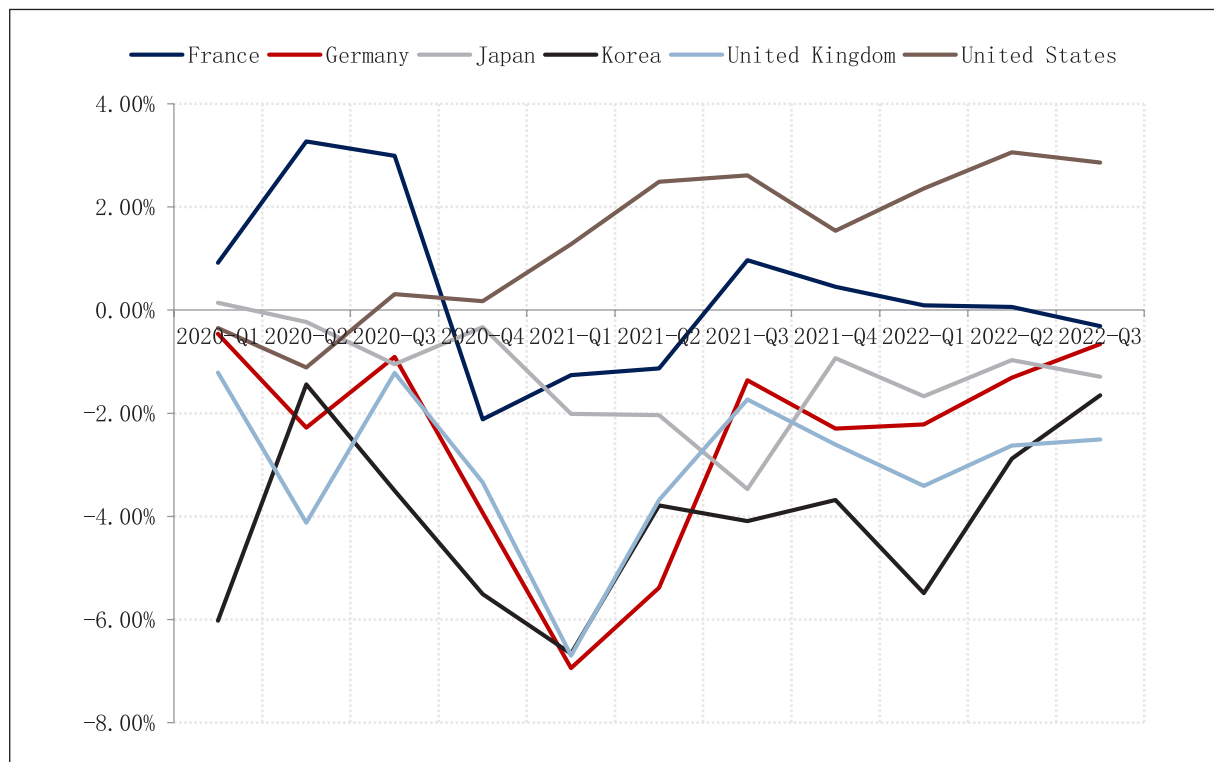
## **II.2023: China's financial sector ushering in the post-pandemic recovery**

**China's post-pandemic recovery will not be smooth. The financial sector continues to face a highly uncertain economic environment and adjustments in pandemic control policies may not necessarily bring about a significant economic and financial rebound.** As the pandemic control adjustment processes and macroeconomic performances of the United States, the United Kingdom, Germany, France, Japan, South Korea, Vietnam, Taiwan province, and Hong Kong show, economic recovery after the loosening of pandemic controls has been

bumpy. It is difficult for people's consumption propensity to return to 2019 levels after pandemic control policies are relaxed. So far, the consumption propensity in Japan and South Korea is lower than what it was in 2018–2019. Consumption tends to recover with relaxations in pandemic control policies but then bottoms out again with a new wave of infections. In Taiwan province, for example, the number of confirmed cases was over 700 per 10,000 people in May and June 2022, and the growth rate of consumption in Q2 2022 was lower than that in Q1 2022. Labour supply is recovering slowly. Core service industries are experiencing a general upward trend.

Multiple indicators, such as the purchasing managers' index (PMI) data for December 2022 and Q4 2022, central bank survey data and high-frequency data, show that there has not been any significant respite in the difficulties facing the economy. Some of these difficulties are short-term and result from an adjustment in pandemic control policies, while others are medium-term and are a result of the global economic slowdown and decline in consumer confidence. In the short term, due to complications in the adjustments to pandemic control policies, the supply-side industrial chain and supply chains will continue to be subdued and demand is unlikely to pick up remarkably; in the medium and long term, it will take time to recover from the economic scarring due to unstable expectations and reduced corporate efficiency. This means that it may not be easy to realise stable growth in 2023 and the macroeconomic environment of the financial industry will remain highly uncertain. However, in 2022, the strict pandemic control policies were not the only factor that contributed to China's economic slowdown. Signs of economic weakness started emerging in the second half of 2021. In the long run, with economic transformation, China's economic growth will show a gradual downward trend. Therefore, we do not expect a significant economic rebound from adjustments in pandemic control policies.

Fig. 9: Post-pandemic recovery in private consumption propensity in major economies (private consumption as a share of GDP compared with that in the same period in 2019)



Source: OECD

**In 2023, China's external headwinds will shift from being caused by the Fed's continued tightening of interest rates to being caused by the decline in exports due to the global economic downturn.** Furthermore, the inflationary pressure in the global economy will not reduce and the Fed's pace on interest rate hikes will likely remain aggressive. As shown by the latest dot plot, the federal open market rate is expected to reach 5.75%. At the same time, the low global aggregate demand will be a challenge for global economic growth in 2023. The IMF predicts that the global economy will grow by 2.7% in 2023, while the OECD's prediction is 2.2%. The World Bank has reduced its global economic growth forecast for 2023 from 3% to 1.9%, and the World Trade Organisation expects the volume of global goods trade to grow by just 1.0% in 2023, far below its previous estimate of 3.4%. That would put a considerable strain on exports, which have sustained China's growth over the past 3 years. Since 2020, the growth in China's exports has continued to beat market expectations, rising from 14% to 16%, and the contribution of net exports to China's economic growth has remained at a fairly high level. In 2022, even when growth in exports had slowed, the contribution of net exports to economic growth was 17.1%. At present, based on a cautious

outlook for the global economy, the market expects China's export growth to decline to approximately -2% in 2023 and thus make a negative contribution to the economy. The direct impact on the financial sector would result from the passive tightening of liquidity in emerging markets because of falling exports and the Fed's interest rate hikes, while the decline in exports would be reflected as a slowdown in real credit demand and liquidity cycles. This will create new challenges for financial policy in 2023.

Fig. 10: China's exports growth rate and share in global trade

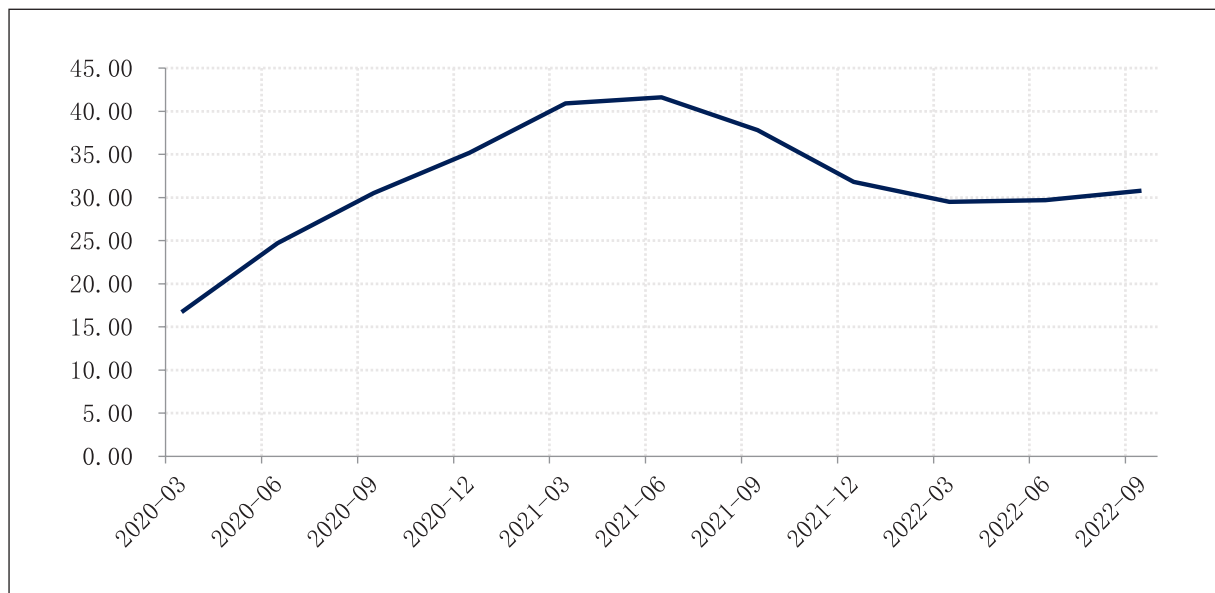


Source: Wind database, UNCTAD

**China's structured monetary policy financial instruments are expected to gain momentum in 2023 and policy-driven credit growth will continue to grow in the short term.** Since the second half of 2022, various special reloans and development policy-based financial instruments have become the 'third way' of economic recovery, in addition to the conventional fiscal and monetary policy instruments. The structured monetary policy-based financial instruments will play a key role in economic rebound because the road to recovery in 2023 will not be smooth. The PBoC's monetary policy in 2023 is said to aim at 'ensuring sufficient quantity and appropriate structure'. Infrastructure and manufacturing are expected to be the key areas for policy and financial support. A total of RMB740 billion was allocated to policy-based financial instruments in 2022, covering

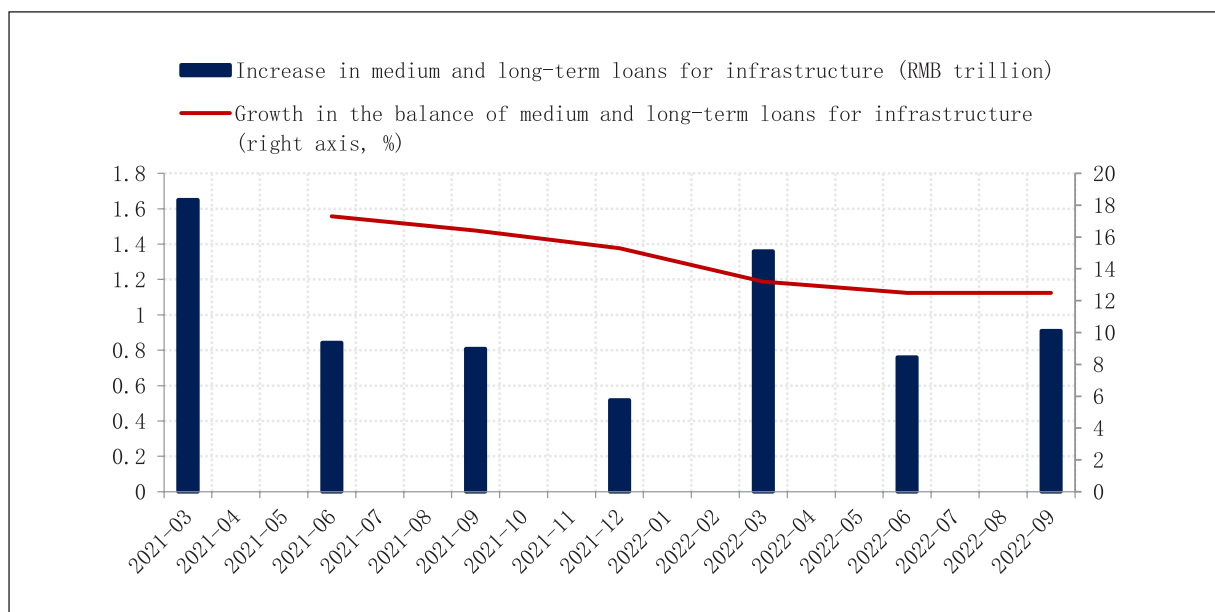
more than 2,700 projects. In 2022, loans to the manufacturing sector increased by approximately RMB5 trillion, up from RMB2 trillion in the previous year, and the growth rate was significantly higher than that of other loans. In 2023, it is expected that the boom in loans for infrastructure construction and manufacturing will continue and the trend of policy-driven credit growth will be significant in the short term.

Fig. 11: Growth rate of the medium and long-term loan balance in the manufacturing industry (%)



Source: PBoC

Fig. 12: Medium and long-term loans for infrastructure construction



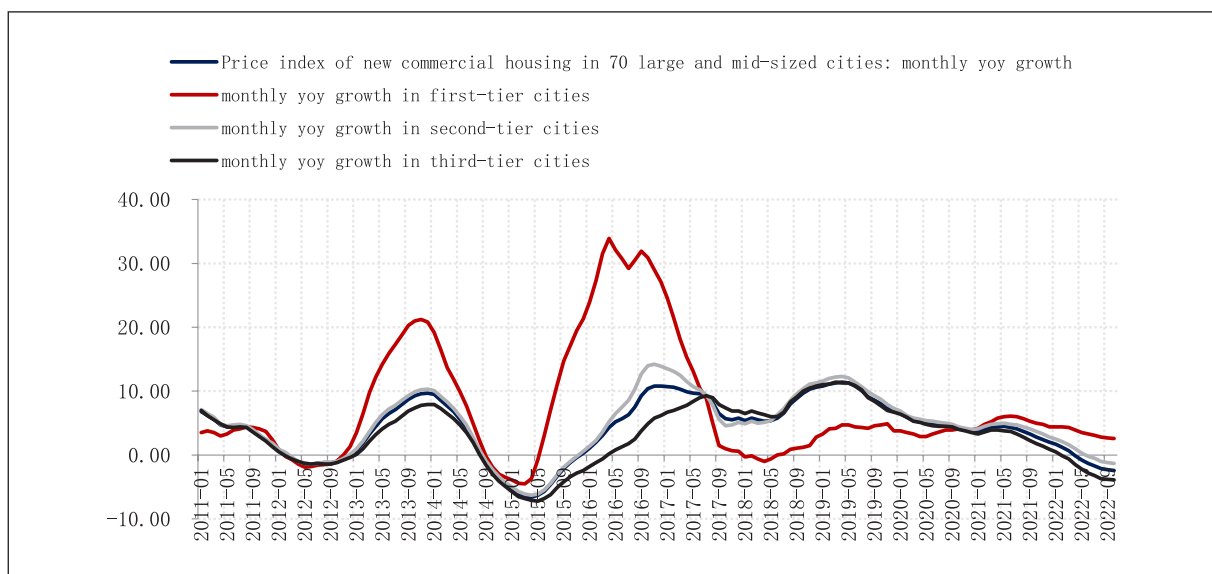
Source: PBoC



**An increase in regional differences in China's real estate market will lead to a reshaping of the financial development model.** Since August 2022, several financing support policies for real estate companies have been introduced and efforts have been made to extend credit, bond and equity financing in real estate. The balance sheets of real estate companies are showing signs of a slow recovery. However, the biggest difference between the easing of the current and previous monetary policies is that it is difficult for the land market to recover comprehensively and the reason for residents' housing purchases have fundamentally changes since the introduction of the land banking system. The improvement in the demand side will not be substantial. Even if all purchase and loan restrictions are lifted in 2023, it is unlikely that the balance sheet of the household sector will fully recover and regional differences will increase.

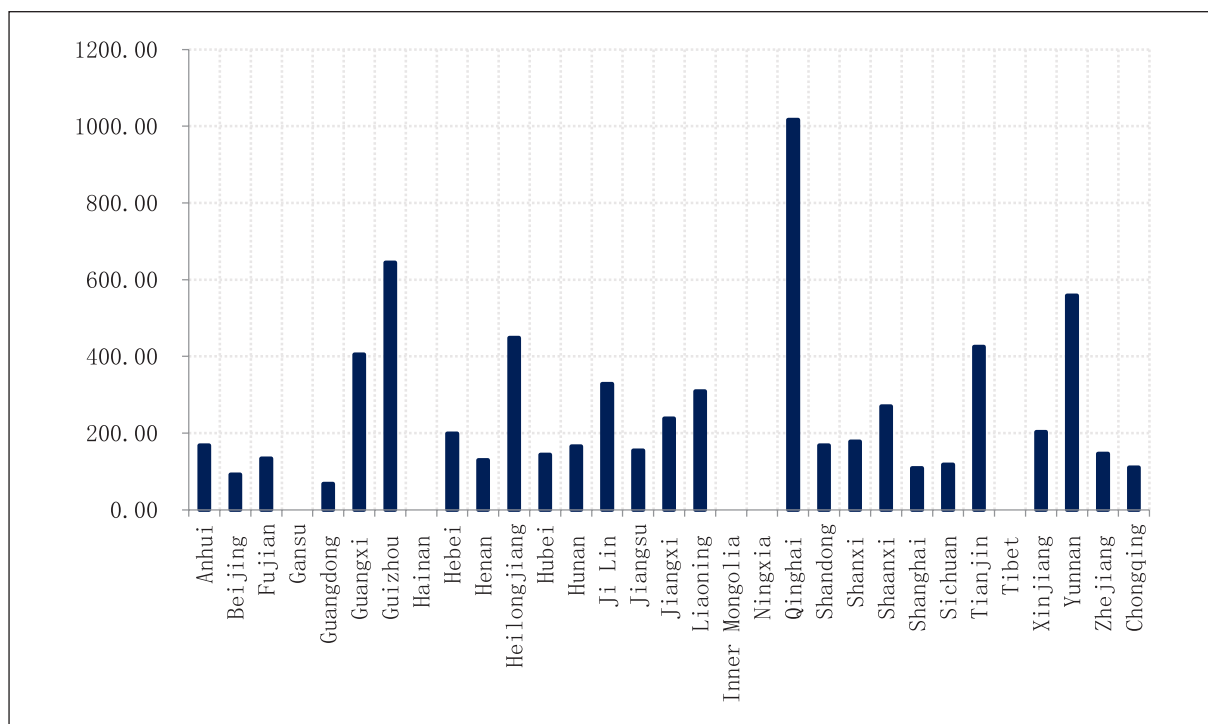
In addition, the real estate cycle tends to rise, which means that real estate companies tend to increase leverage for acquiring land to provide capital for local governments. The current model of industrialisation and urbanisation, in which local governments promote the development of cities and industries through financed land, needs to change. The new logic of real estate growth is to build industry-driven cities and attract people. The debt risk of local governments cannot be fully reduced due to the lack of land financial support, and thus the corresponding regional and urban differences in credit and financial growth will continue.

Fig. 13: Housing price trends in 70 cities



Source: Wind database

Fig. 14: Debt risk differentiation of local governments (median credit spread of provincial and municipal investment bonds on January 3, BP)



Source: Wind database

**Net worth and policy incentives will jointly drive the growth of China's wealth management market and the accelerated ageing of the population will drive the development of the pension system.** 2022 was the first year in which a comprehensive net worth model of bank wealth management was implemented in China. Bank financial products, which had always been considered a 'safe haven' for funds, adopted the net worth model in two rounds and entered the stage of normal net-worth volatility. The bank financial return rate represents the risk-free return rate in the wealth management market. The adoption of the net worth model and the increase in volatility have led to an increase in the market-oriented risk appetite of China's wealth management market. At the same time, with the acceleration of population ageing and a continuous decline in the birth rate, the need for constructing a pension system has become urgent. In 2022, the government accelerated the development of a personal pension system and implemented individual income tax benefits for personal pensions. These factors will drive the long-term growth of the wealth management market in China.



## China's Economic Growth: Lessons and Future Challenges

# China's Economic Growth: Lessons and Future Challenges

Professor Xiaodong Zhu<sup>1</sup>  
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Professor in Economics  
HKU Business School

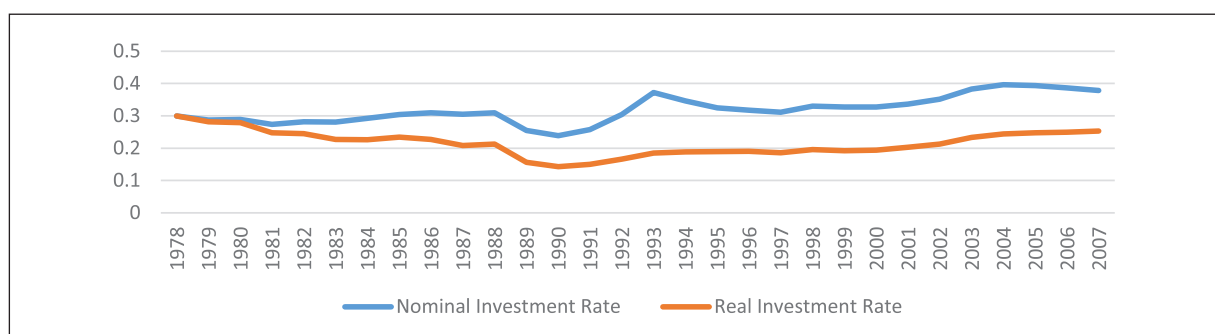
China's GDP growth rate has been on a downward trajectory for the last fifteen years. After reaching a peak of 13.3% in 2007, it fell by more than a half to 5.8% in 2019. The Covid-19 pandemic and policies implemented to control the pandemic led to further slowdown. The GDP growth rate hit a low point of 2.2% in 2020, the lowest since 1976. After a brief rebound to 8% in 2021, the growth rate fell again to 3% in 2022.

Why has there been a secular growth slowdown in China over the last fifteen years? What is China's growth prospect in the next fifteen years? What can China do to reverse the downward trend in its GDP growth rate? What challenges China will face in doing so? To answer these questions, let's first examine the drivers of China's rapid growth in the earlier period, between 1978 and 2007.

## Drivers of China's growth between 1978-2007

Many people have suggested that China's rapid growth during this period was fueled by high and rising rates of fixed-capital investment, often led by local governments and the state sector, the so-called investment-driven growth model of China. This characterization of China's growth is wrong.

Figure 1. Fixed-Capital Investment Rates



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Figure 1 shows the fixed-capital investment rates of China for the period of 1978-2007. The nominal investment rate, measured as the amount of RMB spent on fixed-capital formation as a percentage of nominal GDP, indeed rose from about 30% in 1978 to 38% in 2007. Before 1990, however, the increase in the nominal investment rate was due to the rise in the cost of investment. The real investment rate, which measures the real value of investment as a percentage of real GDP after controlling for the changes in the cost of investment, actually declined from 30% to 15% between 1978 and 1990. Therefore, China's growth before 1990 could not have been driven by any increase in the investment rate.

Since 1990, the real investment rate did increase from 15% to 25%. How much did this increase in the investment rate contribute to China's growth between 1990 and 2007? The answer is not much. During the period, China's GDP growth rate averaged 9.5 percentage points a year. Using a standard growth model, we simulate the counterfactual GDP growth under the assumption that the real investment rate were held at 15% throughout the 17-year period.<sup>2</sup> The simulation shows that, without the increase in the real investment rate, the average GDP growth rate would have been reduced slightly, to 8.5 percentage points a year. That is, the increase in the investment rate contributed only one percentage point to China's GDP growth.

What is then the main driver of China's growth during the period? In Zhu (2012)<sup>3</sup>, I argued that it is the productivity growth. Between 1990 and 2007, China's total factor productivity (TFP), a measure of aggregate production efficiency of the economy, grew at an average rate of 4.5% a year, which is even higher than the TFP growth rates of Hong Kong, Singapore, South Korea, and Taiwan during their miracle growth period of 1965-1990. The fast TFP growth contributed to GDP growth not only directly, but also indirectly by allowing capital to accumulate faster for the same rate of investment. Again, a simulation using the standard growth model shows that, if there were no TFP

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2. The model used for simulations is the standard Solow growth model. The details of the data and simulation method are available on the author's website: [www.xiaodongzhu.net](http://www.xiaodongzhu.net).

3. Zhu, Xiaodong. "Understanding China's Growth: Past, Present, and Future." *Journal of Economic Perspectives*, Vol.26, No.4, Fall, 2012, pp.103-24.

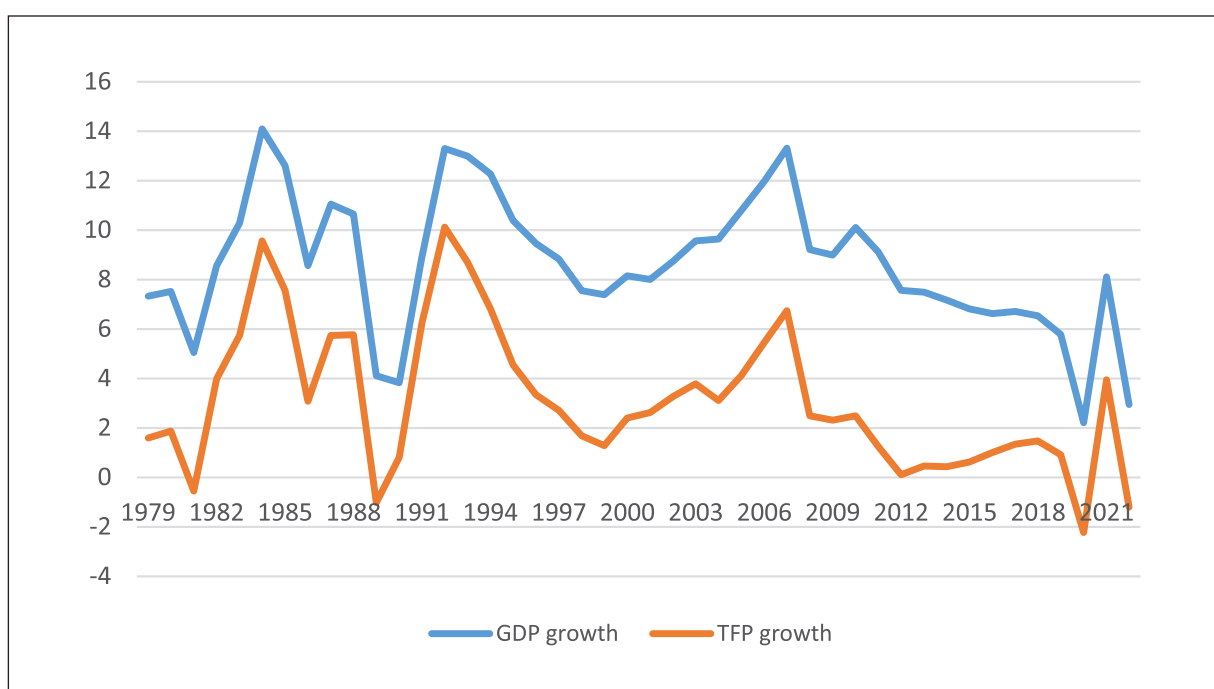
growth during the period, China's average GDP growth rate would have been reduced to only 3.5 percentage points a year, a reduction of 6-percentage points, even with the real investment rate rising from 15% to 25%.

The results of the simulations show clearly that TFP growth, not the increase in the investment rate, is the main driver of China's growth between 1990-2007.

## Reasons for China's growth slowdown after 2007

The TFP growth is important to China's GDP growth not only in the period of 1990-2007, but throughout the last four and a half decades. Figure 2 plots China's GDP growth rate and TFP growth rate between 1978 and 2022. Episodes of accelerating GDP growth are invariably associated with rising TFP growth, and periods of growth slowdown are also the periods of declining TFP growth. During the fast growth period of 1978-2007, China's TFP growth rate averaged more than 4% a year. In the last fifteen years of growth slowdown, on the other hand, the TFP growth rate averaged only 1%. Put it simply, the main reason for China's GDP growth slowdown is the slow pace of TFP improvement. While the US-China trade disputes, the Covid-19 pandemic, and the Russian-Ukraine War all may have contributed negatively to China's GDP growth in the last five years, the slowdown started much earlier, in 2008 when China's TFP growth started to slow down.

Figure 2. GDP Growth and TFP Growth in China: 1978-2022



## Projecting China's GDP growth up to 2035

Given the importance of TFP growth, we now examine China's growth prospect under different scenarios of future TFP growth, again by using the simulations from the standard growth model. For the simulation exercise, we need to make some assumptions about China's future employment and human capital growth. We assume that the aggregate employment declines by half a percentage point a year due to the aging population, and the average human capital of the workforce increases by 1.3 percentage points a year, which is roughly the average human capital growth rate in China over the last ten years. We consider five different scenarios:

- (1) TFP does not grow at all, and fixed-capital investment rate increases by half a percentage point a year
- (2) TFP grows at 1% a year, and fixed-capital investment rate increases by half a percentage point a year
- (3) TFP grows at 2% a year
- (4) TFP grows at 2% a year, and fixed-capital investment rate decreases by half a percentage point a year
- (5) TFP grows at 3% a year

Figure 3. China's Projected GDP Growth Rates under Different Scenarios

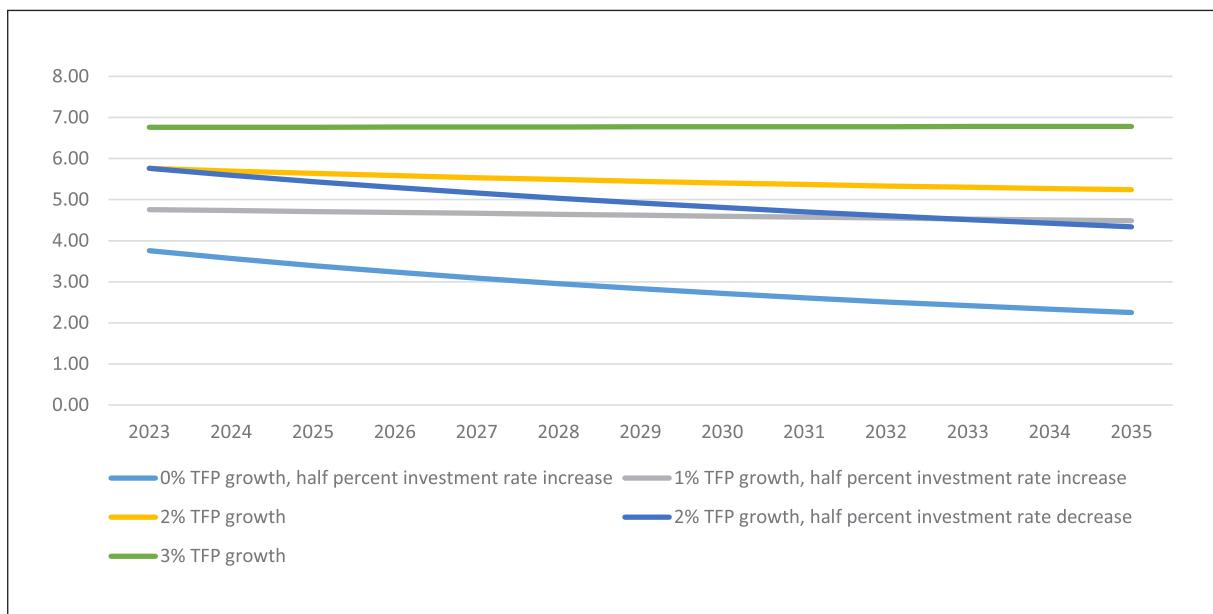


Figure 3 and Table 1 show the projected GDP growth rates for the period of 2023-2035 under all five scenarios. The case of zero TFP growth is the worst among the five scenarios. In this case, the aggregate production efficiency does not improve at all. Without TFP growth, the projected GDP growth rate in 2023 is only 3.76%, far short of the government's target of 5%. We assume that the government tries to stimulate growth by increasing the fixed-capital investment rate by half a percentage point each year, which implies that the nominal investment rate will be more than 51% by 2035. Despite the rising investment rate, the 3.7% GDP growth rate in 2023 cannot be sustained due to diminishing returns to capital investment. The projected GDP growth rate will fall to 2.25% by 2035, and the average GDP growth rate between 2023 and 2035 is projected to be only 2.9%.

Next, consider the case of 1% TFP growth. This is the rate at which China's TFP has grown in the last 15 years. Again, we assume that the government increases the fixed-capital investment rate by half a percentage point each year. In this case, the GDP growth rate in 2023 will be 4.76%, still slightly lower than the government's target of 5%. For the entire period of 2023-2035, the average GDP growth rate is projected to be 4.62% in this case.

In the third scenario, we assume that the TFP grows at 2% a year, and the investment rate does not increase. In this case, the GDP growth rate will be 5.76% in 2023, exceeding the government's target of 5%. The growth rate will decline only slightly in the next 12 years and will still be more than 5% in 2035. The average GDP growth rate between 2023 and 2035 is projected to be 5.47% in this case.

So far we have assumed that the fixed-capital investment rate either increases or stays constant. One plausible scenario is that the investment rate declines due to a decline in the saving rate associated with population aging, which is the experience of Japan since 1970. Assume that the TFP grows at 2% a year, but the investment rate declines by half a percentage point each year. In this case, the GDP growth rate will decline faster and fall to 4.34% by 2035. Still, the average GDP growth rate between 2023 and 2035 is projected to be 4.97%, close to the 5% target the government set for 2023.

Finally, we consider the most optimistic scenario in which the TFP grows at 3% a year, and the investment rate stays constant. Then, the GDP growth rate will be roughly constant for the entire period between 2023 and 2035 and the average growth rate is



projected to be 6.77%.

Table 1. Projected GDP Growth Rates for China 2023-2035

Annual TFP growth rate	0%	1%	2%	2%	3%
Annual change in investment rate	0.50%	0.50%	0%	-0.50%	0
Year					
2023	3.76	4.76	5.76	5.76	6.76
2024	3.57	4.74	5.70	5.59	6.76
2025	3.39	4.71	5.64	5.44	6.76
2026	3.24	4.69	5.59	5.29	6.77
2027	3.09	4.67	5.54	5.16	6.77
2028	2.95	4.64	5.49	5.04	6.77
2029	2.83	4.62	5.45	4.92	6.77
2030	2.72	4.60	5.41	4.81	6.77
2031	2.61	4.57	5.37	4.71	6.78
2032	2.51	4.55	5.33	4.61	6.78
2033	2.42	4.53	5.30	4.51	6.78
2034	2.33	4.51	5.27	4.42	6.78
2035	2.25	4.48	5.24	4.34	6.78
Average	2.90	4.62	5.47	4.97	6.77

In summary, China's future GDP growth depends crucially on its TFP growth. If there will be no TFP growth, then China's GDP growth rate would average less than 3% a year between 2023-2035 even if the government increases the fixed-capital investment rate by half a percent each year. If the TFP will grow at 2%, however, even with a declining investment rate, China's GDP growth rate would still average close to 5% a year between 2023 and 2035. If the TFP grows even faster, at 3% a year and the investment rate stays constant. Then, China's GDP growth can be maintained at around 6.77% a year without any slowdown between 2023 and 2035.

## China's Productivity Challenge

The key question about China's future growth, then, is how can China raise its TFP growth rate from 1% to 2% or even 3%? Before 2007, China's TFP growth rate averaged more than 4% a year because of economic reform and decentralization that resulted in constant policy and institutional changes that often started from below. Since 2007, the Chinese government has moved away from the bottom-up approach and emphasized more on policy design at the top and mobilizing national resources (Ju Guo Ti Zhi). This approach may have achieved some short-term goals such as the growth recovery in 2010 after the global financial crisis and the rapid expansion of infrastructure projects, but at a great cost of economic efficiency. Without bottom-up policy reforms, China had poor TFP growth performance, with the TFP growth rate averaging 1% a year, much lower than the 4% achieved before 2007. In a recent press conference, Premier Li Qiang told the reporters that China should revitalize the entrepreneurial spirit of Zhejiang and Jiangsu provinces in the 1980s and 1990s. I hope this signals a potential change away from the top-down approach of policy design and implementation and a return to the bottom-up policy changes that was so effective and successful in generating remarkable TFP growth in the 1980s and 1990s.



# Chinese Youth Employment: Facts, Causes, and Solutions

# Chinese Youth Employment: Facts, Causes, and Solutions

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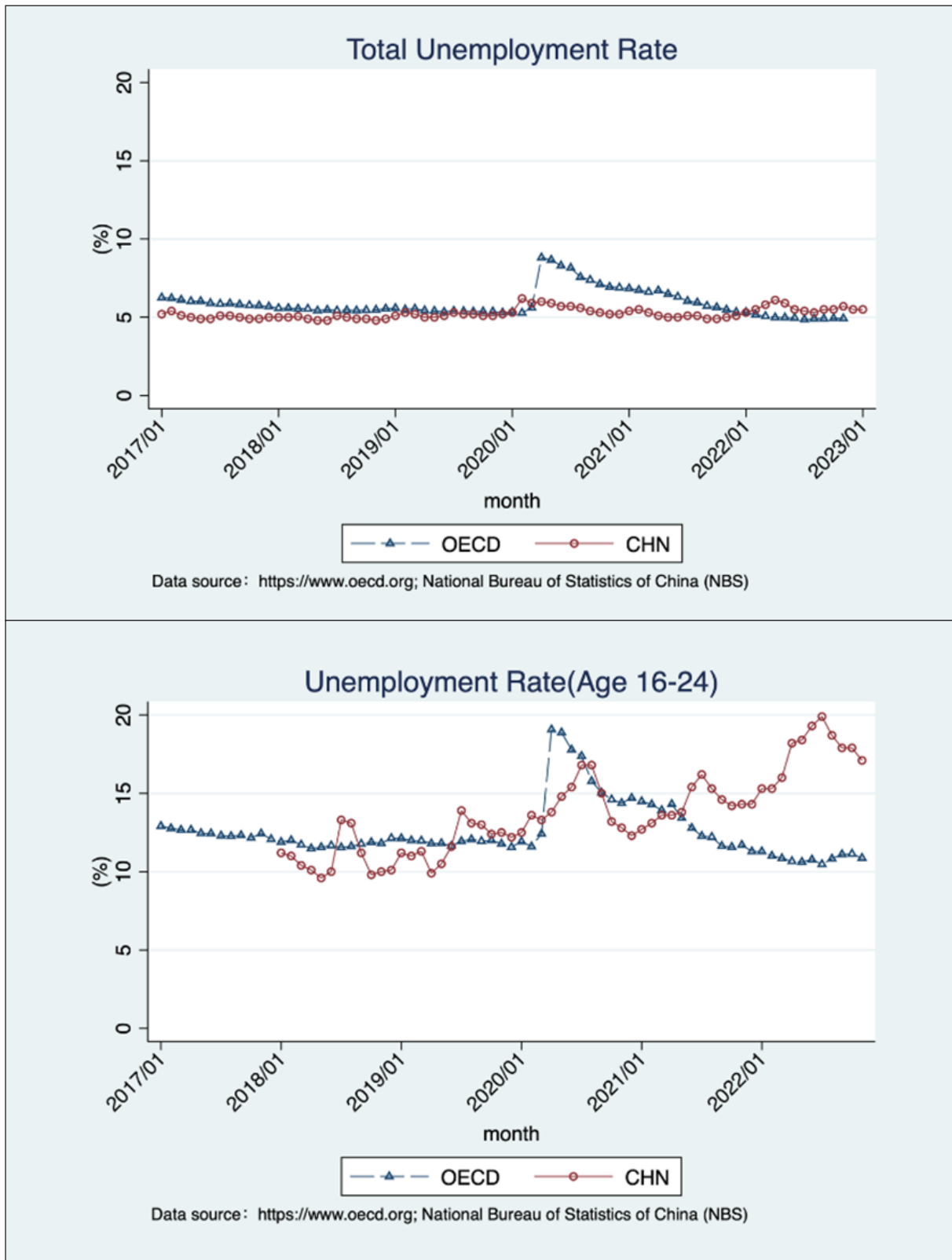
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## Executive Summary

The youth (aged 16-24) unemployment rate in China has risen sharply during the COVID-19 pandemic. This increase may have significant long-term consequences on young workers even if the economy returns to normal. However, the careers of these workers are expected to be further negatively affected by both demand and supply factors in the long run. We discuss policies that can improve the careers of these young workers, both from the perspective of human capital formation and job matching. We do not recommend education/training subsidies to young workers. Instead, we suggest policies that subsidize firms to hire and train workers. We discuss which types of firms to target and caution against the moral hazard problem that arises from such subsidies. Our preferred subsidies include loans for wage payments and incentives for long-term employment.

## 1: Facts and Consequences

During and post the COVID-19 pandemic, there is widespread concern about the weak labor market and especially the economic prospects of young workers entering the labor market during this time. Reviewing aggregate data in the past 5 years, the overall unemployment rate in China remains around 5%, comparable to OECD countries, with temporary hikes associated with lockdowns. However, young workers appear to suffer more: the unemployment rate for workers aged 16-24 is at least 5 percentage points higher than the overall population. By the end of 2022, more than 15% of Chinese workers aged 16-24 could not land a job and the gap with OECD countries does not seem to be closing soon.



Some may argue that the damage is COVID-specific and will not persist. But even if the shocks are temporary, their effects on workers, particularly those who just entered the labor market, can be long-lasting. The reasons for this are manifold, see, for example, Li and Yu (2017) for a discussion. But fundamentally,

labor markets are not goods markets. Employers offer not just jobs, but careers to the workers. Missing a good first job can mean missing good human-capital accumulation opportunities and missing a chance to explore jobs that match one's personality and capability. Economists have long documented the importance of the unemployment rate at the beginning of a worker's career, and even coin the term "cohort effect" to describe its importance.

For example, Baker, Gibbs, and Holmstrom (1994) use personnel records from one firm and show that a cohort's average wage at the start of employment affects its wages years later. Subsequent within-firm studies (see Gibbs and Hendricks (2004) for a review) have also documented the cohort effect within the same employment relationship. At the economy-wide level, seminal work by Beaudry and DiNardo (1991) shows (Table 2 below) that wages depend on past labor market conditions. They show that the unemployment rate at the start of a job affects the worker's wage more than the contemporaneous unemployment rate (Row 4).

**TABLE 2**  
**RESULTS FROM PSID AND CPS**

	Contemporaneous Unemployment Rate	Unemployment at Start of Job	Minimum Rate since Start of Job	Data
1.	-.020 (.002)	...	...	PSID (levels)
2.	...	-.030 (.002)	...	PSID (levels)
3.	...	...	-.045 (.003)	PSID (levels)
4.	-.010 (.002)	-.025 (.002)	...	PSID (levels)
5.	-.001 (.002)	...	-.044 (.003)	PSID (levels)
6.	.000 (.002)	.013 (.004)	-.059 (.006)	PSID (levels)
7.	-.014 (.002)	...	...	PSID (fixed effect)
8.	...	-.021 (.003)	...	PSID (fixed effect)
9.	...	...	-.029 (.003)	PSID (fixed effect)
10.	-.007 (.0025)	-.006 (.007)	-.029 (.008)	PSID (fixed effect)
11.	...	-.017 (.002)	...	CPS (levels)
12.	...	...	-.031 (.003)	CPS (levels)
13.	...	.004 (.003)	-.036 (.005)	CPS (levels)

We want to emphasize that the long-lasting effect of a negative labor market condition is one of the best-documented facts in economics. Entering the US labor market during bad economy is associated with lower earnings and number of weeks and hours worked. The earning losses over the first 10 years is about 6% and remain significant afterwards (Schwandt and von Wachter 2019). Graduates that entered the labor market during the Great Recession had lower employment rate and significant wage loss and the effects are long-lasting (Rothstein 2020).

The quality of jobs that the young workers landed appeared to be worse too: During a recession, the graduates landed jobs at firms that are on average smaller and pay lower wages, which explain 40-50% of the long-term earning losses (Oreopoulos et al. 2012). Because of the lower quality of the first job match, those graduated during recession have problem move to better jobs even after economy recovers (Kahn 2010). Related to this point, Paul Oyer (2008) from Stanford documents that MBAs graduating in recession years are significantly less likely to go to Wall Street, and consequently, suffer an estimated lifetime earnings loss of \$1.5 to \$5 million.

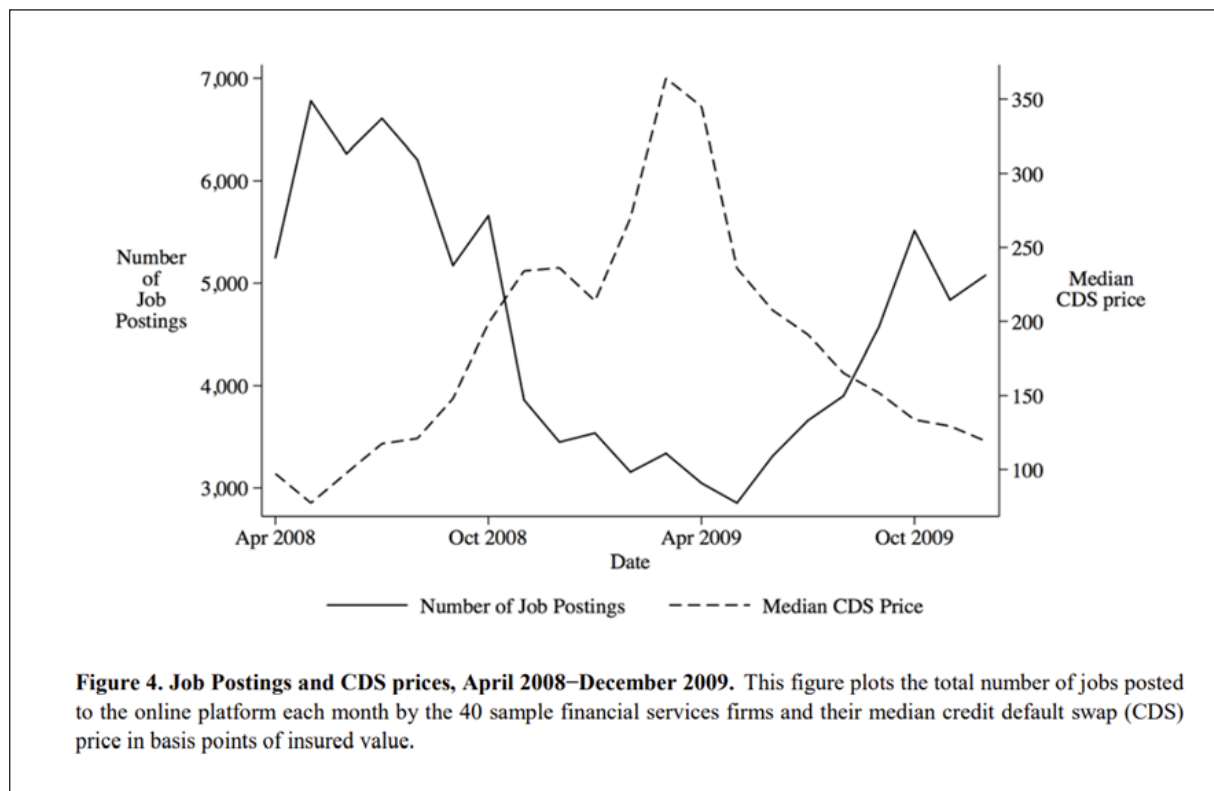
While the long-term impacts of Covid are impossible to document at this stage, there has been evidence suggesting that these effects will also be long-lasting. Aucejo et al. (2020) estimate the causal impact of COVID-19 on current undergraduates and discovered that there is a decline in reservation wage by 2%, and 2020 spring/summer graduates expect a 35-percentage point decrease in the likelihood of finding a job before graduation. Respondents also believe that their long-term outcomes will be affected and expect their earnings at age 35 to fall by close to 2.5%. The pessimistic outlook may influence their current well-being and subsequent job search and labor market behavior that is based on perceptions.

In addition, Gong et al. (2023) show that Singaporean college students who graduated during covid expect significantly worse current and future labor market outcomes as a result of the pandemic. At about six months after graduation, they believe that the pandemic has decreased their chance of employment by 17 percentage points and current monthly wage by 12.5%. They also expect the damage to be long-lasting, in that the wage at age 35 is expected to be 10% lower than no-COVID scenarios.

## 2: Causes

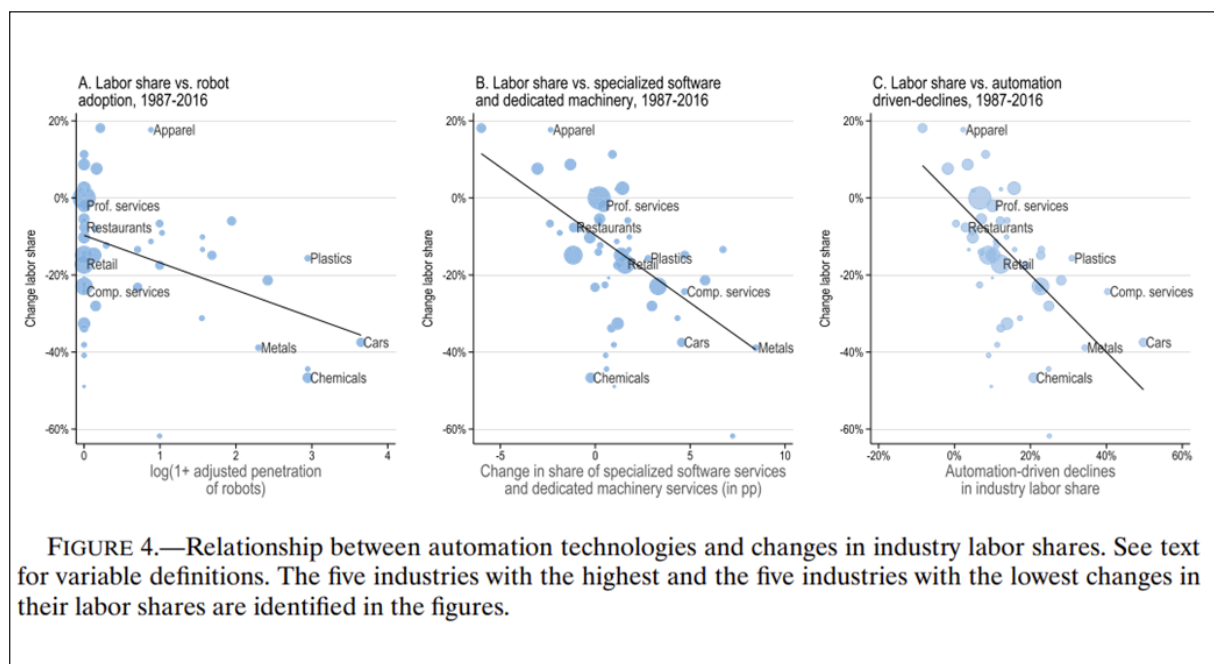
The previous section documents the increase in the youth unemployment rate in China during Covid times and discusses its potential long-term consequences. Before describing the policy recommendations to deal with the problem, we unpack the structural factors that cause the increase in the unemployment rate. We group our discussion into factors related to the demand and supply of labor, describing both long-run and short-run factors.

First, a key factor that affects short-run demand is the financial constraints the companies face. Companies' financial condition has direct effects on their ability to hire and retain human capital. Corporate distress often leads firms to pay lower wages and to downsize their workforce. Average employment decreases by 10% around a bond covenant violation (Falato and Liang 2012), by 27% around a bond default (Agrawal and Matsa 2013), and by 50% or more around a bankruptcy filing (Hotchkiss 1995). Brown and Matsa (2016) demonstrates (Figure 4 below) the association between the number of jobs posted by firms and their median credit default swap (CDS) price. When the CDS price is high, indicating that firms have a higher risk of defaulting on their credit obligations, firms post fewer jobs and attract significantly fewer applications per job opening.



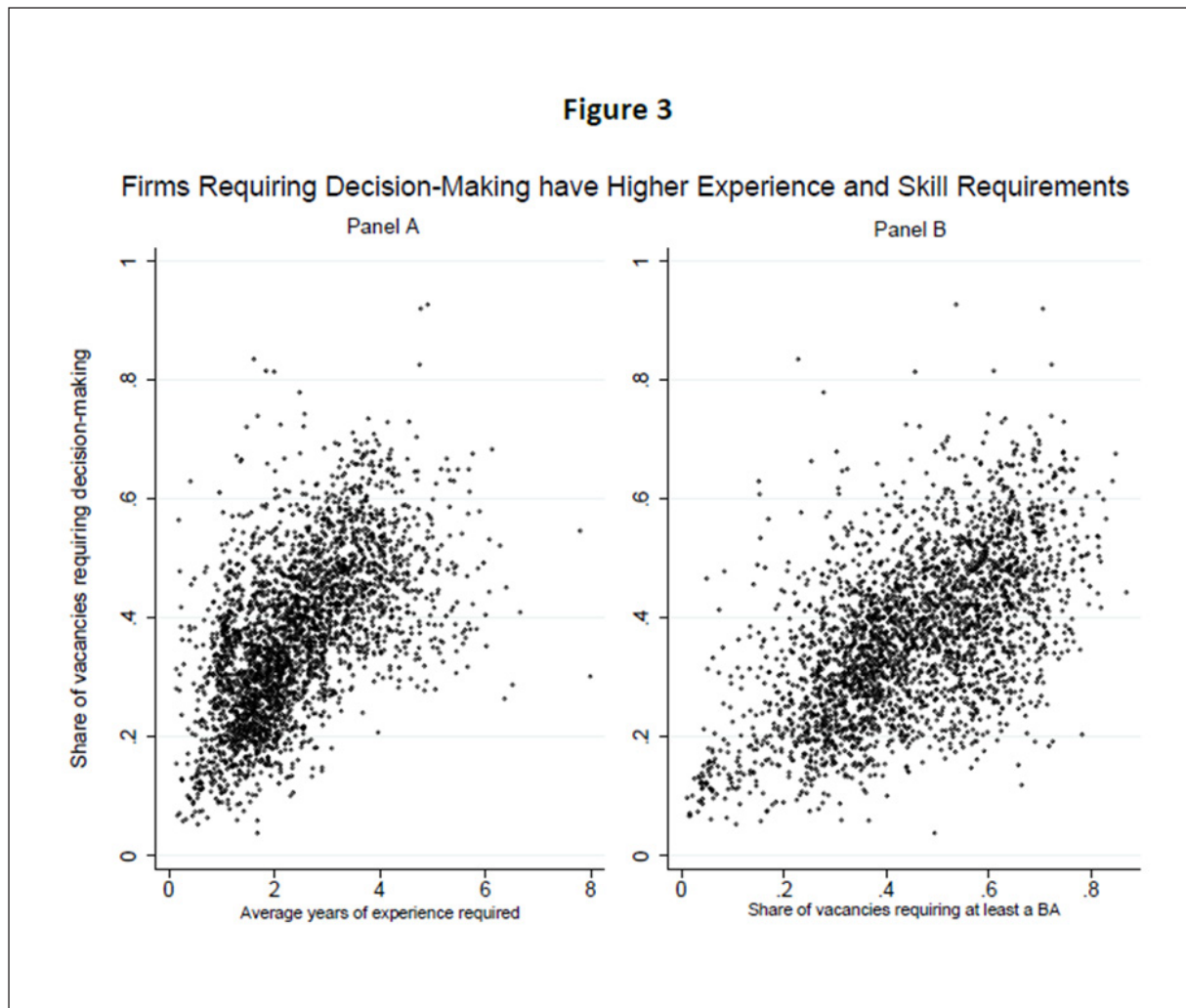


Second, while the financial constraint of the firms is a key factor in labor demand, their hiring decisions are forward-looking, and, therefore, affected by factors that determine the long-term productivity of the workers. One key trend is the rise of AI. Firms increasingly replace people with machines and AI in routine tasks. Acemoglu and Restrepo (2022) shows (Figure 4 below) a negative relationship between automation and industry labor share changes. They show a strong negative association between labor share changes and penetration of robots (Panel A) and for the combined change in specialized software and dedicated machinery services (Panel B). Panel C presents the relationship between observed labor share changes and the predicted labor share decline based on three proxies of automation, which together account for 45% of the variation in industry labor share changes. They further estimate that a 25% increase in task displacement is associated with about 40% (relative) wage decline.

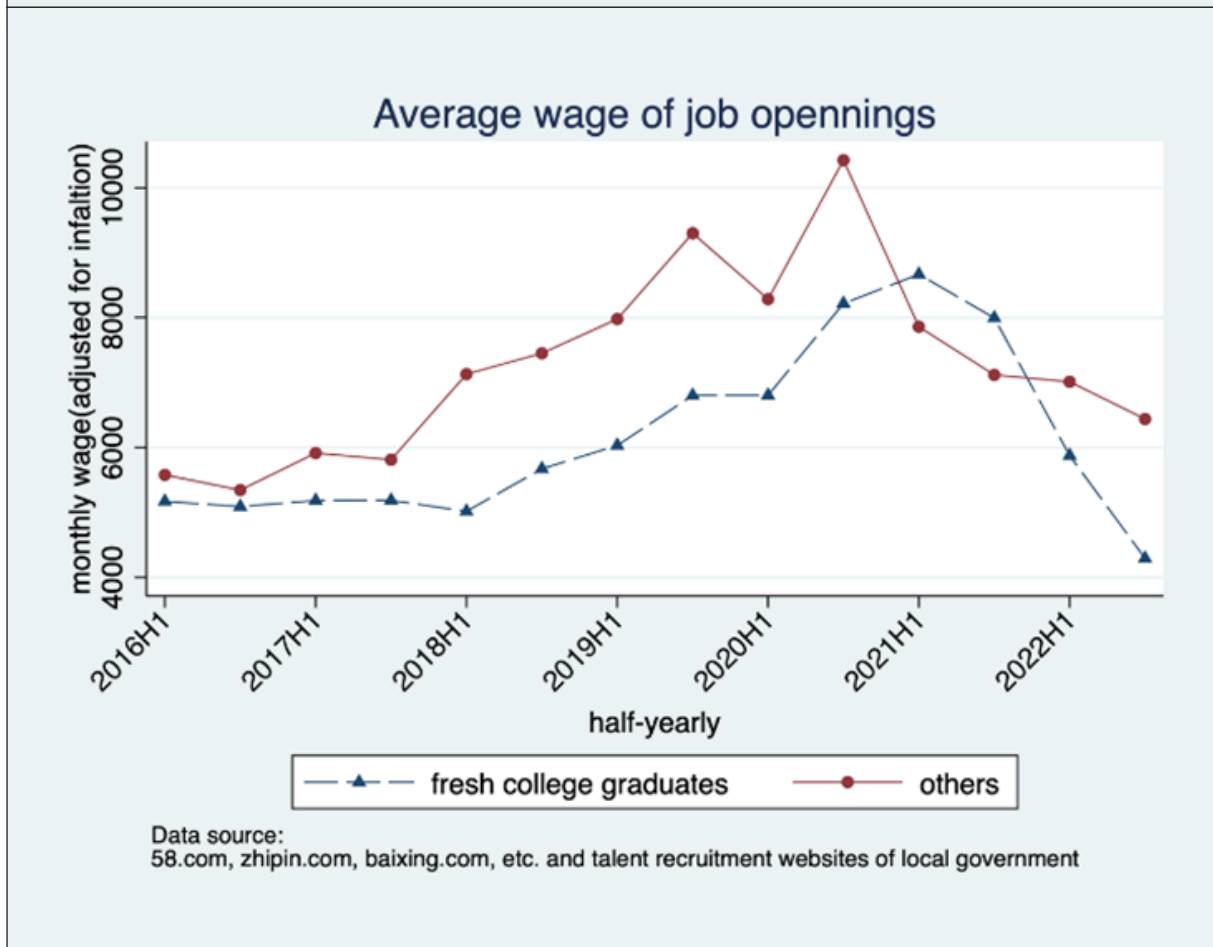
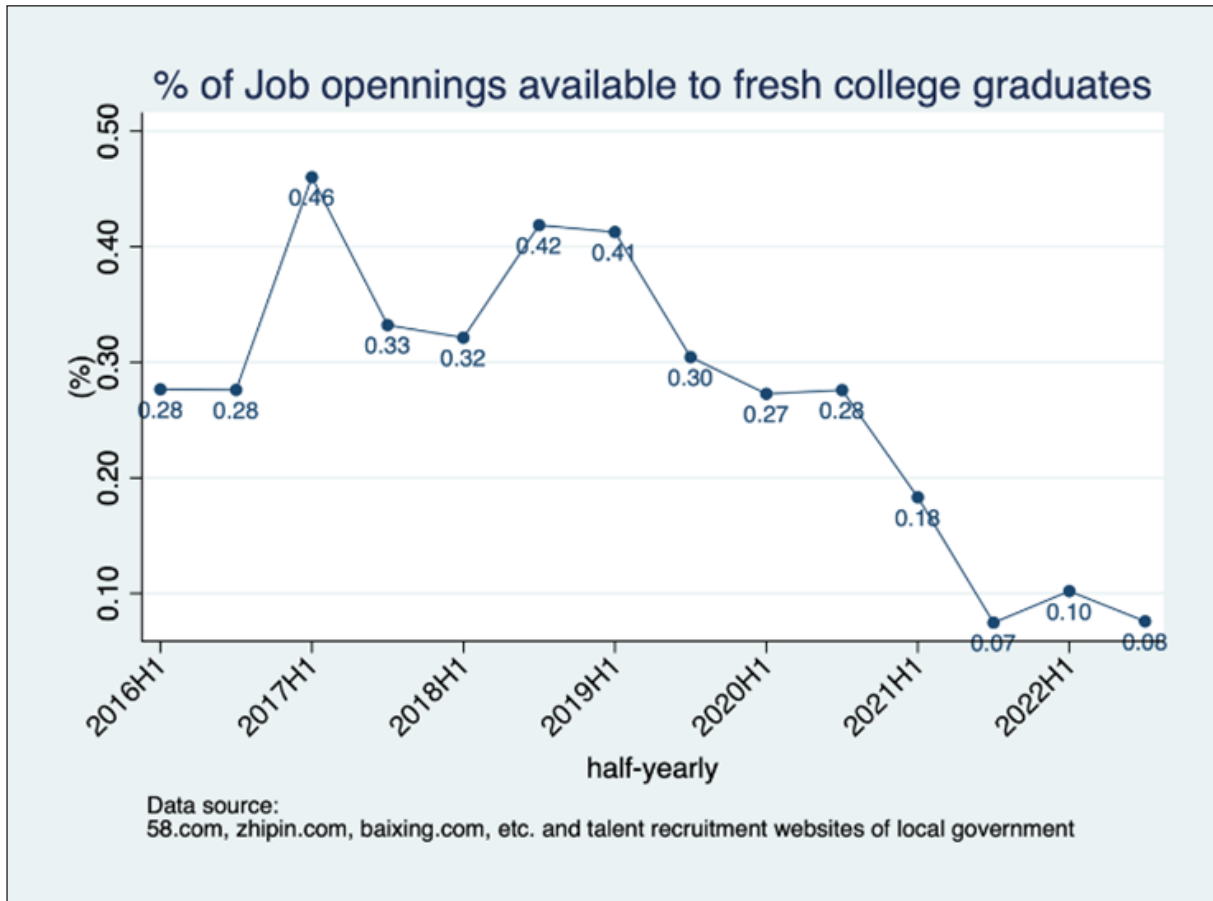


Third, precisely because workers are increasingly replaced by machine in routine tasks, the remaining tasks are typically non-routine and require “soft skills” in customer interactions, adaptation and decision making in unexpected environments. Such skills usually take longer to accumulate with experience than in occupations with routine tasks, leaving young workers less favorable in the labor market. Deming (2022) shows (Figure 3, Panel A below) that there is a strong positive correlation between the share of vacancies requiring decision-making and average years of experience required. The demand for “soft” skills can also explain

the fact that the age-earning profile among US workers shifted outward—the age of peak earnings increased from the late 30s to the mid-50s.

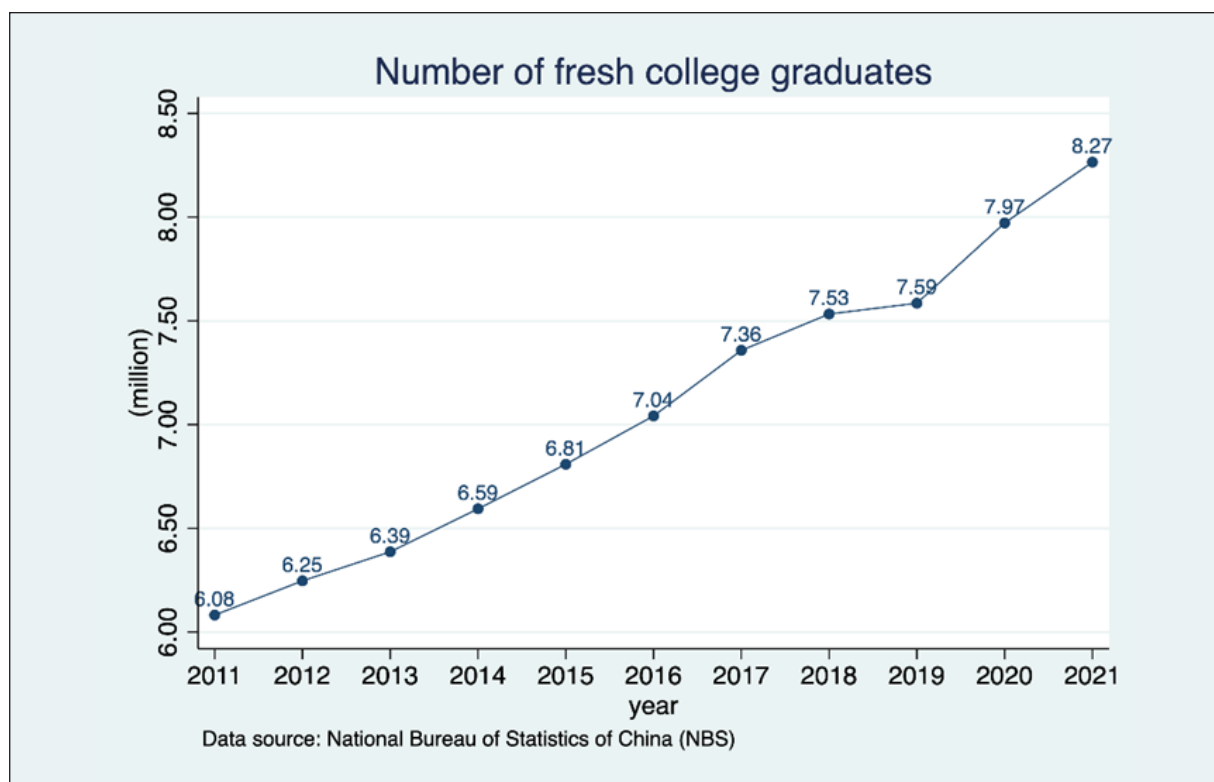


Consistent with the demand for experience associated with non-routine jobs, we see a decline in the job openings for young workers. Scraping job advertisements from major hiring platforms in China, we observe that the share of job positions available for fresh college graduates has declined from 30-40% in 2017 to less than 10% in 2022. One implication is that, even if more jobs will be made available as firms recover from the pandemic, the increased opportunities might be disproportionately few for young workers.



Fourth, another anticipated challenge arises from the delay of retirement age. Young workers hope to flourish but their careers might be stalled because older employees are staying in the workplace longer. When older workers delay retirement, younger workers face few opportunities to rise and advance in their career. One may think that when a young worker's career appears to be blocked because a higher-level position is already occupied, the firm always has the option of creating another higher-level position. And, even if the firm cannot do so, the worker can always move to another firm that can. However, when it is difficult for firms to create positions and for workers to switch to another firm, due to, for example, slow growth or economic downturns, then the negative career spillovers matter. Indeed, Bianchi et al. (2022) show that the 2011 Italian pension reform delayed impending retirements, resulting in decreased wage growth and promotion for younger coworkers. A one-standard-deviation (0.07 years) increase in the average retirement delay decreases the wage growth of young workers by 2.7 percent per year relative to their pre-reform wage growth.

Finally, the labor supply is a key factor that drives the increase in unemployment rate, particularly for college graduates. The number of fresh college graduates entering the labor market has increased from 6 million in 2011 to 8.3 million in 2021 and the trend continues.



### 3: Policy Suggestions

Given the size of the recent youth unemployment rate in China and its potential long-term consequences, policies that aim at helping young workers are clearly needed. The policy suggestions, of course, depend on the policy objectives. Here, we do not take a stand on the exact policy objective, but rather examine the objective using the standard economics framework. The economics framework distinguishes value-enhancing policies from redistribution policies. Using the economics jargon, we distinguish policies that move the outcomes to the Pareto frontier from policies that change the outcomes along the Pareto frontier. In our discussion, we will not focus on the redistribution policies, i.e., how to divide the pie. Instead, we examine policies that are value-enhancing, that is, those that make the size of the pie bigger.

These value-enhancing policies, however, must be used with care. One key lesson from economics is that, the market system, while being imperfect, is not easily amendable to policy improvement. Markets may be inefficient, but policy interventions are typically more inefficient or misguided. As an example, the famous Harvard labor economist, Richard Freeman, lamented in 1976 that Americans were over-educated (Freeman 1976). But the subsequent findings show that the return to education in the U.S. has in fact increased, not decreased (Murphy and Katz 1992).

For value-enhancing policies to be effective, the academic and the policymaker must be clear about the sources of market failure. To identify the market failure, it is useful to take a step back and ask: what does a well-functioning labor market look like, and how does the current situation differ? In the ideal labor market, young workers are equipped with human capital, get matched with employers that demand such skills, gain experience, and advance in their careers. They build human capital through education, experience, on-the-job training, etc. Potential employers weigh the benefit and cost of hiring and training a young worker, and they do so by considering the existence of more experienced workers and possibly capital (such as machines). In an ideal labor market, matchings between workers and employers are frictionless. That is, any worker-employer pair with a positive value takes place.

The discussion on the idealized labor market implies that inefficiency occurs when the workers are unable to develop their human capital properly or unable to find the right type of employers. Below, we focus on policies that address the inefficiency of the workers in developing their human capital. These policies that address human capital investment also address inefficiencies in matching between employers and workers (with proper modifications), so we omit the discussion on matching to avoid redundancy.

For the discussion on human capital, it is useful to decompose human capital into general human capital and firm-specific human capital, a la Becker (1964). Broadly speaking, general human capitals are abilities and skills that increase a worker's productivity regardless of where he goes. Firm-specific human capitals are those that increase a worker's productivity in the particular firm he is employed. The distinction is important because workers (not firms) have incentives to invest in their general human capital, whereas firms (not workers) have incentives to invest in the firm-specific human capital of the workers.

There are two reasons workers don't invest efficiently in their general human capital. First, they're financially constrained, see for example, Lang and Ruud (1986). Second, there are externalities in human capital investment (Kremer 1993). To deal with the first type of inefficiency, one policy suggestion is to subsidize education and training, or ideally, policies that target low-income young workers. For policies that target low-income workers, however, economics logic implies that, rather than offering education-specific subsidies, it is better to simply offer subsidies. **The bottom line of this discussion is that we do NOT recommend policies that offer education/training subsidies.**

Next, for externalities in human-capital investment, the most relevant externality arises from the employers' actions. In particular, many types of human capital, broadly termed on-the-job training, require firms to take direct action such as assigning workers to good projects and offering mentorship, and more extremely, offering a job to the worker in the first place. This discussion suggests that there can be policy gains from encouraging firms to hire workers in the first place, and encouraging firms to facilitate training in workers.

An obvious policy proposal is subsidizing firms to hire and train young workers.

To push for policy proposals along this line, the natural questions are, what types of firms to subsidize, and, will there be any negative consequences, and, if so, what to do about them? To address the first question, the answer lies in the combination of the magnitude of the financial constraints of the firms and the size of the externality (in human capital investment). Specifically, firms that are more financially constrained (hurt more by Covid) should reach priority in receiving the subsidy. We will not discuss how to measure the degree of financial constraints (in hiring workers) the firms face, but just comment that a combination of Tobin's Q and labor share offers a good starting point. For the size of the human capital externality, one possible measure is to look at the earning profile of workers over the life cycle. Human capital investments are more important for workers if their earning profiles have a higher slope. This suggests that subsidies should be prioritized to firms in industries where workers experience faster earning/wage growth. **To sum up, we recommend offering subsidies to firms to train and hire workers. In addition, the subsidies should favor firms with higher degrees of financial constraints and whose employees have higher returns on human capital investment.**

We note that during the recession caused by the COVID-19 pandemic, many countries have expanded pre-existing active labor market policies and enacted new hiring subsidies and job-training programs. For instance, Singapore launched SGUnited traineeship schemes, a large-scale active labor market policy designed to function as both a wage subsidy and a job training program aimed at college students graduating during the pandemic. The intervention provided fresh graduates with traineeship opportunities lasting up to 9 months at various host organizations. Government funds 80% of the training allowance.

The traineeship program is perceived to mitigate the COVID damage by 60% for short-run employment, 16% for short-run wage and 25% of for long-run wage. In a follow-up survey conducted about 2 years after graduation, the participants reported that about 30% of the traineeship position are converted to regular positions. Interestingly, while young workers appear to select into the traineeships by perceived gains from participation, both participants and non-participants perceived positive effects from the policy. It suggests that the option value of traineeship outweighs the potential crowding effects, a common concern around training programs.

	Current Context	Counterfactuals		Perceived TE	
	COVID, w/ Traineeship Scheme	COVID, No Traineeship Scheme	No COVID	Traineeship Effect	COVID Effect
	(1)	(2)	(3)	(1) - (2)	(2) - (3)
Panel A: GES2020 (N = 2534)					
Full-time, Perm Job in Jan '22	0.838	0.741	0.896	0.097*** [0.004]	-0.155*** [0.004]
Log Monthly Income in Jan '22	8.246 (0.298)	8.221 (0.322)	8.344 (0.273)	0.026*** [0.003]	-0.123*** [0.003]
Log Monthly Income at 35	8.774 (0.436)	8.750 (0.453)	8.858 (0.430)	0.024*** [0.002]	-0.108*** [0.003]
Panel B: Follow-up Survey, August 2022 (N = 967)					
	(1)	(2)		(1) - (2)	
Full-time, Perm Job in Aug '22	0.855	0.751		0.104*** [0.014]	
Log Monthly Income in Aug '22	8.507 (0.275)	8.421 (0.293)		0.063*** [0.005]	
Log Monthly Income at 35	9.017 (0.371)	8.986 (0.385)		0.032*** [0.004]	
Job Satisfaction at 35	6.771 (1.537)	6.926 (1.475)		0.154*** [0.031]	

We also note that Kluge (2010) and Card et al. (2010)'s meta-analyses using studies from the United States and Europe find that training programs, such as classroom and on-the-job training programs appear to yield little short-term benefits but positive medium-term outcomes. Subsidized private employment performs modestly better than training programs on aggregate, whereas subsidized public sector employment is relatively ineffective.

To address the second question, i.e., how to deal with the negative consequences of subsidizing firms, a natural concern to note is that, once firms receive subsidies (especially for hiring), they may hire workers they typically would not hire, employ them temporarily (for example through an internship), neglect investments in their human capital, and stop employing them once the internship is over. In other words, subsidies in hiring can create a moral hazard problem for firms, and this may result in both inefficiency in hiring and training. The moral hazard problem cannot be eliminated easily. But to mitigate it, one possibility is to **offer loans to firms for hiring, instead of using wage subsidies directly**. The wage loans relax the financial constraint of the firms. The requirement that the loan needs to be



paid back makes firms less likely to hire sub-par job candidates. This mitigates the moral hazard problem of hiring.

Finally, to mitigate the moral hazard problem of training, one possibility is to **offer incentives to firms if the workers manage to get long-term employment from the firm**. For example, once the worker receives a long-term employment contract from the firm, then the firm can be offered an additional subsidy (that depends on the length of time the worker stays at the firm). These types of incentives, of course, may create further distortion (for example they make the firms more likely to retain the workers than they would otherwise), and the design of such incentives should pay attention to the context.

We conclude our policy discussion by going back to Beaudry and DiNardo (1991), discussed in Section 1. We mentioned that the unemployment rate at the start of the job has a long-lasting impact on the careers of the workers. But an even more important factor is the minimum unemployment rate since the start of the job (see Row 6 of the table). The minimum unemployment rate is a proxy for the prosperity and growth of the economy. This suggests that the careers of the young workers depend, fundamentally, on the health of the economy.

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# Environmental, Climate Change, and Carbon Policies

# Environmental, Climate Change, and Carbon Policies

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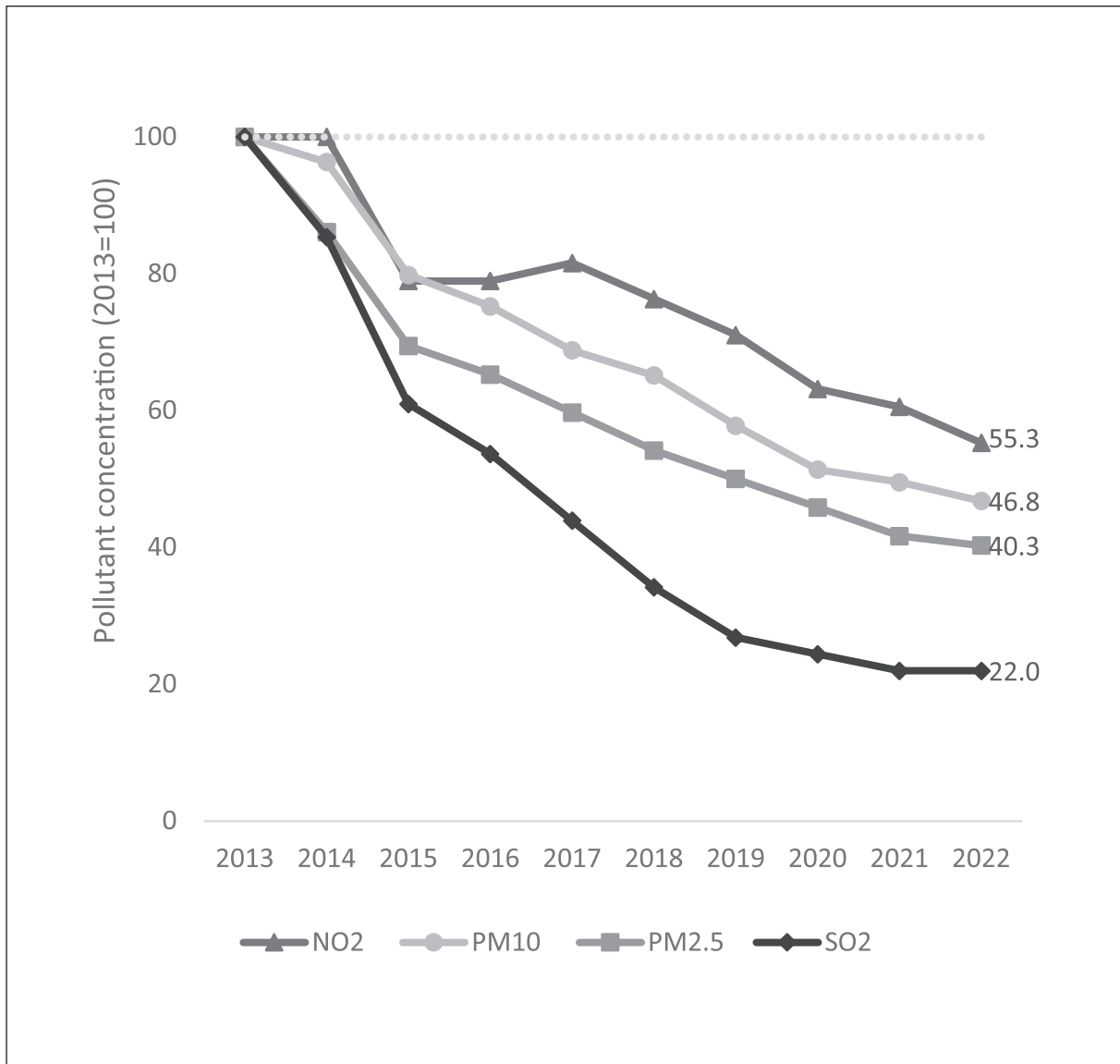
## I. Protection of the atmospheric and water environments

### 1. Achievements in controlling air and water pollution since China's declaration of war on pollution

China was among the most polluted countries from 1998 to 2016. Even worse, China became the world's largest consumer of energy and coal and the largest emitter of carbon dioxide (CO<sub>2</sub>) and sulphur dioxide (SO<sub>2</sub>) in 2010. Pollution imposes a great risk to public health and undermines human capital accumulation and long-term economic growth. To address pollution, China's former Premier Li Keqiang stated in his 2014 State Council Work Report that "we shall resolutely declare war on pollution, just as we declared war on poverty." Since then, the Chinese government has been working on controlling environmental pollution, and its efforts have remarkably improved environmental quality. These efforts have involved the inclusion of 2.5-µm particulate matter (PM<sub>2.5</sub>) indicators in the emission reduction assessment system, the establishment of a national automatic monitoring system to collect pollution data and make these data publicly available in real time, the inclusion of environmental quality as a key performance indicator in the evaluation and promotion of officials and the establishment of a national carbon-emission trading market.

In terms of the atmospheric environment, since 2013, the concentrations of PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub> and nitrogen dioxide in Chinese cities at the prefecture level and above have decreased by approximately 60%, 53%, 78% and 45%, respectively. Moreover, from 2013 to 2020, the concentrations of these four pollutants decreased by 54%, 49%, 76% and 37%, respectively (Fig. 1).

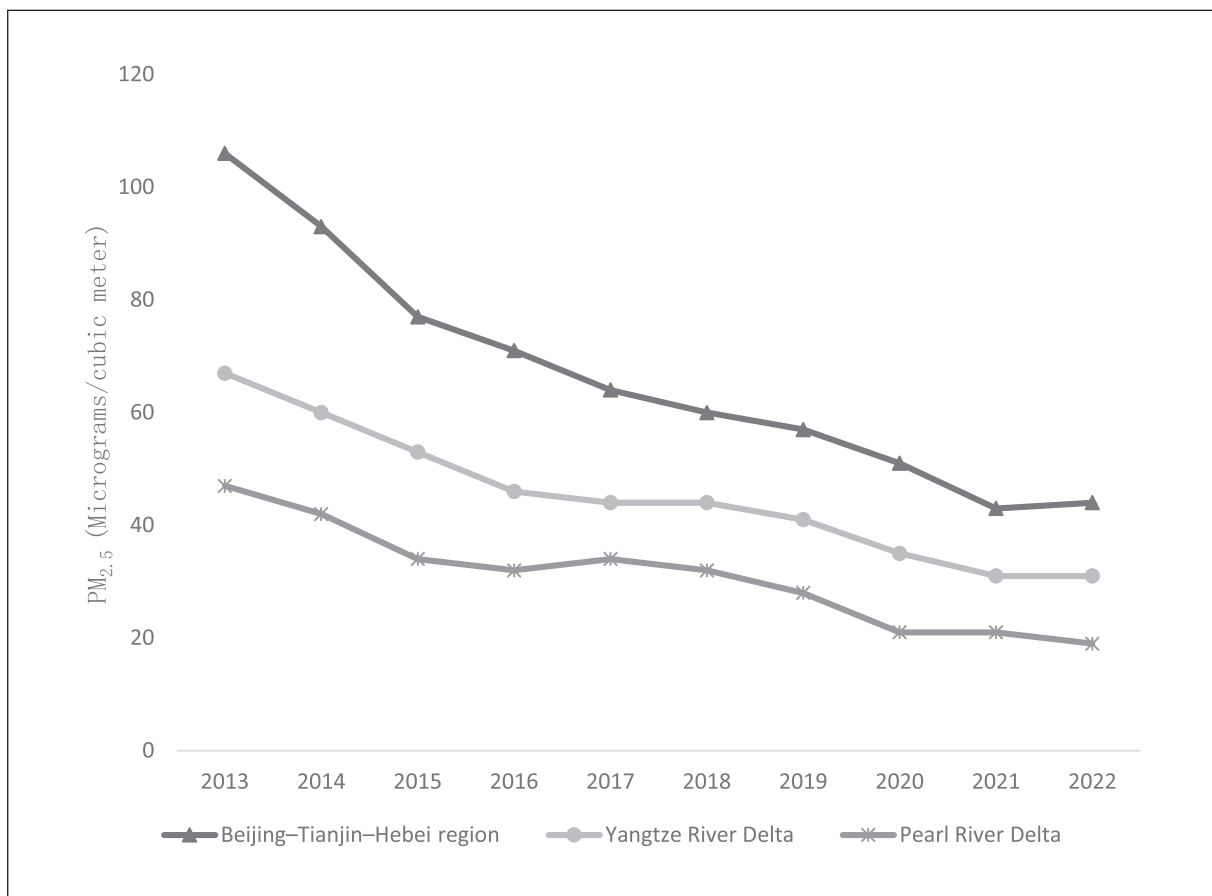
Fig. 1 Change trend of the average concentration of major pollutants in cities at the prefecture level and above in China (2013–2022)



Note: The new air quality standard test did not cover all 338 cities at the prefecture level or above until 2015, and the data before 2015 is only for 161 cities at the prefecture level or above.

Source: Bulletin on the State of the Environment in China

The Beijing–Tianjin–Hebei region, Yangtze River Delta and Pearl River Delta are subject to state-level air pollution prevention and control measures, and joint regional air pollution prevention and control measures were initiated in 2013. Over the past decade, pollution control in these areas has seen remarkable results. Since 2013, the PM<sub>2.5</sub> concentration in the Beijing–Tianjin–Hebei region, which previously had the worst air pollution in China, has reduced by 58%; similarly, that in the Yangtze River Delta and Pearl River Delta has reduced by 54% and 60%, respectively (Fig. 2).

Fig. 2 Change trend of the average PM<sub>2.5</sub> concentration in major areas in China (2013–2022)

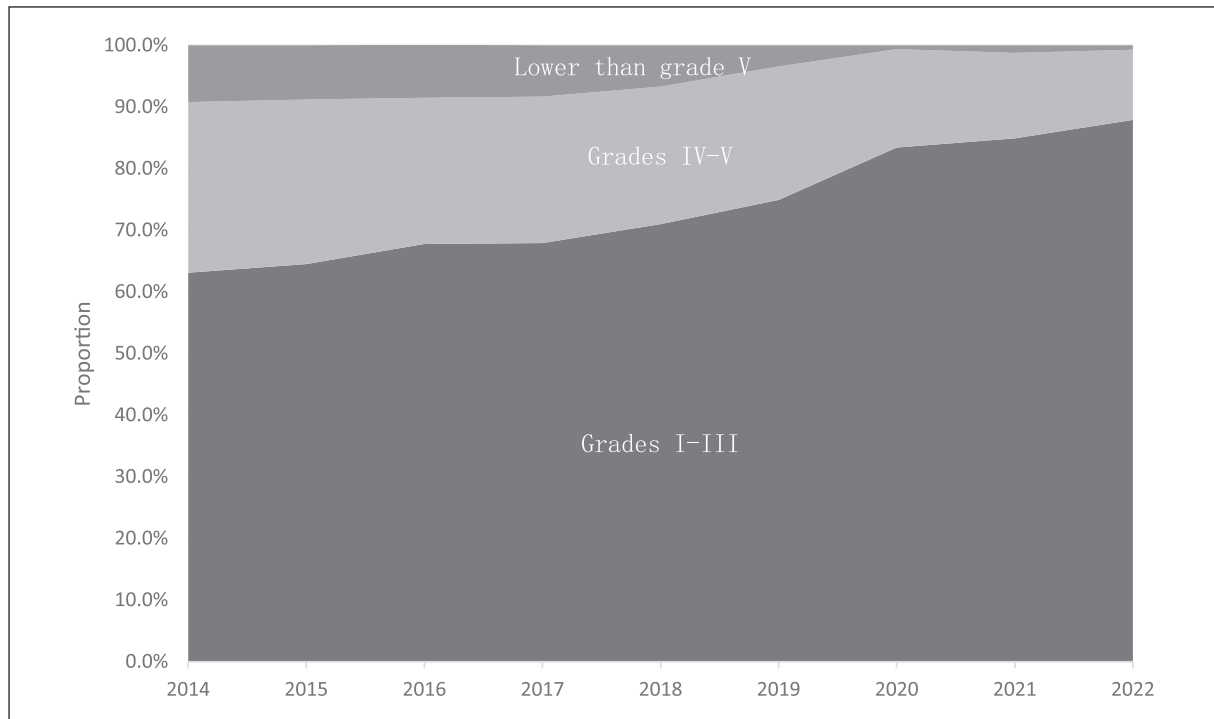
Source: Bulletin on the State of the Environment in China

Compared with the wider international community, China has seen a more remarkable environmental improvement. For example, according to statistics (Greenstone, He, and Lee 2022), from 2013 to 2022, the PM<sub>2.5</sub> concentration increased in developing South Asian countries, such as India, Pakistan and Bangladesh. By contrast, China was the only major developing country to have significantly improved its air quality, contributing to more than 75% of the global decrease in particulate pollution. India, a neighbouring country of China, experienced a significant increase in its overall pollution levels, contributing to approximately 44% of the total increase in global pollution. A comparison of China's achievements with those arising from the Clean Air Act, which was launched in the USA in 1970 and is the most important environmental policy in the history of that country, shows that China has achieved greater success in a shorter period. Specifically, it took the USA approximately 30 years to achieve the same percentage reduction in emissions that China has achieved in 7 years, and several economic depressions occurred in the USA during this 30-year period.



China has also made great progress in controlling water, soil and noise pollution, and this has substantially improved people's health and living standards. For example, in 2022, 87.9% of the 3,641 national surface-water assessment sections in China had good water quality (grades I–III), which was a 24.8-percentage-point increase compared with 2014, and 0.7% had poor water quality (grade V), which was an 8.5-percentage-point decrease compared with 2014 (Fig. 3).

Fig. 3 Change trend and proportions of surface water quality categories in China (2014–2022)



Source: Bulletin on the State of the Environment in China

The above evidence shows that since China's declaration of war on pollution, it has made outstanding progress in environmental pollution control by significantly reducing pollutant concentrations. This is important for the health of Chinese people, as a series of studies have shown there is a direct causal relationship between environmental quality and the health of a population and the accumulation of human capital. Reductions in pollution levels will not only reduce mortality and morbidity but also increase labour productivity and contribute to long-term sustainable economic development (Greenstone et al. 2021). Based on the Air Quality Life Index, if China's air quality in 2020 can be sustained over the long term, it would add more than 2 years to the average life expectancy of the Chinese people, compared with long-term exposure to the air pollution levels of 2013 (Greenstone, He, and Lee 2022).

## 2. Prospects for environmental pollution control

China has performed impressively with respect to its environmental protection goals over the past decade, and overall air quality has largely met national standards. However, the increasing marginal costs of emission abatement imply that continued improvements in environmental quality will be more difficult to achieve in the future. Historically, China's approach to pollution control relies heavily on command-and-control policies. While this approach can ensure that emissions can be reduced rapidly at source within a short period, it also brings about significant economic costs. Regulators may find it increasingly difficult to balance the interests of different parties in the future. In addition, the COVID-19 pandemic and international trade frictions have negatively affected the production and business activities of Chinese enterprises over the past 2 years.

Owing to multiple negative shocks, we expect that the Chinese government will not further strengthen its pollutant control policies for the next few years. The intensity of environmental regulations will be relaxed marginally in 2023, and the government will not introduce more stringent air and water pollution treatment policies in the short term. Maintaining growth, promoting employment, stabilising prices, improving technological breakthroughs in key scientific and technological fields and promoting national security will be among the main goals of the Chinese government in the coming years.

Table 1 Socio-economic and environment-related development objectives over the 14<sup>th</sup> Five-Year Plan period

Category	Indicators	2020	2025	Annual average/cumulative	Properties
Green ecosystem	Reduction of energy consumption per unit of GDP (%)	-	-	[13.5]	Binding
	Reduction of carbon dioxide emissions per unit of GDP (%)	-	-	[18]	Binding
	Proportion of days with good air quality in cities at the prefecture level and above (%)	87	87.5	-	Binding

Green ecosystem	Proportion of surface water quality of or better than Grade III (%)	83.4	85	-	Binding
	Proportion of forest coverage (%)	23.2*	24.1	-	Binding

Note: [ ] indicates 5-year cumulative data; \* indicates data for 2019.

In fact, the overall improvements in air and water quality in China have levelled off since 2020 (Figs. 1–3). Table 1 presents the environment-related development objectives over the 14th Five-Year Plan period. It can be seen that the policy objectives such as air quality and surface water quality will not change much in the coming years, and the focus of environmental policies has shifted from pollution control to green and low-carbon development. Because both air pollutants and CO<sub>2</sub> emissions are generated by the burning of fossil fuels, air pollution prevention and control will be integrated with greenhouse gas emission control in the future. It is expected that air quality will improve naturally with carbon reduction. Pollution control measures will also shift from end-of-the-pipe treatment (reduction of air pollution) to source treatment (reduction of carbon emissions) and will be focused on upgrading industrial structure and adjusting energy structure.

## II. Climate change and carbon neutrality

### 1. Enactment of carbon peaking and carbon neutrality policies, and related investments

China declared to the world in September 2020 that they “will strive to reach the peak of CO<sub>2</sub> emissions by 2030 and achieve carbon neutrality by 2060” to address global climate change and realise the green and low-carbon transformation of its development phase. By 2030, China will reduce its CO<sub>2</sub> emissions per unit of GDP by more than 65% compared with 2005 levels, and non-fossil fuels will account for approximately 25% of China’s primary energy sources.

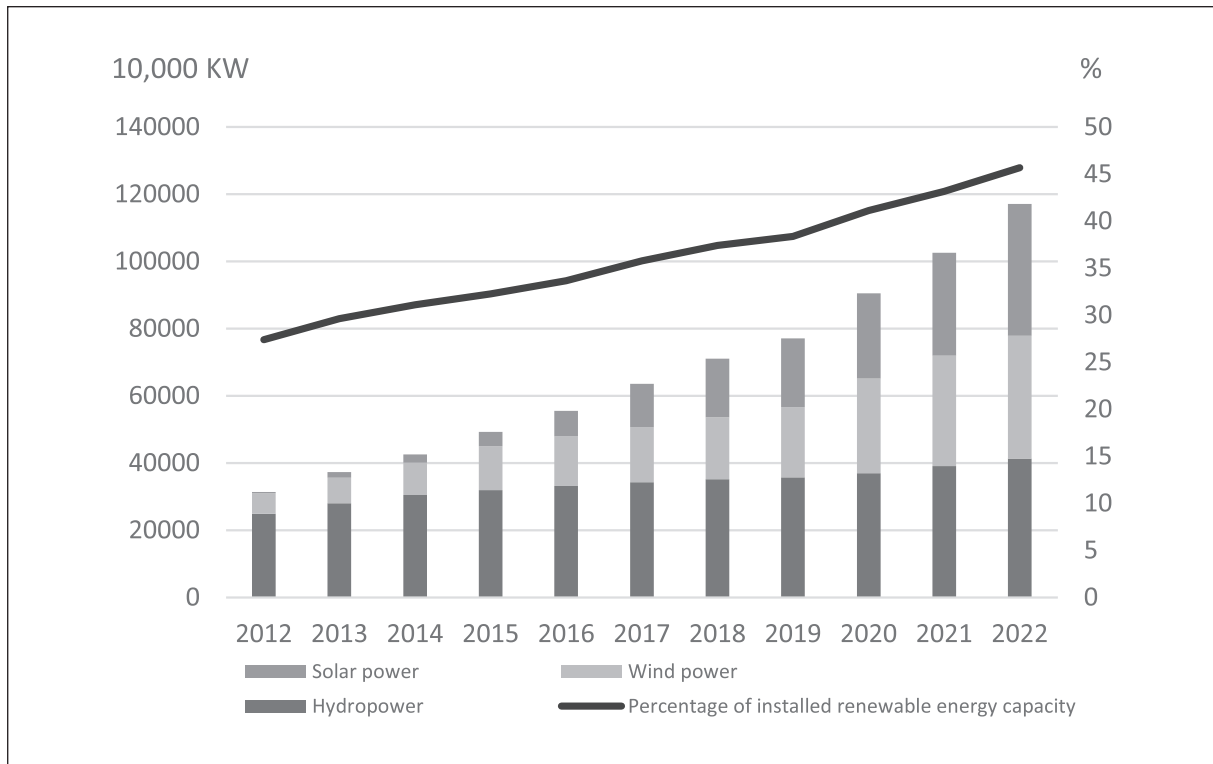
To ensure this, the Chinese government has launched more than 20 important policies and measures, and some of the most important economic measures are listed below. First, the Chinese government aims to develop green finance and provide emission reduction loans to enterprises involved in key areas of emission reduction, such as those involved in energy conservation and environmental protection, or in developing clean energy or carbon emission reduction technologies. According to the People's Bank of China, as of the end of 2022, the green loan balance from financial institutions was RMB20.03 trillion, representing a 38.5% year-on-year increase and 5.5 percentage-point increase compared with the end of 2021.<sup>1</sup> In terms of use, the balance of loans to the green infrastructure upgrading industry, the clean energy industry (including the wind power and photovoltaic power-generation industries) and the energy conservation and environmental protection industry were RMB9.82, RMB5.68 and RMB3.08 trillion, respectively, representing 32.8%, 34.9% and 59.1% year-on-year increases.

Second, the Chinese government provides fiscal and tax policy support, and has been increasing its input by providing subsidies to renewable energy power generation. The installed renewable energy capacity increased from 310 million kW in 2012 to 1.17 billion kW at the end of 2022; moreover, its share in the total installed power capacity increased from 27% in 2012 to 46% at the end of 2022. The installed hydropower, wind power and photovoltaic power capacities in China reached 410, 370 and 390 million kW, respectively, in 2022, placing China first in the world for these capacities (Fig. 4). China has also established a sound financial support system for new energy vehicles (NEVs); this system not only subsidises vehicle purchases but also relieves and reduces vehicle and vessel purchase taxes for NEVs. Fewer than 20,000 NEVs were sold in 2013; however, the domestic production and sales of NEVs reached 7.058 and 6.887 million units respectively in 2022, which correspond to an increase of 96.9%/93.4% relative to the 2021 levels. The market share of NEVs reached 25.6%, placing China first in the world for this measure for the eighth consecutive year (Fig. 5).

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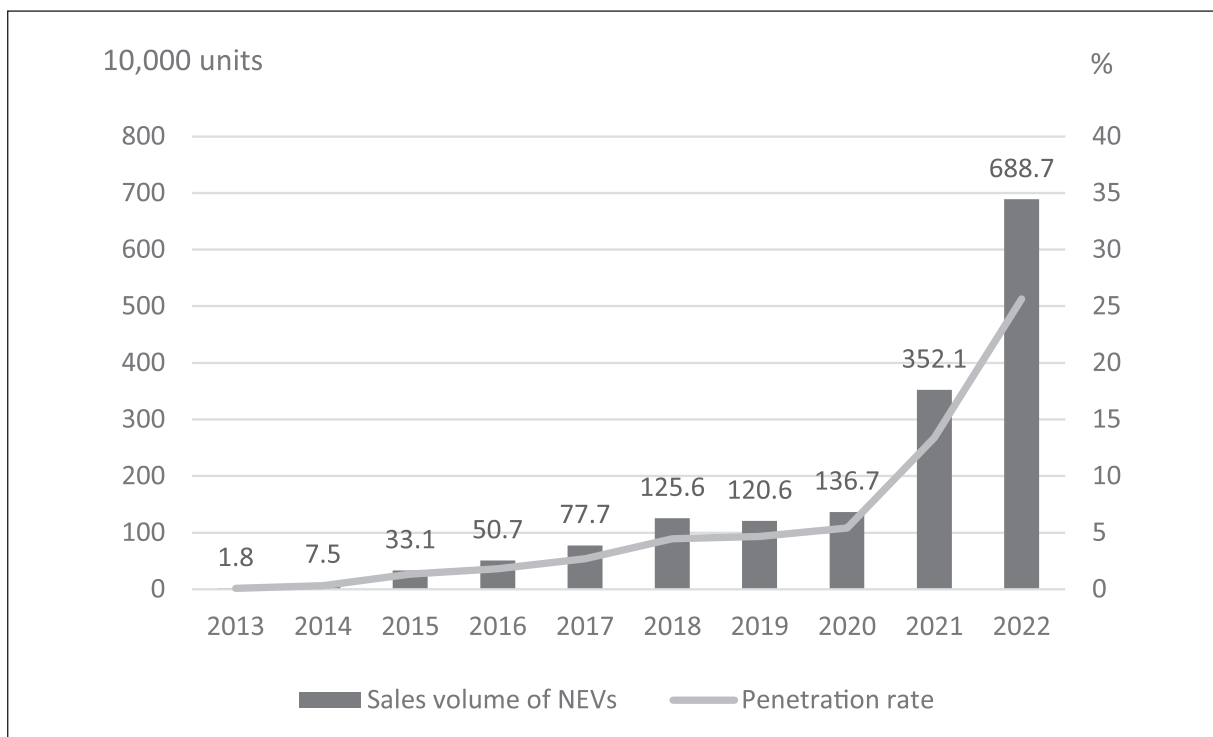
1.<http://www.pbc.gov.cn/goutongjiaoliu/113456/113469/4784452/index.html>

Fig. 4 Installed capacity and proportions of major types of renewable energy power generation in China (2012–2022)



Sources: Electric Power Statistics and Data Center of China Electricity Council, National Energy Administration, <https://cec.org.cn/template2/index.html?177>.

Fig. 5 Annual sales and penetration rate of NEVs in China (2013–2022)



Source: China Association of Automobile Manufacturers, [http://www.caam.org.cn/chn/5/cate\\_39/con\\_5236639.html](http://www.caam.org.cn/chn/5/cate_39/con_5236639.html).

Third, the Chinese government aims to promote its green procurement strategy. This is needed as the abovementioned financial and tax policies are mainly focused on the production end; however, the difficulty of green development lies at the consumption end. At present, China's green consumption is dominated by green procurement by the government. As a national strategy, green procurement is an important means to achieve carbon peaking and carbon neutrality. Green procurement can help to increase the use of low-carbon and energy-efficient products, improve enterprises' low-carbon innovation capacities and optimise China's industrial structure, thereby contributing to carbon peaking and carbon neutrality. As of 31 December, 2022, 48 cities (municipal districts), including Nanjing and the Chaoyang district of Beijing, have implemented the policy aimed at "supporting green building materials and promoting construction quality improvement through government procurement." The projects included in the policy include hospitals, schools and other government procurement projects.

## **2. The national carbon market**

As an important market-based instrument, carbon emission trading is favoured by increasing numbers of countries and regions to achieve their carbon reduction. As of 31 December 2022, 34 emissions trading systems (ETSs) were in operation worldwide, and the jurisdictions with ETSs contributed to 17% of global greenhouse gas emissions, 55% of global GDP and encompassed 33.33% of the global population, respectively (World Bank 2022a).

China's national carbon market was completed and officially launched at the end of 2017 and went online on 16 July 2021. By 31 December 2022, the cumulative trading volume of the carbon quota and the cumulative trading amount had reached 230 million tonnes and RMB10.475 billion, respectively. The national carbon market only includes the power generation industry, covering 45% of China's carbon emissions and making it the largest carbon market in the world.

In contrast to the traditional cap-and-trade system, China's national carbon market uses tradable performance standards; i.e., companies can trade carbon allowances to ensure that their carbon intensity (the ratio of emissions to output) does not exceed the specific levels. These tradable performance standards are designed to reduce the average amount of carbon emitted per unit of output of

the facilities covered by carbon markets (i.e., establish an intensity-based system) rather than directly limit the total amount of carbon emitted (i.e., establish a cap-based system).

In 2022, China's annual carbon market turnover was 50,889,500 tonnes, of which 87.78% and 12.22% were from bulk and listed agreements, respectively. The annual turnover amount reached RMB2.814 billion, including RMB358 million for listed agreements and RMB2.456 billion for bulk agreements. The average price of the listed agreement transactions was RMB57.54 per tonne, 22.00% higher than that in 2021 (RMB47.16 per tonne).

China's national carbon market has the following characteristics. First, emitters are clustered in several regions. The key emitters are mainly located in the northeast, middle Yellow River and eastern coastal comprehensive economic zones. Second, there is a lack of active market transactions. In 2022, the national carbon market turnover fluctuated between 2% and 3%, lower than the average turnover in the seven regional pilot carbon markets (approximately 5%) and much lower than that in the EU carbon market (approximately 500%). This indicates that China's national carbon market remains in the early stage of development. Third, the volume of transactions is "tidal"; that is, trading is active at the beginning and end of the year but sluggish in the middle of the year, with the trading volumes in January–February and November–December accounting for 19% and 66% of the total annual trading volume, respectively (Fig. 6). Early January sees a high trading volume in the national carbon market, mainly because the trading volume remains at high immediately after the end of the first implementation cycle. The daily trading volume is mostly below 500,000 tonnes from February to October but increases significantly from November to December. Finally, the average daily transaction price is relatively stable (Fig. 6). Overall, the average daily transaction price fluctuates around RMB58 per tonne, higher than the price in 2021 (RMB47 per tonne).

Fig. 6 Trend in the trading volume and transaction price in the national carbon market (2021–2022)



Sources: Shanghai Environment and Energy Exchange, [www.cneee.com](http://www.cneee.com).

### 3. Prospects of China's carbon policy in 2023

The national carbon market of China remains in its early stage of development, and there is much room for improvement. Several changes are expected in the coming years. First, the national carbon market is expected to continue to expand, and industries such as cement production, steel and plate glass manufacturing may be the next to be included in carbon market. By that time, the national carbon market will cover more than 70% of the country's carbon emissions. Second, more types of carbon finance products are expected to be added to the national carbon market. Going forward, the national carbon market will learn from experiences in the construction of regional and international carbon markets to develop more carbon financial derivatives to enhance its trading activity. Finally, the Interim Regulations on the Management of Carbon Emissions Trading policy and other related policies will be issued and implemented in 2023 to further standardise the accounting, verification and supervision systems of the national carbon market. On 17 May 2021, China's Ministry of Ecology and Environment issued a circular soliciting opinions on the draft of these regulations.



In terms of NEVs, owing to the withdrawal of purchase subsidies in 2023, the sales of some NEVs (i.e., brands and models that are less competitive than others in the market) may be under pressure. However, the sales of NEVs are expected to keep its momentum in 2023, and NEVs will increasingly replace traditional vehicles, becoming the primary driver of the transformation and upgrading of the global automobile industry. This will also serve as an important starting point for China to achieve its CO<sub>2</sub> emission reduction targets and high-quality industrial development. According to China's Committee of Electric Vehicles 100 Members, the production and sales growth of NEVs and the penetration rate of new cars will be approximately 40% in 2023, and the overall sales are expected to reach 10 million units.

In terms of clean energy for power generation, the central government will no longer provide subsidies for the on-grid price of new energy; however, this will not disrupt the sustained and rapid development of China's new-energy power generation. According to China Electricity Council's "2023 National Power Supply and Demand Analysis and Forecast Report," in 2023, the installed capacities of hydropower, wind power and solar power will reach 420, 430 and 490 million kW, respectively, and the installed capacities of solar and wind power will exceed the installed capacities of hydropower for the first time.

### **III. International perspective**

#### **1. EU carbon tariff agreement**

At the end of 2022, the European Parliament and European Council reached an interim agreement on the EU Carbon Border Adjustment Mechanism (CBAM) to control carbon leakage, i.e., the transfer of carbon emissions from regions with strict emission restrictions to those with less stringent climate-related regulations. A carbon tariff will be imposed on imports from countries with low or no carbon price, covering the steel, aluminium, electricity, cement and other high-carbon-emitting industries in all of the countries exporting to the EU. This carbon tariff will be formally introduced in 2026. Although aimed at avoiding carbon leakage, this move, which for the first time incorporates climate change legislations into global

trade rules, can create a non-trade barrier to normal imports and exports and place EU companies in a more competitive trading position.

China is the EU's largest trading partner. In the short term, the cost of China's export trade will increase because of the EU CBAM. In 2022, the average carbon price of the EU ETS was approximately RMB586.7 per tonne, whereas the average price of the domestic carbon emission quota was approximately RMB55.3 per tonne. China will thus bear the border adjustment cost of approximately RMB531.4 per tonne of CO<sub>2</sub> emitted by domestic goods exported to the EU. Given that the calculation of CBAM is based on implied carbon emissions, according to the calculation of Bin and Fei (2021), China will bear a carbon border adjustment cost of RMB143.48 billion every year. This is based on the assumption that the implied carbon emission of China's export trade to the EU is approximately 270 million tonnes and that the adjustment cost is RMB531.4 per tonne.

Chinese enterprises must cope with the implementation of the CBAM in three ways. First, these enterprises should measure their carbon emissions in advance and conduct timely assessments of the possible impacts of the CBAM. Second, these enterprises should formulate emission reduction plans in advance, increase the proportion of clean energy and introduce advanced emission-reduction technologies to realise the green upgrading of their industries. Finally, these enterprises should enhance their research and development investments and develop deep decarbonisation equipment. This will not only help improve the international competitiveness of their exports to Europe but also help them to meet the domestic carbon-emission reduction requirements.

The areas covered by the EU carbon tariffs are closely related to China's key industries for promoting green upgrading. In the long run, to some extent, this may accelerate the green transformation of China's industrial structure, promote the improvement and development of the carbon market and ultimately contribute to carbon peaking and neutrality.

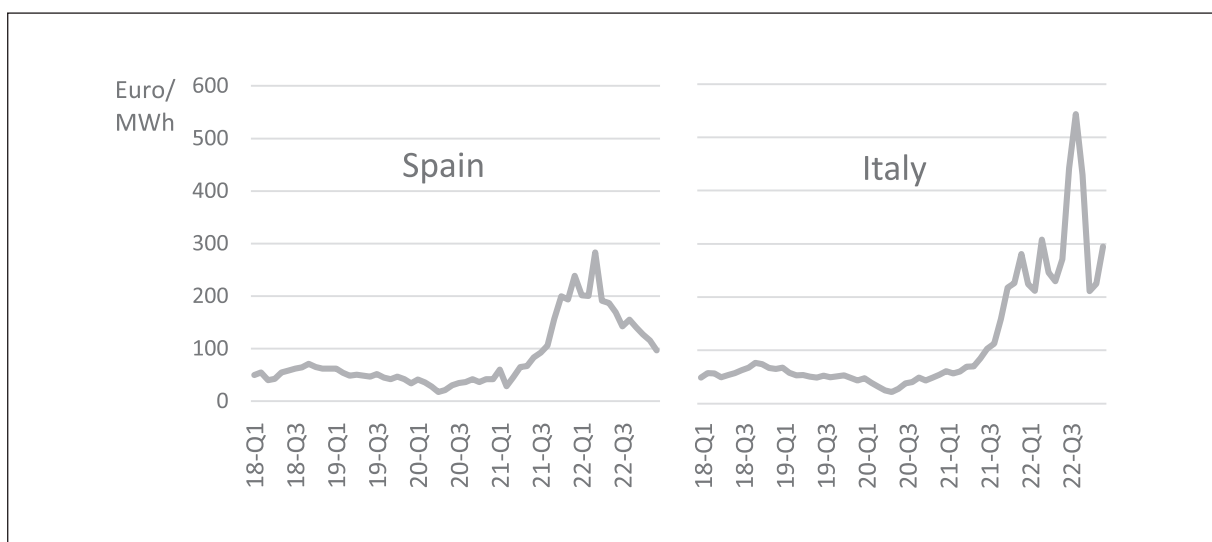
## **2. Energy crisis**

On 24 February 2022, the conflict between Russia and Ukraine broke out, and Western countries, including the EU, subsequently imposed and increasing

number of sanctions on Russia, causing huge shocks in the international energy market that led to electricity prices in Europe reaching a record high (Fig. 7). This surge in electricity prices placed pressure on Europe's energy-intensive industries, including the aluminium, ceramic and glass manufacturing industries. Moreover, the high energy prices negatively affected the entire industrial supply chain in Europe, posing huge challenges to the security of supply, export capacity and job creation in European countries.

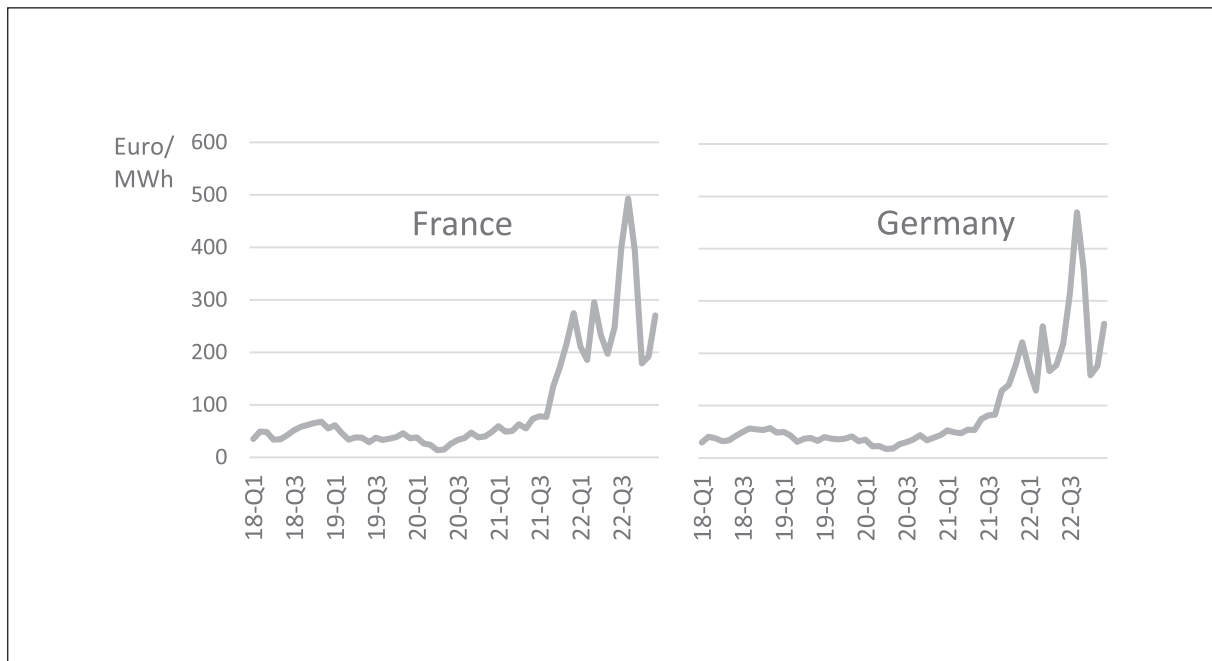
Since then, the EU has managed to deal with the energy crisis, focusing on demand cuts, price caps, subsidies and windfall profits taxes, and has continued to promote the REPowerEU plan<sup>2</sup> and the Fit for 55 package<sup>3</sup> to accelerate the transformation of the energy mix and eliminate the dependence on Russian gas. In addition to the EU level, European countries have introduced different policies to deal with the crisis. In terms of energy supply, countries are trying to find alternative sources for natural gas imports, temporarily restarting previously closed coal power plants and extending the life of nuclear power plants. In terms of energy consumption, many countries have introduced value-added tax cuts, retail electricity price ceilings or subsidies, subsidies for vulnerable income groups, assistance for industries and commerce, and other measures.

Fig. 7 Trends in wholesale electricity prices in major European countries (2018–2022)



2.The plan calls for an overall target of 45% renewable energy in the EU's '55% carbon reduction' portfolio by 2030, up from the previous 40% (which was 22% in 2021) [This is a little unclear; do you mean the target was 40% in 2020 and 22% in 2021?], to wean the EU off its dependence on Russian energy.

3.The plan, launched by the EU to meet its zero-carbon targets on climate change, aims to reduce the EU's greenhouse gas emissions, enhance climate resilience and reduce energy consumption.



Note: The figure presents quarterly data.

Sources: EMBER, <https://ember-climate.org/>.

Although the energy bail-outs of “price controls plus subsidies” have worked in the short term, they have burdened Europe’s public finances. In addition, because the conflict between Russia and Ukraine is expected to continue, energy prices are likely to remain high, and Europe will continue to face energy shortages. The World Bank expects zero growth in the Eurozone in 2023 (2023) because of the high energy prices and inflation expectations.

Because China relies heavily on oil and natural gas imports, rising international energy prices have led to increased foreign-exchange expenses, which has naturally increased the pressure of imported inflation and resulted in larger pressure of domestic inflation. However, due to the regulation and control of the domestic supply and the price stabilisation policy, China’s inflation level in 2022 was moderate overall, and its consumer price index remained low. In addition, the production constraints in Europe have increased the demand for Chinese industrial goods, especially for exports of energy-intensive products, such as chemicals, glass and metals. In the medium term, Europe’s energy crisis may trigger a recession, slowing the overall economic demand. This will place downward pressure on consumer and capital goods, which account for a higher proportion of goods, and could have an even bigger impact on China’s future exports.

### 3. The international carbon market

At present, carbon ETSs are mainly introduced in Europe, Southeast Asia and North America. The major ETSs for 2022 are summarised in the table below.

Table 2 Overall development of the global major emissions trading systems

Region	Average transaction price (USD per tonne of CO <sub>2</sub> )	Emission coverage (%)	Price volatility (%)	Carbon emission intensity (tonnes of CO <sub>2</sub> per 10,000 USD)	Economic benefit (%)	Number of industries included in the major categories
EU	87.3	39	6.00	1.60	0.21	3
UK	96.3	28	4.00	1.06	0.19	3
China (Nationwide)	8.85	44	2.00	5.95	-	1
South Korea	20.19	73	6.00	3.35	0.01	5
New Zealand	50.07	49	3.00	3.17	0.37	7
US (Regional Greenhouse Gas Initiative)	-	16	-	-	-	1

Note: The average transaction price is equal to the average daily transaction price. The carbon emission coverage represents the ratio of carbon emissions covered by the carbon market to the total carbon emissions in the region. The price volatility is equal to the average price volatility of each period compared with that of the previous period. The carbon emission intensity is equal to the ratio of the total carbon emissions of the administrative region in 2021 to the GDP of the administrative region in 2021. The economic benefit is equal to the revenue obtained by the administrative region in 2021 by auctioning carbon allowances compared with the GDP of the administrative region in 2021. The number of industries included in the major categories represents the number of industries included in the carbon market of the administrative region among seven industry categories (electricity, industry, construction, transportation, aviation, waste and forestry).

Source: Wind.

The average transaction price and price volatility in the EU carbon market are at high levels, whereas the other indicators are at a moderate level. The US Regional Greenhouse Gas Initiative carbon emission coverage and the number of included industries are low. Compared with the other major ETSs, the carbon intensity of

China's national carbon market remains high, and its average transaction price and price volatility are low (\$8.85 per tonne and 2%, respectively).

In 2022, the conflict between Russia and Ukraine and the subsequent imposition of sanctions on Russia (which were increased over time) led to changes in the carbon neutrality plans of many European countries. For example, on 6 July 2022, the European Parliament voted to include natural gas in the EU Sustainable Finance Taxonomy, indicating that natural gas can be classified as a sustainable energy source under certain conditions. France announced its withdrawal from the Energy Charter Treaty on 1 October 2022, and was accused of going against the goal of carbon neutrality. Overall, in 2022, geopolitical risks increased the near-term uncertainty in the international carbon market, and this is expected to continue in the coming year.

In the medium to long term, the international carbon market will exhibit good developmental momentum. Many Asian countries are trying to establish their ETSs and are expected to further expand their carbon markets to enhance domestic companies' awareness of the need to reduce carbon emissions. International institutions such as the World Bank and the International Monetary Fund may also provide increase financial assistance to poor countries to reduce their carbon emissions and lead the international community to provide financial compensation to vulnerable regions affected by climate change. Moreover, the global carbon market cooperation will be further deepened, making possible the global circulation of carbon products from different regions. In addition, the energy crisis may accelerate the adjustment of energy structure and the green transformation of European countries to some extent, which will be conducive to the stable development of Europe's and the rest of the world's carbon markets.

The link between China's and the world's global carbon markets will become stronger with the internationalisation of China's carbon market. For example, in October 2022, HKEx launched Core Climate, a national carbon market trading platform, which aims to connect capital to climate-related products and opportunities in Hong Kong, the Chinese mainland and the rest of the world. Leveraging Hong Kong's advantage as a global financial centre, China's carbon market, which has the largest development potential in the world, will

become connected with developed markets overseas. The Chinese government is simultaneously exploring international cooperation in the carbon market to enhance China's international carbon-pricing capacity. China is thus accelerating its policy co-ordination with international carbon trading mechanisms to establish national standards corresponding to the development of international carbon markets.

## IV. Policy Recommendations

### 1. China should improve its carbon pricing mechanism

China has a tradition of using command-and-control methods to address environmental problems (2022b). A World Bank classification of more than 2,000 environmental policies introduced in China between 1978 and 2019 shows that nearly 75% of the policies were command and control policies. Such policies failed to consider the large differences in the cost of reducing emissions from different sources and were thus unable to achieve cost-effectiveness. Market-based instruments are more cost-effective and therefore future policies should focus more on market-based instruments.

Second, the current carbon price in China's national carbon market is low, which is one-tenth of that in the EU carbon market (Table 2). Theoretically, the optimal carbon price should be equal to the social cost of carbon, i.e., the damage to society caused by each additional tonne of CO<sub>2</sub> emission. A low carbon price is not able to incentivise firms to abate carbon emissions and trade carbon allowances. As a good pricing mechanism has not yet been formed, the total trading volume of China's carbon market is only a small portion of the total quota. Companies participate in carbon trading passively in response to performance requirements rather than actively seeking investment opportunities, leading to failure to reflect on the investment value of carbon allowances. More market players should be allowed to participate in carbon market trading, and more carbon financial derivatives should be designed to enhance carbon market activity.

Moreover, China's carbon market differs from the carbon markets of most other

countries. That is, China's intensity-based market design works by subsidising electricity production and limiting the use of output reductions for reducing emissions. Low-carbon-intensity power plants may be encouraged to expand their output. These factors make China's intensity-based market design less cost-effective. We recommend that China should move as soon as possible to a regime that strictly controls the allocation of total carbon emission allowances, with clear and predictable forward guidance on the extent to which the emission cap will be tightened in the coming years. This will not only improve the cost-effectiveness of carbon reduction but also allow businesses and investors to plan for and consider the expected increases in carbon prices.

Finally, it is critical to remove the remaining fossil-fuel subsidies. Phasing out the existing inefficient fossil-fuel subsidies is the first step to provide a good incentive. A supplementary carbon tax could be levied on sectors not covered by the carbon market. A carbon tax would also be administratively easier to implement based on China's existing tax system, particularly in sectors where there are high transaction costs for carbon trading.

## **2. Carbon policies should focus more on production and try not to restrict consumption**

Facing the increasing threats imposed by climate change, policymakers have two strategies: (1) mitigating climate change by reducing carbon emissions, and (2) helping people better adapt to climate change. However, if we examine these two sets of policies at the same time, a dilemma immediately emerge. In order to mitigate climate change, policymakers often want to reduce energy and electricity consumption and design policies to achieve that goal (like various energy-saving programs that encourage households to reduce consumption). However, in order to adapt to extreme climates, it is indispensable for people to have sufficient energy/electricity usage. If climate policies focus too much on reducing energy and electricity consumption, it may affect our ability to adapt to climate change and bring about non-negligible social costs. For example, a recent study found that Japan's massive energy-saving policies after the Fukushima nuclear disaster resulted in more than 7,700 deaths a year due to extreme temperatures (He and Tanaka Forthcoming).



To avoid such tragedies, policymakers should design climate policies that emphasize more on the production side rather than the consumption side, and climate policies should especially avoid restricting energy/electricity consumption for low-income households. The main reason for not imposing restrictions at the consumer end is that energy consumption (which generates emissions) is one of the necessities of life. Thus, if energy consumption is directly restricted, it may lead to widespread social dissatisfaction and cause unexpected harm. As for the production side, the climate policies should focus on speeding up the green transition of power generation and significantly increasing the proportion of renewable energy, such as solar and wind power in the coming decades.

### **3. Improve environmental governance and encourage public engagement**

Environmental protection and pollution control usually require trans-regional cooperation. In China, such cross-regional externalities and the corresponding coordination problems are usually solved by the central government in a relatively low-cost way. China also has unique official accountability and evaluation mechanisms (e.g., a mechanism linking environmental performance to promotion, and a one-vote veto mechanism) that ensure that local governments have the incentive to perform environmental management. Many of China's environmental quality improvements over the past decade have benefited from these special institutional arrangements.

However, this strategy, which relies mainly on political incentives for environmental governance, may face increased challenges in the future. These mechanisms often work well in situations wherein local governments have a single objective, such as protecting the environment. However, when the government has multiple objectives, these mechanisms may limit the local government's ability to take risks. If a local government is too risk-averse, this will harm local economic development (especially investment and innovation).

Moreover, this strong political incentive will lead to widespread moral hazard problems due to information asymmetry. Specifically, because the central government often does not have a full picture of local governments' behaviours, local governments may devote more efforts to aspects that are more easily observed by the central government but ignore those aspects that are difficult

for the central government to observe. For example, local governments often impose strict regulations on firms near monitoring stations but turn a blind eye to those that are not monitored (He, Wang, and Zhang 2020). A similar pattern applies to pollution regulation, wherein the regulated pollution decreases but the unregulated pollution increases. To avoid this, it will be important to promote information disclosure and encourage bottom-up monitoring and public engagement. For example, the Ministry of Environment and Ecology has established a ‘National Platform for Environmental Complaints and Reporting’ and has mandated environmental protection agencies at all levels to establish social media platforms, such as Weibo and WeChat platforms. These approaches can be expanded to cover more sectors. It is found that this type of public engagement can significantly reduce the emissions violations of the polluting firms (Buntaine et al. 2022).

#### **4. Burden of climate change policies and equity considerations**

Policymakers also need to consider the burden of climate change policies and related equity considerations. For example, decarbonising China’s coal-dependent and carbon-intensive industries will inevitably lead to higher production costs, which will adversely affect consumers and businesses. For necessities with a low demand elasticity (e.g., electricity, clothing and food), more of the cost of reducing carbon emissions will be passed on to consumers, and policymakers need to pay attention to the effects of carbon reduction on low-income households. By contrast, for goods with a high demand elasticity (e.g., cars, computers and mobile phones), the cost of reducing carbon emissions will be mainly borne by manufacturers.

Special consideration shall be given to carbon emissions caused by the centralized winter heating system in North China. In northern China, the centralized heating system – a process that consumes large amounts of fossil fuels – provides heat to public and civil buildings in winter. The large source of carbon emissions is almost non-existent in southern cities. If a carbon emission policy does not consider these differences between North and South China and the need for heating, it will likely lead to a substantial increase in heating costs in the north and affect northern Chinese people’s living standards.

In addition, much of China's existing carbon-intensive capital is likely to be phased out in the future, and this may impact potential employment and economic growth. Compared with the richer coastal areas in southeast China, some of the less developed northern and western Chinese provinces are more dependent on coal and heavy-polluting industries. Without the relevant policy support, China's regional development could become more uneven as a result of achieving carbon neutrality. The government should therefore consider a series of labour market policies in advance, including transfer payments, public employment services, training, retraining and entrepreneurship, to promote the transformation of these industries and the re-employment of workers. Targeted policy support and investment should also be provided to specific regions, focusing on economic growth and green transformation in former coal-producing regions.

## **5. China should play a more important role in a carbon-neutral global economy**

As the world's "factory," China's producers have tremendous opportunities from the globe for renewable power generation and the electrification of the transport sector in the coming decades. China needs to further open up and integrate with the rest of the world to lead global efforts to reduce carbon emissions. For example, China is already a major producer of key green products, such as solar panels, wind turbines and electric vehicle batteries, and should integrate these commodities into the global value chain and promote its green transformation. Meanwhile, China is also a major outward investor and provides more infrastructure financing to developing countries than any other country (e.g., power plants, roads, and railways). Therefore, how China will invest, whether these investments will be low- or high-carbon intensive, will have profound implications for global carbon neutrality in the coming decades. To fully play its role in global climate governance, China should set stricter rules for outbound investments and encourage developing economies that receive Chinese infrastructural financing to choose low-carbon projects. When providing technical assistance, China should also make full use of its own experiences in developing renewable energy to help other countries carve out a viable low-carbon path and improve the market for low-carbon technologies.

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**Taking history as a mirror: The COVID-19 pandemic and China's post-pandemic investment and growth**

# Taking history as a mirror: The COVID-19 pandemic and China's post-pandemic investment and growth

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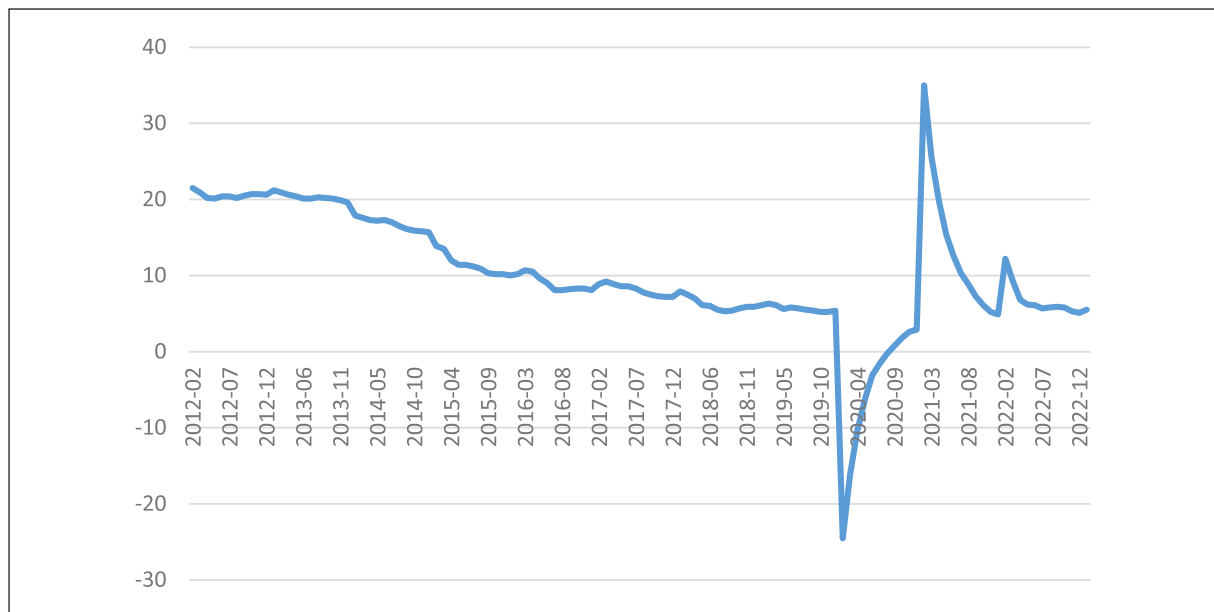
The COVID-19 pandemic that began in early 2020 has had a tremendous impact on investment and economic growth around the world. China is no exception. China's fixed-asset investment saw a 24.5% drop in combined YoY growth in January–February 2020, according to the National Bureau of Statistics (NBS). Despite edging up gradually, the growth rate stayed low, standing at 2.9%, 4.9% and 5.1% in 2020, 2021 and 2022, respectively, well below pre-pandemic levels. This is worrying for several reasons. Investment has long sustained GDP growth, and declines in fixed-asset investments by businesses and society will have a major impact on China's current economic growth on the one hand. On the other hand, fixed-asset investment can determine social production capacity in the near future and underpin economic growth in years to come.

It is therefore necessary to consider a number of questions about China's post-pandemic economy and its prospects in years to come. First, to what extent has three years of pandemic restrictions undermined China's fixed-asset investment and economic growth? Second, how long will the pandemic-induced investment decline continue to disrupt China's economy? Lastly, what policies would help to minimise the pandemic's impact on investment and economic growth and put China back on track for high-quality development? By drawing lessons from the last major economic shock, namely the 2008 financial crisis, this article takes history as a mirror and probes the impact of COVID-19 on China's fixed-asset investment and economic growth, prospects for post-pandemic investment and growth recovery, and policies that might best support this recovery.

## 1.COVID-19 impact and the status quo of China's fixed-asset investment

The COVID-19 pandemic has severely undermined the fixed-asset investment in China. Growth in China's fixed-asset investment steadily declined from 2012 to 2019, according to the NBS (Fig. 1). In that eight-year span, the YoY growth rate plunged to 6% in the first half of 2018 from 20.6% in 2012. The figure hovered around 5.5% from the second half of 2018 to 2019 prior to the pandemic outbreak. In the wake of the pandemic, China's fixed-asset investment plummeted by 24.5% in the first two months of 2020. Although the outbreak was kept under control in China afterwards for two years until early 2022, fixed-asset investment recovered only modestly, reporting an annual growth of merely 2.9% in 2020. Despite rebounding to 4.9% and 5.1% in 2021 and 2022, respectively, growth remains below pre-pandemic levels.

Fig. 1: Accumulated monthly growth in China's fixed-asset investment (%), 2012–2022



GDP growth has been similarly affected by the pandemic. China's GDP steadily grew by 6% to 7.9% YoY in the eight years prior to the pandemic, per NBS figures. GDP growth dipped to 6% in 2019, down from 7.9% in 2012, presenting a steady downtrend. However, China's GDP slumped 6.9% in the first quarter after the pandemic broke out. Despite moderate recovery in the ensuing three quarters, annual GDP growth in 2020 was only 2.2%, a four-decade low since the Reform and Opening Up. China's GDP in 2021 grew 8.1% from the year before, mainly driven by

two factors. One factor was the short-term benefits of pandemic control measures. The pandemic was well curbed in China but continued to rage outside the country, generating an enormous but short-lived boost to China's exports. After other countries emerged from the pandemic, the benefits quickly evaporated. Another factor is the base effect: growth in 2021 was high relative to 2020's ultra-low growth. As outbreaks swept across China while the rest of the world loosened restrictions, China's 2022 GDP growth dropped to 3%, half of pre-pandemic levels. Clearly, the COVID-19 pandemic has significantly undermined both investment and economic growth. The question is to what extent, and for how long its impact will linger. We can glean answers by analysing the impact of the 2008 global economic crisis on China's fixed-asset investment and economic growth.

## **2.The 2008 global financial crisis, fixed-asset investment and economic growth**

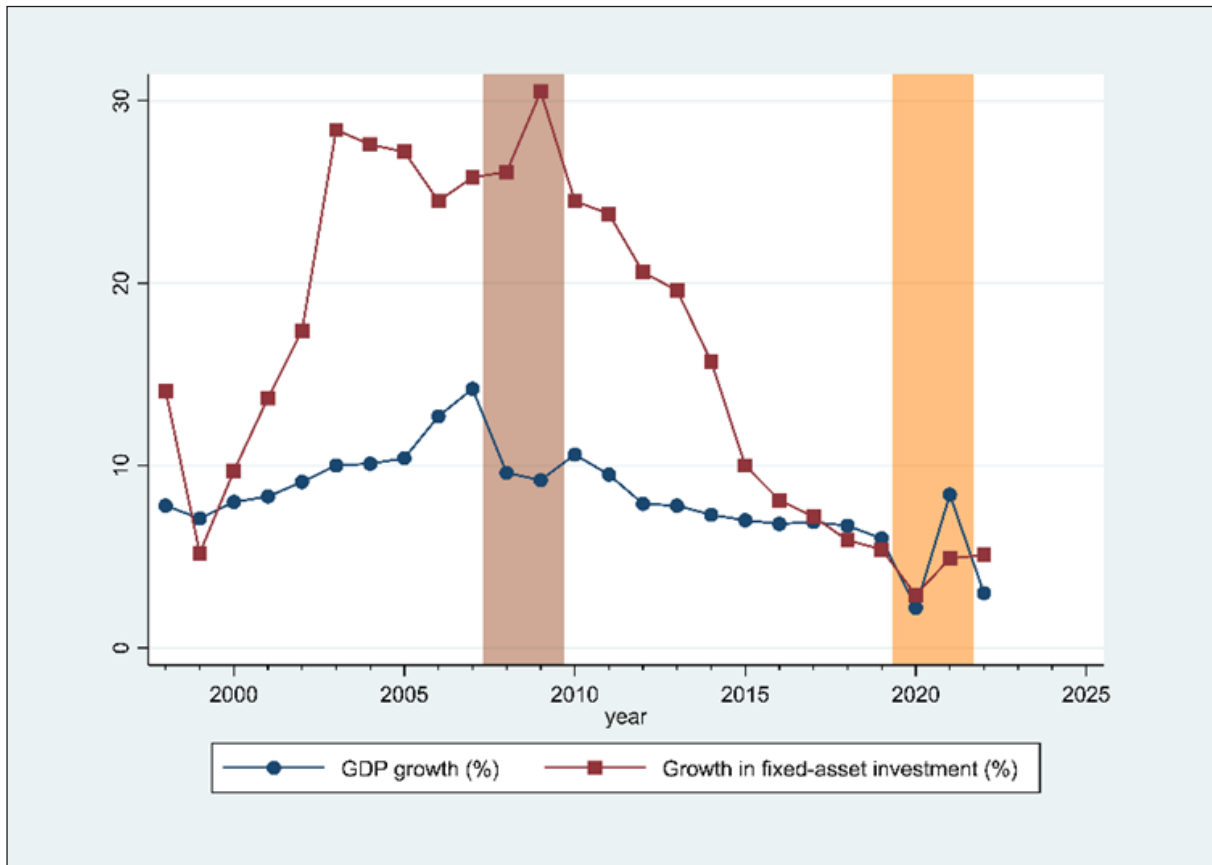
The 2008 global financial crisis, which was the last large-scale shock to China's economy, serves as a reference for our examination of the impact of massive economic shocks and policy responses on fixed-asset investment and GDP growth. Fig. 2 indicates the impact of the 2008 global financial crisis on China. Prior to the financial crisis, growth in China's fixed-asset investment had accelerated after China's accession to the World Trade Organisation and peaked at 28.4% YoY in 2003. The ensuing period from 2003 to 2007 saw steady growth of around 25%. Over the same period, GDP growth remained high, showing a constant rise and peaking at 14.2% in 2007.

However, China's economy came under extreme pressure from the 2008 global financial crisis. This is evidenced by the abrupt decline in GDP growth in 2008. China's GDP in 2008 grew only 9.7%, barely two thirds the level in 2007. China's fixed-asset investment bucked the trend and surged in 2008 and 2009 following an unprecedented RMB 4 trillion stimulus programme and massive capital inflows into investment. Yearly growth peaked in 2009 at 30.5%, but declined over the next decade to 5.4% in 2019 from 24.5% in 2010. China's GDP growth showed a consistent decline after the 2008 financial crisis, which is at least partially attributable to slowing fixed-asset investment growth and worldwide trade



frictions. It diminished to 6% in 2019, from highs of 10.6% in 2010 and 9.6% in 2011.

Fig. 2: Impact of the 2008 global financial crisis on fixed-asset investment and GDP



Of course, the declining growth in fixed-asset investment and GDP over consecutive years cannot be entirely ascribed to the global financial crisis and the ensuing RMB 4 trillion stimulus programme. They are also partially due to trade frictions and adjustments in China's economic structure following years of high-speed growth. However, the global financial crisis and the RMB 4 trillion stimulus programme created low-quality excess capacity, dragging down returns on capital and demotivating subsequent investment. This can be confirmed by the much lower levels of China's entrepreneur confidence index and business climate index in the decade following the financial crisis compared to pre-2008. Weak willingness to invest not only drags down GDP growth in the short-run, but also adversely affects medium- and long-term GDP growth. Developing policies in response to massive economic shocks (for instance, the global financial crisis and the COVID-19 pandemic) that enable the quick resumption of fixed-asset investment growth is therefore important to near-, medium- and long-term growth.

### **3. Main factors influencing investment and growth recovery following economic shocks**

Several reasons explain the long-term impacts of massive economic shocks on fixed-asset investment, which undermine medium- and long-term economic growth.

#### **Investment friction and investment cost**

Many micro and macro studies have shown that investment has remarkable friction. Time is one factor: entrepreneurs need time to re-appraise investment opportunities in the aftermath of massive economic shocks. Financial constraints are another: even when businesses identify investment opportunities, entrepreneurs need to raise funds, a challenge made more difficult by sharp declines in profitability following massive negative economic shocks like the COVID-19 pandemic. Furthermore, a funding crunch raises investment costs for businesses. Therefore, even if an economy hit by negative economic shocks is on the mend, investment and economic growth will not be restored immediately. The process of restarting investment after large negative shocks can be as short as half a year or persist for years, extending the impacts of negative economic shocks such as the COVID-19 pandemic on fixed-asset investment and economic growth.

Negative economic shocks can also disrupt supply chains. Large negative economic shocks such as trade wars, financial crises and the COVID-19 pandemic have disrupted supply and sales for many businesses. Seeking new suppliers and rebuilding supply chains take time, further pushing up businesses' investment and production costs, and undermining their fixed-asset investment and economic growth.

#### **Investor confidence**

Large economic shocks tend to undermine investors' confidence, dampening their faith in the economy and returns on investment. As indicated in Fig. 3, the Chinese entrepreneurs' confidence in the near term plunged nearly one-third following the 2008 global financial crisis. Despite a moderate subsequent recovery, China's

entrepreneur confidence index averaged around 120 in the decade following the financial crisis, considerably lower than the average of 130 in the five years prior to the crisis. This may in part explain the decrease in China's fixed-asset investment growth in the decade following the 2008 financial crisis.

Similarly, in response to the COVID-19 pandemic, China's entrepreneur confidence index plunged from around 124 to 91 at the beginning of 2020. This is very similar to what happened in the 2008 financial crisis. Once China curbed the pandemic in 2020–2021, entrepreneur confidence improved, but it began to weaken when the pandemic resurged in 2021. Lacking the latest entrepreneur confidence data, we turn to the Purchasing Managers' Index (PMI), which is closely correlated to the entrepreneur confidence index. Fig. 4 shows that fluctuations in the PMI are closely related to the entrepreneur confidence index. The PMI consistently declined after an initial recovery from the pandemic, dropping to 47 at the end of 2022—a record low since the 2008 financial crisis, excluding the immediate pandemic shock of February 2020. Declining entrepreneur confidence is bound to slow growth in fixed-asset investment, as well as near- and medium-term economic growth.

Encouragingly, shortly after China removed its COVID-19 restrictions and re-affirmed the priority of economic growth, the PMI surged to a ten-year high of 52.6 in February 2023. Still, this recovery must be treated with caution. Additional time and data will tell whether it is a near-term outcome of strong policy stimulus or a long-term recovery of entrepreneur confidence.

Fig. 3: China's entrepreneur confidence index

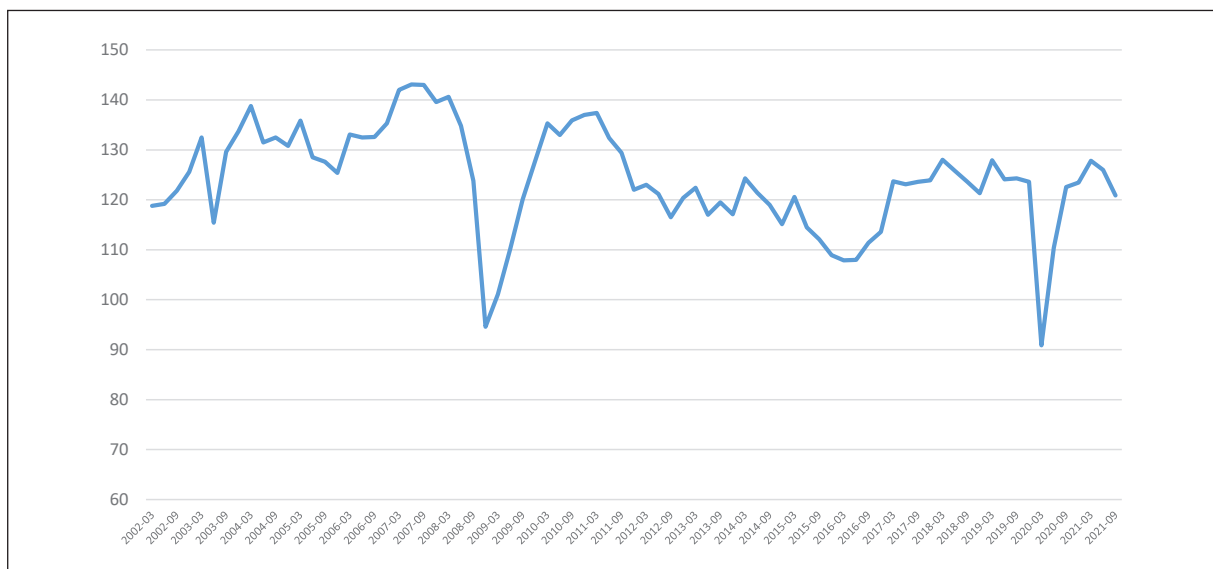
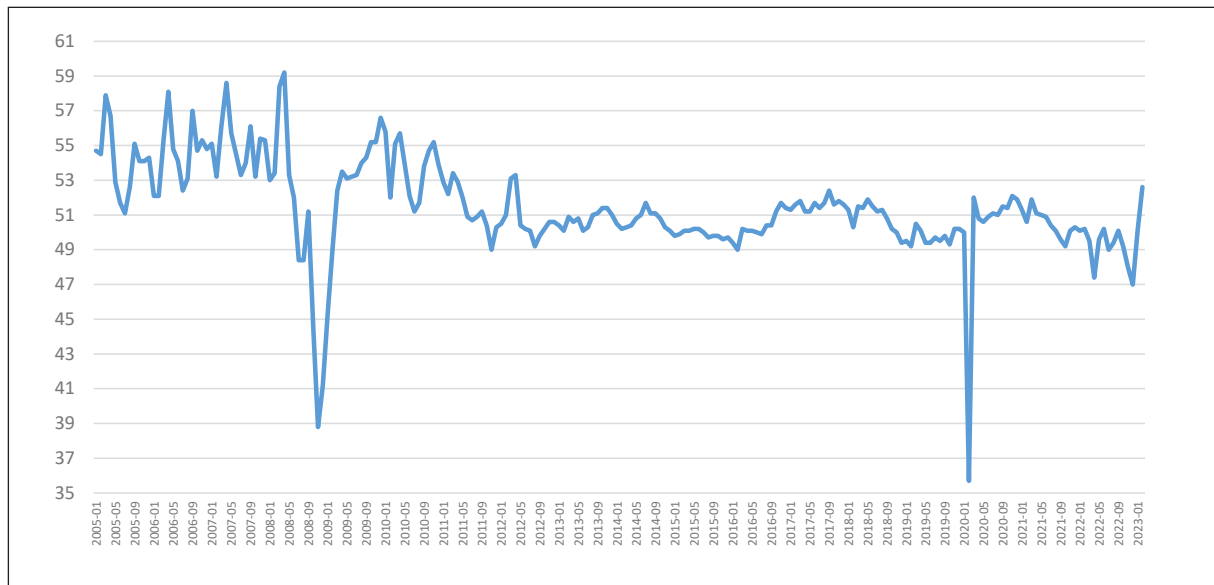
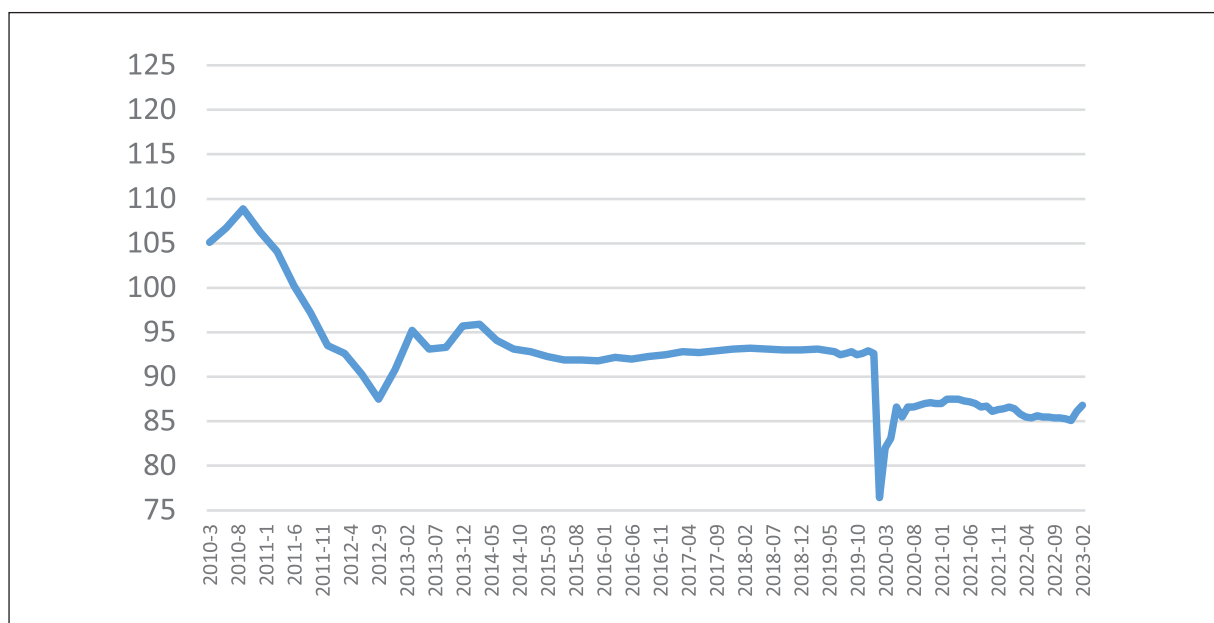


Fig. 4: China's Purchasing Managers' Index



The impact of the COVID-19 pandemic on small- and mid-sized enterprises (SMEs) may be more serious and longer-lasting. Fig. 5 shows China's SME development index from 2010 to early 2023. It is evident that the pandemic severely impacted SMEs in the near term. Notably, the SME development index did not recover by February 2023, in contrast to the PMI. This suggests possible long-lasting impact of the COVID-19 pandemic on China's SMEs. It is necessary to ensure the continued development of SMEs, as they contribute substantially to economic growth and job creation.

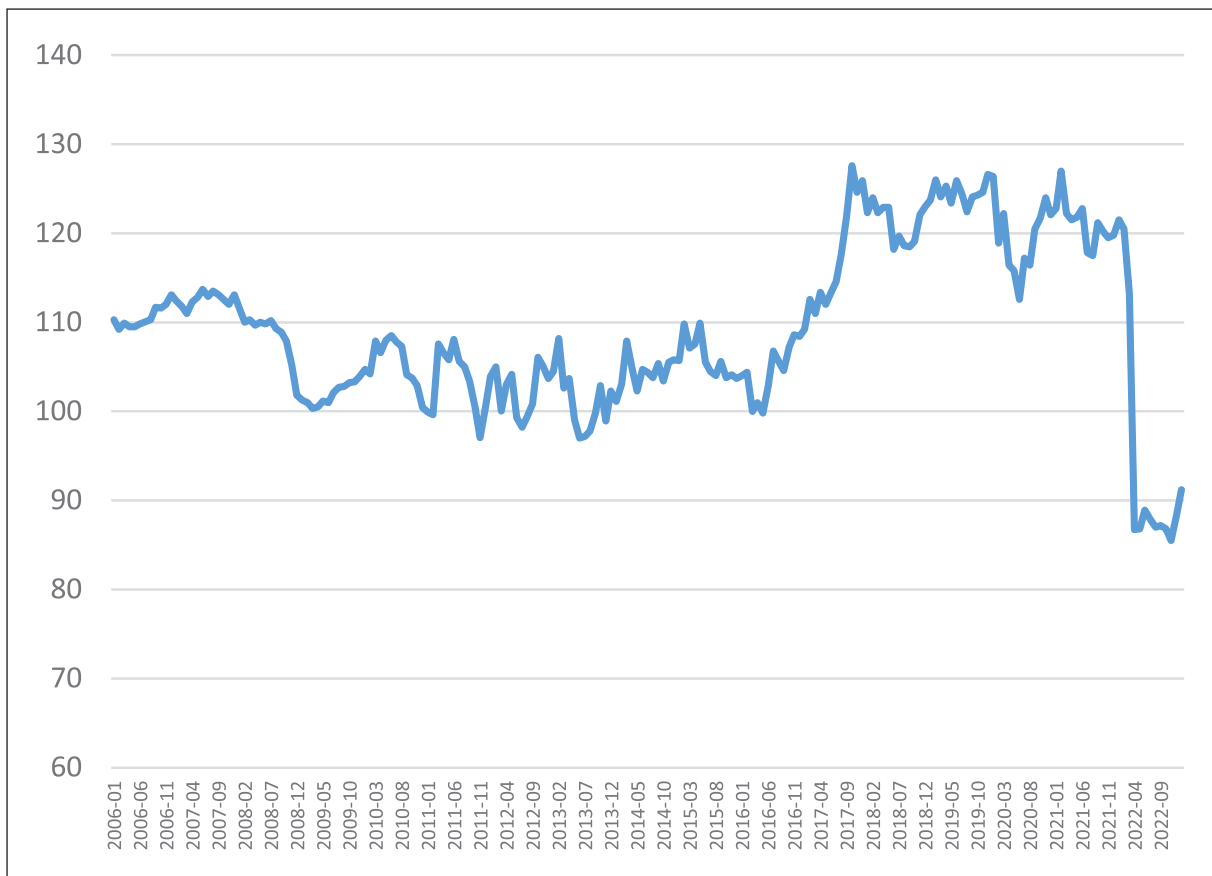
Fig. 5: China's SME Development Index



## Consumer confidence

Similar to declines in investor confidence, significant economic shocks can jeopardise consumer confidence. As indicated in Fig. 6, both the 2008 financial crisis and the 2020 COVID-19 pandemic hurt Chinese consumer confidence in the near term. Consumer confidence suffered an especially serious setback after the occurrence of COVID-19 outbreaks in economically significant cities such as Shanghai, Beijing, and Zhejiang in early 2022, precipitating lockdowns across China. At that time, the consumer confidence index plunged to below 90, from around 120 in 2021. Chinese consumer confidence was much harder hit at this time than during the 2008 financial crisis. By the end of 2022, the last point for which data are available, consumer confidence had only edged up to slightly over 90. Declines in consumer confidence can weaken demand and expectations of returns on investment, which in turn can slow growth in fixed-asset investment. Therefore, policies must be developed to shore up consumer confidence and boost demand. This is particularly important given the new export restraints resulting from deglobalisation.

Fig. 6: China's Consumer Confidence Index



## 4. Policy proposals

As with the 2008 global financial crisis, the COVID-19 pandemic has had enormous adverse impacts on China's fixed-asset investment and economic growth in the near term. China's medium- and long-term economic growth depend on addressing this shock. Prudential stimulus policies are thus necessary. Policies must not only consider eliminating large near-term pandemic shocks, but also prevent the pandemic and associated policy responses from having long-term adverse impacts in a manner similar to the 2008 global financial crisis.

Above all, policies must prioritise boosting investor confidence, particularly the confidence of SMEs. Local government policies during the pandemic had a tremendous impact on investor confidence. Therefore, it is a top priority to stabilise the expectations of entrepreneurs to ensure the continuity of central and local policies.

In addition, it is important to shore up consumer confidence to boost demand, stimulate economic growth, and reinforce businesses' willingness to invest. This is particularly important because of the increase in export growth restrictions due to trade wars and deglobalisation. One near-term solution is to issue consumption vouchers, near-term consumption loans, and education loans. Conditions permitting, the Chinese government should further reform medical care and elder care in the medium and long term to boost consumer confidence.

Moreover, investment frictions and costs, particularly for SMEs, must also be lowered. Businesses should be granted direct access to credit loans. This will reduce business investment costs and financial restraints, thereby spurring fixed-asset investment.

Lastly, medium- and long-term policies should focus on building industrial supply chains and regional industrial clusters to reduce business investment and production costs. This will improve businesses' economic resilience, making them better able to cope with economic shocks and achieve stable long-term economic development.



## **Boosting Entrepreneurs' Confidence to Restart China's Post-pandemic Economy**

# Boosting Entrepreneurs' Confidence to Restart China's Post-pandemic Economy

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## 1. Economic Restart: Will 2022 be the 1992 of the 21st Century?

In 2022, the Omicron variant of SARS-CoV-2 swept across China. For a long time, this phase of the pandemic was kept under control by China's stringent response. However, these efforts incurred tremendous economic costs. In 2022, the growth rate of China's gross domestic product (GDP) was only 3%, its second lowest level since 1977 (with the lowest being 2.2% in 2020). Consumption continuously contracted and total retail sales of consumer goods dipped by 0.2% year on year. Business development was hard hit, and industrial businesses above a certain size were down by 4.0%. Investment in real estate development dropped by 10.0%, its first decrease since 1999, when this figure began to be tracked. Worse still, youth unemployment hit a new high of 19.9% in July 2022.

Five months later, China lifted its pandemic restrictions under the dynamic zero-COVID policy. The Omicron phase of the pandemic came to an end in early 2023 in the wake of large-scale infection in China. On 7 December 2022, the State Council Joint COVID-19 Prevention and Control Mechanism issued the New Ten Rules. These rules aimed to loosen China's COVID-19 controls by scrapping the dynamic zero-COVID policy. The number of people infected soared to approximately 248 million between 1 December 2022 and 20 December 2022, according to the Chinese Centre for Disease Control and Prevention. On 25 December 2022, the National Health Commission of the PRC announced that it would no longer issue daily pandemic updates. On 8 January 2023, China downgraded its COVID-19 prevention and control measures to the rules applying to Class B infectious diseases.



Restarting the economy is a top priority for policymakers and the residential sector. Some think that China's economy will soon experience a large-scale and swift rebound to its pre-pandemic state, characterised by sound and fast growth. For example, Hamid Rashid, Head of the UN Department of Economic and Social Affairs, argues that ongoing economic growth, a lower consumer price index and relevant monetary and fiscal policies will support the strong recovery of China's economy. Others are more pessimistic, opining that although China's economy will eventually recover, it will maintain a relatively low growth rate. Sarah Y. Tong, a senior fellow at the University of Singapore, believes that the impact of COVID-19 on China's economy may persist for a long time. China may see an ongoing economic slowdown, structurally constrained by industrial upgrading, global economic slowdown and an uncertain external scenario.

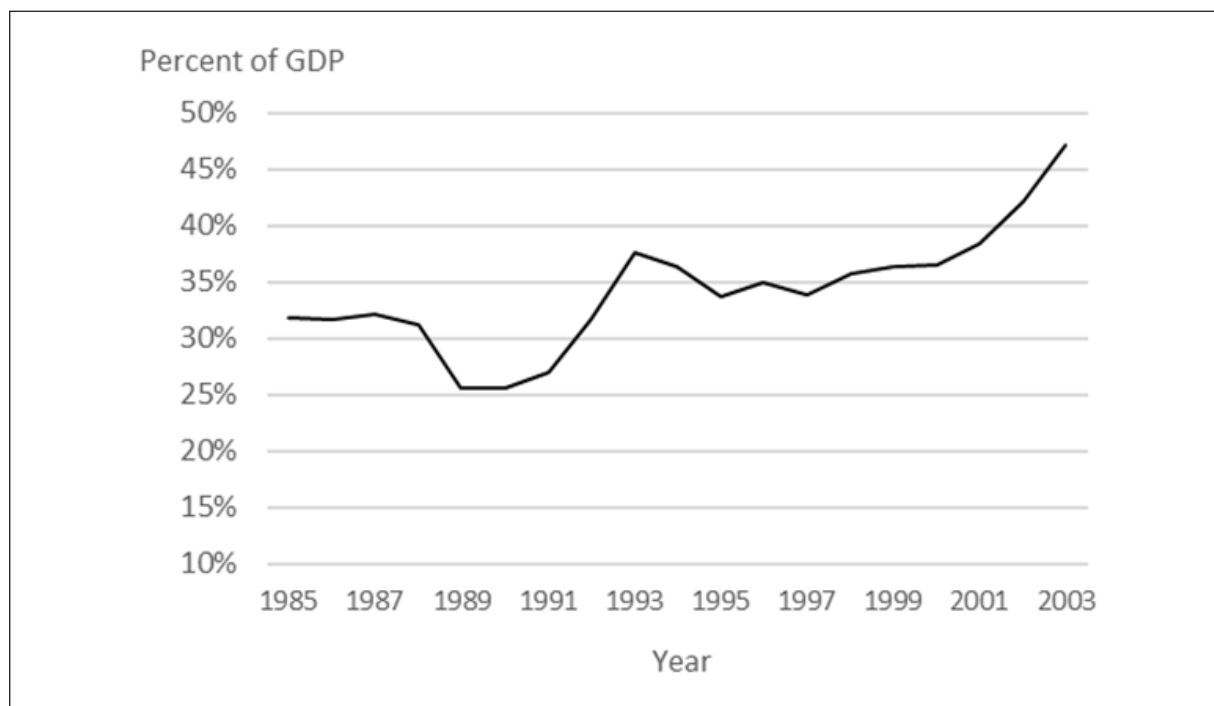
China has rarely experienced such serious economic challenges and tremendous uncertainty in the private sector as it did in 2022. However, 2022 showed similarities with 1992, both economically and psychologically. In 1990 and 1991, China was suffering the most acute lack of economic demand since the beginning of its reform and opening-up, known as the 'sagging economy'. In addition to insufficient demand, the private sector, which lacked confidence in the future, was a major source of problems. In 2022, China took the same approach to its economic issues as it had done three decades earlier. In some ways, the 1992 economic recovery began with the private sector, whose restart reflected restored confidence in the future. Accordingly, restarting the post-pandemic economy will involve restoring the confidence of the private sector and boosting economic activities, which show better cost performance than the government's traditional monetary policies, fiscal policies and infrastructure construction.

Figure 1 shows the percentages of fixed asset investments in China's GDP from 1985 to 2003. China's fixed asset investments began to fall in 1988, reaching 26% of GDP in 1990. However, they saw a significant rebound in 1992. In 1993, fixed asset investments approached 40%, and they remained at 34% or above for the next decade.

In terms of policy objectives to restore the private sector's confidence and eliminate its concerns about the future, we must reassure entrepreneurs and

relieve the uncertainty and pressure they face. What is preventing entrepreneurs from regaining their confidence? To investigate entrepreneurs' confidence and related characteristics, the Hong Kong University Business School and the Peking University Institute of Economic Policy Research cosponsored an entrepreneur survey team, headed by Dr Lin Haiqing, who administered an extensive survey covering various industries and an enormous number of entrepreneurs. This survey provides invaluable insights into Chinese entrepreneurs' mindsets.

Fig. 1 Percentages of fixed asset investments in China's GDP from 1985 to 2003



## 2. Comprehensive Survey of Chinese Entrepreneurs

### 2.1 About the Survey

A survey questionnaire was distributed to approximately 3,000 entrepreneurs, 2,412 of whom responded, including 1,312 entrepreneurs from medium-sized and large enterprises (MLEs) and 1,100 from micro and small enterprises (MSEs). Employees from private enterprises represented 87% of the sample. Another 7% were from state-owned enterprises and 6% were from collectively owned enterprises.

The respondents worked in a range of industries: 27% in primary industries (agriculture, forestry, animal husbandry and fisheries), 14% in secondary industries (mining, manufacturing, electricity, gas and water supply and construction), and 59% in tertiary industries (transport, information service, wholesale and retail, catering and hotel, financial services, real estate, leasing and commercial services, scientific and technological research, utilities, residential services, education, health, culture and sports). The majority of their enterprises were unlisted; only 19% were listed. A large proportion of the sampled enterprises, 46%, were high-tech enterprises.

The questionnaire survey covered enterprises of all sizes: 19% of the enterprises had an annual revenue of no more than RMB1 million, 26% earned between RMB1 million and RMB10 million per year, and 32% had an annual revenue exceeding RMB100 million. Their staffing also varied widely: 25% had no more than 10 employees, 24% had 100–500 employees and 11% had more than 1,000 employees.

More than 20% of the entrepreneurs participating in the survey were 50 years old or older, and a large proportion (21%) of them were under 35. Compared with the entrepreneurs from MLEs, the entrepreneurs from MSEs were younger: the entrepreneurs from MLEs had an average age of 45, while the entrepreneurs from MSEs had an average age of 39. More than half of the entrepreneurs had started their own businesses, and 18% of them had started more than three new businesses.

Most of the surveyed entrepreneurs were well-educated. Only 18% did not hold a bachelor's degree; 35% held a bachelor's degree and 47% held a master's degree or above. The entrepreneurs from MLEs were far better educated than the entrepreneurs from MSEs: 67% of the MLE entrepreneurs held a master's degree or above (9% had a doctoral degree or above), whereas only 24% of the MSE entrepreneurs held a master's degree or above (3% had a doctoral degree or above).

The entrepreneurs from MLEs and MSEs also differed in political status. More than one third of the entrepreneurs from MLEs were Communist Party of China members, whereas only one fifth of the MSE entrepreneurs held this status.

According to the questionnaire responses, the entrepreneurs' annual personal incomes also varied widely: 20% of the entrepreneurs from MLEs earned an annual income above RMB5 million, while 21% earned less than RMB500,000 per year. However, most of the entrepreneurs from MSEs reported a low annual income. More than half of the entrepreneurs from MSEs earned less than RMB100,000 per year; 46% had an annual income between RMB100,000 and RMB500,000; and only 10% earned more than RMB1 million per year.

Concerning family asset structures, the entrepreneurs' homes represented up to 46% on average of their families' total assets, followed by financial assets, at 31%. On average, financial assets represented 33% of the total assets of the MLE entrepreneurs, and this figure was slightly lower, at 28%, for MSE entrepreneurs.

## **2.2 Have Entrepreneurs Opted to do Nothing? Who has Opted to do Nothing?**

Two major concerns are whether entrepreneurs have opted to do nothing and what they are likely to do next. Investment behaviour is an important indicator of entrepreneurs' confidence. At the same time, investment serves as a core driver of economic growth.

The survey asked the entrepreneurs about their investments over the past year; specifically, whether they had scaled up their investments in the past year (from summer 2021 to summer 2022). Despite being hard hit by the pandemic, 58% of the MLEs had made new investments (Fig. 2(a)). However, more MSE entrepreneurs have opted to 'lie down' during the pandemic, with only 41% of them making new investments, a proportion far smaller than that of the MLE entrepreneurs. In particular, fewer than half of the enterprises bringing in RMB1 million to RMB10 million in revenue had made new investments over the past year, whereas this figure was higher than 60% for the enterprises with revenue between RMB1 billion and RMB5 billion (Fig. 2(b)). These findings suggest that small enterprises have been more strongly impacted than larger enterprises by the pandemic. This result is consistent with our observation and intuition that MSEs are more vulnerable to the effects of the pandemic and operating difficulties than other enterprises.

Fig. 2(a) Proportions of MLEs and MSEs making new investments

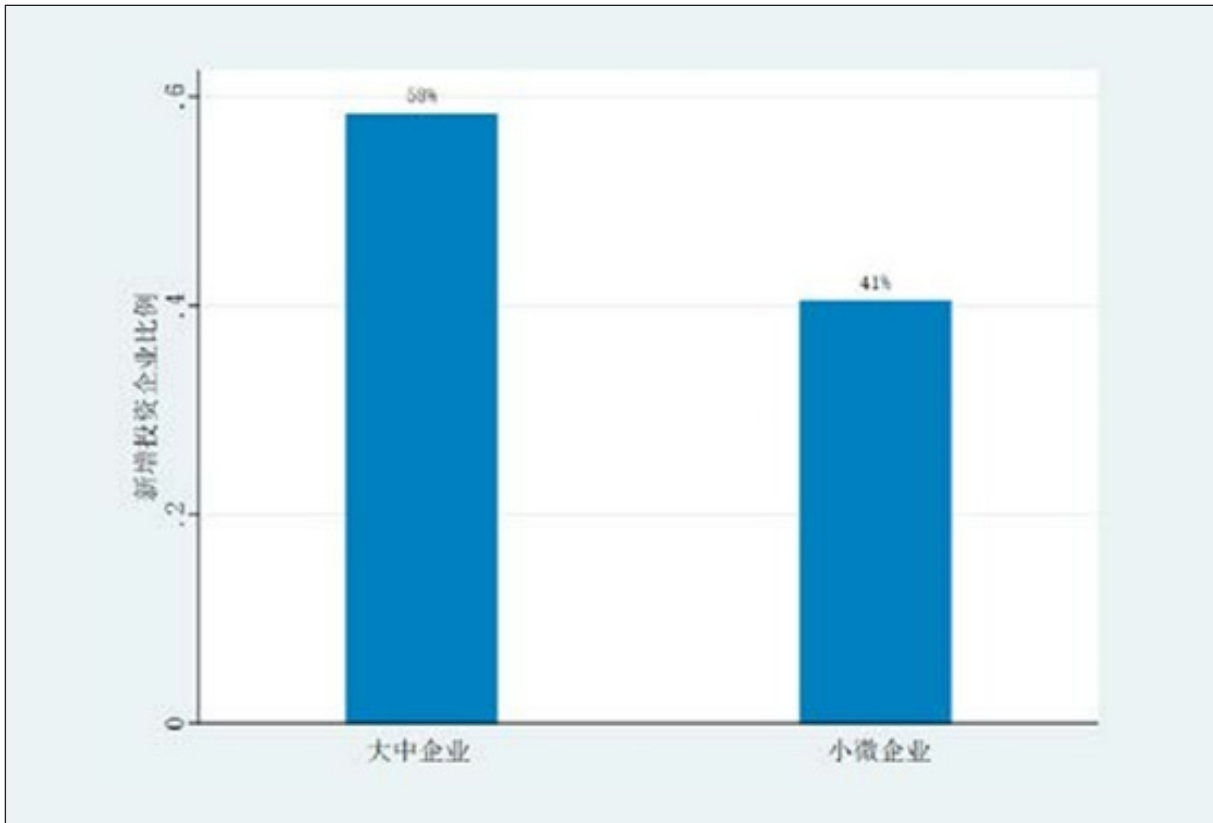
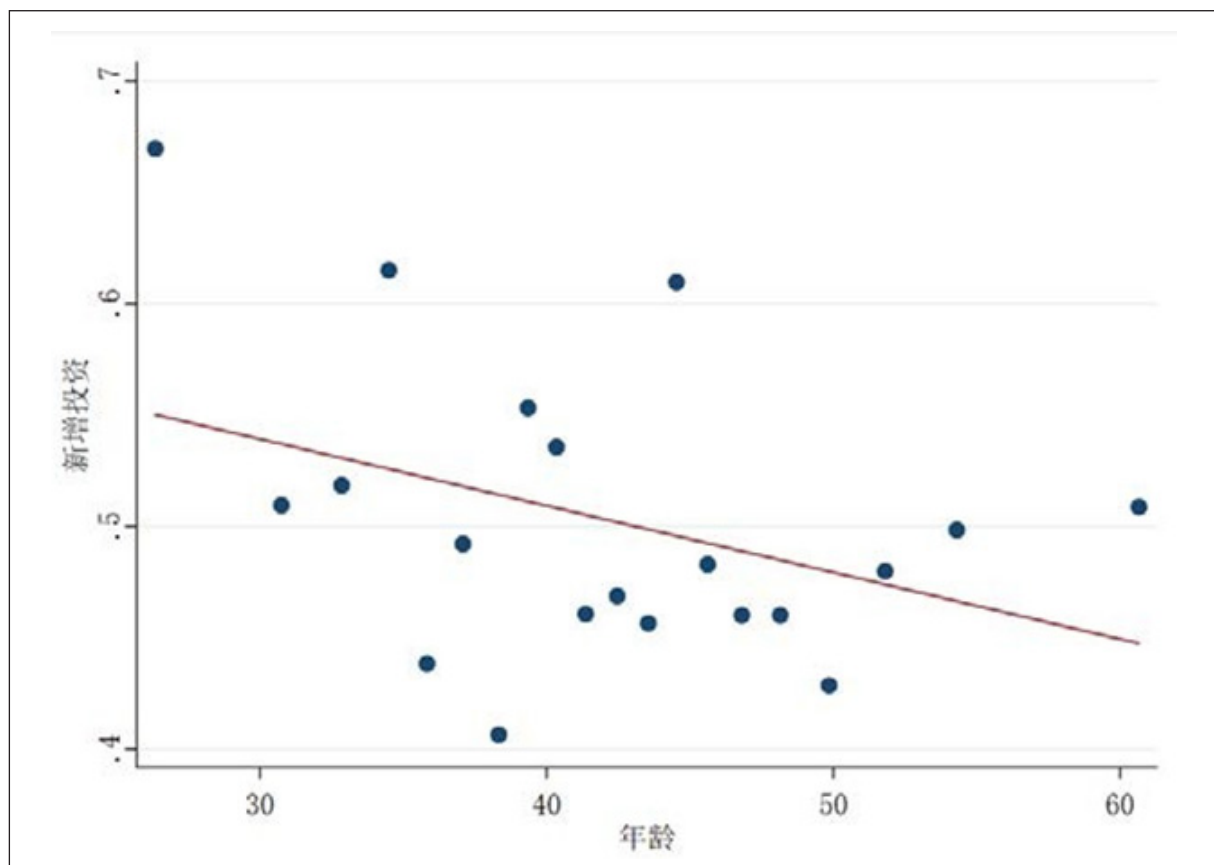


Fig. 2(b) Proportions of enterprises of various sizes making new investments



Additionally, entrepreneurs' new investments correlated with their age. As shown in Figure 3, the younger an entrepreneur was, the more likely their enterprise was to make a new investment, and for every decade by which an entrepreneur was younger, their average probability of making a new investment increased by 3% after controlling for gender, political status, educational level, the entrepreneur's income and the enterprise's size and industry. In other words, older entrepreneurs are more conservative and younger entrepreneurs are more progressive in response to today's unique economic climate, which also indicates that younger entrepreneurs are more optimistic than older ones. Younger entrepreneurs also represent the backbone of the force that will lead the Chinese economy out of adversity in the years to come.

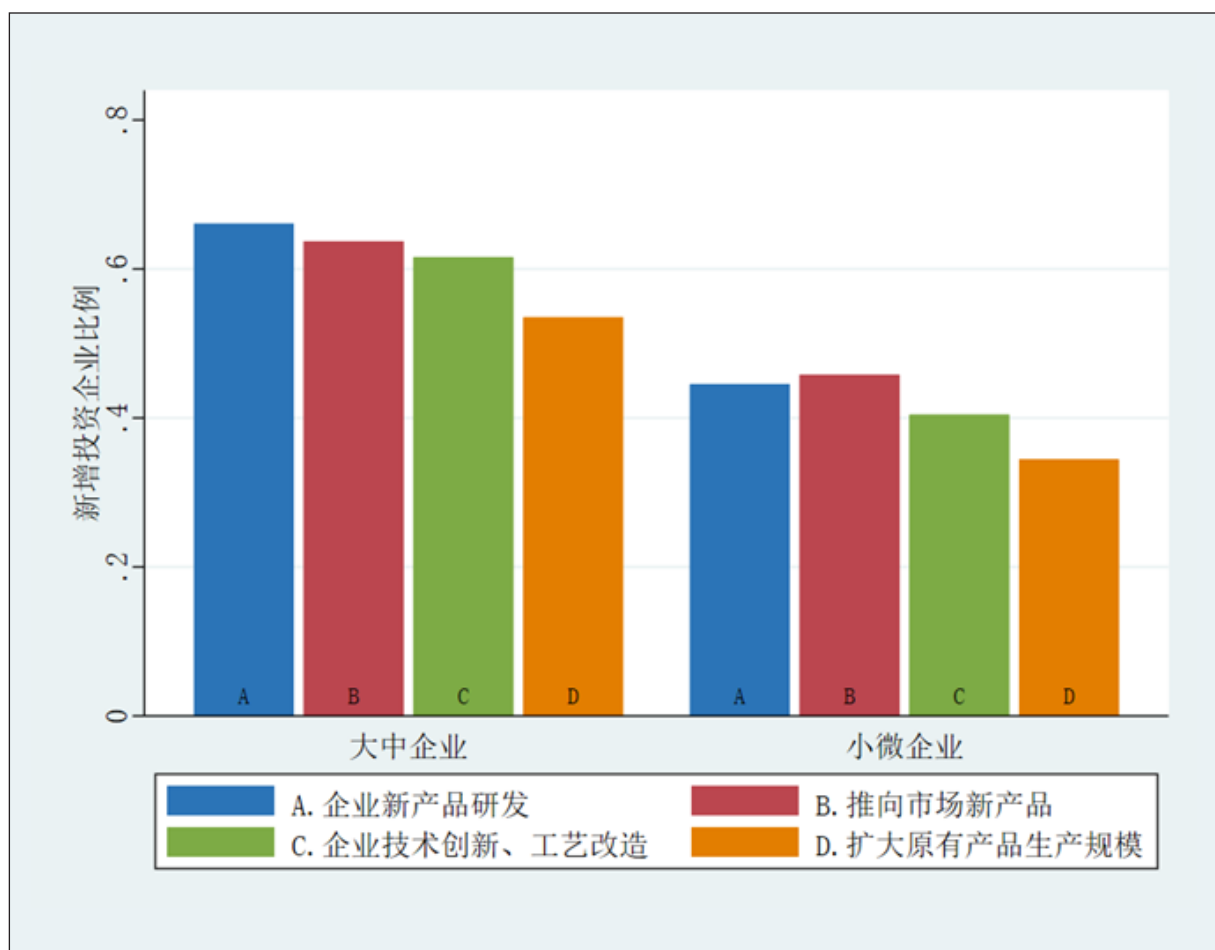
Fig. 3 New investments made by entrepreneurs by age



We classified the enterprises' investments as new product development, new product marketing, technological innovation and upgrading and increasing original production scale. We then compared the investments of micro, small, medium-sized and large enterprises by type. Product research and development (R&D), marketing and technological innovation are longer-term investments,

whereas increasing production scale is a short-term investment. As shown in Figure 5, an increasing number of enterprises had made longer-term investments over the past year in response to the pandemic. More than 60% of the MLEs had invested in new product R&D, new product marketing, and technological innovation and upgrades, and more than 40% of the MSEs had done the same. However, a smaller proportion of the enterprises had increased their production scale. Only half of the MLEs and 30% of the MSEs had made this short-term investment.

Fig.5 Proportions of micro, small, medium-sized and large enterprises making new investments by type



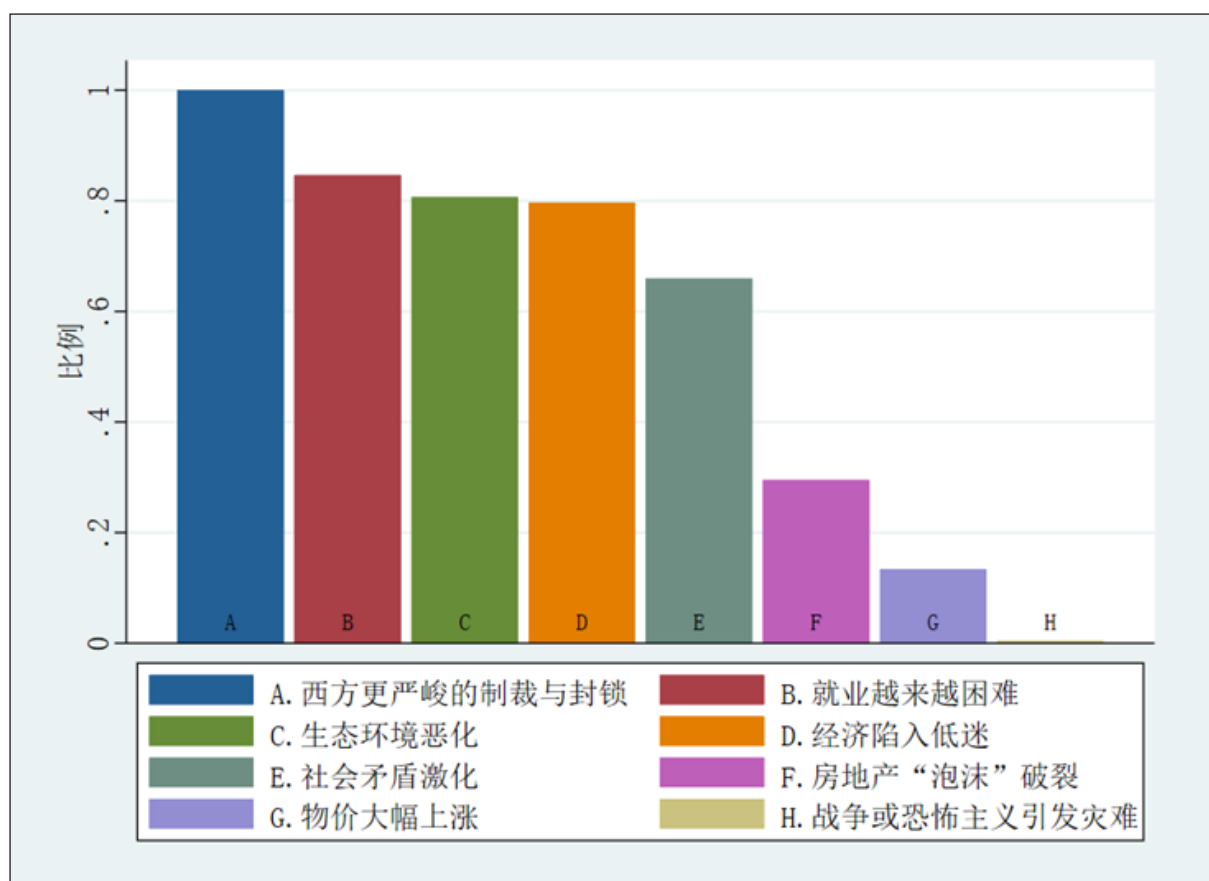
### 2.3 What are Entrepreneurs' Concerns?

Another major question is as follows. What are entrepreneurs' concerns about the future? Such concerns present an obstacle to the restoration of their confidence. The questionnaire asked the following question: 'What economic and social risks may China face in the following five years?' The respondents were presented with

eight items: economic downturn, worsening employment, significant inflation, bursting of the real estate ‘bubble’, intensification of social conflict, deterioration of the ecological environment, increased sanctions and blockades by the Western world and disasters triggered by war or terrorism. The survey asked the entrepreneurs to indicate the probability of each of these eight outcomes: ‘most probable’, ‘probable’, ‘less probable’, ‘improbable’ or ‘hard to say’.

Entrepreneurs’ concerns about economic and social issues are an indirect reflection of their confidence in the future. The results (Fig. 7) indicate that almost all of the entrepreneurs believed that there would be increased sanctions and blockades from the Western world in the next five years; more than 80% worried about employment, economic and environmental problems; approximately 70% anticipated the intensification of social conflicts; fewer than 30% believed that the real estate bubble would burst; approximately 15% predicted significant inflation; and only a very few believed that there would be disasters caused by war or terrorism. There were no significant differences between the entrepreneurs based on their industries and cities.

Fig.7 Proportions of entrepreneurs’ concerns about various issues





However, the concerns of the entrepreneurs from MLEs were quite different from those of the entrepreneurs from MSEs (Fig. 8). The responses indicated that 89% of the entrepreneurs from MSEs were worried about employment, compared with 80% of the entrepreneurs from MLEs; and 86% of the entrepreneurs from MSEs were worried about the economic downturn, compared with only 74% of the entrepreneurs from MLEs. More than 70% of the entrepreneurs from MSEs were worried about intensified social conflicts, whereas this figure was only 61% among the entrepreneurs from MLEs. The proportion of the entrepreneurs who were worried about inflation was also higher than that of the entrepreneurs from MLEs. In addition, 83% of the entrepreneurs from MLEs were worried about the deterioration of the ecological environment, whereas this figure was only 78% among the entrepreneurs from MSEs. Approximately 30% of the entrepreneurs from MLEs were worried about the real estate bubble would burst, whereas this figure was only 28% among the entrepreneurs from MSEs. Approximately 30% of the entrepreneurs from MSEs and those from MLEs were worried that the real estate bubble would burst.

Fig.8 Proportions of enterprises by entrepreneurs' concerns about various issues

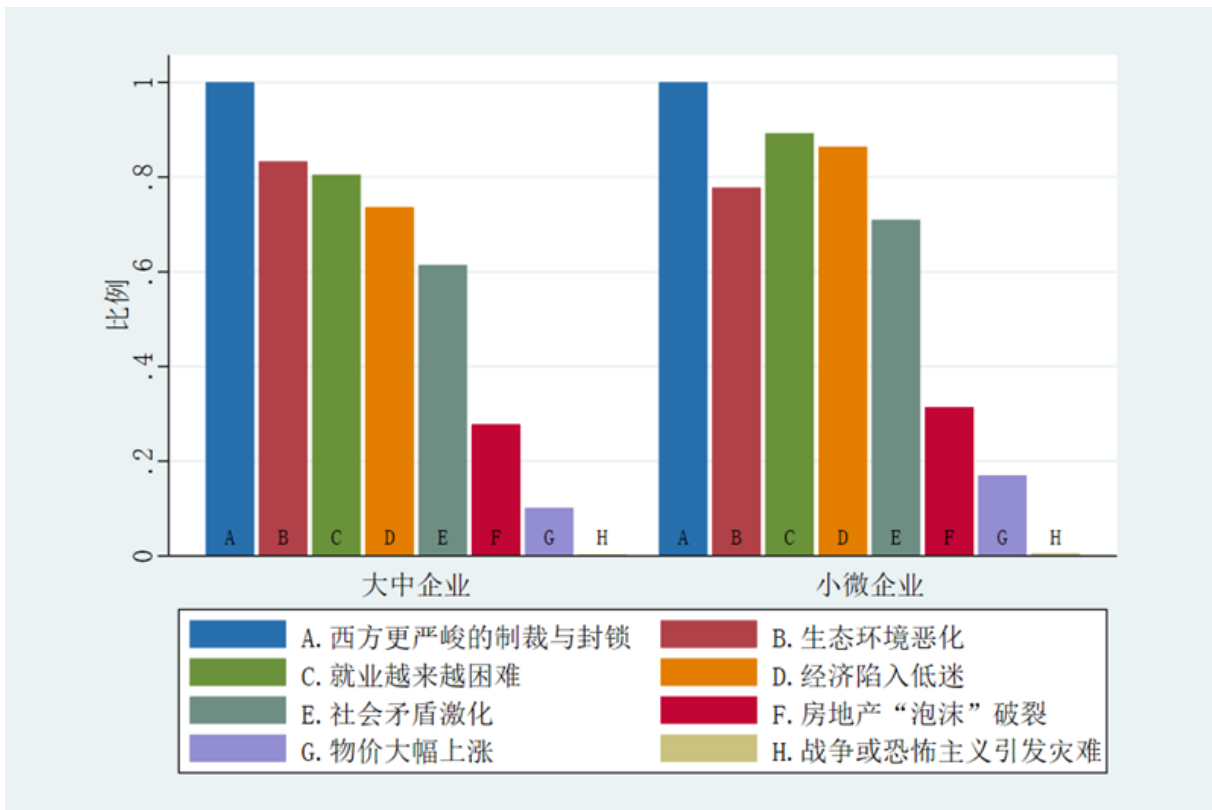


Figure 9 more clearly displays the relationship between enterprise size and entrepreneurs' concerns. After controlling for age, political status, marital status, educational level, number of family members, health status and annual income,

we found that the smaller the enterprise, the more an entrepreneur worried about an economic downturn, employment problem, inflation and the intensification of social conflict. Enterprise size contributed the most to concern about an economic downturn and least to concern about social conflict, reflecting small enterprises' tendency to focus on the 'big picture'. The bigger the enterprise, the more an entrepreneur worried about the deterioration of the ecological environment.

Fig. 9(a) Enterprise size vs. concern about an economic downturn

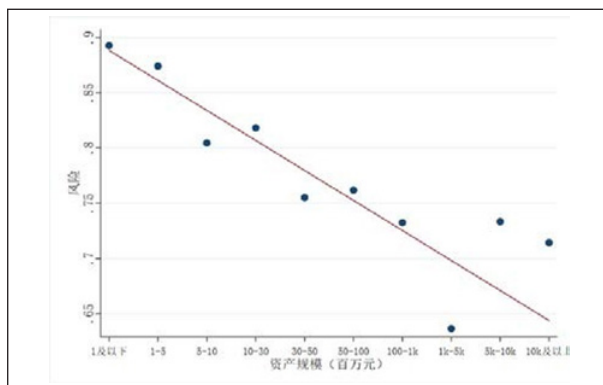


Fig. 9(b) Enterprise size vs. concern about employment problems

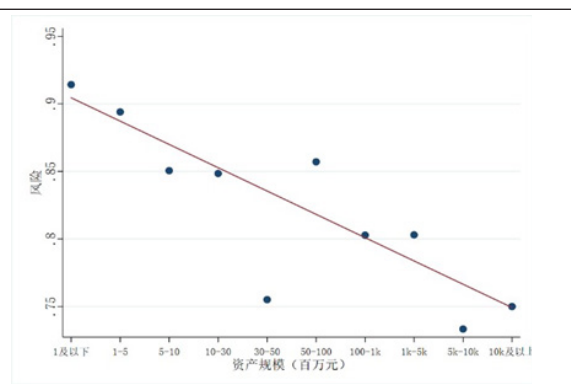


Fig. 9(c) Enterprise size vs. concern about significant inflation

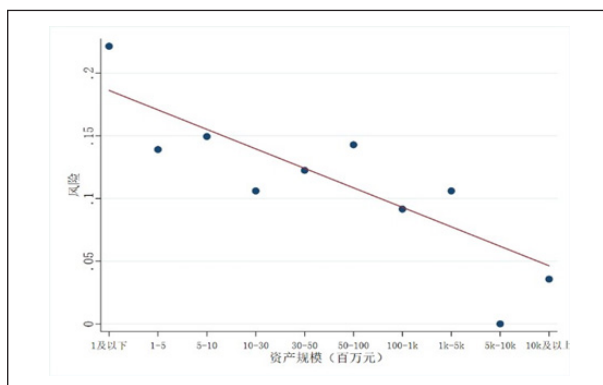


Fig. 9(d) Enterprise size vs. concern about the intensification of social conflict

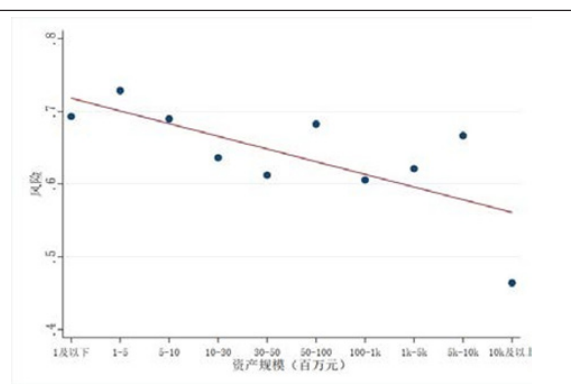


Fig. 9 (e) Enterprise size vs. concern about bursting of real estate bubble

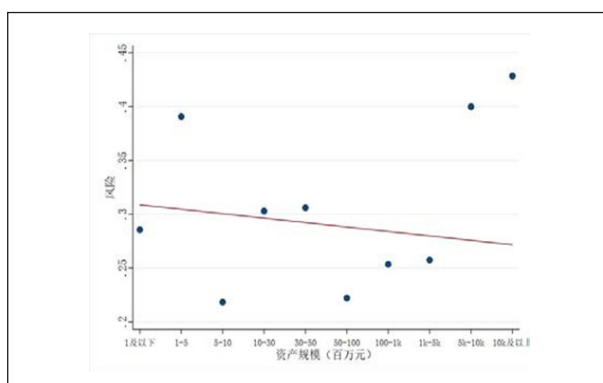
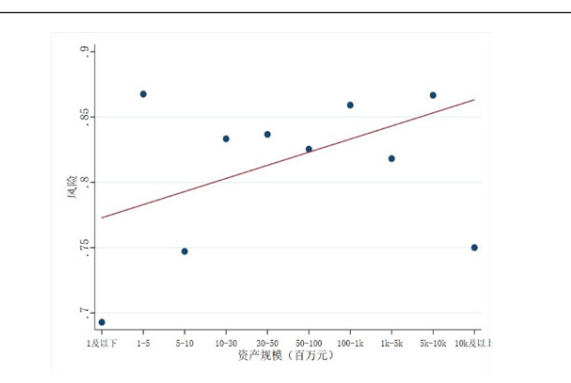


Fig. 9 (f) Enterprise size vs. concern about deterioration of ecological environment



## 2.4 The Political Status of Entrepreneurs

Another factor that determines entrepreneur confidence is the role that entrepreneurs perceive themselves to play in society. This featured prominently in our survey, which asked the respondents to rate their economic and political status. Figure 11 indicates that annual income was positively correlated with entrepreneurs' self-rated economic status: the higher an entrepreneur's annual income, the higher their economic status, after controlling for age, political status, educational level, marital status, number of family members, subjective well-being and enterprise size. This finding is both easy to understand and intuitive.

Interestingly, our regression analysis did not identify a significant correlation between political status and entrepreneurs' income. In other words, the entrepreneurs did not perceive their political status to rise with their income. The entrepreneurs' self-scored political status was not affected by their income. This result held when enterprise size was used as the analysis unit (Fig. 12). The bigger the enterprise, the higher the entrepreneur's self-rated economic status, but their political status showed no clear change.

Fig.11 Entrepreneurs' income and self-evaluated status

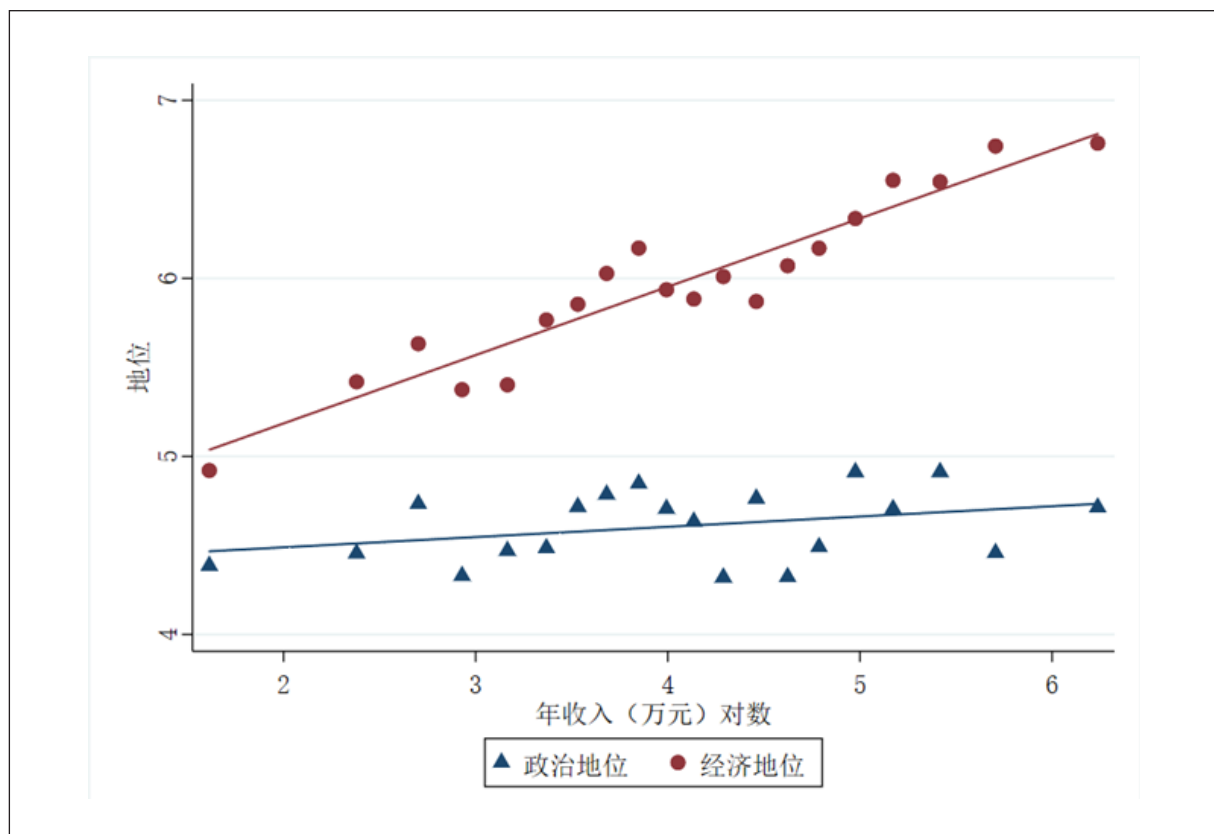
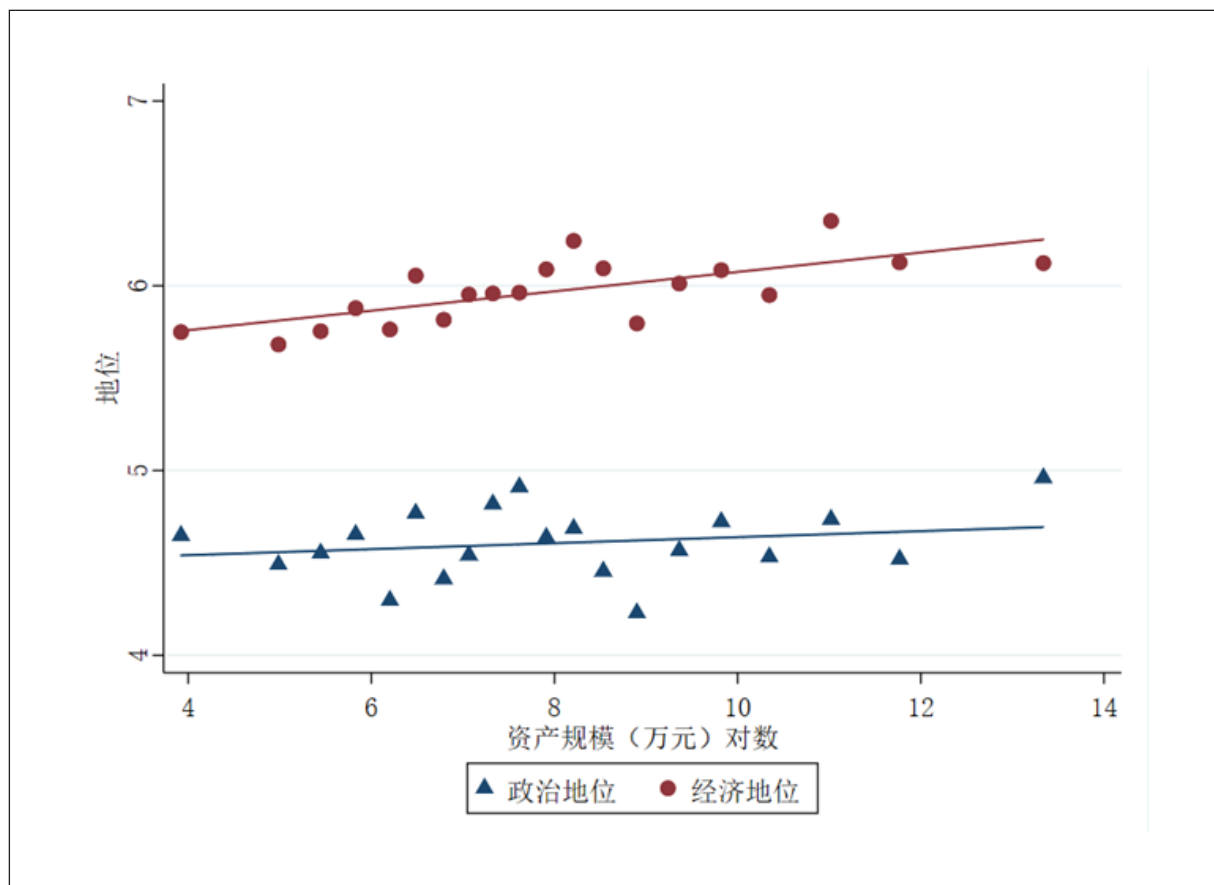


Fig. 12 Enterprise size and entrepreneurs' self-evaluated status



An entrepreneur's perception of their status is not an empty concept but directly determines their well-being, investment decisions and expectations of the future. After controlling for the entrepreneurs' age, political status, educational level, marital status, number of family members, health status and annual income, we found that the higher the entrepreneurs' self-evaluated economic and political status, the greater their perceived well-being. Compared with political status, increased economic status had a stronger influence on the entrepreneurs' subjective well-being: when their self-evaluated economic status rose by one unit, their current subjective well-being increased by 5%, and when their self-evaluated political status rose by one unit, their current subjective well-being increased by 3.4% (status self-evaluated on a scale from 1 to 10). We also found that entrepreneurs with a higher self-evaluated economic and political status had made more new investments in the past year. When self-evaluated economic or political status rose by one unit, the probability of investment in the past year increased by approximately 2%. Political status also influenced the entrepreneurs' concerns about the economy. Figure 15 indicates that entrepreneurs with a

higher self-evaluated political status were less likely to worry about an economic downturn.

Fig. 13 Entrepreneurs' self-evaluated status and well-being

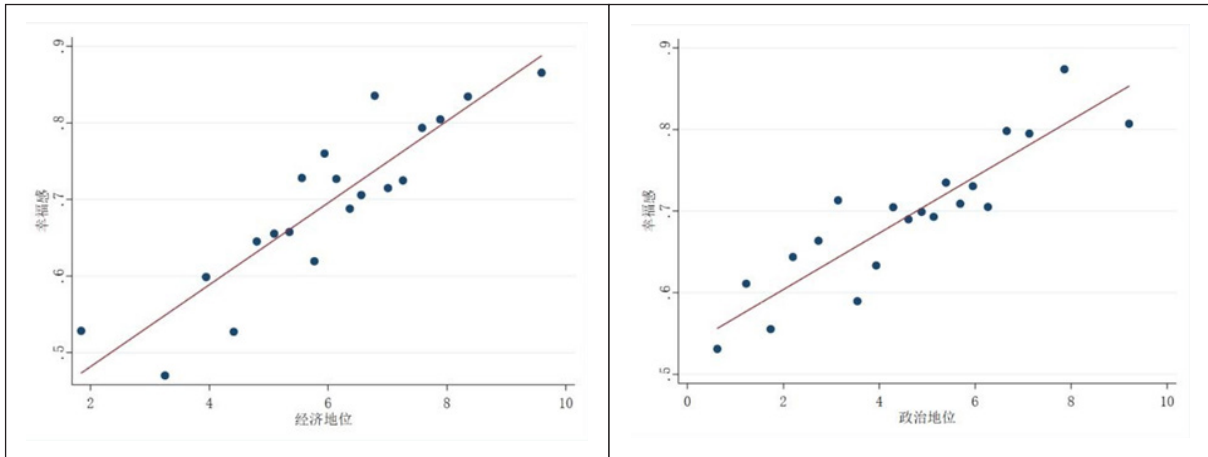


Fig.14 Entrepreneurs' self-evaluated status and enterprises' new investments

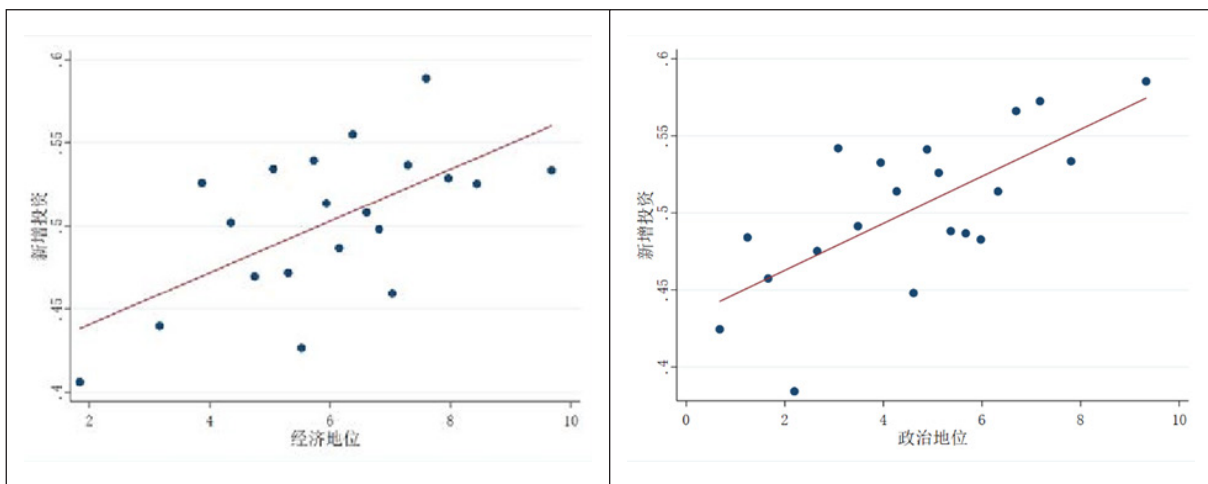
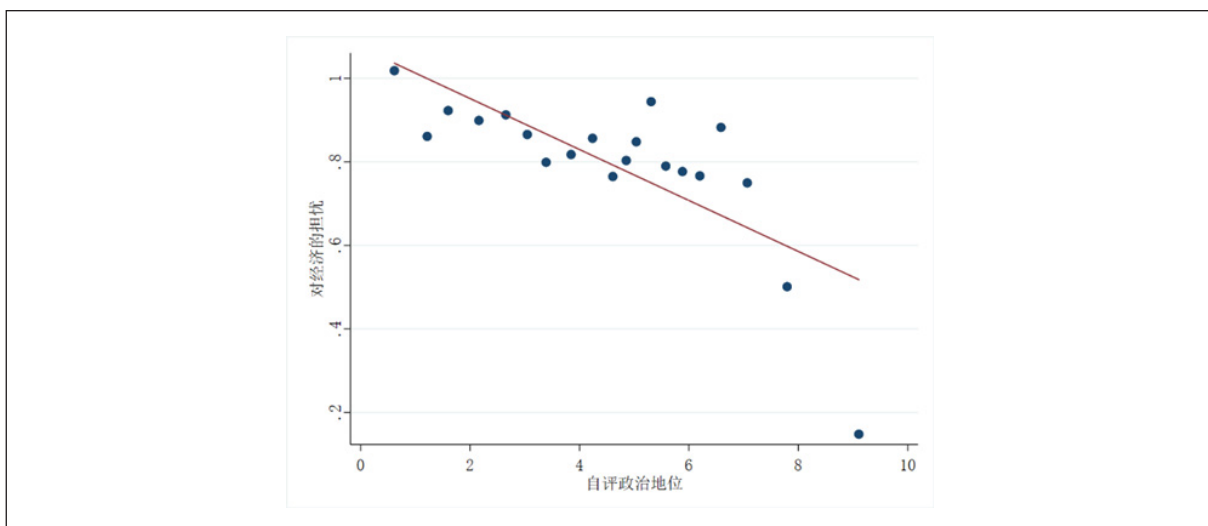


Fig.15 Entrepreneurs' self-evaluated political status and concern about economic downturn



## 2.5 Follow-up Visits in 2023

At the beginning of March 2023, we paid follow-up visits to 381 of the surveyed entrepreneurs to track their changes after the pandemic. We found that 51% of the entrepreneurs reported making new investments (Fig. 16) in 2022. This figure was relatively unchanged from the previous survey. However, 61% of them had an investment plan for 2023, indicating their increased confidence following the pandemic. Of the enterprises reporting no new investments in 2022, 32% planned to make new investments in 2023, and 89% of the enterprises reported making new investments in 2022 to continue scaling up their investments in 2023 (Fig. 17). After controlling for the enterprises' industries, our conclusions remained the same. Figure 18 shows that the enterprises reporting new investments in 2022 were likely to step up their investments in 2023.

Fig. 16 Proportions of enterprises making new investments in 2022 and 2023

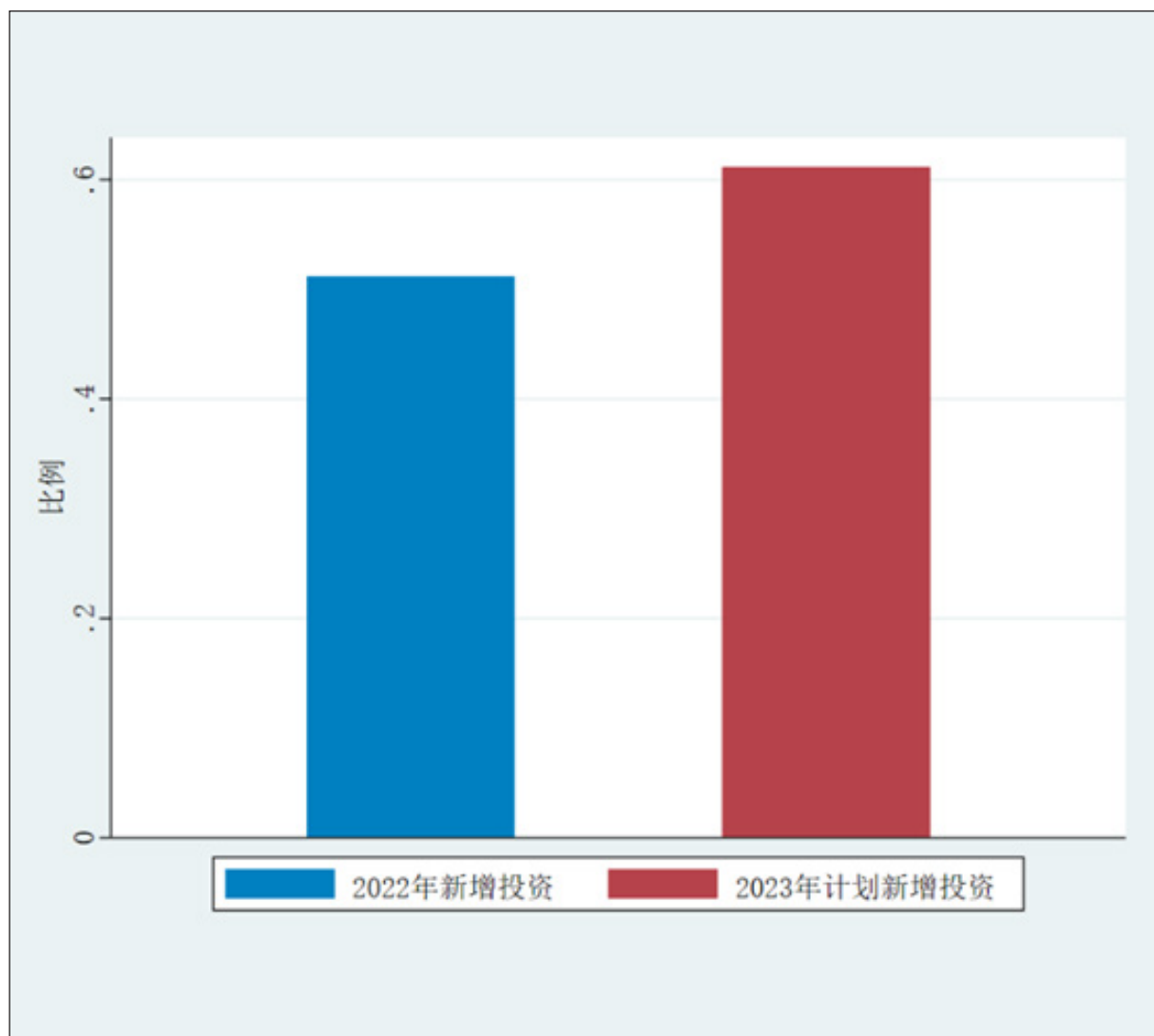


Fig. 17 Proportions of enterprises reporting new investment plans for 2023

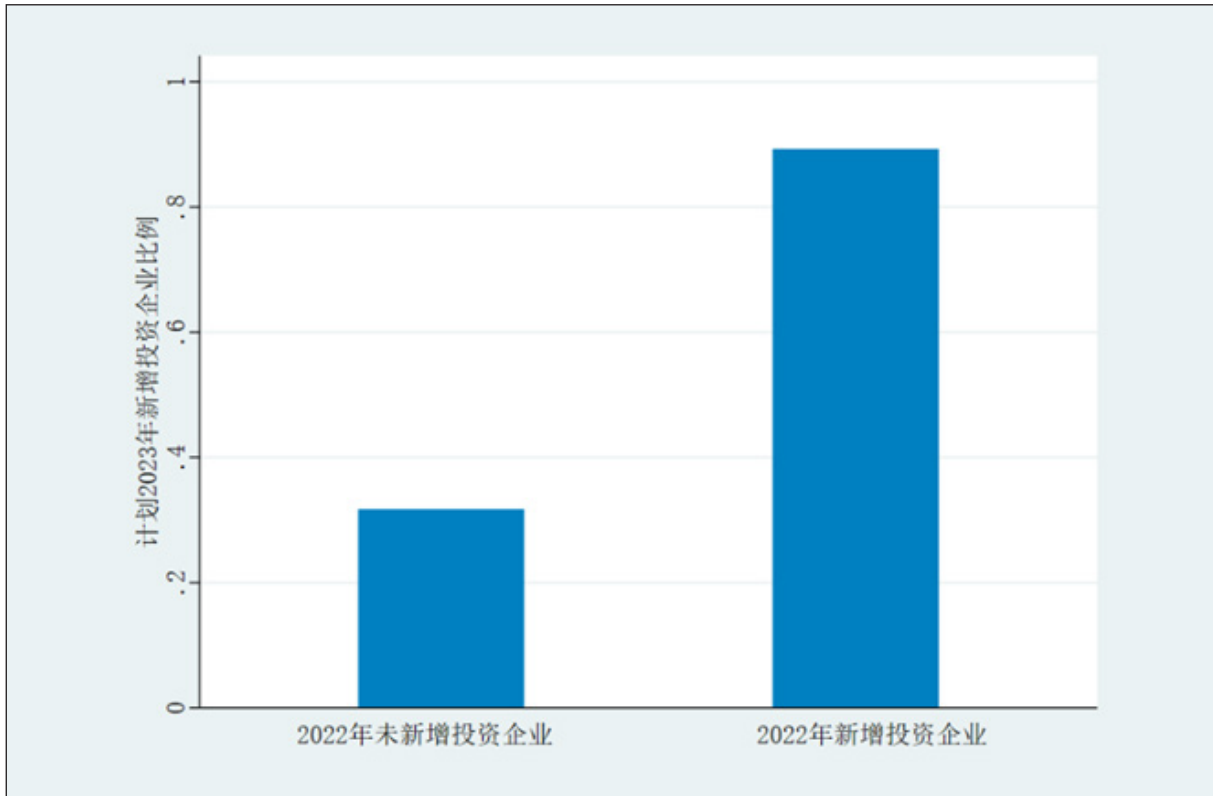
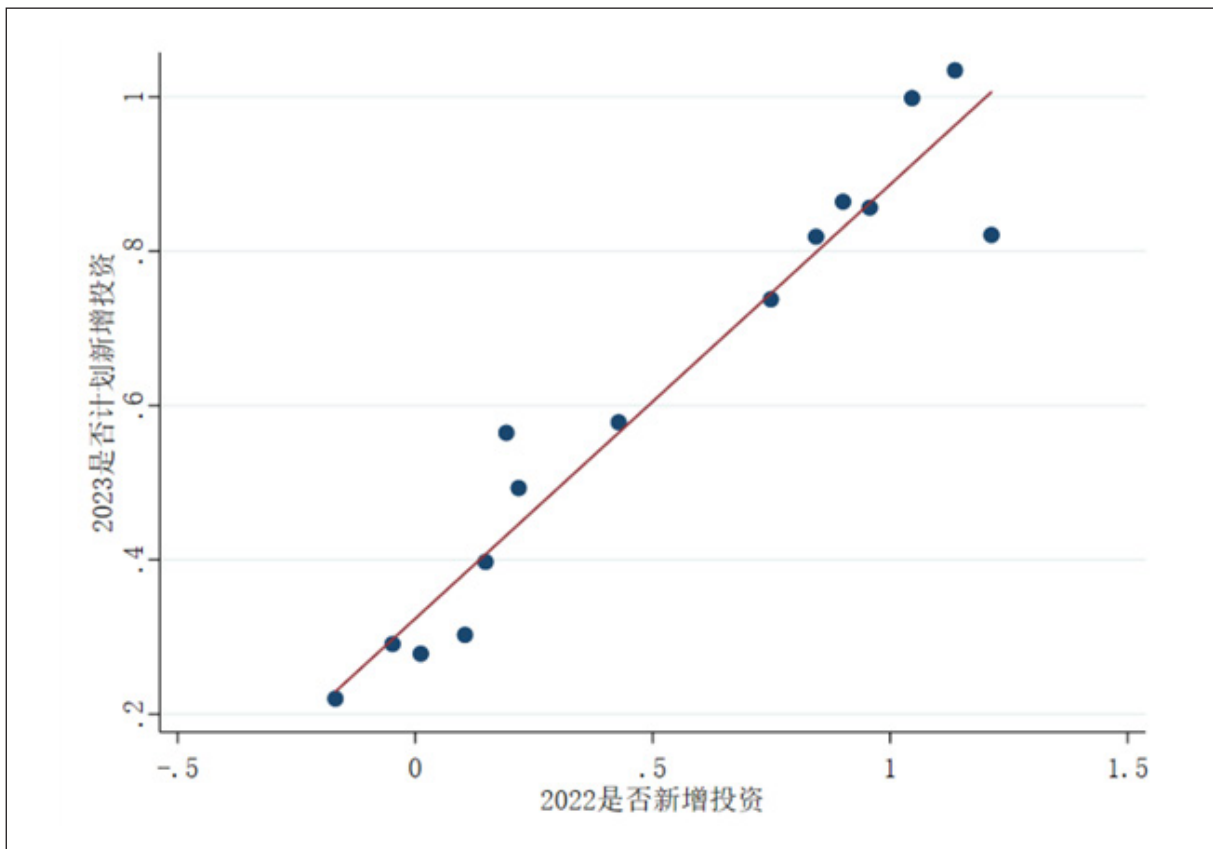


Fig. 18 Relationship between new investments in 2022 and 2023



In 2023, compared with 2022, the proportions of the enterprises that intended to make various types of investments rose (Fig.19). Furthermore, the entrepreneurs reported their continuing tendency to make longer-term investments, particularly in new product marketing, in 2022 and 2023.

Fig. 19(a) Proportions of new investments by type in 2022

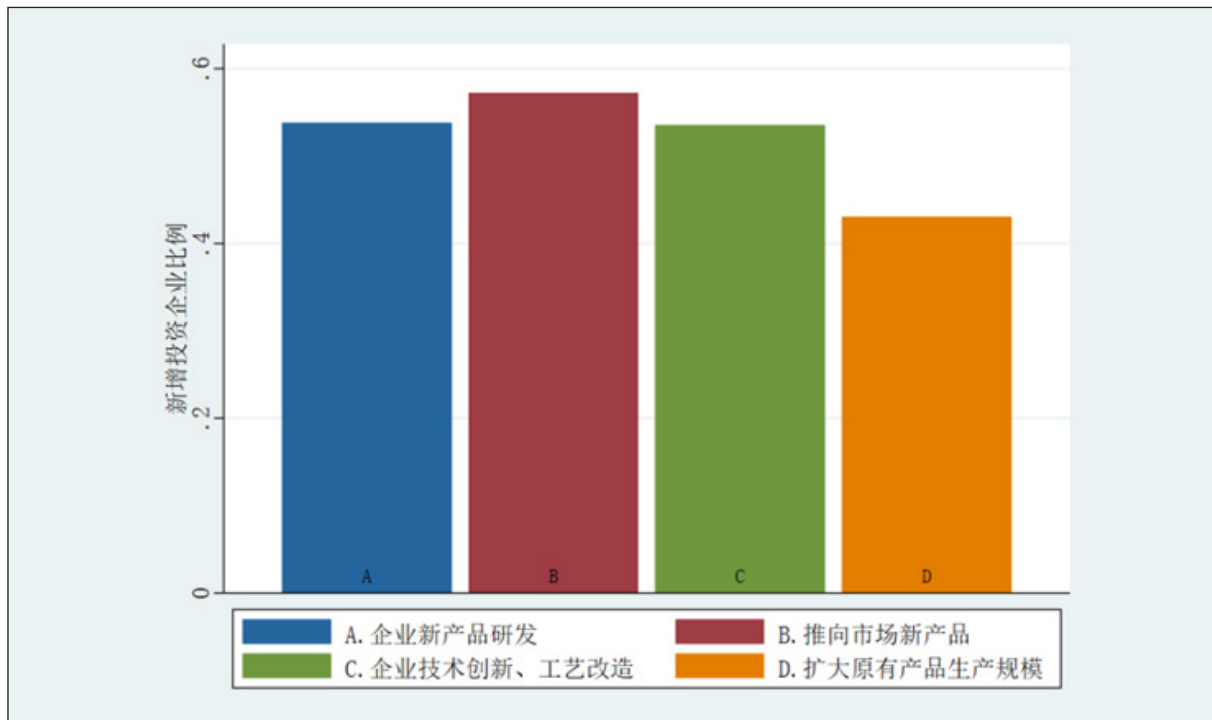
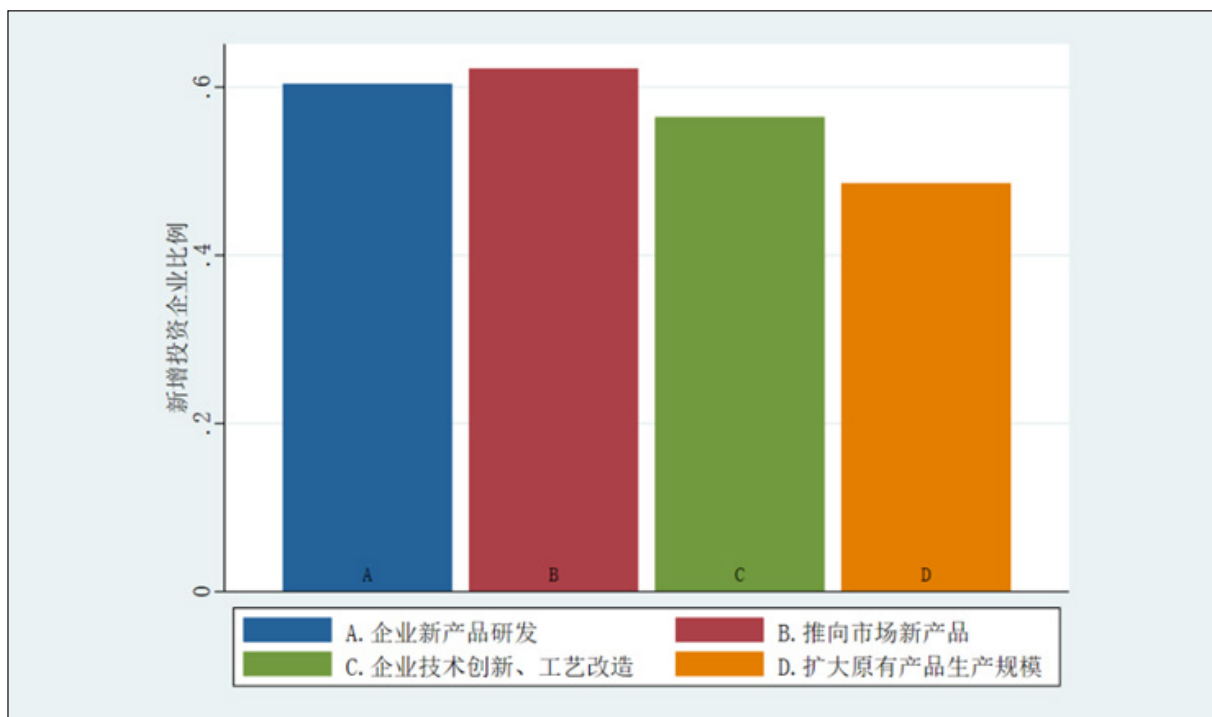


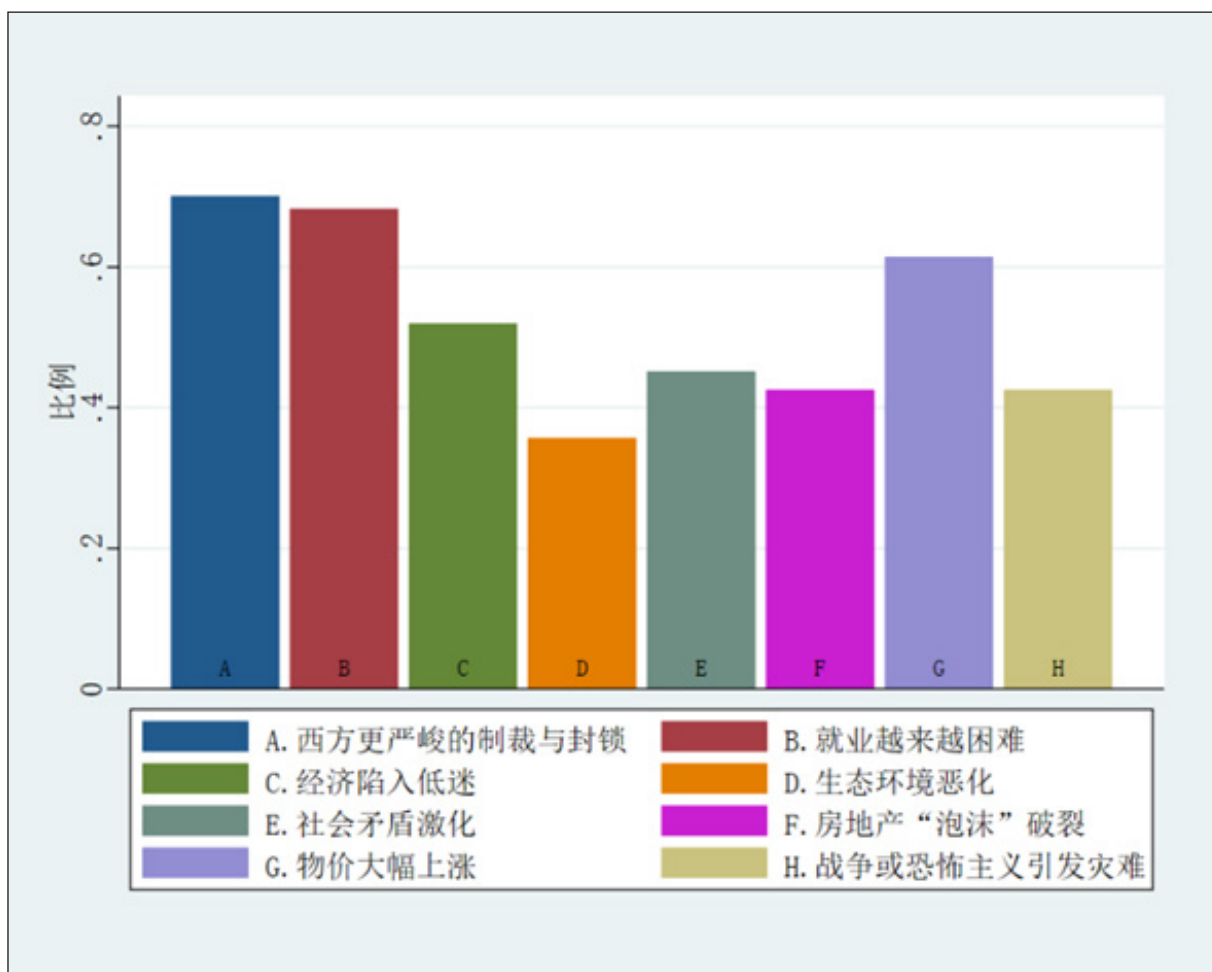
Fig. 19(b) Proportions of new investments by type in 2023





In the follow-up questionnaire, the entrepreneurs again indicated their concerns about the eight economic and social issues discussed above. As shown in Figure 20, the proportion of the entrepreneurs who were concerned about Western sanctions decreased from 100% to 70% between the main survey and the follow-up survey; the proportion concerned about the deterioration of the ecological environment decreased from 80% to 36%; and the proportion concerned about employment, an economic downturn and the intensification of social conflict decreased by . However, the proportion of entrepreneurs worrying about significant inflation increased from 13% to 43% between the main survey and the follow-up; the proportion worrying about jumped from 0.3% to 43%; and there was a small increase in the proportion of entrepreneurs worrying that the real estate bubble would burst. These findings reflected significant post-pandemic psychological changes in the entrepreneurs: they were less worried about the ongoing downturn of the overall climate but more worried about the impact of certain emergencies.

Fig.20 Proportions of entrepreneurs worrying about various issues



### **3. Restarting the Chinese Economy: Policy Suggestions Inspired by Survey of Entrepreneurs**

Our survey provided a good opportunity to explore the psychological states of entrepreneurs. The resulting insights lay a foundation for policy suggestions with the following question in mind. What policy measures will increase confidence among entrepreneurs and in the private sector to bolster China's economic recovery?

#### **3.1 Deepening Reform and 'Presenting More Compelling Stories'**

If China's economic problems today are indeed very similar to those faced in 1992, we may benefit from reflecting on the government's efforts to navigate the Chinese economy to emerge from the earlier crisis.

In academic circles, it has long been the view that Deng Xiaoping's series of speeches during his inspection tour of southern China in 1992 resolved the issue of whether China should turn back or proceed with reform, stabilised the confidence of the residential sector and laid a foundation for the country's subsequent economic take-off. However, what truly persuaded participants in the Chinese economy to believe that neither the Yangtze River nor the Yellow River 'flowed backwards' was a series of new economic liberalisation policies.

A brief look back at history reveals that the pilot shareholding reform, preparation for which began as early as 1988, was repeatedly set aside due to uncertain prospects. Less than three months after Deng Xiaoping voiced his support for the shareholding reform during his southern inspection tour in February 1992, however, the government issued its Regulation Opinions on Joint-stock Limited Liability Companies and Regulatory Opinions on Limited Liability Companies to provide a legal basis and standard for reorganising enterprises' shareholding and operations. Subsequently, shareholding reform swept through China. Almost every region selected several enterprises to participate in the pilot project, and by the end of 1992, China had approved 3,700 enterprises to pilot the shareholding reform. Guided by Deng Xiaoping's strategic blueprint for the reform and opening-up, the Chinese economy has since changed immeasurably and made historic achievements.

Also in 1992, China instituted a broad and deep price reform. In September 1992, the State Bureau of Commodity Prices announced that China would delegate enterprises to price 571 productive material products. In April 1993, the reform of the grain circulation system began, grain and oil coupons were cancelled, and grain and oil commodities were supplied without restrictions. These events marked the complete deregulation of 95% of China's total social retail volume of consumer goods, 90% of its total procurement volume of agricultural products and 85% of its total sales volume of production materials. Prices were determined by market supply and demand, enlarging the scope of the market mechanism in the allocation of social resources. Driven by market forces, the Chinese economy entered an even more liberal era, and the reform sustained the swift development of the Chinese economy.

The securities market also experienced a great transformation. To resolve non-compliance, disruption and other problems in the securities market, the Securities Commission of the State Council and the China Securities Regulatory Commission, dedicated to securities market regulation and investor protection, were established in October 1992. The Circular on Further Strengthening the Overall Administration of the Securities Market and the Share Issuance and Administration Regulation that followed were the first documents on the stock market to be issued in the name of the State Council. They outlined a centralised regulation system for the securities market and extended the pilot project for share issuance from Shanghai and Shenzhen to other autonomous regions, provinces and municipalities of China. The inauguration of the China Securities Regulatory Commission increased the share issuance amount from RMB5 billion in 1993 to RMB30 billion in 1997. China's capital market had begun to embrace development like never before.

In 1993, China promulgated the Company Law. This law, describing China's corporate governance system, ruled out the government's administrative intervention in enterprises, defined enterprises' industrial attribution and proprietorship, vowed to ensure fair play between enterprises under different ownerships and established the legal status of companies as market entities. The Company Law initiated a legal and compliant shareholding reform of state-owned enterprises and provided a legal environment and platform more conducive to the investment and establishment of private enterprises than had existed previously.

In 1994, China embarked on a new round of foreign trade system reforms according to the principles of fairness, competition and freedom. The reform plan accelerated the approval of various production enterprises' right to import and export, implemented a settlement system for foreign exchange incomes, cancelled foreign exchange reserves, payments and quota management systems and terminated directive plans. Furthermore, the plan promised nationwide consistency in foreign trade policies. These measures ensured that export enterprises of all kinds could obtain more opportunities in a relatively fair competitive environment and grow their exports. In 1994 alone, China's total export value exceeded RMB121 billion, a 31.9% rise over the previous year.

We can see from the simple review above that Deng Xiaoping's southern inspection tour was only a precursor to China's economic recovery. What has truly encouraged entrepreneurs in the private sector is China's deepening reform and increasing economic liberalisation. Providing greater economic autonomy is the best method to reassure and increase the confidence of the private sector and entrepreneurs.

### **3.2 Relations with the Western World and the Economic Restart**

Our survey revealed entrepreneurs' greatest concern: whether China would suffer further sanctions that would prevent it from participating fully in the global economy. We found that the entrepreneurs were not worried about management issues or direct economic sanctions against their enterprises, but they were worried about economic sanctions weakening the competitive strengths of the Chinese economy in science, technology, foreign trade and other fields, leading to the marginalisation of China's market advantages.

The important influence of sanctions is closely related to the Russia-Ukraine war that broke out at the beginning of 2022 and is ongoing at the time of writing. The West's strict sanctions are squeezing the Russian economy out of the global economic cycle – marginalising and even destroying it. Since April 2022, Russia has suffered negative GDP growth for eight consecutive months. Furthermore, Russia's inflation rate has reached 17.8%, its highest in two decades. A series of economic and trade sanctions imposed by Europe and the US (for example, restricting Russian imports of high-technology products and setting price ceilings

for Russian energy exports) have led to Russia's industrial production turning negative, particularly in coal, base pharmaceuticals, metal ore, motor vehicles and other industries, with an average decline of nearly 40%. Under pressure from these sanctions, many international investors have fled the Russian market. As of the end of September 2022, the number of Russian enterprises with foreign shareholders had plummeted by 74.2%. Russia's sanctions-related crises are panicking Chinese entrepreneurs and triggering their concerns about similar sanctions against China, shaking their investment confidence.

For the above-mentioned reasons, an important policy priority in restarting the Chinese economy, at least to a certain extent, will be to alleviate the tension between China and the West. Tension with the West will foster entrepreneurs' negative expectations of the future business environment. For example, they may think that the further escalation of the trade war will increase tariffs and restrict the importation of certain products, shaking the private sector's confidence. Such concern and uncertainty about China's relationship with the West will majorly inhibit enterprises' motivation to invest and expand. Therefore, to bolster the Chinese economy, it is important to adopt a friendly attitude towards and decrease tension with the West to reduce entrepreneurs' perception of the risks of sanction. For example, disputes could be settled through diplomatic consultation and discussion to minimise conflict and confrontation. Furthermore, we should create a business environment conducive to international cooperation by, for example, lowering the threshold for foreign investment access and otherwise facilitating foreign investment. This approach would help reduce trade friction and attract more foreign investment. Moreover, it would strengthen the private sector's confidence in the future business environment and economic development, inspiring members of this sector to increase their investment.

### **3.3 Improving Entrepreneurs' Perceived Political Status Will Help Stimulate Investment**

From the medium- and long-term perspectives, Chinese entrepreneurs play a unique role in the current system. Our survey revealed that earning a higher income and belonging to larger enterprises improved entrepreneurs' assessment of their economic status. However, the entrepreneurs' assessment of their political

status was not affected by income or enterprise size. In other words, neither their own nor their enterprises' achievements improved the entrepreneurs' subjective political status. However, political status had a significant impact on the entrepreneurs' investment decisions. Entrepreneurs with a high self-evaluated political status were less likely to 'lie down' in the face of the shock from the pandemic and were more enthusiastic about investing and increasing the scale of their operations.

Our survey also suggested that entrepreneurs' assessment of their political status may shape their expectations of future economic trends. This is intuitive. When entrepreneurs believe that they have a relatively high political status, they will be more likely to see themselves and their enterprises as important players in social development and integrate their enterprises' development with the nation's overall development trend. Therefore, in the face of economic crisis, entrepreneurs with a higher self-evaluated economic status are likely to demonstrate a stronger sense of mastery, feel more confident about China's system and future and be more likely to invest in adversity, thereby bolstering China's economic recovery. In other words, increasing the social status of Chinese entrepreneurs is important to enhance their identification with the regime, thus restoring their economic confidence. Therefore, to encourage entrepreneurs to invest, we should improve their assessment of their political status in addition to providing policy support for corporate investment.

Personal income and enterprise size, which reflect entrepreneurs' personal achievements, are not measures of their political status, and entrepreneurs' assessment of their political status is relatively susceptible to external factors. For this reason, improving the social status of entrepreneurs requires external measures. There are many ways to improve the self-evaluated political status of entrepreneurs. For example, we could increase their political involvement. The more they participate in politics, the more likely they are to believe that their political status is rising. Furthermore, we could listen more closely to entrepreneurs' voices when making policies so that they feel they are not only piloting their enterprises but also guiding and advising on national development, thus increasing their self-evaluated political status. We could also increase policy support for enterprise development. When China's policy echoes enterprises'

development objectives, entrepreneurs will be more optimistic about the overall climate and will be more likely to believe that the state prioritises enterprise development, thereby enhancing their self-perceived political status. Measures that improve entrepreneurs' political self-evaluation will also promote enterprises' investment.





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