II. Potential macro environmental risk factors

2.1 International economic and financial conditions

2.1.1 International economic conditions

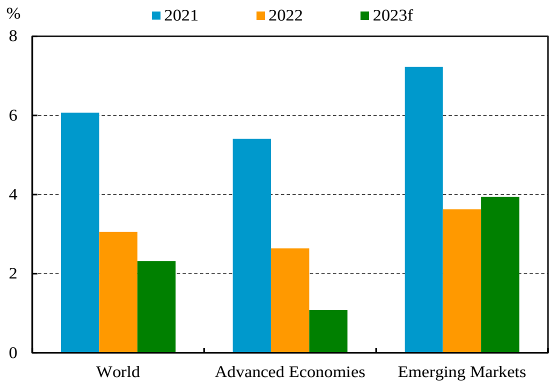
The deteriorating global inflation trends triggered by the Russia-Ukraine war in 2022, coupled with a larger-than-expected economic downturn in China, posed significant obstacles to global economic growth. To curb rising inflation, the central banks of major economies accelerated their interest rate hike cycles, resulting in spillover effects that tightened international financial conditions and accelerated the decline in global economic growth.

Looking ahead to 2023, the withdrawal of China's zero-COVID policy is expected to boost the global economy. However, tightened financial conditions, high geopolitical risks, and potential downside risks faced by the US and European economies all point to a continued slowdown in global economic growth. Furthermore, with the decline in commodity prices, cooling demand, and improvements in supply chain conditions, global inflationary pressures are expected to ease slightly but remain elevated.

Global economic growth slows significantly

In 2022, the Russia-Ukraine war caused supply shortages and a surge in commodity prices, exacerbating global inflationary pressures. Additionally, China's zero-COVID policy intensified the strains on global supply chains, resulting in a larger-than-expected economic slowdown domestically and creating significant hurdles for global economic growth. Moreover, major central banks tightened monetary policies to combat rising inflation, leading to spillover effects that not only resulted in tighter financial conditions

Chart 2.1 Global economic growth rates



Note: Figures for 2023 are S&P Global Market Intelligence estimates.
Source: S&P Global Market Intelligence (2023/5/15).

internationally but also hastened the global economic downturn. Consequently, the economic growth rate experienced a sharp deceleration, dropping to 3.1% (Chart 2.1).

Looking ahead to 2023, the reopening of China's economy and the sustained economic expansion of other major Asia-Pacific economies are expected to bolster the global economy and trade. Nonetheless, the negative effects of tightening monetary policies by major central banks are gradually emerging. Furthermore, the persistence of geopolitical risks, such as the Russia-Ukraine war, and the sluggish growth momentum of the US and European economies will further impede global economic growth. In addition, the financial sector turmoil in the US and Europe in March 2023 added additional downside risks to the already fragile global economy. S&P Global estimates[12] that the global economic growth rate will decline to 2.3% in 2023. For advanced economies, growth is projected to substantially drop to 1.1%, while emerging economies are expected to demonstrate a slight rebound to 3.9% (Chart 2.1).

China's economy is set for a strong rebound as the zero-COVID policy ended

In 2022, China's zero-COVID policy had a more negative impact on the economy than anticipated, with the annual economic growth rate sharply declining to 3.0%, falling short of the initial target of 5.5%. Looking ahead to 2023, the policy focus is expected to shift from zero-COVID towards stimulating economic recovery through several measures, such as credit policies, infrastructure investments, loosening restrictions on the real estate sector, and easing regulatory oversight on the technology industry. Given the clear policy stance on stabilizing economic growth, S&P Global predicts that the economic growth rate of China will rebound to 5.5% throughout the year.

In terms of fiscal condition, with the phase-out of the zero-COVID policy at the end of 2022, China is set to continue pursuing an expansionary fiscal policy in 2023 to stabilize economic growth. Alongside maintaining tax cuts and fee reductions, the fiscal deficit-to-GDP target will be raised to 3%, and the issuance of local government special bonds will be expanded to RMB3.8 trillion, reflecting a more accommodative fiscal policy. The IMF forecasts that China's government debt-to-GDP ratio will keep rising, reaching 82.4% in 2023.[13]

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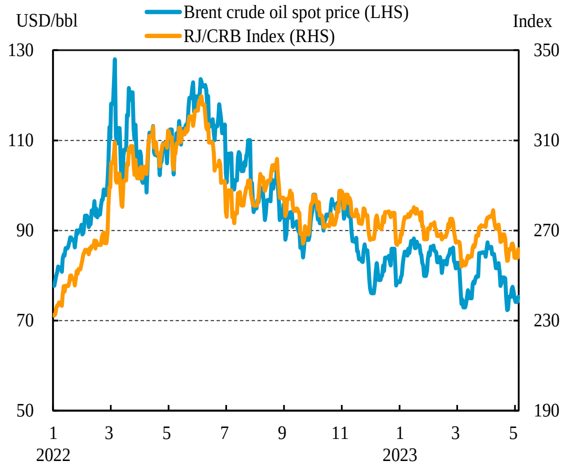
[12] S&P Global Market Intelligence estimate on May 15, 2023.
[13] IMF (2023), *Fiscal Monitor*, April.

Global inflation moderated, but remained at elevated levels

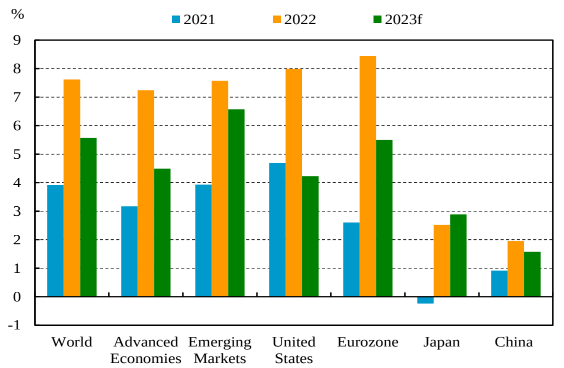
In 2022, the Russia-Ukraine conflict worsened global inflation and led to a sharp rise in prices of European natural gas and international oil, which had significant impacts on the global economy. China's zero-COVID policy further exacerbated tensions in supply chains. In early March, the price of Brent crude oil peaked at a new high since 2008 of US$128 per barrel, representing an increase of over 60% from the US$77.78 per barrel at the beginning of the year. The R/J CRB Index, designed to track global commodity prices, also witnessed a substantial surge (Chart 2.2). As a result, the global CPI inflation rate skyrocketed to a peak of 8.3% year-on-year in September 2022. Afterwards, the rate saw a decline but its annual growth rate throughout the year still reached 7.6%, significantly higher than the 3.9% in 2021. Among countries, advanced economies and emerging economies saw increases of 7.2% and 7.6%, respectively (Chart 2.3).

Chart 2.2 Global commodity prices



Source: Bloomberg.

Chart 2.3 Global headline inflation indices

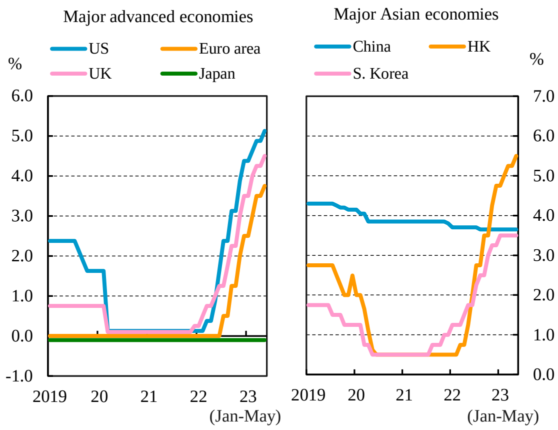


Note: Figures for 2023 are S&P Global Market Intelligence estimates.
Source: S&P Global Market Intelligence (2023/5/15).

In 2023, as the global pandemic eased, national governments successively withdrew relevant fiscal and monetary stimulus measures. This, coupled with tightening global financial conditions, weak demand, and a noticeable easing of supply chain bottlenecks, led to a gradual alleviation of global inflationary pressures. S&P Global predicts that the global CPI annual growth rate will come down to 5.6% from 7.6% in 2022 but remain high. Among countries, advanced economies and emerging economies are expected to see decreases to 4.5% and 6.6%, respectively (Chart 2.3).

The recent fallout of the banking turmoil in the US and Europe has induced financial tightening. Considering this, coupled with ongoing global inflationary pressures, the impact of the future trajectory of interest rate hikes or monetary policy stances by major central banks in response to the global inflation outlook warrants close attention. Moreover, climate change heightens uncertainty surrounding commodity supply and disrupts supply chains, which could contribute to the risk of a second wave of inflation and should not be underestimated.

Chart 2.4 Policy rates in major economies



Notes: 1. Advanced economies: figure for the US is based on the median of the federal funds rate target range; for the euro area, the interest rate on the main refinancing operations; for the UK, Bank Rate; for Japan, interest rate on banks' excess reserves.
2. Emerging Asia: figure for China is based on one-year loan prime rate; for Hong Kong, Base Rate; for South Korea, Base Rate.
3. Figures are as of May 15, 2023.

Sources: Central banks and monetary authority websites.

Major central banks tightened monetary policies to curb inflation

Since the second half of 2022, the inflation rate has surged significantly owing to the ongoing Russia-Ukraine conflict. In response, major economies' central banks ended their accommodative monetary policies introduced during the pandemic and accelerated the pace of monetary tightening to curb inflationary pressures. Among them, the Fed raised its target band for the federal funds rate seven times by a total of 3.5 percentage points (pps) to 5.00%-5.25% from July 2022 to May 2023, along with an ongoing tapering. However, in March 2023, in order to mitigate potential systemic risks stemming from the collapse of Silicon Valley Bank (SVB), the Bank Term Funding Program (BTFP)[14] was initiated to provide market liquidity.

The European Central Bank (ECB) has raised its main interest rates seven times since the second half of 2022, totaling 3.75 pps, in response to persistently high inflation. Furthermore, from March 2023 onwards, the ECB has gradually shrunk the scale of its asset purchase program on a monthly basis. Similarly, the Bank of England (BoE) has increased its Bank Rate seven times from August 2022 to May 2023 by a total of 3.25 pps to 4.5% in view of rising domestic prices. Apart from a temporary open market operation where long-term UK government bonds were purchased, the BoE has continued to scale back its bond-buying stimulus plan. As for Japan, thanks to relatively mild domestic inflationary pressures, the Bank of Japan (BOJ) maintained an accommodative monetary policy without adjusting its policy interest rates (Chart 2.4).

[14] Eligible depository institutions that meet the criteria can pledge US Treasury securities and agency mortgage-backed securities as collateral to the Fed, which will be valued at par, to apply for loans with a term of up to one year.

Among Asian economies, China continued its accommodative monetary policies to stimulate the real economy. Since the second half of 2022, the People's Bank of China (PBOC) has successively reduced the reserve requirement ratio for financial institutions, the reserve requirement ratio for foreign currency deposits, and the loan prime rate. Meanwhile, in response to the persistently high domestic inflation rate and inflation expectations, the Bank of Korea raised its policy rate five times, totaling 1.75 pps, to 3.5% with the aim of preventing high inflation from becoming deeply entrenched. The Hong Kong Monetary Authority, for the purpose of maintaining effective operation of a linked exchange rate system, has raised the policy rate by a total of 3.5 pps since July 2022 following the Fed's rate hikes (Chart 2.4).

Given that the sharp interest rate hikes by central banks in the US and Europe, triggering tighter financial conditions and a decline in asset prices, led some banks to experience turmoil, there will be a trade-off between combating inflation and ensuring financial stability for the monetary tightening trajectory among major central banks. This could amplify the uncertainty of monetary policy and warrants close attention.

2.1.2 Global financial conditions

In the first three quarters of 2022, most central banks adopted tighter monetary policies to curb inflation, which resulted in significantly tighter financial conditions in advanced economies. Nonetheless, the aforementioned financial conditions have eased somewhat since 2022 Q4, driven by more stable stock and bond markets, as well as market expectations of a slower pace of monetary policy normalization from major central banks. Subsequently, a tightening of financial conditions resurged when a series of turmoil in several US and European banks erupted in March 2023.

Looking ahead to 2023, several factors warrant close attention as they could exacerbate global financial instability, including the spillover effects of the turmoil in the US and European banking system, subsequent developments in the real estate market and higher local government debt in China, and further escalation of risks related to geopolitical tensions and climate change.

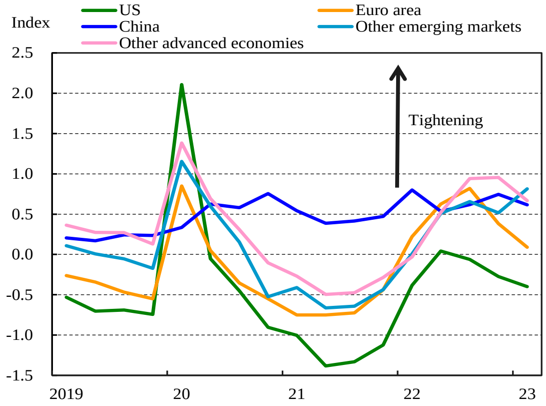
Financial conditions eased

In the first three quarters of 2022, despite cooling economic activity in major economies like Europe and the US, inflation rates remained stubbornly high. This prompted central banks such as the Fed to accelerate the pace of monetary policy tightening, leading to a faster tightening of financial conditions in advanced economies. However, China continued to adopt a loose monetary policy in order to mitigate the negative impacts stemming from its zero-COVID policy and the rapid deterioration of the real estate market on economic growth. As a result, financial conditions in China remained accommodative.

From 2022 Q4 onwards, investors' anticipation of major central banks slowing down their rate hikes has led to a rebound in stock markets and lower bond yields. Therefore, global financial markets have gradually recovered, and the financial conditions in both the US and the Euro area have also moderately loosened (Chart 2.5).

However, in March 2023, financial conditions tightened sharply in Europe and the US owing to surging stock market volatility triggered by the fallout of some US regional banks, such as SVB, and Credit Suisse in Europe. Although financial conditions stabilized afterwards, panic sentiment and a higher level of uncertainty surrounding future developments remain. Therefore, the impact of the turmoil on the global financial landscape is still a matter requiring close attention.

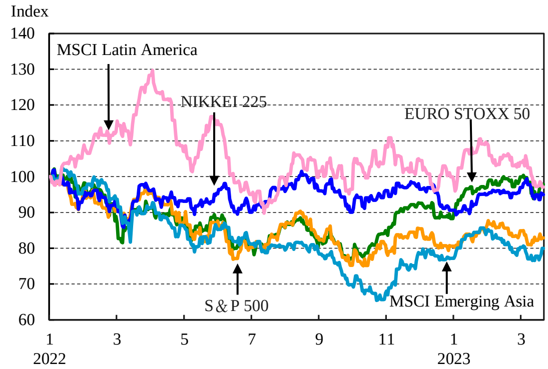
Chart 2.5 Financial conditions indices in major economies



Notes: 1. Financial conditions indices are gauged by standard deviations from the mean. These indices were calculated quarterly from 2006-2019 and monthly after 2020.
2. Other emerging economies exclude Russia, Ukraine, and Turkey.

Source: IMF (2023), *Global Financial Stability Report*, April.

Chart 2.6 Major international equity indices



Notes: 1. January 1, 2022 = 100.
2. The EURO STOXX 50 refers to a stock index consisting of the largest 50 stocks in the 12 major economies of the euro area.

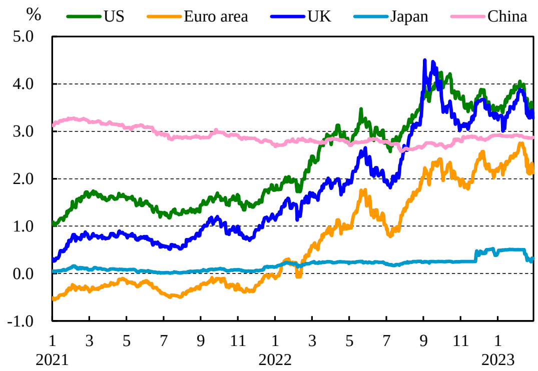
Source: Bloomberg.

Aggressive policy rate hikes by the Fed have jolted global financial markets, and lifted debt risks and capital outflow pressures for emerging markets

In 2022, the rapid rate hikes by the Fed had adverse spillover effects on financial markets and other economies. Accordingly, stock markets around the world saw an evident decline in the first three quarters before a rebound from Q4 as markets anticipated that the Fed might ease up on its pace of tightening (Chart 2.6). With regard to bond markets, except for Japan and China, the 10-year government bond yields in other economies markedly trended upwards following the movement of the US bond market (Chart 2.7). Furthermore, given the notable magnitude of interest rate increases by the Fed, the spread between the US 10-year and 2-year government bond yields, as well as the one between 10-year and 3-month yields, reached negative values, indicating an inverted yield curve, in which longer-term bonds had a lower yield than short-term debt instruments. The inverted yield curve could pose a threat to some financial institutions which face significant maturity mismatches between assets and liabilities, and thus dampen their profitability.

Higher borrowing costs in advanced economies arising from monetary policy tightening has put upward pressure on interest costs of sovereign debt for emerging economies, especially among the group of low-income economies with substantial demand for short-term US dollar funding. Moreover, many of these emerging economies have confronted a deterioration in debt-servicing capacity. If the aformentioned economies do not improve their debt servicing capacity, it could leave them more vulnerable to default and liquidity risks. On top of that, amid recent rising investor risk aversion, emerging economies with weaker macroeconomic fundamentals could face sizable capital outflows in case of a sharp tightening in financial conditions, which warrants close attention.

Chart 2.7 10-year government bond yields in major economies

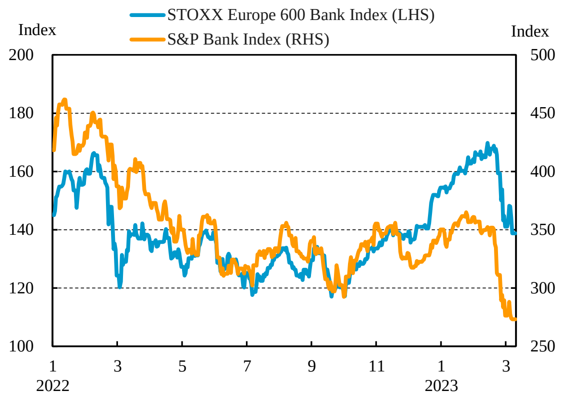


Source: Bloomberg.

Recent turmoil in the US and European banking sector exacerbated global financial vulnerabilities

Since March 2023, a series of banking turmoil in the US and Europe have caused sharp price corrections in the bank equity indices across these regions (Chart 2.8). Credit rating agencies also downgraded the ratings of some US regional banks. The index of Additional Tier 1 (AT1) contingent convertible (CoCo) bonds issued by European banks plummeted as well after the Credit Suisse fallout. To tame the escalation of systemic risks, authorities in the

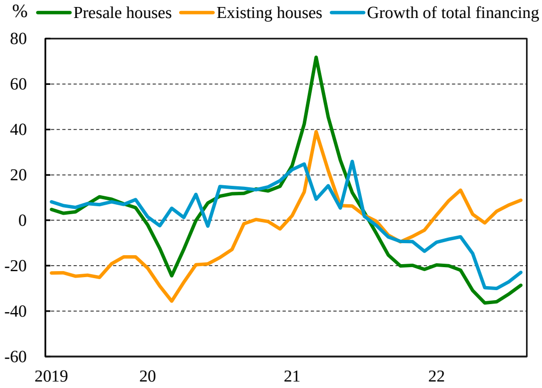
Chart 2.8 Bank equity indices in the US and Europe



Source: Bloomberg.

US and Europe actively took actions to prevent the spread of the turmoil. Six major central banks further increased the frequency of US dollar swap lines for the purpose of strengthening liquidity support to the market (Box 1).

Chart 2.9 Annual growth rates of real estate sales in China



Notes: 1. Year-on-year growth.
2. The data covers the period from May 2019 to August 2022.
Source: IMF (2022), *Global Financial Stability Report*, October.

Although the swift actions taken by central banks temporarily contained market panic, the recent failure of banks in the US and Europe provided evidence that major central banks' ongoing tightening of monetary policy resulted in an environment of tighter financing conditions. Once the banking system experiences liquidity shortfalls, fearful sentiment could spread widely through financial channels. This, in turn, could cause massive bank runs if the banking system faces a loss of confidence, which may further trigger systemic risks amid more significant contagion effects. Correspondingly, global financial vulnerabilities could potentially accumulate.

China's move to ease COVID-19 restrictions brought hope of economic recovery, but funding pressures remained in the real estate market

In 2022, in order to stimulate housing demand, China's authorities continually relaxed regulations governing the real estate market. Nevertheless, the implementation of large-scale lockdowns clouded home sales, with a 28% contraction (Chart 2.9) year on year. In light of the slow progress in completion and delivery of presold properties which impacted home buyers' confidence, financially weaker private developers continued to face funding challenges.

With a still sizable stock of unsold houses and increased fiscal burdens caused by the pandemic, total local government financing vehicle (LGFV) debt reached 50% of China's GDP in 2022. Given the substantial levels of local government debt and the sluggish recovery of the real estate market, financial institutions in China are facing potential threats. If the real estate market remains gloomy or local governments fail to address debt problems in the future, it could incur considerable losses to both investors holding trust products and trust companies. This, in turn, will lead banks to tighten their lending standards owing to mounting non-performing real estate loans, hence exerting pressure on the funding markets. Accordingly, it is worth continuing to monitor the subsequent developments in this regard.

Geopolitical and climate change risks had a greater impact on the financial sector

Financial fragmentation[15] resulting from geopolitical risks, such as Russia's invasion of Ukraine and a spike in tensions between the US and China, could affect cross-border capital allocation, international payment systems, and asset prices. Rising geopolitical tensions would thus cause sudden reversals in cross-border capital flows. These effects are more pronounced for emerging markets and developing economies than for advanced economies. Additionally, a rise in geopolitical tensions between an investing and a recipient country could reduce bilateral cross-border portfolio and bank credit. This, in turn, may lead to higher funding costs for banks, as well as bringing down their profitability and prompting them to contract lending to the corporate sector, and could even undermine macro-financial stability.

Extreme weather events driven by climate change brought about significant economic losses. Physical and transition risks arising from climate change are also reshaping the financial risk landscape through spillover effects and adverse effects between the financial and real sectors, hence they are becoming a potential threat to financial stability. In order to mitigate the impacts of climate change, major economies have been actively promoting policies governing transitions toward net-zero emissions. In spite of these policies, investment in fossil fuels did not see a notable decrease in 2022.[16] Moreover, the ongoing Russia-Ukraine conflict has further pushed up prices of raw materials critical for the green transition, making it more difficult for economies to keep in line with the transition goals of the Paris Agreement. This raises concerns about the heightened financial stability risks generated by climate change, which warrants close attention.

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[15] Financial fragmentation refers to situations like disruption in cross-border payments, or capital outflows triggered by a reallocation of cross-border capital.

[16] By the end of 2022, the share of investment in fossil fuels by emerging economies remained above 60%, while in advanced economies this figure was close to 40%. Both of them showed no significant decline compared to the end of 2015.

Box 1
Analysis of recent US and European banking turmoil and the possible effects on Taiwan's financial system

As of March 2023, four small and medium-sized banks in the US had failed or been liquidated one after another. Meanwhile, Credit Suisse had also encountered financial distress. Authorities and bank coalitions in respective countries took proactive measures to prevent the turmoil from spreading globally. This Box explains these incidents and their spillover effects, as well as the relevant authorities' quick response measures and subsequent focus areas. It also analyzes the reasons why these incidents had little impact on the domestic financial system.

1. US and European banking turmoil

1.1 Four small and medium-sized banks in the US collapsed or sought to be wound up, and Credit Suisse became embroiled in financial distress

Both Silicon Valley Bank (SVB) and First Republic Bank (FRB) had problems such as high uninsured deposit ratios and asset-liability maturity mismatches.[1] Suffering from remarkable deposit outflows and inadequate capital levels, they were taken over by the Federal Deposit Insurance Corporation (FDIC) on March 10 and May 1, 2023, respectively. FRB was then acquired by JPMorgan Chase Bank on the same day.

Both Silvergate Bank and Signature Bank experienced a deterioration in their financial and operational conditions owing to substantial deposit withdrawals by investors following the crypto market crash in 2022. Silvergate Bank announced its intent to wind down operations on March 8, and Signature Bank was taken over by the FDIC on March 12, 2023.

In recent years, Credit Suisse has had serious problems recurrently such as material weaknesses in internal control, significant losses, and massive fund outflows. On March 15, 2023, Saudi National Bank, its largest shareholder, refused to sustain investment in new capital to Credit Suisse, causing its stock price to plummet and the five-year credit default swap rate to skyrocket on one occasion. Afterwards, under the guidance of the Swiss authorities, the Union Bank of Switzerland (UBS) acquired Credit Suisse at a nearly 60% discount of its market price in order to avoid the spreading of the turmoil.

1.2 Regulators took prompt countermeasures or bank coalitions provided quick assistance

In order to maintain domestic banks' liquidity, the Fed announced the launch of the Bank Term Funding Program (BTFP) on March 12, 2023, offering loans of up to one year to eligible depository institutions pledging qualifying assets as collateral, which were valued at par.

FRB accessed US$70 billion in funds from the Fed and JPMorgan Chase Bank on March 13 and then received other deposits totaling US$30 billion from 11 major US banks on March 16, 2023. This aid eased FRB's pressure of insufficient funds. However, it was eventually sold to JPMorgan Chase Bank owing to continuous and substantial deposit outflows.

On March 20, six central banks including the Bank of Canada, the Bank of England, the Bank of Japan, the European Central Bank, the Fed, and the Swiss National Bank increased the frequency of 7-day maturity operations from weekly to daily via standing U.S. dollar liquidity swap line arrangements until the end of April 2023.

2. Spillover effects

2.1 Volatility in financial markets surged

The successive closures of small and medium-sized banks in the US sparked off a sharp drop in stock prices of other banks, such as Western Alliance Bancorporation (WAL), and led to a noticeable decline in regional banking indices.

2.2 Credit rating agencies downgraded the credit outlook on the US banking system

Credit rating agency Moody's lowered its credit outlook on the US banking system from "stable" to "negative" in March 2023. Subsequently, the credit ratings of some US regional banks were also downgraded. Among them, FRB and WAL were downgraded to junk grade owing to their deteriorating financial conditions.

2.3 Reducing the willingness of traditional banks to cooperate with the virtual asset industry

The successive collapse of two major virtual banks, Silvergate Bank and Signature Bank, might reduce the willingness of other traditional banks to cooperate with the virtual asset industry. Additionally, the small-scale startups in the virtual asset industry might encounter difficulties in opening bank accounts, which would hinder the future development of this industry.

3. Subsequent focus areas

3.1 Impact of interest rate hikes by the US and European central banks on international economic and financial conditions

If the central banks in the US and Europe continue to implement significant monetary tightening policies, it may increase the volatility in financial markets, thus reducing disposal gains or amplifying impairment losses of financial institutions' financial assets. As a consequence, the above-mentioned developments may expose the already fragile economies to more risks and lead them toward hard landing concerns, which warrants close attention.

3.2 The public's lack of confidence in the banking system may trigger systemic risks amid greater contagion effects

The successive failures of small and medium-sized banks in the US have raised concerns about the business conditions of other regional banks, such as Pacific Western Bank, which was reported to be sold and saw a slump in its stock price. Furthermore, the turmoil highlights the problem that many banks' deposits are not covered by deposit insurance.[2] Once public confidence in the banking system collapses, even sound banks may be affected. If the contagion effects spread out, they could possibly trigger systemic risks and result in a recurrence of financial turmoil, warranting extra caution.

3.3 Impact of regional banks tightening credit on individuals and small and medium-sized businesses

Regional banks in the US may tighten their credit owing to massive deposit outflows, which could pose adverse impacts on households and businesses. In addition, as small and medium-sized banks' loans account for 38% of total loans in the US banking system, if they suffer from poor performance, it could exert negative effects on US employment and economic growth, increasing downside risks to the economy.

3.4 Fund raising is difficult for startups following the collapse of SVB, which may be unfavorable for the future development of the startup industry

The failure of the startup-friendly bank SVB has raised concerns about broader shocks on the US technology industry. Although the financing needs of startups have increased, it is difficult for them to acquire funds through initial public offerings. This situation, for small-scale startups, may lead to operational predicaments and be unfavorable for the future development of the US startup industry.

3.5 US regulatory authorities strengthened their efforts in banking supervision, which may further tighten the financial situation

The incidents prompted regulatory authorities to review their supervisory intensity on medium-sized banks. In the future, if regulatory authorities strengthen their monitoring of interest rate risks on banks' balance sheets and incorporate them into capital adequacy requirements, it may further tighten the financial situation.

3.6 Full write-down of Credit Suisse's AT1 bonds sparked a controversy, which may strike the CoCo bond market

The recent controversy over the priority of loss absorption between Credit Suisse's shareholders and AT1 bondholders may lead to a re-evaluation of AT1 bonds. This increases the funding costs of CoCo bonds in the market, reducing banks' willingness to issue the bonds, which is thereby detrimental to market development. In addition, regulatory authorities will also need to review the management of capital adequacy provisioning for CoCo bonds in the future.

4. Effects on the domestic financial system

4.1 Domestic stock markets were not significantly affected, and financial institutions' exposure to the four failed American banks and Credit Suisse was still manageable

Affected by the market concerns surrounding the recurrence of financial turmoil and the impairment losses of financial institutions' exposure, the TWSE Finance and Insurance Index briefly declined, dragging down the TAIEX of the TWSE market. Nonetheless, after US and Swiss authorities quickly intervened, which then boosted European and American stock markets, domestic stock markets rebounded and were not significantly affected. According to the statistics of the FSC, domestic financial institutions' exposure to the four failed American banks, including SVB, Silvergate Bank, Signature Bank, and FRB, and Credit Suisse was NT$410 million and NT$155.6 billion, respectively, as of the end of February 2023. The above-mentioned exposure was still manageable and none of them invested in Credit Suisse's AT1 bonds.

4.2 Financial conditions of domestic banks remained sound and the capability to withstand adverse shocks increased

The net income before tax of domestic banks in 2022 reached NT$392.8 billion, the highest level in the past 20 years, and the average NPL ratio dropped to a record low of 0.15%, suggesting satisfatory asset quality. All capital ratios of domestic banks were above statutory minimum standards, and the average liquidity coverage ratio (LCR) and net stable funding ratio (NSFR) were much higher than the minimum requirement of 100%, indicating the overall financial conditions of domestic banks remained sound.

4.3 The asset-liability structure of domestic banks differs from that of the failed banks such as SVB, reflecting that their operations were relatively stable

Taiwan's domestic banking units (DBUs) primarily rely on stable funding sources such as personal and business deposits. There is less credit concentration in a single type of customer, and the ratio of the depositors covered by the maximum deposit insurance of NT$3 million reaches 98.01%. In contrast, SVB's deposit customers were concentrated in startups, and the proportion of deposits which was not covered by deposit insurance accounted for 86% of total deposits. As for the uses of domestic banks' assets, customer loans made up the largest share with 57.07%, and the proportion of investments was not high. Therefore, domestic banks were less affected by international financial markets. On the other hand, SVB allocated nearly 57% of its funds to long-term bond investments (Table B1.1), leading it to become susceptible to substantial valuation losses in financial assets when US interest rates reversed to rise rapidly.

Table B1.1 Asset-liability structure between Taiwanese banks and SVB

Unit: %

Domestic Banks				SVB			
Assets		Liabilities and Equity		Assets		Liabilities and Equity	
Cash	6.64	Customer deposits	79.46	Cash	6.52	Customer deposits	81.74
Investments	27.83	Other liabilities	13.13	Investments	56.68	Other liabilities	10.57
Customer loans	57.07	Equity	7.41	Customer loans	34.76	Equity	7.69
Other assets	8.46			Other assets	2.04		

Notes: 1. Figures are as of the end of 2022.
2. Domestic banks' cash included cash, cash equivalents, and cash due from banks, while SVB's cash contained cash and cash equivalents.
3. SVB's investments included available-for-sale securities (12.31%), held-to-maturity securities (43.12%), and non-marketable and other equity securities (1.25%).

Sources: SVB and CBC.

4.4 The interest rate hike path in Taiwan has been steady, which differs from the accelerated rate hikes in the US

Considering that inflation in Taiwan remained relatively moderate compared to the US and Europe, the Bank was able to raise the policy rates progressively without triggering drastic volatility in the domestic bond market. Furthermore, this gave domestic banks ample time to adjust their asset-liability structure, resulting in an expansion of the average interest rate spread between deposits and loans,[3] making the profit of domestic banks in 2022 rise to the highest level in the past 20 years.

4.5 The Bank will provide sufficient liquidity to the domestic financial system when necessary

If international incidents in the future trigger abnormal capital outflows from the domestic financial system, the Bank will fully support the liquidity of financial markets, including extending the scope of repurchase operations established during the global financial crisis,[4] to provide necessary funds for financial institutions.

5. Conclusion

The recent bank failures in the US and the financial turmoil in Credit Suisse were attributed to individual bank-specific factors. Although the US and the Swiss authorities took swift and decisive actions to avoid the spreading of bank turmoil, many uncertainties still exist in the future. The aftermath of these incidents potentially impacts the interest rate path of major economies, macroeconomic conditions, credit supply, financial regulatory intensity, public confidence in the banking system, and so on, warranting continual close attention.

In addition, domestic banks' financial conditions remain sound, and their operation model differs from banks like SVB and Credit Suisse, indicating that they are not highly involved in cryptocurrency transactions. Moreover, with the steady interest rate hike path by the Bank, domestic banks benefited from an expansion of the average interest rate spread between deposits and loans in 2022, resulting in the highest profitability in the past 20-years. Overall, the domestic financial system is not expected to have systemic risks. The Bank will continue to pay close attention to the impacts of relevant subsequent developments and employ appropriate policy tools to promote financial stability in Taiwan.

Notes: 1. According to Fitch Solutions, SVB and FRB had uninsured deposit ratios of 86% and 68%, respectively, significantly higher than the ratios of JPMorgan Chase Bank (43%), Citibank (43%), and Wells Fargo Bank (51%) at the end of 2022. Meanwhile, the sums of loan-to-deposit and investment-to-deposit ratios for SVB and FRB were 109% and 112%, respectively, also higher than the ratios of JPMorgan Chase Bank (91%) and Citibank (85%).

2. Jiang et al. (2023) indicated that among the 190 US banks each with total assets over US$300 billion, even if only half of the uninsured deposits were withdrawn, without intervention from regulatory authorities, the remaining assets valued at market prices might be insufficient to support the withdrawals of insured deposits, which was estimated to exceed US$250 billion. Please see E.X. Jiang, G. Matvos, T. Piskorski, and A. Seru (2023), "Monetary Tightening and US Bank Fragility in 2023: Mark-to-Market Losses and Uninsured Depositor Runs?" *Stanford Institute for Economic Policy Research Working Paper* No. 23-13, March.

3. The interest rate spread between deposits and loans of domestic banks at the end of 2022 notably elevated to 1.36% (after interest rate hikes by the Bank) from 1.24% (before interest rate hikes) at the end of 2021.

4. The Bank's repurchase operations include "regular repurchase operations" and "extended repurchase operations." The extended repurchase operations enlarge the scope of eligible counterparties including banks, bills finance companies, Chunghwa Post Co., securities firms, and insurance companies. The repurchase period could be up to180 days.

2.2 Domestic macro environment

2.2.1 Domestic economic and fiscal conditions

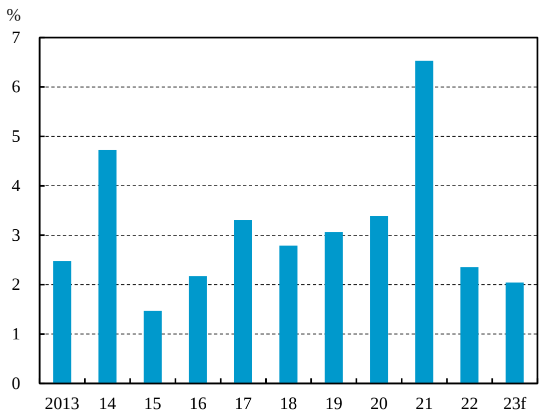
Export growth slowed down in 2022; however, benefiting from steady growth in private consumption and investment, domestic economic growth was still stable. Although domestic prices were high, inflation remained relatively moderate compared to other countries. External debt servicing capacity stayed robust on the back of a persistent surplus in the balance of payments and ample FX reserves. Moreover, fiscal surpluses and outstanding public debt within a manageable level were conducive to weathering uncertainties surrounding international political and economic conditions and maintaining economic growth momentum.

Taiwan's economy grew steadily

In 2022, as domestic epidemic prevention and control measures were gradually relaxed, domestic consumption returned to normal, and private consumption kept expanding. Coupled with steady investment growth, domestic demand continued to be the main driving force for economic growth. The annual economic growth rate reached 2.35% (Chart 2.10),[17] indicating that Taiwan's economy grew steadily.

Looking ahead to 2023, economic growth is anticipated to slow in the first half of the year owing to weak exports and private investment. Although investment momentum is forecast to remain sluggish in the second half of the year, export momentum is expected to gradually recover thanks to reduced inventory levels in global supply chains. Besides this, steady private consumption and government initiatives to enhance "post-pandemic economic and social resilience and national sharing economy achievement" will likely be conducive to domestic demand. As a result, economic growth is expected to pick up. However, considering persistent weakness in global final demand, which could restrain Taiwan's international trade momentum, the DGBAS

Chart 2.10 Economic growth rate in Taiwan



Note: Figure for 2023 is a DGBAS forecast released on May 26, 2023.
Source: DGBAS.

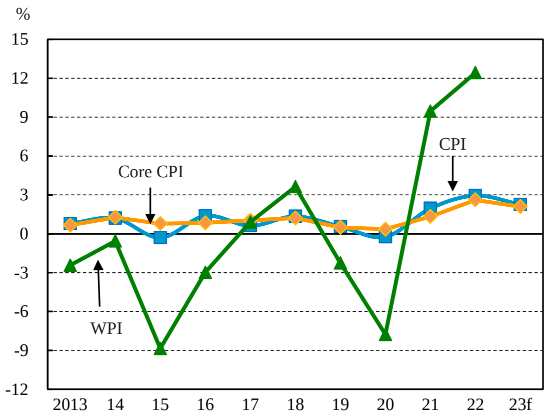
[17] See Note 2.

revised down the annual economic growth rate forecast to 2.04% (Chart 2.10).[18]

Although domestic prices were still-elevated, inflation remained relatively moderate compared to other countries

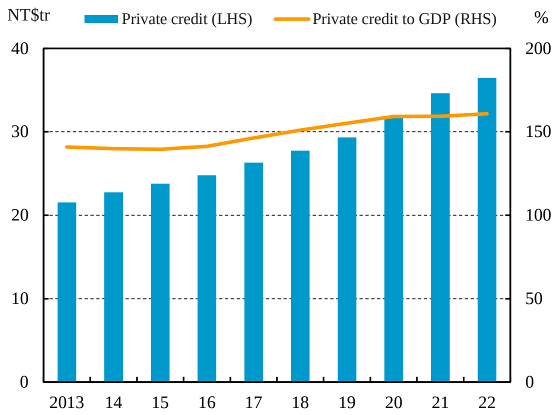
On account of hikes in international crude oil and raw material prices, annual wholesale price index (WPI) inflation ascended progressively to 12.43% in 2022, and annual producer price index (PPI)[19] inflation registered 10.51%. Nevertheless, in April 2023, annual PPI inflation dropped to 1.98%. With regard to consumer prices, owing to the impact of energy and food prices, annual CPI inflation rose to 2.95% in 2022 from 1.97% a year earlier, and reached a 14-year high. Core CPI inflation, which excludes fruit, vegetables, and energy, also gradually increased to 2.61% (Chart 2.11). However, compared to major economies, inflation in Taiwan remained relatively moderate.[20] In April 2023, annual CPI inflation dropped to 2.35%, while annual core CPI inflation continued to increase to 2.72%.

Chart 2.11 Consumer and wholesale price indices (% change, yoy)



Notes: 1. Figures for Core CPI in 2023 are CBC forecasts released on March 23, 2023; other figures are DGBAS statistical data and a forecast released on May 26, 2023.
2. From January 2023, DGBAS discontinued the calculation of the WPI to align with international practices.
Sources: DGBAS and CBC.

Chart 2.12 Private credit provided by financial institutions



Sources: DGBAS and CBC.

Looking ahead to 2023, considering the ongoing effects of monetary policy tightening by major central banks worldwide and the decline in international energy prices, the Bank forecasted in March 2023 that the annual CPI and core CPI inflation rates in 2023 would both ease to 2.09%. Furthermore, taking into account the elevated prices of various domestic

18 See Note 2.
19 Considering that the WPI is calculated as a weighted average of three price indices: domestic sales, exports, and imports, including both domestically produced and imported goods, as well as information on price changes in business output and input, it is acknowledged that the WPI lacks clear economic significance and can be prone to misuse. Therefore, starting from January 2023, the DGBAS discontinued the calculation of the WPI and introduced the PPI to align with international practices and facilitate cross-country comparisons for users.
20 Compared to major economies, Taiwan's annual CPI inflation in 2022 was 2.95%, which was significantly lower than the United States (8.02%), the EU (8.36%), the United Kingdom (9.05%), South Korea (5.05%), and Singapore (6.07%). However, it was higher than Japan (2.37%) and China (1.96%).

services, the DGBAS revised the predicted CPI annual inflation rate of 2023 upward to 2.26% in May.

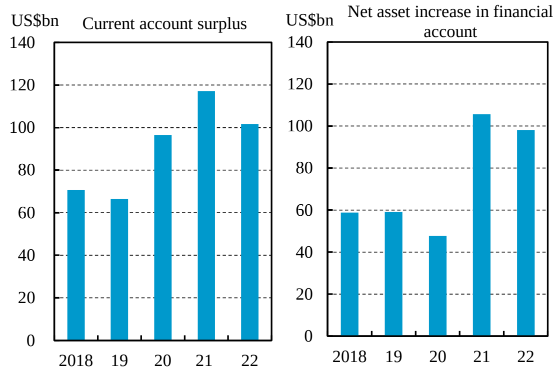
Credit to the private sector increased continually

Private credit[21] to private enterprises and households provided by domestic financial institutions kept growing in 2022, reaching NT$36.45 trillion at the end of the year, an increase of 5.25% year on year, which exceeded the economic growth rate of 2.35% in the same year. The ratio of credit to GDP registered 160.82%, slightly higher than 159.31% as compared to a year earlier (Chart 2.12). This showed that the credit provided by domestic financial institutions was sufficient to support economic activity.

Current account sustained a surplus and FX reserves stayed ample

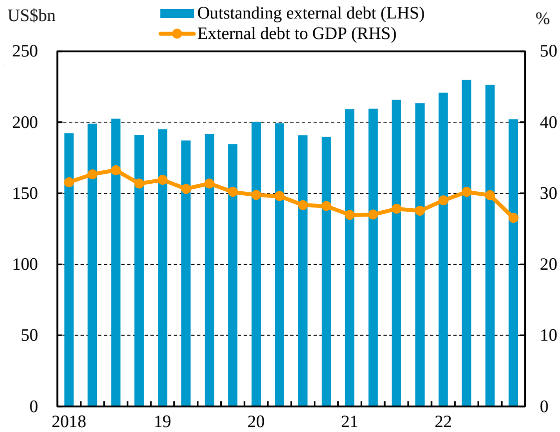
In 2022, owing to a decrease in the merchandise trade surplus caused by a smaller increase in exports than imports, the annual current account surplus contracted to US$101.7 billion (Chart 2.13, left panel), or 13.36% of the year's GDP, a decrease of US$15.4 billion, or 13.16% over the previous year.[22] In terms of the financial account, as banks increased foreign securities investments which boosted foreign assets, along with a decrease in foreign liabilities owing to reduced holdings of Taiwanese stocks by foreign institutional investors, the financial account posted an increase of US$98.1 billion throughout the year (Chart 2.13, right panel). Meanwhile, the Bank's reserve assets increased by US$10.9 billion compared to the previous year.

Chart 2.13 Current account surplus and net asset increase in financial account



Source: CBC.

Chart 2.14 External debt servicing capacity



Notes: 1. Figures for outstanding external debts are on an end-of-period basis.
2. Figures for GDP are on an annualized basis.
Sources: CBC and DGBAS.

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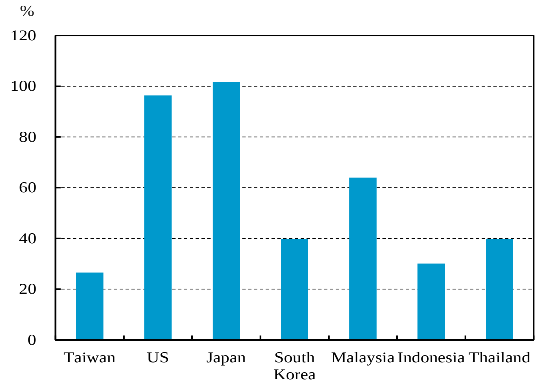
[21] Private credit refers to the loans granted by major financial institutions to various private enterprises, individuals, and non-profit organizations in Taiwan, as well as the purchases of securities such as stocks, corporate bonds, commercial paper, acceptance bills, beneficiary certificates issued by private enterprises, and the equities of long-term investments in private enterprises.

[22] For the ratio of current account deficit to GDP, it is generally deemed that its critical value as a risk measure is 3%. A country in which the reading is greater than 3% and has risen by at least 5 pps from the previous year is considered to be relatively high risk.

FX reserves amounted to US$554.9 billion at the end of 2022, rising by 1.19% from a year earlier, mainly supported by the earnings from portfolio investment operations of FX reserve assets and the adjustment operations by the Bank to maintain an orderly foreign exchange market. At the end of April 2023, the FX reserves continuously increased to US$561.1 billion.

Chart 2.15 External debt to GDP in selected countries

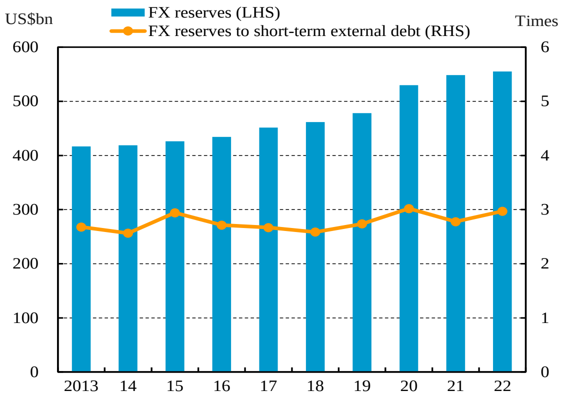


Note: Figures are as of the end of 2022.
Sources: CEIC and DGBAS.

External debt contracted, while debt servicing capacity remained satisfactory

Primarily because of a decrease in the short-term external debt of the domestic banking sector, Taiwan's external debt[23] declined to US$202.1 billion at the end of 2022, decreasing by 5.36% compared to a year earlier (Chart 2.14). The largest share of external debt went for the private sector, registering US$201.1 billion, while the public sector share only reached US$1.0 billion. In addition, Taiwan's external debt to GDP stood at 26.55% at the end of 2022, declining from 27.53% at the end of the previous year. It was lower than those in the US and neighboring Asian countries (Chart 2.15), and far below the internationally recognized alert threshold.[24]

Chart 2.16 Short-term external debt servicing capacity



Source: CBC.

Furthermore, at the end of 2022, the ratio of FX reserves to short-term external debt went up to 2.97 times owing to an increase in FX reserves and a shrinkage in short-term external debt (Chart 2.16), and was still much higher than the internationally recognized alert threshold,[25] implying that Taiwan's FX reserves have a decent capacity to meet short-term external debt obligations.

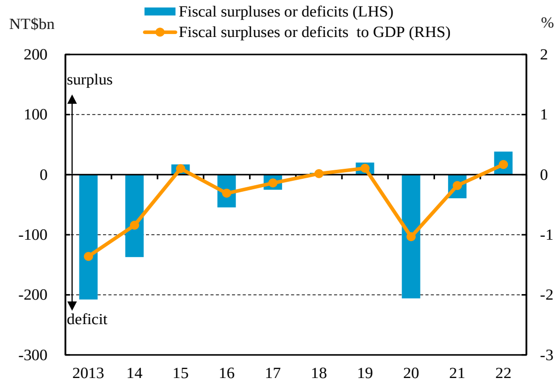
[23] See Note 3.
[24] The general international consensus is that a country with a ratio of external debt to GDP lower than 50% is deemed to be relatively low risk.
[25] The general international consensus is that a country with a ratio of FX reserves to short-term external debt higher than 100% is deemed to be relatively low risk.

Fiscal position registered surpluses and government debt stayed within a manageable level

In 2022, in order to address uncertainties in international political and economic conditions and sustain economic growth momentum, the government actively promoted the Three Major Programs for Investing in Taiwan.[26] However, as a result of a significant increase in profit-seeking enterprise income tax and the budget implementation of the government in conjunction with the principle of austerity, the government fiscal surplus stood at NT$38.4 billion, equivalent to 0.17% of GDP for the year (Chart 2.17), which was better than those of major economies including the US, the euro area, the UK, and Japan (Chart 2.18), and also much higher than internationally recognized minimum levels.[27]

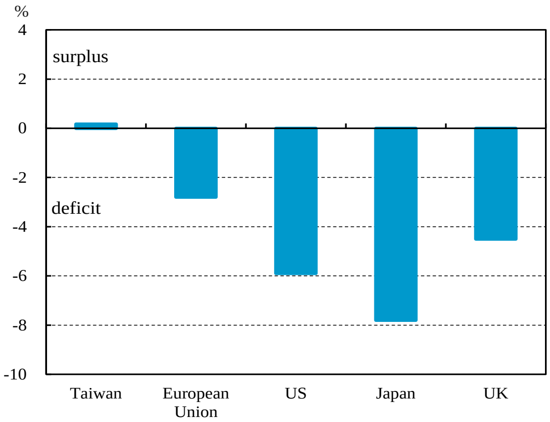
The outstanding public debt at all levels of government[28] rose to NT$6.7 trillion at the end of 2022, increasing by 2.73% year on year. Nevertheless, the ratio of total public debt to the year's GDP continued to drop to 29.69% (Chart 2.19), indicating that government debt stayed within a manageable level.[29]

Chart 2.17 Fiscal surpluses or deficits



Notes: 1. Fiscal position data include those of central and local governments.
2. Figures for 2022 are final accounts for the central government and self-compiled final accounts for local governments.
Sources: MOF and DGBAS.

Chart 2.18 Fiscal surpluses or deficits to GDP in selected countries



Note: Figures are as of the end of 2022.
Sources: IMF and MOF.

26 The Three Major Programs for Investing in Taiwan include the Action Plan for Welcoming Overseas Taiwanese Businesses to Return to Invest in Taiwan, the Action Plan for Accelerated Investment by Domestic Corporations, and the Action Plan for Accelerated Investment by Small and Medium-sized Enterprises (SMEs). These programs will be implemented from July 1, 2019, to December 31, 2024.

27 See Note 5.

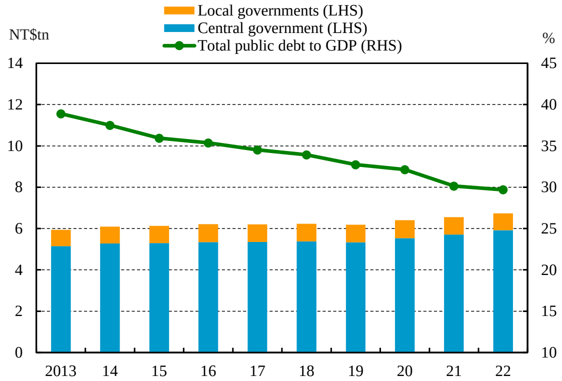
28 The term "outstanding debt at all levels of government" as used in this report refers to outstanding non-self-liquidating debt with a maturity of one year or longer.

29 See Note 6.

2.2.2 Corporate sector

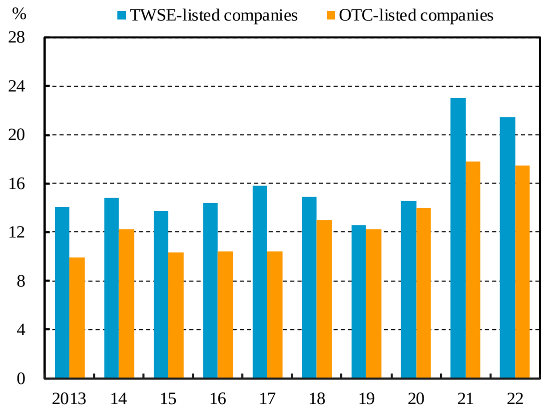
In 2022, the overall revenue of TWSE- and OTC-listed companies reached a new high with favorable profits. Their average financial leverage ratios decreased, and the short-term debt servicing capacity remained sound at the end of 2022. Although the foreign currency liabilities of listed companies contracted to a lower level at the end of September 2022, their exchange rate risks still warrant prudent management. The NPL ratio for corporate loans granted by financial institutions continued to hit a new low at the end of the year, and the credit quality for the corporate sector was satisfactory.

Chart 2.19 Public debt



Notes: 1. Outstanding public debt refers to non-self-liquidating debt with a maturity of one year or longer, excluding external debt.
2. Figures for 2022 are preliminary final accounts for the central government and self-compiled final accounts for local governments.
Sources: MOF and DGBAS.

Chart 2.20 Return on equity in corporate sector



Note: Return on equity = net income before interest and tax/average equity.
Source: TEJ.

Revenue of both TWSE- and OTC-listed companies reached a record high with favorable profitability

The net operating revenue of TWSE- and OTC-listed companies in 2022 reached a historical high of NT$37.85 trillion and NT$2.71 trillion, respectively, benefiting from the continuous developments of emerging technology applications and digital transformation opportunities although global final demand showed signs of weakening. Their average ROEs registered 21.44% and 17.49%, slightly lower than the previous year's figures of 23.01% and 17.78%, respectively (Chart 2.20), but still reached the second-highest level on record. Overall, the profitability remained strong.

The leverage for listed companies decreased, and their short-term debt servicing capacity remained sound

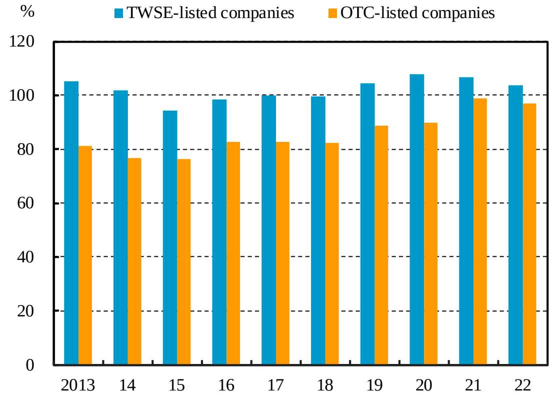
At the end of 2022, the average leverage ratios for both TWSE- and OTC-listed companies decreased from 106.85% and 98.81% at the end of the previous year to 103.65% and 96.79%, respectively (Chart 2.21), benefiting from the sustained profitability. This indicated a slight improvement in the overall financial leverage level of listed companies.

Moreover, the current ratios for TWSE- and OTC-listed companies continued to rise to 163.74% and 189.05% at the end of 2022 from 159.79% and 183.21%, respectively, a year earlier (Chart 2.22). Although the interest coverage ratios dropped to 23.17 times and 24.91 times from 34.58 times and 30.23 times, respectively (Chart 2.23), owing to a greater increase in interest expenses, the overall short-term debt servicing capacity for listed companies remained sound.

Foreign currency liabilities of the corporate sector contracted, but their exchange rate risks still warrant prudent management

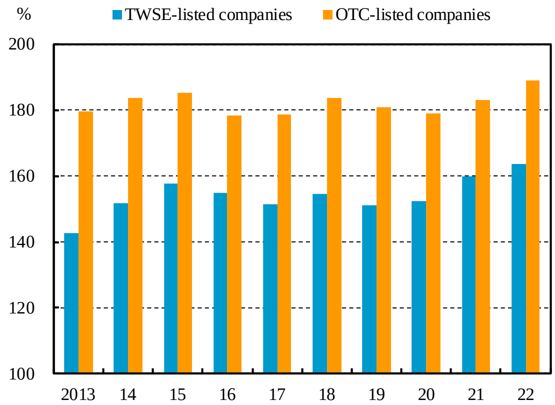
As foreign currency liabilities reduced and equity expanded, the foreign currency liability-to-equity ratios of listed companies decreased from 32.85% and 21.07% at the end of the previous year to 30.78% and 19.10%, respectively, as of end-September 2022 (Chart 2.24). Considering the recent amplified volatility in the international FX market, it is still advisable for listed companies to prudently manage exchange rate risks.

Chart 2.21 Leverage ratios in corporate sector



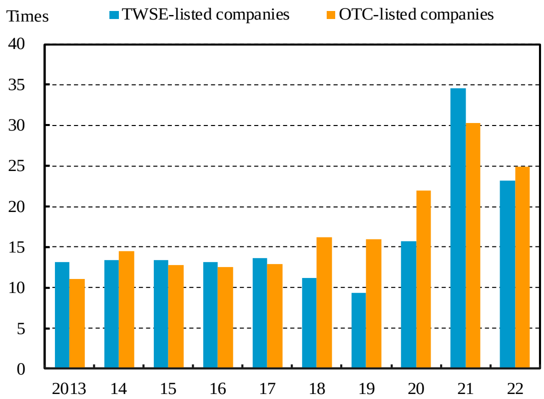
Note: Leverage ratio = total liabilities/total equity.
Source: TEJ.

Chart 2.22 Current ratios in corporate sector



Note: Current ratio = current assets/current liabilities.
Source: TEJ.

Chart 2.23 Interest coverage ratios in corporate sector



Note: Interest coverage ratio = income before interest and tax/interest expenses.
Source: TEJ.

Credit quality remained satisfactory as the NPL ratio of the corporate sector continued to reach a new low

The NPL ratio for corporate loans[30] from financial institutions dropped to a new low of 0.21% at the end of 2022 from 0.23% a year earlier (Chart 2.25). This showed that the overall credit quality for the corporate sector was satisfactory.

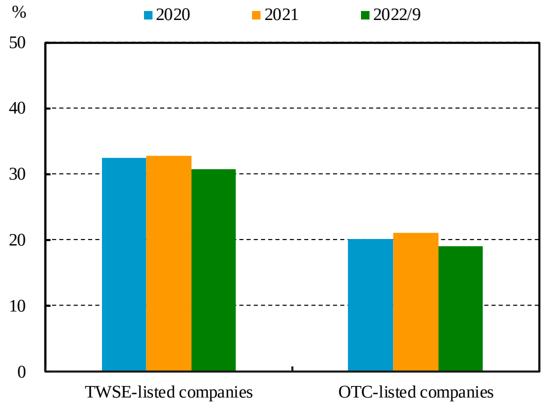
2.2.3 Household sector

Household borrowing expanded at a slower pace and household indebtedness slightly decreased in 2022, while the short-term household debt servicing pressure tightened marginally. However, the household sector held enormous net worth, reflecting that the debt servicing capacity of households remained sound. Moreover, the credit quality of household borrowing from financial institutions appeared to be satisfactory. Nevertheless, considering the rise in interest rates on bank loans and the fall in real regular earnings for employees owing to inflation, the debt servicing capacity of some households with higher debt burdens warrants close attention.

Growth of household borrowing slowed

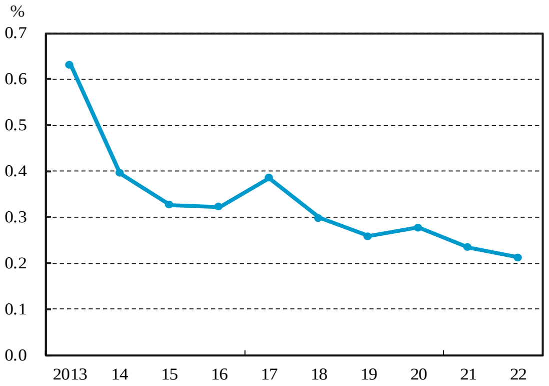
Household borrowing reached NT$19.98 trillion at the end of 2022, equivalent to 88.15% of annual GDP for the year (Chart 2.26), higher

Chart 2.24 Foreign currency liability-to-equity ratios in corporate sector



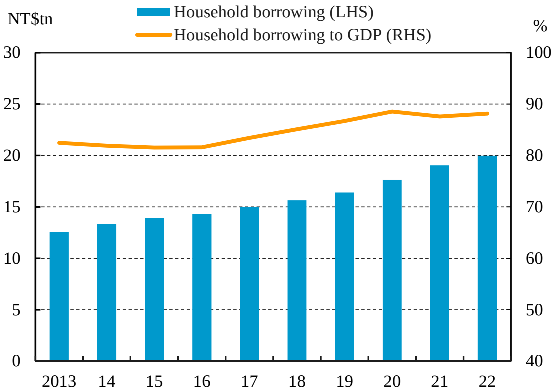
Note: Data on foreign currency liabilities in the corporate sector has been disseminated from 2020 onwards.
Source: TEJ.

Chart 2.25 NPL ratio of corporate loans



Source: JCIC.

Chart 2.26 Household borrowing to GDP



Sources: CBC, JCIC, and DGBAS.

[30] The data for the corporate sector herein are on the basis of listed and unlisted corporations provided by the Joint Credit Information Center (JCIC), excluding the data of overseas branches of domestic banks.

than the 87.57% of the previous year. The main purpose of household borrowing was to purchase real estate, accounting for 63.16%, followed by current operation loans,[31] accounting for 34.62%, and the rest of the household borrowing took small proportions (Chart 2.27).

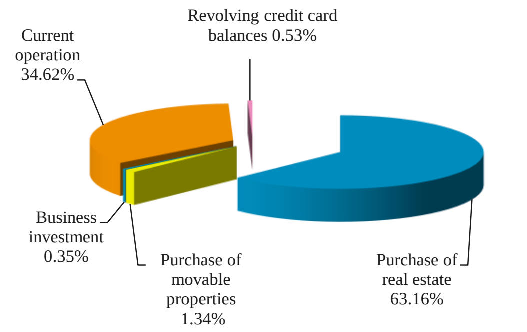
The annual growth rate of household borrowing rose at a slower pace of 4.95% in 2022, down from 7.99% in the previous year, mainly attributable to the purposes of real estate purchase and working capital needs. Compared to other countries, the growth rate of household borrowing in Taiwan was lower than those in the US and Australia, but higher than those in South Korea and Japan. As for household borrowing to GDP, Taiwan's ratio was lower than those in Australia and South Korea, but higher than those in the US and Japan (Chart 2.28).

Household indebtedness decreased slightly and net worth was high

The ratio of household borrowing to total disposable income[32] slightly dropped to 1.51 in 2022, reflecting a slightly eased household debt burden. However, with the rise in interest rates on bank loans, the debt servicing ratio ascended marginally to 48.87% (Chart 2.29), indicating that short-term household debt servicing pressure tightened marginally.

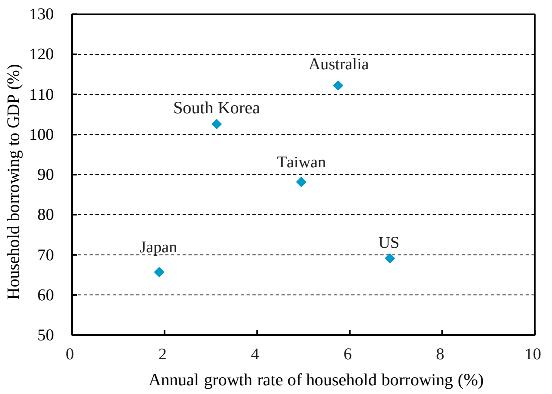
Furthermore, household net worth[33] in Taiwan

Chart 2.27 Household borrowing by purpose



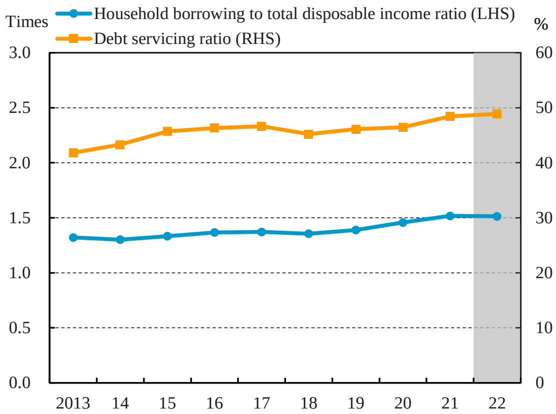
Note: Figures are as of the end of 2022.
Sources: CBC and JCIC.

Chart 2.28 Household indebtedness in selected countries



Note: Figures are as of the end of 2022.
Sources: Fed, BOJ, BOK, ABS, IMF, DGBAS, JCIC, and CBC.

Chart 2.29 Household indebtedness and debt servicing ratio

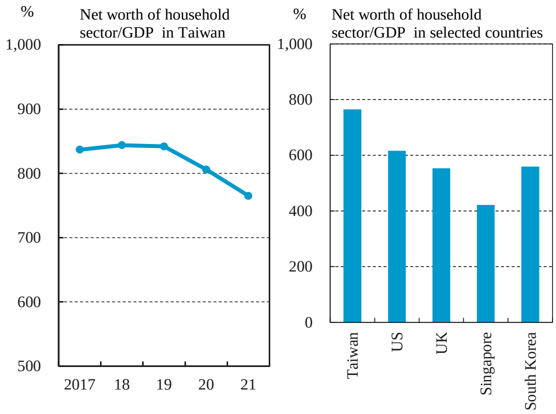


Note: Total disposable income in shaded area is a CBC estimate.
Sources: CBC, JCIC, and DGBAS.

31 The term "current operation loans" includes outstanding cash card loans.
32 Total disposable income = disposable income + rental expenses + interest expenses.
33 See Note 7.

has been remarkable over the past decades and has held at more than 7 times the GDP in recent years. Compared to other countries, the household net worth to GDP ratio in Taiwan was far higher than those in the US, the UK, Singapore and South Korea (Chart 2.30), showing that the financial condition of households in Taiwan was sound.

Chart 2.30 Household net worth to GDP

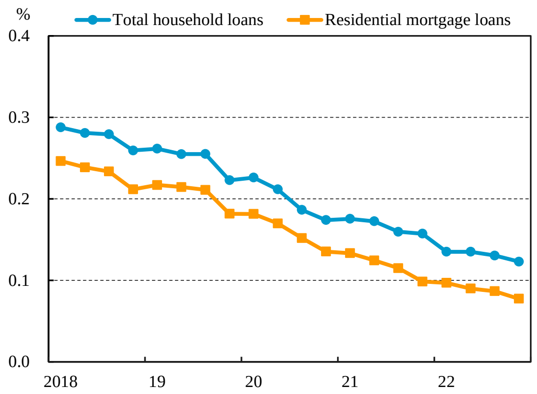


Notes: 1. The household sector herein includes households and non-profit organizations.
2. In the right panel, figures are as of the end of 2021.
Sources: DGBAS and official websites of selected countries.

The NPL ratios of household borrowing fell to a new low, reflecting satisfactory credit quality

As the impact of COVID-19 on the household sector shrank noticeably, the NPL ratio of household borrowing fell to a new low of 0.12% at the end of 2022. Among the categories, the NPL ratio of loans for purchase of real estate declined to a historical low of 0.08% (Chart 2.31), reflecting satisfactory credit quality.

Chart 2.31 NPL ratios of household borrowing



Source: JCIC.

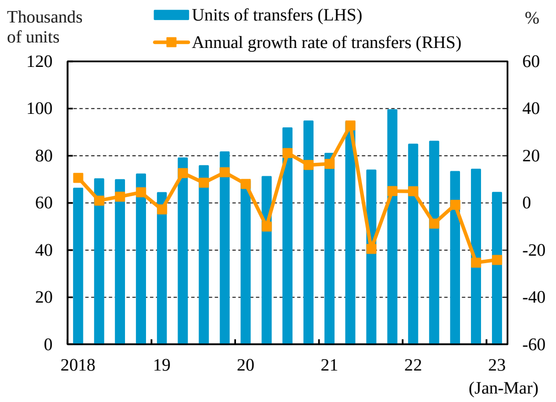
Although the minimum wage rose in recent years, real monthly regular earnings for employees in 2022 decreased slightly by 0.15% year on year owing to inflation. This, coupled with rising interest rates on bank loans, indicated that the debt servicing capacity of some households with higher debt burdens warrants close attention.

2.2.4 Real estate market

Transactions in the housing market cooled down remarkably as the uptrend in house prices decelerated and even showed signs of decline in some areas in the second half of 2022. The mortgage burden slightly decreased but still remained at a high level. The pressure from an overhang of unsold new residential houses is gradually increasing. As the Bank's tightening of monetary policy since March 2022 and continuous implementation of targeted macroprudential measures, coupled with relevant measures adopted by ministries and government agencies to curb speculation in the housing market, achieved positive effects, the growth of construction loans and new housing loans extended by banks continued to slow down, and related credit risk management stayed satisfactory.

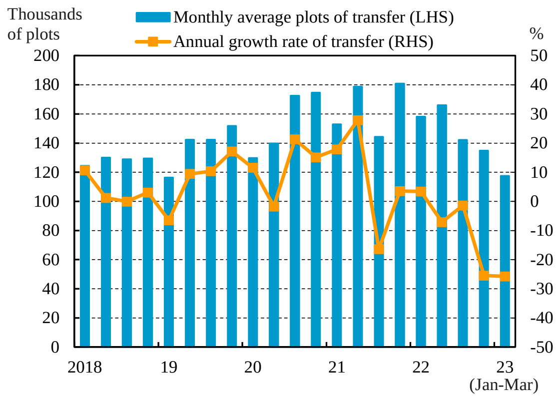
Transactions in the real estate market cooled down remarkably

Chart 2.32 Number and growth of building transfers



Source: *Monthly Bulletin of Interior Statistics*, MOI.

Chart 2.33 Land transfers for transaction and annual growth rate



Source: *Monthly Bulletin of Interior Statistics*, MOI.

Domestic housing transactions thrived in 2022 Q1. However, from Q2 onwards, as banks gradually raised the interest rates on real estate loans and the government continued to implement measures ensuring the soundness of the housing market, a wait-and-see sentiment to the demand for real estate emerged. These, coupled with a higher base period in the previous year, resulted in the annual growth rate of the total number of building ownership transfers turning negative and dropping to -25.32% in Q4. As a result, the total number of building ownership transfers decreased by 8.64% year on year from 348 thousand to 318 thousand units in 2022 (Chart 2.32). Entering 2023, owing to the wait-and-see atmosphere in the housing market, the total number of building ownership transfers declined to 64 thousand units in Q1, a record low since 2019 Q2 (Chart 2.32).

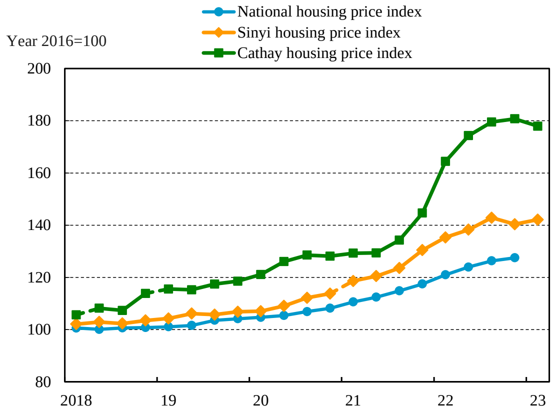
In terms of loans for land transactions extended since January 2022, the Bank stipulated that, in principle, the construction shall commence within 18 months. From then on, the real estate industry became more conservative in their purchase of vacant land. Coupled with the lessening land demand from manufacturers seeking to expand their factories, the total number of land ownership transfers fell by 8.45% compared to the previous year (Chart 2.33). From early 2023 onwards, as the real estate industry's prudent outlook of the housing market continued, the total number of land ownership transfers decreased by over 20% for two consecutive quarters, registering a drop of -25.74% in Q1 (Chart 2.33).

Real estate prices decelerated, showing signs of decline in some areas

The national housing price index released by the MOI continued to rise gradually in 2022 and reached a new high of 127.51 in Q4 (Chart 2.34). However, the annual growth rate in Q4 fell to 8.52%, moderating for two consecutive quarters.

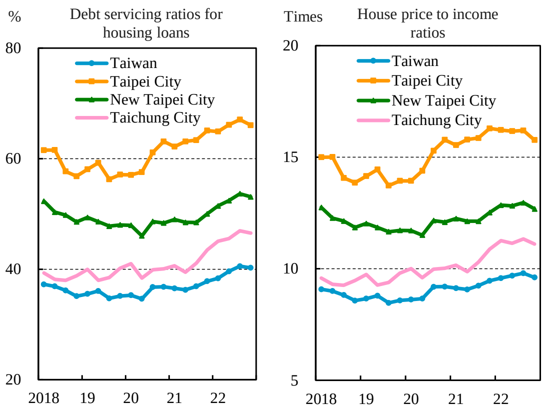
The Cathay housing price index (for newly built houses) elevated sharply in 2022, and hit a historical high of 180.74 in Q4, with double-digital growth for five consecutive quarters. Afterwards, influenced by hesitation among real estate buyers, the index dropped to 177.91 in 2023 Q1, while the annual growth rate shrank to 8.20%. The Sinyi housing price index (for existing houses) kept its upward trend in the first three quarters of 2022 and has slightly fluctuated at high levels since Q4. However, the index registered 142.12 in 2023 Q1 with the annual growth rate dwindling to 5.03%, indicating contractions for two successive quarters (Chart 2.34).

Chart 2.34 House price indices



Note: For comparison purposes, all three indices use the same base year of 2016 (2016 average = 100).
Sources: MOI, Cathay Real Estate, and Sinyi Real Estate Inc.

Chart 2.35 Debt servicing ratios for housing loans and house price to income ratios



Notes: 1. Debt servicing ratio for housing loans = median monthly housing loan payment/median monthly household disposable income.
2. House price to income ratio = median house price/median annual household disposable income.
Source: *Statistic on Housing Affordability*, MOI.

Mortgage burden went down mildly after reaching a peak

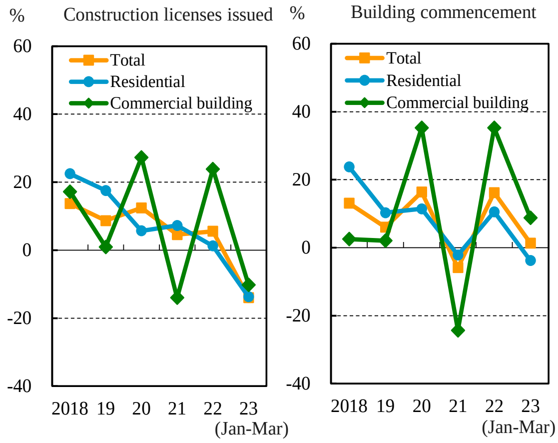
The debt servicing ratio for housing loans rose gradually quarter by quarter since 2022 Q1 and reached a peak of 40.55% in Q3, but mildly went down to 40.25% in Q4. Among the cities in Taiwan, Taipei City showed the heaviest mortgage burden with its ratio registering 66.06% (Chart 2.35, left panel). Similarly, Taiwan's house price to income ratio grew quarter by quarter and reached a peak of 9.80 times in 2022 Q3, then declined to 9.61 times in Q4 (Chart 2.35, right panel).

Construction licenses issued and building commencement soared, while pressure from the overhang of unsold newly built residential houses went up gradually

With an abundance of new residential housing projects open for pre-sale, the total floor space of construction licenses issued increased by 5.53% year on year in 2022. Meanwhile, the total floor space of construction commencement went up by 16.20%, mainly because part of residential building commencements of the previous year had been postponed to 2022, and the Bank required borrowers to start construction within 18 months after their land loans were approved. Along with construction companies being cautious about launching new projects in 2023 Q1, the total floor space of construction licenses issued reduced by 13.96% year on year, while the total floor space of construction commencement kept growing by 1.34% year on year (Chart 2.36).

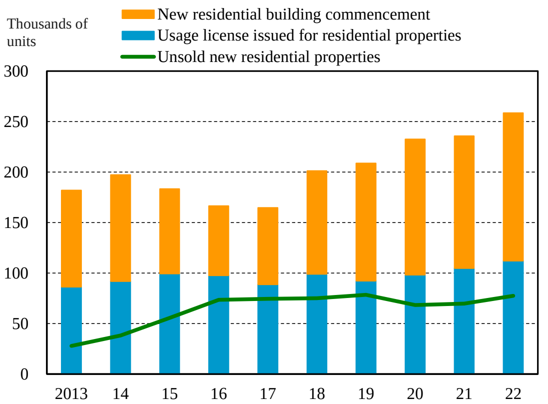
Additionally, the total floor space of usage licenses issued increased by 2.47% year on year in 2022, resulting from successive completion and release of residential housing projects. The aforementioned total floor space increased by 9.64% in 2023 Q1, mainly because those industrial and commercial buildings had surged by 72.37%.

Chart 2.36 Annual growth rates of floor space of construction licenses issued and construction commencement



Note: Commercial building includes buildings for commerce, industry, storage, business and service.
Source: *Monthly Bulletin of Interior Statistics*, MOI.

Chart 2.37 New residential buildings and unsold properties



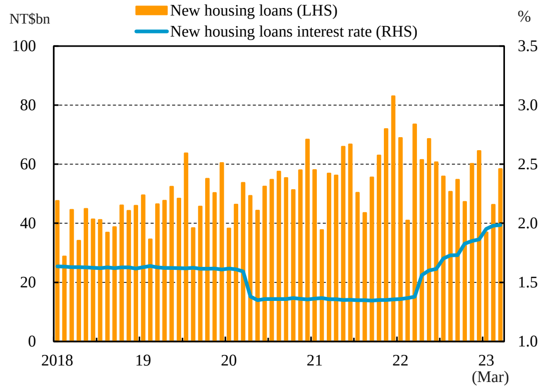
Notes: 1. The MOI uses data from land registration, Taiwan Power Company, and house tax registration to classify residences that have been registered for the first time within the last 5 years and have an average electricity consumption of less than 60 kWh as unsold new residential properties.
2. Figures are yearly data, except for figure for 2022 of unsold new residential properties, which is as of the end of 2022 Q2.
Source: Real Estate Information Platform, MOI.

According to statistics from the MOI, the number of construction projects commenced for new residential buildings set a record high of 146.4 thousand units in 2022 (Chart 2.37), and then kept growing at an annual rate of 7.03% to reach 35.8 thousand units in 2023 Q1. With the enormous supply, high prices, and low sales of new residential buildings, the pressure to sell unsold newly built residential houses went up gradually.

Real estate loans grew at a slower pace and mortgage interest rates rose

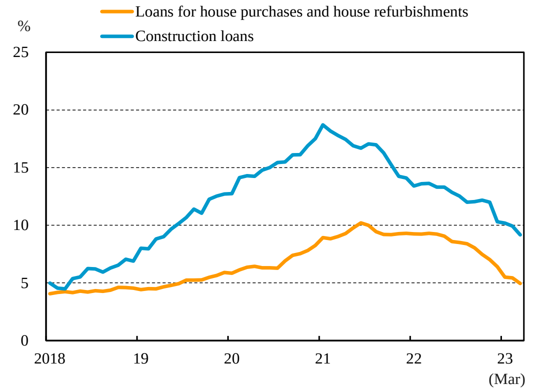
The transaction volume of the housing market shrank in 2022. However, because of the upward movement of housing prices and the considerable amount of bank loans issued in cooperation with construction companies for housing ownership transfers, the average monthly amount for new housing loans granted by the dominant five banks was about NT$58.9 billion, only contracting by 0.23% over the previous year. The aforementioned average amount for 2023 Q1 declined to NT$47.2 billion (Chart 2.38), with an expanding year-on-year decrease of 22.75%.

Chart 2.38 New housing loans – amount and interest rate



Source: CBC.

Chart 2.39 Annual growth rates of real estate loans



Source: CBC.

Regarding the interest rate of real estate loans, as the Bank urged banks to fulfill the risk pricing principle and had raised its policy rates five times from March 2022, the average interest rate for new housing loans granted by the dominant five banks rose month by month from early 2022 onwards, and elevated to 1.985% in March 2023 (Chart 2.38). Nevertheless, the degree of increase was still limited compared to other major economies.

As the transactions of buildings and land became less active in 2022, the annual growth rate of outstanding construction loans granted by banks[34] plunged dramatically to 9.17% at the end of March 2023. Meanwhile, the annual growth rate of outstanding loans for house purchases and refurbishments also dropped to 4.96% (Chart 2.39). The aggregate amount of the aforementioned real estate loans accounted for 36.84% of total loans at the end of March 2023, which remained roughly unchanged compared to the end of 2022, yet lower than the peak at the end of 2021 (Chart 2.40).

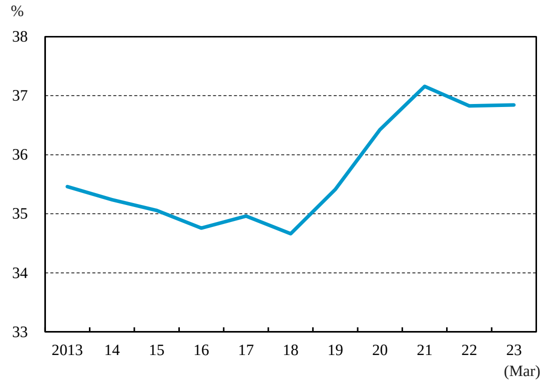
[34] Refers to domestic banks and the local branches of foreign and China's banks.

Banks' risk management on real estate loans remained satisfactory

The weighted average loan-to-value (LTV) ratio for new housing loans decreased marginally and the annual average registered 72.41% in 2022. The average LTV ratio for the regulated loans newly granted by banks dropped significantly, while regulated housing loans extended to corporations registered the lowest level among the loan types, with a ratio of 35.93% in March 2023.

Furthermore, the NPL ratios of housing loans and construction loans granted by domestic banks both dropped to 0.07% at the end of March 2023, lower than the 0.15% NPL ratio of total loans (Chart 2.41). In addition, most of the 36 domestic banks passed the latest stress tests requested by the FSC. All of these revealed that the risk management of domestic banks on real estate loans remained satisfactory.

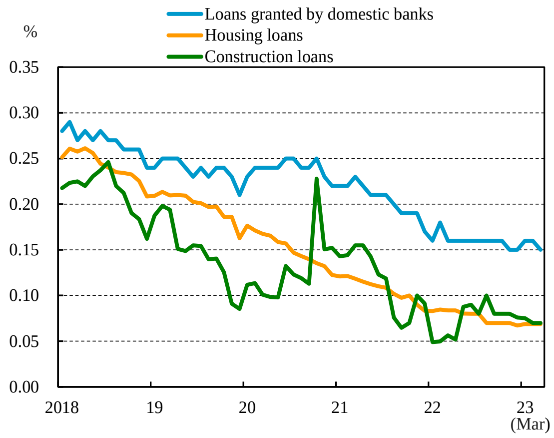
Chart 2.40 Real estate loans to total loans



Notes: 1. Real estate loans refer to the aggregate amount of loans for house purchases, house refurbishments, and construction loans.
2. Figures are end-of-year data, except for figure of 2023, which is end-March data.

Source: CBC.

Chart 2.41 NPL ratios of housing loans and construction loans



Note: NPLs herein exclude non-accrual loans.

Source: CBC.

The Bank and the relevant ministries and agencies persistently endeavored to implement the Healthy Real Estate Market Plan to foster a sound real estate market

To implement the Healthy Real Estate Market Plan initiated by the government for effective allocation and rational application of credit, the Bank has adjusted its targeted macroprudential measures four times since December 2020. Additionally, the Bank continued to cooperate with the FSC to strengthen the risk management of real estate lending or guarantee business of banks and bills finance companies for the purpose of promoting financial stability. The Bank and the FSC also launched a targeted examination toward mortgage loans. Besides this, the FSC imposed fines on banks that failed to establish and implement anti-money laundering practices on housing loans to natural persons which involved groups of speculators. Moreover, the FSC raised risk weights on mortgage loans of banks in February 2022[35] to enhance their risk management.

In addition, the MOI, the Fair Trade Commission, the Consumer Protection Committee, and local governments have consecutively carried out joint audits targeting pre-sold houses and amended *The Equalization of Land Rights Act* in February 2023 to refine the property market mechanism. The Ministry of Finance (MOF) also amended regulations to prevent short-term speculation and tax evasion. All of the abovementioned efforts contributed to fostering a sound real estate market. Notwithstanding, with part of the authority and responsibility of real estate market management resting with local governments, a consummate system relies on cooperation between central and local governments to execute and improve relevant measures constantly to achieve the goals of sound development of the real estate market and fulfill housing justice.

2.3 General assessment of international and domestic macro environments

As for international economic and financial conditions, major central banks accelerated interest rate hikes to curb surging inflation in 2022, resulting in spillover effects that tightened global financial conditions and spurred a slowdown in global economic growth. Looking ahead to 2023, with a tighter financial environment and still-elevated geopolitical risks, global economic growth is likely to continue its downward path, while inflation pressures may ease but still remain high. In addition, the turbulence in global financial markets stemming from rapid interest rate hikes by major central banks, subsequent developments of the banking turmoil in the US and Europe, and the intensifying impact of climate change on the financial sector all exacerbate global financial vulnerabilities.

Regarding the domestic macro environment, Taiwan's economic growth remained stable in 2022. Although domestic prices were high, inflation was relatively moderate compared to other countries. Moreover, external debt servicing capacity stayed robust with ample FX reserves. Fiscal surpluses and outstanding public debt within a manageable level were conducive to weathering uncertainties surrounding international political and economic conditions, as well as maintaining economic growth momentum. With regard to the corporate sector, the overall revenue of TWSE- and OTC-listed companies reached a new high with favorable profits, coupled with a sustained short-term debt servicing capacity. However, their exchange rate risks still warrant prudent management. When it comes to the household sector, despite the fact that

[35] Applies to loan cases that were new, renewed or transferred since February 18, 2022.

the short-term debt burden trended upwards marginally, household financial health was steady, underpinned by their enormous net worth. Nonetheless, in view of rising interest rates on bank loans and decreasing real monthly regular earnings for employees, the debt servicing capacity of some households with higher debt burdens warrants close attention. Lastly, transactions in the real estate market cooled down remarkably, with moderately increasing house prices. Additionally, rising interest rates for bank loans and higher commodity prices could lead to some small and medium-sized construction firms with poor financial conditions facing greater challenges. Accordingly, the impact of real estate market trends on banks' credit quality should be closely observed.

In sum, in a scenario of major central banks tightening monetary policies and geopolitical risks remaining high, the trends of rising global interest rates, heightened volatility in financial markets, and gloomy global economic prospects could affect Taiwan's corporate sector outlook, household debt servicing capacity, and real estate market performance. This, in turn, could add risks to the financial sector, which warrants close attention.