Central Bank of the Republic of China (Taiwan)

Financial Stability Report

May 2024 | Issue No. 18

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About the Financial Stability Report

Key points of the task to promote financial stability

Promoting financial stability not only is one of the operational objectives pursued by the Central Bank of the Republic of China (Taiwan), but also lays the cornerstone for the effective implementation of monetary policy. To achieve this objective, in addition to serving as lender of last resort when necessary, the Bank regularly monitors the financial system and the overall economic and financial environment. This allows it to be constantly aware of the potential vulnerabilities and risks that could threaten financial stability so that the relevant financial authorities and market participants can respond in a timely manner to avoid financial turbulence.

In its work to promote financial stability, the Bank focuses primarily on the risks that could affect the stability of the overall financial system. Nevertheless, the Bank still pays close attention to the status of individual institutions as their weaknesses can trigger systemic risks.

Purpose of this report

The Financial Stability Report is issued annually. The aims of this report are to offer insight into the state of Taiwan's financial system and its potential vulnerabilities and risks, and to spark broad-based discussion that will enhance awareness of risk among market participants and spur them to take responsive action in a timely manner. This does not mean, however, that the risks mentioned in this report are sure to occur. Furthermore, this report is intended to serve as a reference for financial authorities, market participants, and others interested in the subject. Readers are advised to interpret or quote the information contained herein with caution.

Definition of financial stability

There is as yet no universally accepted definition of "financial stability." Defined positively, "financial stability" can be thought of in terms of the financial system's ability to: (1) facilitate an efficient allocation of economic resources both spatially and intertemporally; (2) assess and manage financial risks; and (3) withstand adverse shocks. From a negative view, "financial instability" refers to the occurrence of currency, banking, or foreign debt crises, or inability of the financial system to absorb adverse endogenous or exogenous shocks and allocate resources

efficiently, with the result that it cannot facilitate real economic performance in a sustained manner.

Note:	*Except as otherwise noted, all data and information cited in this report are current as of April 30, 2024.*

Abstract

In 2023, global economic growth experienced a slight decline but has shown resilience. Against the backdrop of a more optimistic market expectation for interest rate cuts, global financial conditions have turned to ease. Domestically, economic growth moderated, and inflation rates maintained a gradual downward trend. While corporate revenues and profits contracted, the overall short-term debt servicing capacity remained sound. Household borrowing expanded continually, but its financial health remained steady. In addition, the government persistently endeavored to implement measures to ensure a healthy housing market which contributed to fostering its sound development. Under this macro environment, financial markets in Taiwan kept operating smoothly. Major financial institutions have maintained sound operations. Meanwhile, domestic systemically important payment systems functioned in an orderly manner. On the whole, the financial system remained stable; however, the potential impacts stemming from a myriad of uncertainties surrounding international economic and financial conditions on Taiwan's financial system warrant close attention.

International and domestic macro environments were influenced by monetary policies of major central banks and geopolitical tensions

In 2023, although major central banks significantly hiked interest rates to tame inflation, the global economic growth rate merely saw a slight decline, demonstrating resilience in economic activity. Global financial conditions have gradually eased with optimistic market expectations for interest rate cuts. Looking ahead to 2024, the outlook for global manufacturing and services sectors is expected to recover gradually. Nonetheless, considering geopolitical tensions, elevated funding costs, as well as uncertain monetary policy stances of central banks in the US and Europe, S&P Global Market Intelligence (hereafter S&P Global) estimates that global economic growth will remain unchanged, with inflation moderating but staying at elevated levels. Furthermore, the trajectory of monetary policy stances by major central banks, rising geopolitical risks, deterioration in the credit quality of the commercial real estate (CRE) markets in the US and Europe, along with the real estate market downturn and substantial levels of local government debt in China, could potentially heighten global financial instability risks, which require close attention.

In 2023, domestic economic growth slowed and the inflation rate gradually decreased. The scale of external debt slightly rose, but foreign exchange (FX) reserves remained ample, ensuring robust external debt servicing capacity. Despite the fact that the fiscal position registered a deficit, government debt to GDP shrank and stayed within a manageable level. Taiwan Stock Exchange (TWSE) listed and over-the-counter (OTC) listed companies both saw declines in revenue and profitability, but their leverage ratios improved and the overall ability to service short-term debt stayed strong. Household financial conditions remained sound and demonstrated satisfactory credit quality. Starting from the second half of the year, transactions in the real estate market recovered, thus intensifying the burden on homebuyers. Relevant ministries and agencies will continually implement measures to ensure a healthy housing market so as to foster its sound development.

Financial markets, institutions, and infrastructures operated smoothly in Taiwan

From 2023 onwards, the outstanding amount of issuance and trading volume of bills and bonds have mostly expanded. The stock indices fluctuated with an uptrend and reached historical highs. The NT dollar broadly depreciated against the US dollar, while its volatility remained relatively stable. Domestic banks saw improvements in asset quality, profits, and capital adequacy. Life insurance companies experienced a notable recovery in profits after a slump, and their average risk-based capital (RBC) ratio edged up. Bills finance companies underwent a substantial reduction in profitability, but their capital levels remained adequate.

Furthermore, domestic systemically important payment systems functioned in an orderly manner. The Bank and the Financial Supervisory Commission (FSC) have enhanced their research and implementation of climate change scenario analysis. Additionally, to refine the domestic financial environment, the FSC announced transitional measures for the insurance industry to align with international standards, strengthened the management of platforms involving crypto assets and digital lending, and published the "Core Principles and Policies for Artificial Intelligence (AI) Applications in the Financial Industry."

The Bank and the FSC kept taking measures to promote financial stability

The Bank raised the policy rates by 0.125 percentage points in March 2024, aiming to curb domestic inflation expectations and sustain price stability. The Bank also conducted open

market operations for the purpose of adjusting funds in the banking system. Besides this, the Bank kept adopting selective credit control measures and other policies to support the government's Healthy Real Estate Market Plan, and took flexible FX policies to safeguard the dynamic stability of the NT dollar exchange rate. Meanwhile, the FSC kept fortifying insurance companies' risk-bearing capacity and strengthened the supervision of the Exchange Traded Fund (ETF) market. It also enhanced financial institutions' risk management for outsourcing operations and took measures to guard against illegal offshore funds, all with the goal of preserving financial stability.

The Bank will continually take measures to promote financial stability as needed

In 2023, despite a slowdown in both domestic and global economic growth, Taiwan's financial markets continued to function smoothly, and financial institutions maintained stable operations. As a whole, Taiwan's financial system remained stable. Looking ahead, a number of factors would amplify the uncertainties of global inflation as well as trade and economic development, including the trajectory of monetary policy stances by major central banks, geopolitical risks, and climate change. Moreover, a high interest rate environment, risks from China's economic downturn, supply chain restructuring, and fragmentation of the global economy, could all pose adverse impacts on global economic development and financial stability. In response, the Bank will continue to pay close attention to the potential impacts of relevant subsequent developments and take appropriate response measures to promote domestic financial stability.

# I. Overview

Potential macro environmental risk factors

International economic and financial conditions

Global economic growth showed resilience, while inflation moderated but still remained at elevated levels

In 2023, major central banks raised interest rates to combat inflation, thus limiting the momentum for economic growth. Nevertheless, thanks to greater-than-expected government spending and household consumption, along with a higher-than-expected labor force participation rate, the global economic growth rate only mildly dropped to 2.7%, demonstrating resilience in economic activity. Meanwhile, with suppressed oil price increases and a gradual downward trend in commodity prices, the global consumer price index (CPI) inflation rate declined to 5.7% (Chart 1.1).

Looking ahead to 2024, global manufacturing and services sectors are expected to recover gradually, potentially boosting economic growth momentum. Notwithstanding, considering various negative factors such as geopolitical tensions, elevated funding costs, as well as uncertain monetary policy stances of central banks in the US and Europe, S&P Global[1] estimates that the global economic growth rate will remain at 2.7%. For advanced economies, growth is projected to stay at 1.7%, while the rate in emerging economies is expected to drop to 4.0%. Additionally, although a constant softening in labor markets and relatively tight monetary policies helped

Chart 1.1 Global economic growth rates and headline inflation indices
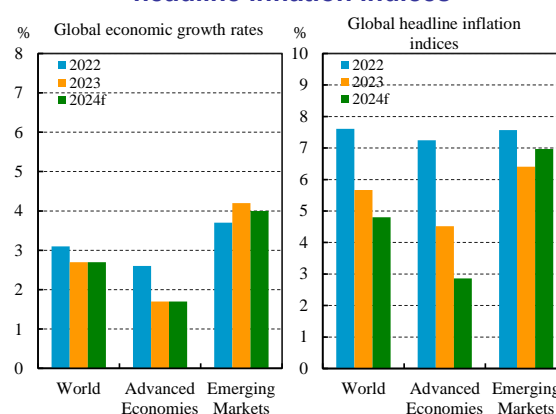
Note: Figures for 2024 are S&P Global Market Intelligence estimates.
Source: S&P Global Market Intelligence (2024/5/15).

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[1] S&P Global Market Intelligence (2024), *Global Executive Summary*, May.

cool inflation, ongoing geopolitical tensions could pose upside risks to international commodity prices again. In light of this, together with food insecurity arising from extreme climate events and rigidity of services sector prices, S&P Global predicts that the global CPI annual growth rate will drop moderately to 4.8% in 2024 (Chart 1.1), with only a slight decrease. Currently, central banks in the US and Europe intend to preserve interest rates at restrictive levels until inflation falls back to the desired range, though the timeline for potential rate cuts still remains highly uncertain. Therefore, the future trajectory of monetary policy is worthy of close attention.

Financial conditions turned to ease

In 2023, although major economies in Europe and the US continued to implement monetary tightening to tame inflation, investors anticipated that inflation would soon ease, leading to a more optimistic market expectation for interest rate cuts. As a result, global financial conditions turned to ease. On the other hand, in China, while financial conditions also became somewhat easier under monetary loosening, the overall condition remained relatively tight by historical standards owing to poor economic prospects and lingering pressures in the real estate market.

On the backdrop of supply chain disruptions, labor shortages, and a shifting preference to work from home, the commercial real estate (CRE) markets in the US and Europe witnessed a notable downturn. By the end of 2023, global real CRE prices had slumped, and the quality of loans had visibly deteriorated. In 2024, the IMF predicts that a drop in global CRE prices may have a significant impact on small and regional banks amid a tightening interest rate environment. These banks are generally less well capitalized and have a larger exposure to the CRE sector than large banks. If CRE prices fall, their funding ability will be constrained, thereby posing an adverse shock to the macro-financial environment.

In addition, geopolitical tensions will induce a reallocation of cross-border credit lines and portfolios. This could hinder capital accumulation, affect asset prices and allocations, and disrupt the international payment system, thereby jeopardizing macro-financial stability. Furthermore, the number of cyberattacks has skyrocketed, with banks being the most frequent targets. The IMF warns that cyberattacks can dampen market and public confidence in financial institutions, potentially leading to bank runs and posing liquidity risks in a severe scenario. Eventually, it will adversely affect macroeconomic and financial outcomes by undermining the ability of banks to grant loans and disrupting the functioning of payment systems.
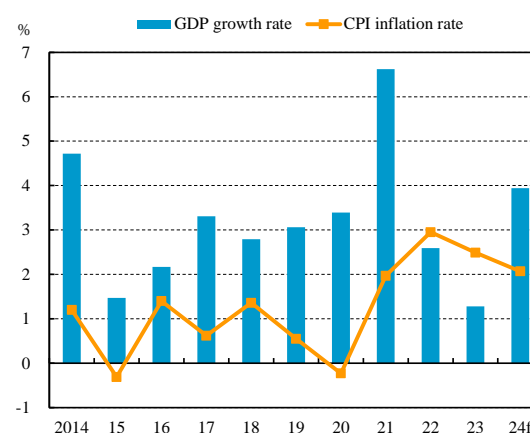
Domestic macro environment

Taiwan's economic growth decelerated; domestic inflation rates maintained a gradual downward trend, and external debt servicing capacity remained sound

In 2023, although exports declined, domestic consumption momentum grew rapidly as the impact of the domestic pandemic diminished, resulting in the annual economic growth rate of 1.28% (Chart 1.2).[2] The domestic inflation rate gradually decreased, with the annual CPI

Chart 1.2 Economic growth rate and CPI inflation rate of Taiwan

Note: Figures for 2024 are DGBAS forecasts released on May 30, 2024.
Source: DGBAS.

inflation rate falling to 2.49%. Looking ahead to 2024, Taiwan's exports and private investment are expected to recover, private consumption is anticipated to grow moderately, and government expenditure is projected to keep increasing. Considering these, together with a lower base comparison period, the DGBAS predicts that the annual economic growth rate will rise to 3.94%, with the CPI annual inflation rate dropping to 2.07%.

Taiwan's external debt[3] slightly rose to US$206.5 billion at the end of 2023, and FX reserves amounted to US$570.6 billion, implying a robust capacity to service external debt. Since the government continued to promote several initiatives such as the Forward-looking Infrastructure Development Program, technology-driven power generation, and the net-zero transition, the government's fiscal deficit stood at NT$145.6 billion,[4] equivalent to 0.62% of gross domestic product (GDP) for the year. This figure was much lower than those of major economies including the US, the UK, and Japan, as well as the internationally recognized minimum levels.[5] The ratio of total public debt to annual GDP continued dropping to 29.11%, implying that government debt still stayed within a manageable level.[6]

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[2] Data cited from the DGBAS in this report, including Taiwan's economic growth rate, GDP, and CPI figures of 2023, refer to its press release published on May 30, 2024.

[3] External debt refers to the combined amount owed to foreign parties by Taiwan's public and private sectors, including long-term debt with a maturity of greater than one year and short-term debt with a maturity of one year or less. Among them, public external debt refers to the external debt for which the public sector is directly responsible for repayment or provides payment guarantees. Private external debt, on the other hand, refers to external debt that does not include payment guarantees from the public sector.

[4] It is based on the latest data from the 2023 Yearbook of Public Finance Statistics, as of May 2024.

[5] As a comparison, fiscal deficits in European Union (EU) member nations are not allowed to exceed 3% of GDP according to the *Maastricht Treaty* and the subsequent *Stability and Growth Pact*.

[6] As a comparison, outstanding government debt in EU member nations is not allowed to exceed 60% of GDP according to the *Maastricht Treaty* and the subsequent *Stability and Growth Pact*.

Revenue of the corporate sector sharply contracted, resulting in reduced overall profitability

Affected by continually weak global economic growth in 2023, the corporate sector experienced a significant reduction in annual revenue, leading to a decline in the overall profitability of both TWSE- and OTC-listed companies (Chart 1.3, left panel). Among them, key industries such as electronics, shipping, plastics, and steel witnessed a slump in profitability. At the end of the year, leverage ratios for both TWSE- and OTC-listed companies improved (Chart 1.3, right panel). Despite the fact that their current ratios and interest coverage ratios have both trended downwards, the overall short-term debt servicing capacity remained sound. Finally, the non-performing loan (NPL) ratio for corporate loans from financial institutions dropped to a new low of 0.18% at the end of 2023, suggesting satisfactory credit quality.

Household borrowing expanded continually, but its financial health remained sound
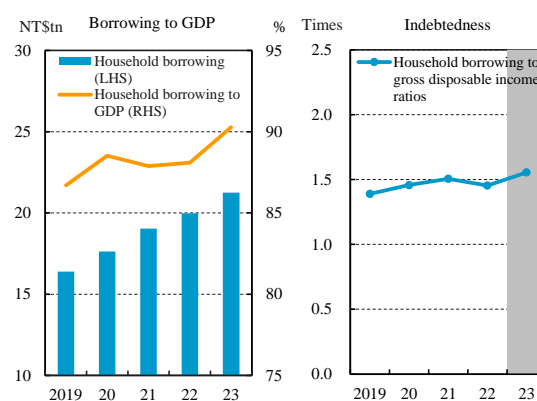
Chart 1.3 Return on equity and leverage ratios in the corporate sector
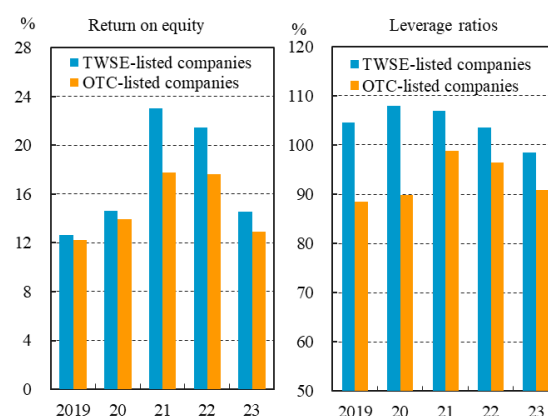
Notes: 1. Return on equity = net income before interest and tax/average equity.
2. Leverage ratio = total liabilities/total equity.
Source: TEJ.

Chart 1.4 Household indebtedness

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

Household borrowing reached NT$21.25 trillion at the end of 2023, equivalent to 90.27% of annual GDP (Chart 1.4, left panel). The annual growth rate rebounded to 6.38%, indicating continuous borrowing growth. The ratio of household borrowing to total disposable income rose marginally to 1.55 (Chart 1.4, right panel), reflecting a higher debt burden. Meanwhile, the debt servicing ratio ascended to 48.72%, suggesting that short-term debt servicing pressure tightened. Nevertheless, household net worth[7] in Taiwan has been remarkable and has held at

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[7] Household net worth includes household net non-financial assets and net financial assets. Net non-financial assets include produced assets (buildings and constructions, transport equipment, machinery equipment, etc.) and non-produced assets (construction land, non-construction land, and other assets). Net financial assets are domestic and foreign financial assets minus liabilities (deposits, loans, shares of listed companies or other enterprises, life insurance reserves, etc.).

more than 8 times the GDP in 2022, showing a healthy financial condition. The NPL ratio of household borrowing from financial institutions slightly increased to 0.13% at the end of 2023, remaining at a low level and demonstrating satisfactory credit quality. Given the subtle dip in real regular wages and elevating interest burdens arising from a gradual increase in bank loan rates, it is important to closely monitor changes in the debt servicing capacity of some households with higher debt burdens.

Transactions in the real estate market recovered and prices remained high, imposing a greater burden on homebuyers

Chart 1.5 Debt servicing ratios for housing loans and house price to income ratios
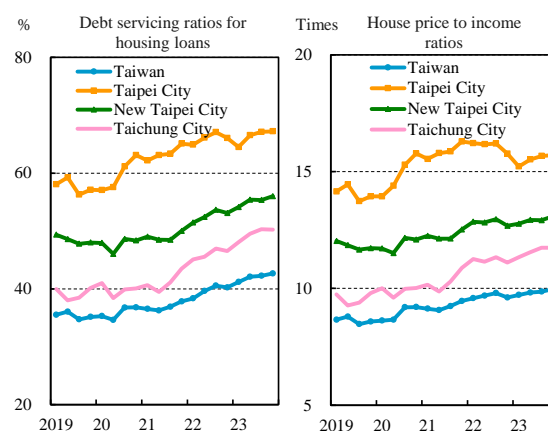
Notes: 1. Debt servicing ratio for housing loans = median monthly housing loan payment/median monthly household disposable income.
2. House price to income ratio = median house price/median annual household disposable income.
Source: Housing Price Affordability Indicator Statistics, Construction and Planning Agency of the MOI.

Following the implementation of the new Preferential Housing Loans for the Youth in 2023 Q3, there was a positive growth in the total number of building ownership transfers nationwide. As a consequence, the year-on-year growth rate went up to 26.01% in 2024 Q1. In the meantime, the total number of land ownership transfers surged in line with the heating up of the real estate market, with the annual growth rate reaching 17.90% in 2024 Q1. Regarding housing prices, the national housing price index released by the Ministry of the Interior (MOI) continued to rise gradually in 2023. The Cathay housing price index (for newly built houses) peaked in 2023 Q2 before slightly declining, but then rebounded in 2024 Q1 owing to a housing market rally. The Sinyi housing price index (for existing houses) picked up quarter by quarter. In sum, the Cathay housing price index and Sinyi housing price index both reached highs of 188.93 and 157.01, respectively, in 2024 Q1. Taiwan's debt servicing ratio for housing loans and house price to income ratio both saw consistent growth each quarter, with Taipei City exhibiting the highest figures among the six metropolitan areas (Chart 1.5).

From the second half of 2023, with a surge in the amount of the Preferential Housing Loans for the Youth, the annual growth rate of outstanding loans for house purchases and refurbishments has bounced back, but the rate of outstanding construction loans has kept dropping. Regarding the interest rate of real estate loans, it elevated to a new peak in May and mildly declined afterwards. However, it demonstrated a slight rebound after the Bank's policy

rate hikes in March 2024. Furthermore, the NPL ratios of housing loans and construction loans granted by domestic banks dropped to 0.06% and 0.04%, respectively, at the end of March 2024, showing satisfactory risk management on real estate lending. Since December 2020, the Bank has adjusted its selective credit control measures five times. In order to urge financial institutions to comply with regulations, the Bank also actively cooperated with the FSC to launch targeted examinations toward mortgage loans. Moreover, relevant ministries and agencies successively amended the regulations to refine management schemes and to prevent short-term speculation and tax evasion, in order to foster sound development in the real estate market.

Financial system assessment

Financial markets

The outstanding amount of issuance and trading volume of bills and bonds expanded compared to the previous year

In 2023, mainly driven by a substantial rise in the issuance of commercial paper (CP), the outstanding amount of bill issuance in the primary market went up by 15.81% year on year, and the trading volume also increased by 14.50% year on year (Chart 1.6, left panel). The outstanding amount of bond issuance grew by 3.87% over the end of the previous year and reached a new high. This growth was primarily fueled by elevating bond issuance from state-owned enterprises such as Taiwan Power Company and Chinese Petroleum Corporation. Trading volume in the secondary market[8] held at the same level compared to the end of 2022, with the outright transaction volume shrinking by 3.26%. As a consequence, the average monthly outright turnover rate of major bonds[9] continued its downward trend and declined further to a record low of 1.27% in 2024 Q1 (Chart 1.6, right panel).

Chart 1.6 Primary and secondary bill and bond markets
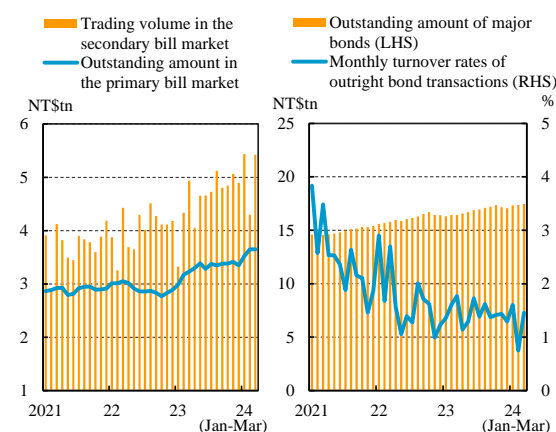
Notes: 1. Major bonds include government bonds, international bonds, corporate bonds, and financial debentures.
2. Monthly turnover rate = trading value in the month/average outstanding amount of bonds issued. Average outstanding amount of bonds issued = (outstanding amount at the end of the month + outstanding amount at the end of last month)/2.

Sources: CBC and FSC.

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[8] Includes repo and outright transactions.
[9] Includes government bonds, international bonds, corporate bonds, and financial debentures.

After the Bank raised policy interest rates and negotiable certificates of deposit (NCDs) interest rates in March 2023, the interbank overnight call loan rate trended upwards and then stabilized. Still, liquidity in financial markets remained ample. As for long-term market rates, during the first three quarters of 2023, Taiwan's benchmark 10-year government bond yields (hereinafter referred to as domestic 10-year government bond yields) fell gradually but then began to rise, peaking at 1.34% on October 19 before dropping again. Taking into account the possibility that geopolitical tensions could disrupt global supply chains and drive inflation higher, there remains pressure for global bond yields to escalate, which could influence the dynamic of domestic 10-year government bond yields. Therefore, the interest rate risks related to bond investments of domestic financial institutions warrant close attention.

Chart 1.7 TWSE market index and volatility
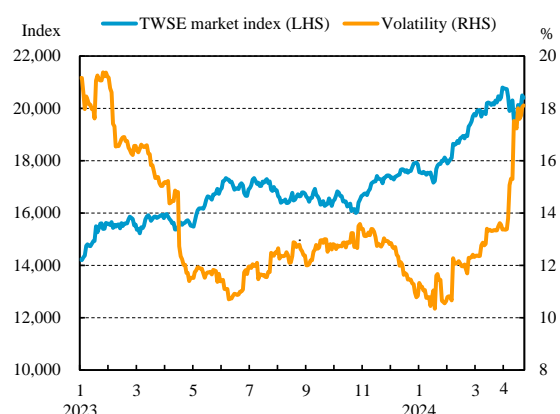
Note: Volatility refers to the annualized standard deviation of 60-day daily index returns.
Sources: TWSE and CBC.

Stock indices fluctuated with an uptrend and reached historical highs

From 2023 onwards, benefiting from international stock market recovery and massive inflows of foreign capital to invest in Taiwan's stock markets, the domestic stock market has shown an upward trend. At the end of 2023, the Taiwan Stock Exchange Weighted Index (TAIEX) closed at 17,931, posting an increase of 26.83% year on year, with the volatility gradually stabilizing and slipping to 10.78% by December. From January to April 2024, driven by market expectations that major central banks will ease monetary policies and a rise in technology stocks, the TAIEX climbed steadily and kept reaching historical highs with mounting volatility (Chart 1.7).

In 2023, the annual turnover rate in terms of trading value in the TWSE market elevated to 121.19%, underpinned by a buoyant stock market with ample liquidity. Domestic stock markets are highly correlated with international stock markets. Considering that rising geopolitical risks, a limited decline in global inflation, and uncertain monetary policy stances by major central banks will all affect the global economy and international stock markets and, in turn, impact the performance of domestic stock markets, it is necessary to pay close attention to these developments.

Furthermore, supported by the excellent performance of domestic stock markets, expectations for the Fed's policy rate cuts, and the incentive to invest in high dividend products in recent years, the domestic ETF market has grown rapidly. As those products become more complex and investment risks grow, it warrants closely monitoring the associated risks.

Chart 1.8 Movements of NT dollar exchange rate against US dollar
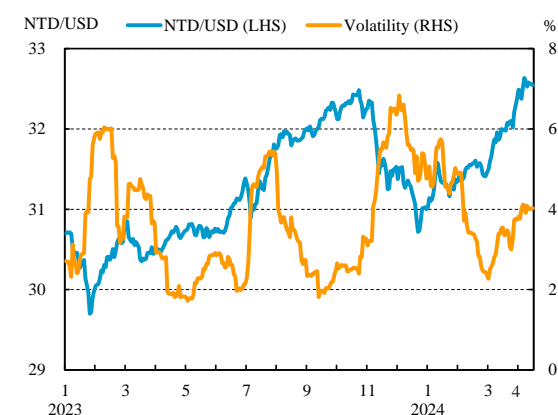
Note: Volatility refers to the annualized standard deviation of 20-day daily returns.

Source: CBC.

The NT dollar broadly depreciated against the US dollar, while its volatility remained relatively stable

In the first half of 2023, the NT dollar exchange rate against the US dollar appreciated to below 30 but then stabilized. In the second half of the year, the strong US dollar led to the NT dollar reversing and sharply depreciating against the US dollar. Subsequently, with a fall in US government bond yields and the US dollar from November onwards, the NT dollar exchange rate rebounded to 30.735 against the US dollar at the end of 2023, depreciating by 0.09% from the end of the previous year. In early 2024, continuously tight monetary policies by the Fed, coupled with escalating geopolitical risks, have driven the US dollar stronger. Accordingly, the NT dollar turned to depreciate and stood at 32.542 against the US dollar at the end of April 2024, depreciating by 5.55% compared to the end of 2023. Moreover, in 2023, owing to improved export performance and inflows of foreign capital, the nominal effective exchange rate (NEER) index of the NT dollar slightly increased, reaching 103.05 at the end of the year. Yet, because of the strong US dollar, the NEER of the NT dollar dropped to 100.4 at the end of April 2024.

The volatility of the NT dollar exchange rate against the US dollar fluctuated between 1.72% and 6.83% in 2023 and registered an annual average of 3.6%. From January to April 2024, the volatility ranged between 2.27% and 5.74% (Chart 1.8), which was relatively stable compared to major currencies.

Financial institutions

Domestic banks saw improvements in asset quality and consistently set new records in profitability, with capital adequacy levels also rising
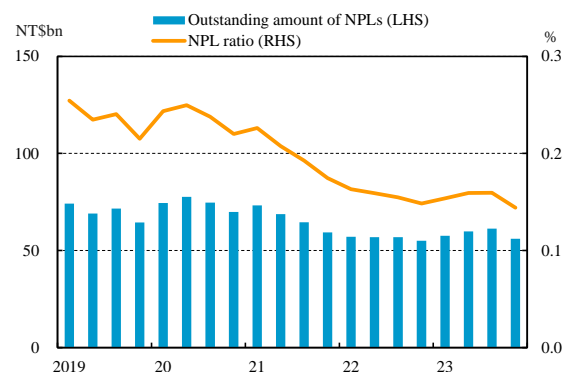
Growth in customer loans of domestic banks decelerated in 2023, while the credit concentration in corporate loans slightly decreased. However, the share of real estate-secured credit increased. The average NPL ratio declined to a record low of 0.14% at the end of the year (Chart 1.9), reflecting an improvement in credit quality, and the provisions for loan losses remained sufficient. Credit quality of overseas CRE deteriorated at the end of 2023, yet the risk was manageable because its share of total loans remained relatively low. Meanwhile, the exposures of domestic banks to China as a percentage of net worth continually descended to a new low of 23%. Nevertheless, the potential economic and financial risks in China are still elevated, which warrant constant close attention.

Chart 1.9 NPLs of domestic banks

Note: Excludes interbank loans.
Source: CBC.

Chart 1.10 Profitability of domestic banks

Notes: 1. ROE = net income before tax/average equity.
2. ROA = net income before tax/average total assets.
Source: CBC.

Benefiting from a pickup in profits from investment, gains on disposal, and valuation from FX swap transactions, the net income before tax kept rising by 20.30% to a new historical high of NT$472.6 billion (Chart 1.10, left panel). The average return on equity (ROE) and the return on assets (ROA) also went up to 10.33% and 0.70%, respectively (Chart 1.10, right panel), showing an improvement in profitability. Furthermore, the capital adequacy ratio rose to 15.33% and the capital quality was satisfactory.

Life insurance companies, after experiencing a slump in profits, saw a notable recovery, and their average RBC ratio improved

In 2023, life insurance companies saw a considerable year-on-year decrease in pretax income, down by 53.09% to NT$80.6 billion (Chart 1.11, left panel). This mainly resulted from a huge
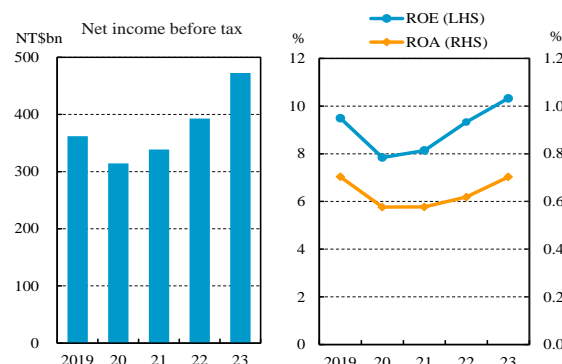
reduction in FX gains and the elevation of hedging costs. However, in 2024 Q1, primarily driven by an improvement in FX gains and investment revenue, the net income before tax rebounded sharply to NT$96 billion from the same period of the previous year. The average RBC ratio slightly rose to 298.09% at the end of 2023 (Chart 1.11, right panel). The average equity to asset ratio[10] also climbed to 7.12%, suggesting enhanced capital adequacy.

Foreign investment positions of life insurance companies grew continuously and reached NT$21.86 trillion at the end of 2023. Nonetheless, owing to uncertainties surrounding the US monetary policy outlook, as well as ongoing tensions from the Russia-Ukraine war and Middle Eastern conflicts, there are concerns about the impact on the performance of domestic and foreign stock and bond markets. Consequently, equity investment risk and interest rate risk are still elevated, and the FX risk inherent in large-value open FX positions still remains high. Moreover, in 2023, premium income fell short of benefit payment. Although cash and cash-equivalent positions were sufficient to cover these outflows, the future cash flow still warrants continuous attention.

Chart 1.11 Net income before tax and risk-based capital ratio of life insurance companies
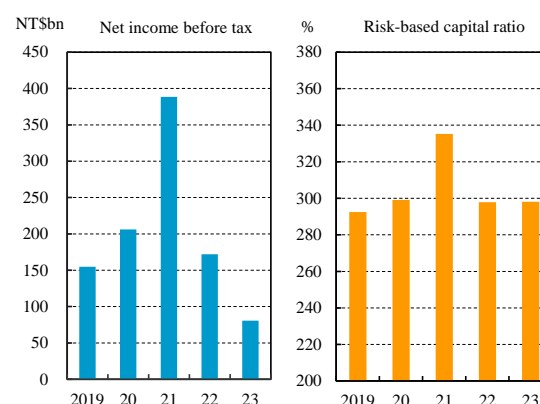
Note: Figures for risk-based capital ratios exclude insurance companies taken into receivership by the FSC.
Source: FSC.

Chart 1.12 Net income before tax and capital adequacy ratio of bills finance companies
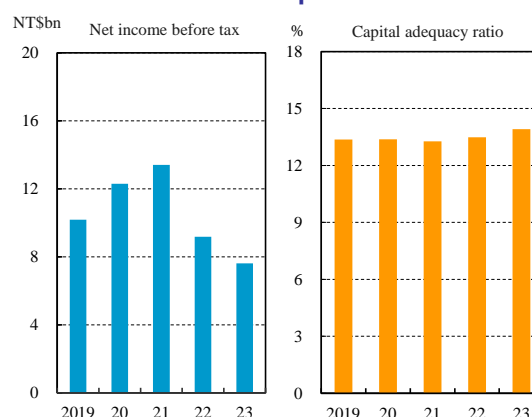
Source: CBC.

Bills finance companies' guarantee business recovered but saw a reduction in profitability and still-high liquidity risks

CP guaranteed by bills finance companies increased by 5.28% year on year in 2023, and the guaranteed advances ratio slid down to 0.07%, showing an enhancement in overall credit quality.

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[10] Assets are exclusive of the assets of insurance products in separate accounts.

The net income before tax of bills finance companies reduced by 17.05% year on year to NT$7.6 billion in 2023 (Chart 1.12, left panel), owing to a decrease in net interest income resulting from a narrowing yield spread between their long-term bonds and short-term reverse repos, along with an increase in loss reserves to guarantees. The average capital adequacy ratio continuously rose to 13.91% at the end of 2023 (Chart 1.12, right panel), and the ratio for each company remained well above the statutory minimum standard of 8%. Nevertheless, bills finance companies still faced a maturity mismatch between assets and liabilities, reflecting an elevated liquidity risk.

Financial infrastructure

Domestic payment systems functioned smoothly, and consumption via e-payment instruments expanded

The CBC Interbank Funds Transfer System (CIFS) functioned smoothly in 2023, settling funds worth a total of 23.2 times the GDP for the year. The total transaction values processed by the Interbank Financial Information System (IFIS) also increased by 2.63% compared to 2022. The overall consumption expenditure via a variety of e-payment tools[11] rose by 18.67%, mainly supported by the continuous improvement of shared infrastructure for retail payments, which has enhanced the convenience of e-payments. Additionally, the shared platform for cross-institution e-payments established by the Financial Information Service Co., Ltd. (FISC) introduced a new "e-payments for shopping" feature in October 2023. Meanwhile, Taiwan's common QR code payment standard was officially labeled as "TWQR." By means of the app of any e-payment institution, the public can seamlessly conduct transfers, bill payments, tax payments, and shopping transactions across different e-payment and financial institutions.

Other measures to strengthen the financial system

To promote the sustainable development of domestic enterprises and enhance the resilience of the financial industry in response to climate change risks, the FSC released the "Roadmap for Taiwan Listed Companies to Align with the IFRS Sustainability Disclosure Standards." Starting from 2026, listed companies will take a three-phase approach to adopt IFRS Sustainability Disclosure Standards. On top of that, the FSC has commissioned the Bankers Association of the Republic of China (BAROC) to develop a climate change scenario analysis model applicable to all domestic banks. The Bank also initiated research on climate risk

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[11] Non-cash payment tools include credit cards, debit cards, electronic tickets, electronic payment accounts, and ACH interbank collection.

methods for measuring and assessing climate change risks, which will serve as crucial references for future macro-stress tests on climate risks.

Moreover, in order to assist domestic insurers in gradually aligning with the International Financial Reporting Standards (IFRS) 17 and the new-generation solvency regime for the insurance industry, referred to as TW-ICS, the FSC has established transitional measures to help the industry smoothly align with international standards, thereby strengthening the resilience in sustainable operations for insurers. Furthermore, the FSC released guidelines for platforms involving digital lending and crypto assets to enhance protections for the rights and interests of customers. The FSC also launched the core principles and policies for AI applications, aiming to help financial institutions leverage the benefits of AI technology while effectively managing risks and safeguarding consumer rights.

Measures to promote financial stability

Measures undertaken by the Bank and the FSC to promote financial stability

Measures undertaken by the Bank to promote financial stability

From the beginning of 2023 onwards, Taiwan's inflation rate showed a downward trend. Nevertheless, considering that a proposed electricity rate hike could shift inflation expectations upwards, the Bank raised the policy rates by 0.125 percentage points in March 2024. The policy aims to tame domestic inflation expectations, sustain price stability and foster sound economic and financial development. Apart from that, with regard to international and domestic economic and financial conditions, the Bank conducted open market operations and managed reserve money at an appropriate level by issuing NCDs.

Moreover, the Bank adjusted selective credit control measures for the fifth time in June 2023, including the introduction of a 70% cap on the LTV ratio for a second home loan of a natural person for housing in a specific area, along with issuing measures targeting the funding needs of genuine homebuyers. The Bank also continually adopted flexible FX rate policies and undertook appropriate FX management measures (such as reinforcing off-site monitoring efforts and urging banks to enhance their exchange rate risk management) to safeguard the dynamic stability of the NT dollar exchange rate and maintain FX market order, thus ensuring sound financial development.

Measures undertaken by the FSC to maintain financial stability

The FSC required insurers to conduct stress tests and amended the formula for calculating their RBC ratios. Alongside that, for the sake of fortifying their risk-bearing capacity, the FSC approved that insurance companies could issue corporate bonds overseas as capital instruments. Likewise, to bolster banks' internal risk management capability and adopt more precise methods to measure and manage credit risk and credit assets, the FSC allowed banks to apply for the adoption of an internal ratings-based (IRB) approach for credit risk to calculate capital.

In addition, since the second half of 2023, given rapid growth of the ETF market in recent years, the FSC has successively introduced relevant supervisory measures to ensure the healthy development of the market and protect investor interests. These measures are based on ETF practices issued by international financial organizations and involve a gradual implementation of measures from three aspects, namely product structure, information disclosure and liquidity provision. The FSC also strengthened financial institutions' risk management for outsourcing operations and deliberated preventive measures against illegal offshore funds, targeting to reinforce the resilience of outsourcing operations and protect financial consumers.

The Bank will continue to adopt measures to promote financial stability when necessary

In 2023, affected by interest rate hikes by major central banks and heightened geopolitical risks, global economic growth momentum waned. Since early 2024, the global economy has been expected to rebound amid easing inflation worldwide. However, ongoing geopolitical conflicts have compounded the uncertainties over global economic prospects. In this context, Taiwan's financial institutions maintained robust operations, and financial infrastructures operated smoothly. As a whole, Taiwan's financial system still remained stable. To facilitate sound business operations of financial institutions and promote financial stability, the Bank will keep adopting appropriate monetary, credit and FX policies, and the FSC will revamp relevant financial regulations and enhance financial supervisory measures.

Looking ahead, the trajectory of monetary policy stances by major central banks may affect global economic growth and financial stability. Geopolitical risks and climate change would add to the uncertainties of global inflation as well as trade and economic development. Moreover, the high interest rate environment and the spillover effect of economic downturn in China still exist. These, coupled with supply chain restructuring and fragmentation of the global economy stemming from the ongoing US-China competition and the rise of national security

awareness, could pose adverse impacts on global economic development and financial stability. Against this backdrop, the Bank will continue to pay close attention to the impacts of relevant subsequent developments on domestic economic and financial conditions and take appropriate response measures in a timely manner, thus fostering financial stability.

II. Potential macro environmental risk factors

2.1 International economic and financial conditions

### *2.1.1 International economic conditions*

The economic growth rate saw only a slight decline throughout the year amid the global disinflation of 2023, reflecting resilient economic conditions. However, economic growth showed divergent paths across countries. Among them, the US and Japanese economies grew steadily, while the euro area experienced a sharp decline. China's economic growth somewhat exceeded the target, set at the beginning of the year, as a result of a lower base period in the previous year.

Looking ahead to 2024, in spite of the fact that global manufacturing and services sectors are expected to recover gradually, economic growth will stay at the same level owing to geopolitical tensions and still-high funding costs. Moreover, several adverse factors such as geopolitical issues are likely to limit the decline in global inflation, and the future trajectories of monetary policies in major economies are also highly uncertain.

Global economic growth showed resilience, but uncertainty remained elevated

During the global disinflation of 2023, sharp interest rate hikes by major central banks limited the momentum for economic growth. Nevertheless, thanks to greater-than-expected government spending and household consumption, employment and incomes saw steady growth. A higher-than-expected labor force participation rate also benefited a supply-side expansion. Moreover, the accumulation of substantial savings by the households in major advanced economies during the pandemic helped support global economic performance.

Chart 2.1 Global economic growth rates
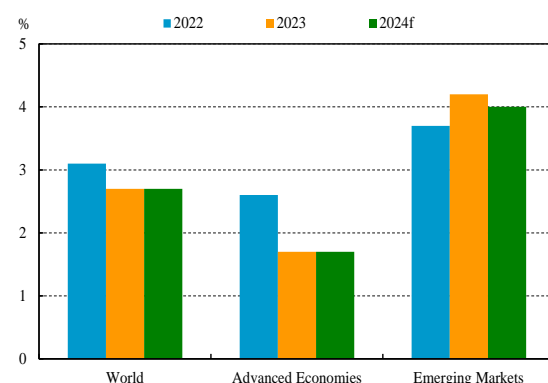
Note: Figures for 2024 are S&P Global Market Intelligence estimates.
Source: S&P Global Market Intelligence (2024/5/15).

Consequently, the economic growth rate only experienced a mild deceleration, dropping to 2.7% in 2023 (Chart 2.1), showing that economic activities were still resilient.

Looking forward to 2024, the gradual recovery in global manufacturing and services sectors are anticipated to fuel momentum for economic growth. Nonetheless, geopolitical tensions and elevated funding costs owing to the high interest rate environment, as well as uncertain monetary policy stances of central banks in the US and Europe, may impede global economic growth. Additionally, upcoming elections in the most populous economies, including the European Union, the US, and India, will further complicate international political and economic conditions. S&P Global estimates[12] that the global economic growth rate will remain at 2.7% in 2024. For advanced economies, growth is projected to remain at 1.7%, while the rate in emerging economies is expected to drop to 4.0% (Chart 2.1).

China's economic growth may slow down

In 2023, the post-pandemic economic recovery in China fell short of expectations. Defaults by major real estate developers, such as Evergrande Group and Country Garden Holdings Company Limited, triggered a domino effect that led to a significant downturn in the real estate sector and severely undermined market confidence. This greatly reduced the effectiveness of the government's economic stabilization policies. Nonetheless, owing to the lower base effect, the annual economic growth rate still rose substantially to 5.2% in 2023, surpassing the initial target of 5.0%.

Looking ahead to 2024, a resurgence in the real estate sector in China appears unlikely in the short term. Rising local government debt risks, coupled with sluggish investment, weak domestic demand, and a rapidly deteriorating demographic structure, are expected to decelerate economic growth. S&P Global forecasts that the annual economic growth rate will decline to 4.8%. In terms of fiscal conditions, China is anticipated to maintain its expansionary fiscal policy and intensify regulatory efforts to stabilize the economy. According to the IMF, China's government debt-to-GDP ratio is projected to continue trending up to reach 88.6% in 2024.

## *Global inflation moderated, but remained at elevated levels*

In 2023, oil prices had been affected by a mix of bullish and bearish factors. Among them, the output cuts announced by the Organization of the Petroleum Exporting Countries and its allies

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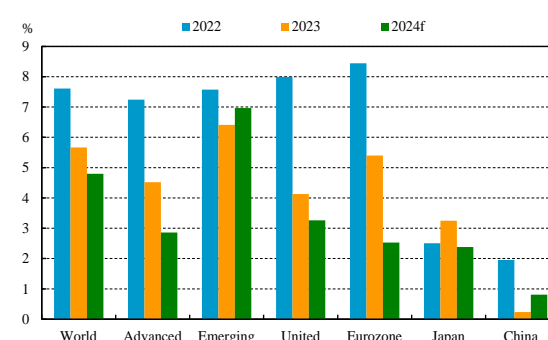[12] S&P Global Market Intelligence estimate on May 15, 2024.

(OPEC+) and the Red Sea shipping crisis led to a rise in oil prices. On the contrary, market expectations of oversupply as a result of the deteriorating economic outlook in China, along with a greater-than-expected increase in output among non-OPEC countries, suppressed the potential rise in prices. In sum, crude oil prices fluctuated within a limited range throughout the year (Chart 2.2). In terms of commodity prices, as central banks in major economies continued to adopt tightening monetary policies to curb inflation, the annual average of the R/J CRB Index, designed to track overall global commodity prices, came down to 272 in 2023 from 285 the previous year. As a result, the global CPI inflation rate declined to 5.7% in 2023 from 7.6% in 2022. Among economies, advanced economies and emerging economies saw decreases to 4.5% and 6.4%, respectively (Chart 2.3), albeit still higher than the pre-Russia-Ukraine war level in 2021.[13]

Chart 2.2 Global commodity prices
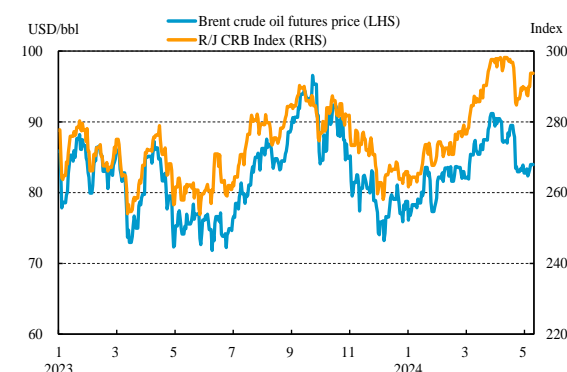
Source: Bloomberg.

Chart 2.3 Global headline inflation indices

Note: Figures for 2024 are S&P Global Market Intelligence estimates.
Source: S&P Global Market Intelligence (2024/5/15).

From the beginning of 2024 onwards, a constant softening in labor markets and relatively tight monetary policies helped cool inflation. However, given ongoing geopolitical tensions, commodity prices may be exposed to upside risks again owing to shipping disruptions. Considering this, together with food insecurity arising from extreme climate events and El Niño, as well as rigidity of services sector prices, S&P Global predicts that the global CPI annual growth rate will drop only moderately from 5.7% to 4.8% in 2024. On one hand, the rate in advanced economies is expected to continuously decrease to 2.9%. On the other hand, S&P Global anticipates that the CPI inflation rate of emerging economies will rebound to 7.0% as many economies in Latin America and emerging Europe have already begun easing cycles (Chart 2.3).

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[13] The global CPI inflation rate in 2021 was 3.9%. Among economies, advanced economies and emerging economies reported CPI inflation rates of 3.2% and 3.9%, respectively. For more details, please refer to CBC (2023), *Financial Stability Report*, May.
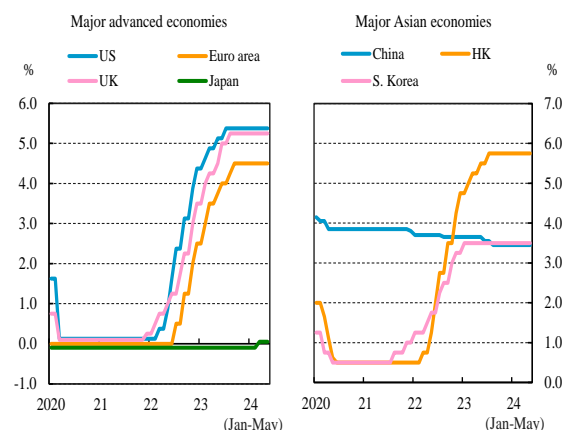
The future monetary policy path of major central banks remains unclear

Since the second half of 2023, considering the progress made on combating inflation, together with subdued global manufacturing, moderate activity in services sectors such as tourism and entertainment, and rising global geopolitical risks that might hinder global trade recovery, most of the major economies' central banks have paused interest rate hikes but kept rates at an elevated level. Among them, the Fed put a hold on interest rate hikes after raising its target band for the federal funds rate to 5.25%-5.50% in July 2023, and continued to reduce the size of its balance sheet. The Fed emphasized it would maintain the target range until inflation was moving sustainably toward 2%.

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. Asian economies: 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, 2024.

Sources: Central banks and monetary authority websites.

The European Central Bank (ECB) suspended reinvestments under the asset purchase program as of July 2023, and raised its main interest rates two times, totaling 0.5 percentage points (pps), in July and September, respectively, before keeping them unchanged. The ECB stated that it would gradually adjust its monetary policy stance based on the incoming economic and financial data, the dynamics of underlying inflation and the transmission effects of monetary policy on the inflation outlook. In view of the ongoing inflationary pressures resulting from wage growth, the Bank of England (BoE) also paused rate hikes after raising its Bank Rate in August 2023 by 0.25 pps to 5.25%. As for Japan, thanks to relatively mild domestic inflationary pressures, the Bank of Japan (BOJ) kept an accommodative monetary policy. Nonetheless, in March 2023, the BOJ raised the policy rate by about 0.10 pps, ending its negative interest rate policy (Chart 2.4).

Among Asian economies, China continued its accommodative monetary policies to underpin the real economy. Since the second half of 2023, the People's Bank of China (PBOC) has successively reduced the loan prime rate and the reserve requirement ratio for financial institutions. Meanwhile, the Bank of Korea decided to maintain its restrictive monetary policy stance over a certain period of time in the future. It will keep its policy rate unchanged at 3.50% with the aim of ensuring price stability. The Hong Kong Monetary Authority, for the purpose

of maintaining effective operation of the linked exchange rate system, raised the Base Rate by 0.25 pps in July 2023 following the Fed's rate hikes (Chart 2.4).

Currently, central banks in the US and Europe intend to maintain interest rates at restrictive levels until inflation falls back to the desired range. However, the timeline for rate cuts, to some extent, still remains uncertain. A premature pivot toward monetary easing could lead to an overheated economy triggering asset price bubbles, thus pushing up inflation once again. Instead, if rates were cut too late, it could result in a recession and, in turn, have an impact on the financial system. The future trajectory of monetary policy, therefore, warrants close attention.

2.1.2 Global financial conditions

From the beginning of 2023 onwards, despite the fact that global central banks maintained high interest rates to curb inflation, the pace of rate hikes has slowed, which has fueled optimism about future rate cuts. As a result, international stock and bond markets have rebounded noticeably and global financial conditions have turned to ease. However, despite a slight easing in China, the poor economic outlook, coupled with significant declines in property prices and corporate valuations, means that China's financial conditions have been kept somewhat tight by historical standards.

Looking ahead to 2024, several factors warrant close attention as they could heighten global financial instability risks, including the future trajectories of monetary policies among major central banks in advanced economies (e.g., the Fed), the deterioration of credit quality in the US CRE markets, the ongoing developments in China's financial and real estate markets, together with its substantial levels of local government debt, and the elevating geopolitical and cyber risks.

Financial conditions turned to ease

In 2023, although major economies, such as Europe and the US, continued to implement monetary tightening to tame inflation, investors anticipated that inflation would soon ease and central banks were likely to achieve a soft landing relying on their policy tools. Supported by widespread market expectations of interest rate cuts, corporate valuations in advanced economies like Europe and the US improved, resulting in gradually easing financial conditions. On the other hand, in China, financial conditions have eased slightly amid monetary loosening. However, concerns surrounding the lack of economic growth momentum and the pressure on

the real estate market have raised financial stability risks. These issues have eroded the prices of risky assets and investor confidence, keeping financial conditions relatively tight.

Since the beginning of 2024, market investors have held a cautiously optimistic outlook on achieving a soft landing. This, together with decreasing long-term bond yields and the recovery of stock and corporate bond markets, have further loosened financial conditions, especially in advanced economies. In emerging markets, decreasing volatility in exchange rates has led to a lower external financing risk, thus modestly easing financial conditions. In China, notwithstanding further easing of financial conditions compared to a year earlier, the overall condition remained tight by historical standards owing to persistent weakness in the real estate market.

The future trajectories of monetary policies in advanced economies will have decisive impacts on financial markets

From the beginning of 2023 onwards, amid abating inflation, global stock markets have been mildly recovering. Nonetheless, in October, the surge in US government bond yields reduced the attractiveness of stocks, bringing about capital outflows from stock markets and a reversal in prices. Since November, with market expectations that the Fed's rate hike cycle would conclude soon, along with optimistic prospects in industries like semiconductors fueled by robust demand for AI-related products, stock markets in Europe, the US, and Japan saw substantial gains, with Japan showing the most remarkable increase (Chart 2.5).

With regard to bond markets, in 2023, as a consequence of ongoing tightening monetary policies by central banks in Europe and the US, government bond yields gradually ascended. Among them, the yield on the US 10-year Treasury hit a 16-year high in October but later retreated as the market predicted a shift in the Fed's monetary policy stance. Subsequently, European and US bond yields fluctuated within a narrow range. Japan scrapped its negative interest rate policy, leading to mounting government bond yields. In China, monetary policy remained accommodative owing to a slower-than-expected economic recovery, which triggered a gradual decline in

Chart 2.5 Major international equity indices
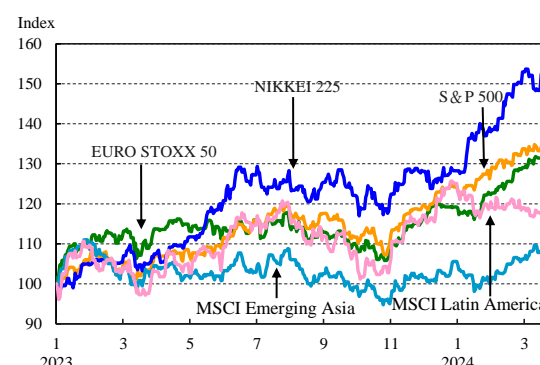
Notes: 1. January 1, 2023 = 100.
2. The EURO STOXX 50 refers to a stock index consisting of the largest 50 stocks in the 12 major economies of the euro area.
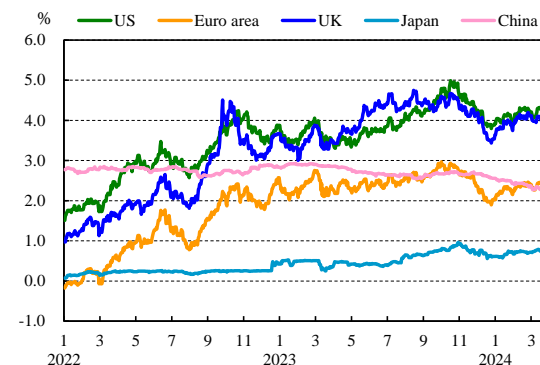Source: Bloomberg.

bond yields (Chart 2.6). The movement of US interest rates has caused fluctuations in both the global financial cycle and financial asset prices. Therefore, the end of the Fed's rate hike cycle will undoubtedly pose a critical impact on global financial markets, warranting close attention.

Chart 2.6 10-year government bond yields in major economies

Source: Bloomberg.

The weakening of China's housing and stock markets, coupled with unresolved local government debt issues, could exert a serious adverse effect on financial institutions

Compared to the housing price trajectories during Japan's real estate bubble in the early 1990s, China's housing market downturn has shown few signs of bottoming out and declines in the prices of newly built houses have been moderate (Chart 2.7). Yet, home prices, sales and investments have dropped off sharply. In spite of the government's supportive policies, the effectiveness in restoring home buyers' confidence was somewhat limited. The abovementioned policies include mortgage rate cuts, easing of home purchase restrictions, and encouraging banks to grant loans for real estate enterprises and the redevelopment of urban villages, which are literally traditional villages within a city.

Chart 2.7 China versus Japan's 1990s housing market movements

Notes: 1. The vertical axis represents an index with the highest data point set to 100.
2. On the horizontal axis, the starting point of the data is 0, and 60 represents 60 months after the starting point. For China's data of newly built houses, the starting point is September 2021; for data of existing houses, the starting point is December 2021. The starting point for Japan's housing price data is September 1990.
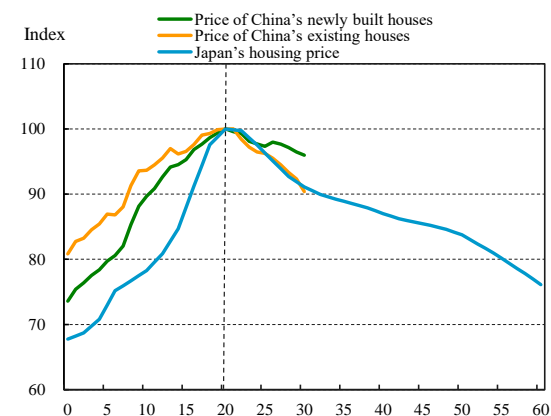Source: IMF (2024), Global Financial Stability Report, April.

Apart from the real estate market, the continuing operation of China's local government financing vehicles (LGFVs) has also raised market concerns. By the end of 2022, total LGFV debt reached 45% of GDP, with four-fifths held by banks, mainly in the form of loans. More than 30% of this LGFV debt has had an interest coverage ratio below 1, which can be considered nonperforming without government support. If the banks were to suffer half of the debt restructuring cost of the LGFV debt, they could face impairment charges of about RMB3.4

trillion, equivalent to a reduction of 1.7 pps in their average capital adequacy ratios.

Reflecting property market ailments as well as disinflationary pressures, China's stock market has come under pressure. In comparison to the strong rebound in global stock markets, Chinese and Hong Kong stock prices saw a slump, dragging down the net asset value of equity and hybrid mutual funds by over 20%. Since wealth management products such as funds are held almost exclusively by retail investors who lack experience in handling market volatility, an increase in bond yields could prompt large-scale redemptions by investors. This, in turn, would induce further spikes in yields and trigger tightening in other funding markets.

Chart 2.8 CRE coverage and NPL ratios in the US
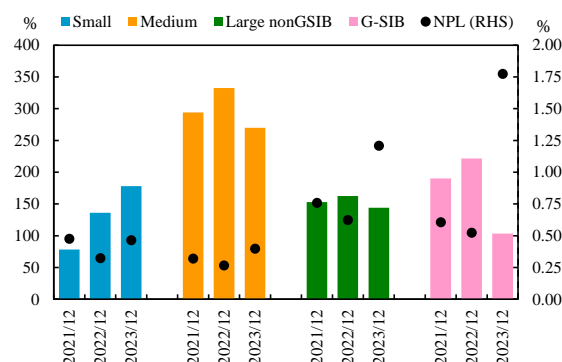
Notes: 1. The left scale represents the coverage ratio, while the right scale represents the nonperforming loan rate.
2. Small banks correspond to banks with less than $10 billion in total assets, Medium banks correspond to banks with assets between $10 billion and $100 billion, Large nonGSIB corresponds to large banks with assets above $100 billion not classified as G-SIBs, and G-SIB corresponds to banks classified as G-SIBs.

Source: IMF (2024), *Global Financial Stability Report*, April.

The CRE sector in the US faced big challenges

Since the outbreak of the pandemic in 2020, the real estate market has undergone structural changes. Under the impacts of supply chain disruptions, labor shortages, and a shifting preference to work from home, the CRE market in the US and Europe witnessed a notable downturn. In 2023, global real CRE prices fell, with the US office sector dropping sharply by 23%. In a high interest rate environment, it was estimated that of the $1 trillion of debt maturing in the US CRE market in 2024 and 2025, the refinancing gap would exceed $300 billion. In addition, the quality of CRE loans also deteriorated markedly. The nonperforming CRE loan rate for US banks by the end of 2023 doubled from a year earlier, reaching 0.81%, and the coverage ratio slid to 154%, with a more pronounced decrease for global systemically important banks (G-SIBs) than for other banks (Chart 2.8).

In 2024, global CRE prices could decline by more than 10% in several segments. This may have a significant effect on small and regional banks, which are generally lower capitalized and have a larger exposure to the CRE sector than large banks, thus constraining their funding ability when CRE prices fall. Under severe scenarios, this could bring about more restrictive funding conditions, and ultimately form a vicious cycle of plummeting CRE prices and bank losses, which might pose an adverse shock to the macro-financial environment.

Geopolitical and cyber risks may threaten financial stability

With the outbreak of the Russia-Ukraine war, and conflicts between Israel and Palestine, as well as Israel and Iran, prolonged hostilities will continuously impose high uncertainty on the global economic outlook. If these conflicts escalate and severely impact economic activities, there would be a sudden pullback from risky assets, resulting in negative effects such as large declines in asset prices.[14] Furthermore, geopolitical tensions will induce a reallocation of cross-border credit lines and investment portfolios. A worsened situation could cause a reversal of capital flows from rival countries and a reduction in foreign direct investment. This, in turn, may affect asset prices and allocations, and disrupt the international payment system, thereby undermining macro-financial stability.

Since the outbreak of the COVID-19 pandemic in 2020, owing to increasing dependency on technology, together with financial innovation and Russia's invasion of Ukraine, the number of cyberattacks has almost doubled. Additionally, almost one-fifth of the cyberattacks in the past two decades have influenced the financial sector, with banks being the most frequent targets. Cyberattacks can dampen market and public confidence in financial institutions, potentially leading to bank runs and posing liquidity risks. Eventually it could adversely affect macroeconomic and financial outcomes by undermining the ability of banks to grant loans and disrupting the functioning of payment systems.

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[14] OECD (2023), *OECD Economic Outlook, Volume 2023 Issue 2*, November.

2.2 Domestic macro environment

2.2.1 Domestic economic and fiscal conditions

In 2023, under the environment of declining exports amid increasing private consumption, domestic economic growth decelerated and the inflation rate continued its downward trend. External debt servicing capacity stayed robust on the back of a persistent surplus in the balance of payments and ample FX reserves. Moreover, despite fiscal deficits, outstanding public debt stayed within a manageable level, which was conducive to weathering uncertainties surrounding international political and economic situations and maintaining economic growth momentum.

Taiwan's economic growth decelerated

In 2023, although exports declined, the impact of the domestic epidemic diminished, domestic consumption momentum grew rapidly, and private consumption continued to increase. The annual economic growth rate decelerated to 1.28% (Chart 2.9).[15] Looking ahead to 2024, the anticipated rebound in global commodity trade growth, together with expanded business opportunities in applications of emerging technologies, are expected to bolster exports and private investment momentum. In addition,
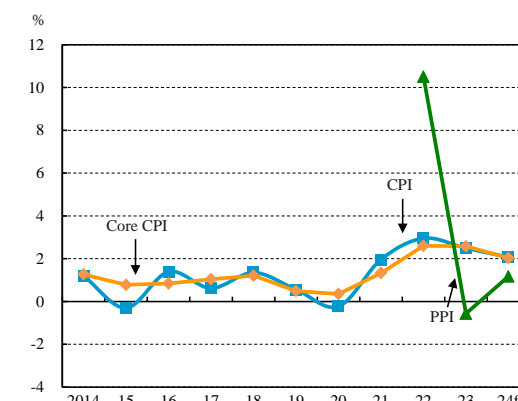
Chart 2.9 Economic growth rate in Taiwan
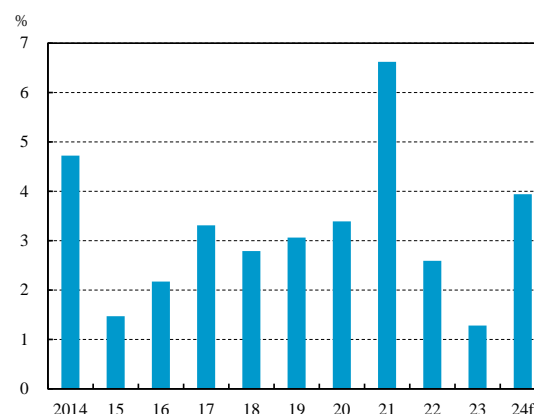
Note: Figure for 2024 is a DGBAS forecast released on May 30, 2024.
Source: DGBAS.

Chart 2.10 Consumer and wholesale price indices (% change, yoy)

Notes: 1. Figures for Core CPI in 2024 are CBC forecasts released on March 21, 2024; other figures are DGBAS statistical data and a forecast released on May 30, 2024.
2. DGBAS discontinued the calculation of the WPI from January 2023 and introduced the PPI from January 2021 to align with international practices.
Sources: DGBAS and CBC.

moderate growth in private consumption, the further increase in government expenditure, and a lower base comparison period are expected to contribute to the economic recovery. Taking into account the strong demand for emerging technologies such as Artificial Intelligence (AI), which

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[15] See Note 2.

boosts Taiwan's international trade momentum, the DGBAS revised the annual economic growth rate forecast up to 3.94% (Chart 2.9).

Domestic inflation rates maintained a gradual downward trend

In 2023, as the global economy slowed down and demand weakened, international crude oil and raw material prices declined, resulting in a downward trend in annual producer price index (PPI) inflation. Annual PPI inflation dropped to -0.57% from 10.51% a year earlier. With regard to consumer prices, although domestic demand for entertainment and services increased significantly after the pandemic, commodity prices rose at a slower pace owing to declines in imported crude oil and other raw materials. As a result, annual CPI inflation decreased to 2.49%

in 2023 from 2.95% a year earlier. Core CPI inflation, which excludes fruit, vegetables, and energy, also slightly decreased to 2.58% in 2023 from 2.61% a year earlier (Chart 2.10). In April 2024, influenced by the slower increase in food, entertainment, and services prices, annual CPI inflation continued to decrease to 1.95%. Similarly, annual core CPI inflation also decreased to 1.81%, maintaining a gradual downward trend.

Looking ahead to 2024, international institutions forecast that oil prices will be slightly higher than they were a year earlier. Domestic commodity prices are expected to rise moderately, while inflation is anticipated to decrease because of the higher base period effect on domestic services prices. Therefore, the Bank forecasts that the domestic inflation rate will decelerate compared to a year earlier. However, following the domestic electricity price adjustment in April, the Bank revised its predicted annual CPI and core CPI inflation rates for 2024 upward to 2.16% and 2.03%, respectively, on March 21 (Chart 2.10), which

Chart 2.11 Private credit provided by financial institutions
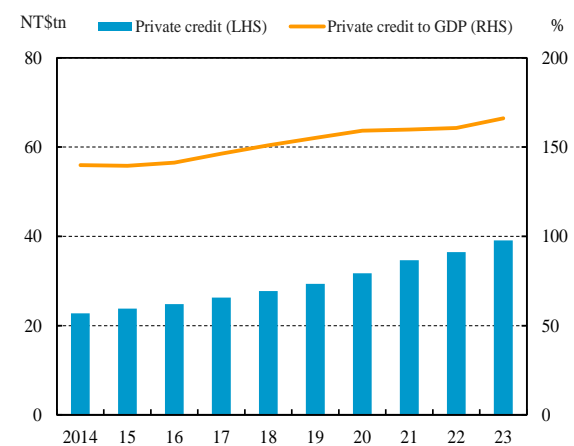
Sources: DGBAS and CBC.

Chart 2.12 Current account surplus and net asset increase in financial account
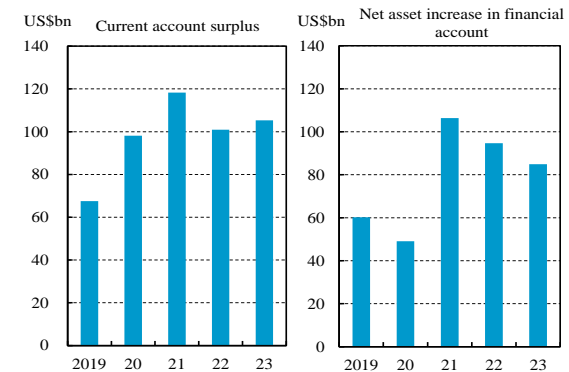
Source: CBC.

were still lower than 2.49% and 2.58% as compared to a year earlier. Furthermore, considering the still-high prices of essential consumer items such as medical care, food, and housing, the DGBAS revised its predicted annual CPI inflation rate for 2024 upward to 2.07% in May.

Credit to the private sector increased continually

Private credit [16] to private enterprises and households provided by domestic financial institutions continued to grow in 2023, reaching NT$39.11 trillion at the end of the year, an increase of 7.29% year on year, which far exceeded the economic growth rate of 1.28% in the same year. The ratio of credit to GDP registered 166.11%, also higher than 160.72% as compared to a year earlier (Chart 2.11). 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

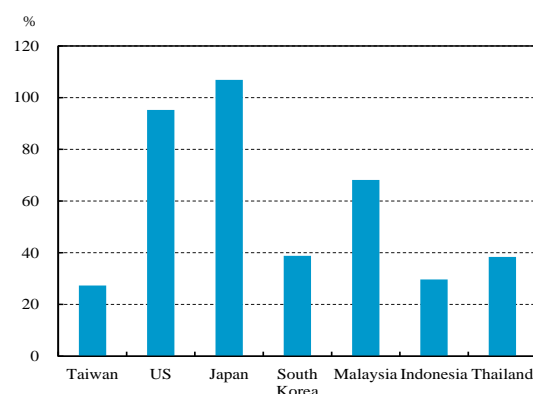**Chart 2.13 External debt servicing capacity**
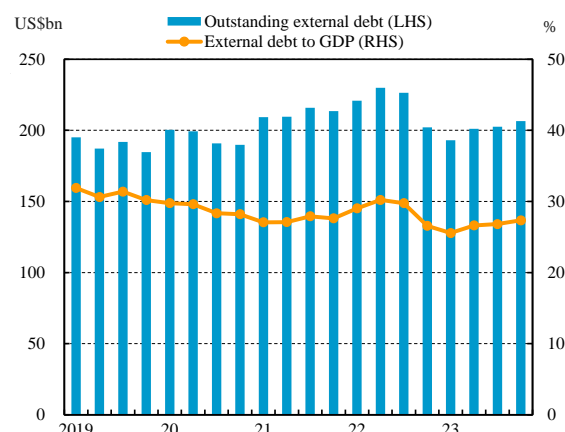
Notes: 1. Figures for outstanding external debts are on an end-of-period basis.
2. Figures for GDP are on an annualized basis.
Sources: CBC and DGBAS.

Chart 2.14 External debt to GDP in selected countries

Note: Figures are as of the end of 2023.
Sources: CEIC and DGBAS.

In 2023, owing to an increase in the merchandise trade surplus, the annual current account surplus rose to US$105.3 billion (Chart 2.12, left panel), or 13.95% of the year's GDP, an increase of US$4.4 billion, or 4.36% over the previous year.[17] In terms of the financial account, as banks and domestic securities investment trust funds increased foreign securities investments and enterprises also increased foreign direct investment, which boosted foreign assets, the financial account posted an increase of US$84.9 billion throughout the year (Chart

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[16] 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.

[17] 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.

2.12, right panel). Meanwhile, the Bank's reserve assets increased by US$14.3 billion compared to the previous year.

FX reserves amounted to US$570.6 billion at the end of 2023, rising by 2.82% from a year earlier, mainly supported by the earnings from portfolio investment operations of FX reserve assets. At the end of April 2024, the FX reserves slightly decreased to US$567 billion.

The scale of external debt expanded, while debt servicing capacity remained strong

Primarily because of an increase in the short-term external debt of the domestic banking sector, Taiwan's external debt[18] slightly rose to US$206.5 billion at the end of 2023, increasing by 2.15% compared to a year earlier (Chart 2.13). The largest share of external debt went for the private sector, registering US$205.6 billion, while the public sector share only reached US$0.9 billion. Taiwan's external debt to GDP stood at 27.35% at the end of 2023, slightly increasing from 26.57% at the end of the previous year. It was lower than those in the US and neighboring Asian countries (Chart 2.14), and far below the internationally recognized alert threshold.[19]

Furthermore, at the end of 2023, the ratio of FX reserves to short-term external debt slightly rose to 2.98 times owing to an increase in FX reserves (Chart 2.15), and was still much higher than the internationally recognized alert threshold,[20] implying that Taiwan's FX reserves have a decent capacity to meet short-term external debt obligations.

Chart 2.15 Short-term external debt servicing capacity
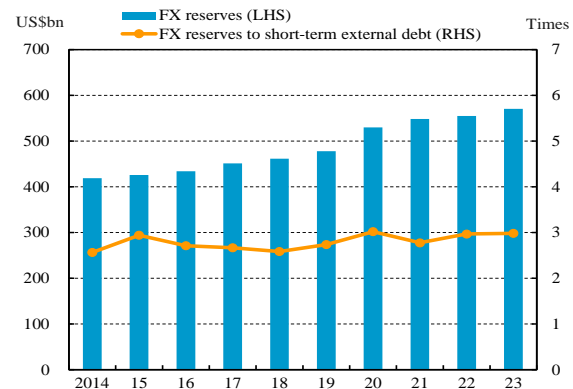
Source: CBC.

Chart 2.16 Fiscal surpluses or deficits
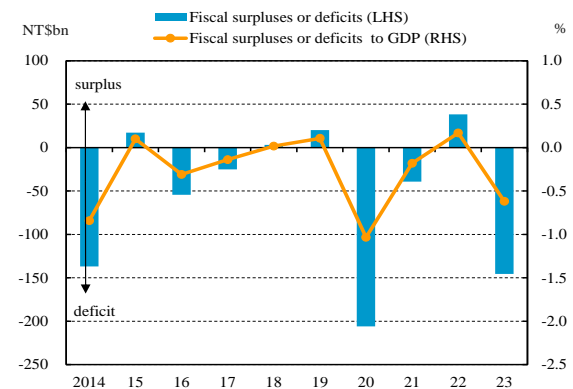
Notes: 1. Fiscal position data include those of central and local governments.
2. Figures for 2023 are final accounts for the central government and self-compiled final accounts for local governments.

Sources: MOF and DGBAS.

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[18] See Note 3.
[19] 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.
[20] 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.

Although the fiscal position registered a deficit, government debt to GDP decreased and stayed within a manageable level

In 2023, to address uncertainties in international political and economic conditions and sustain economic growth momentum, the government continued to promote several initiatives such as the Forward-looking Infrastructure Development Program Phase 4, technology-driven power generation, the net-zero transition, improvements in defense and armaments, and measures to counter the falling fertility rate. Consequently, the government fiscal deficit stood at NT$145.6 billion, [21] equivalent to 0.62% of GDP for the year (Chart 2.16), which was much lower than those of major economies including the US, the UK, and Japan (Chart 2.17), and also much lower than internationally recognized minimum levels. [22]

The outstanding public debt at all levels of government [23] rose to NT$6.9 trillion at the end of 2023, increasing by 2.58% year on year.

Chart 2.17 Fiscal surpluses or deficits to GDP in selected countries
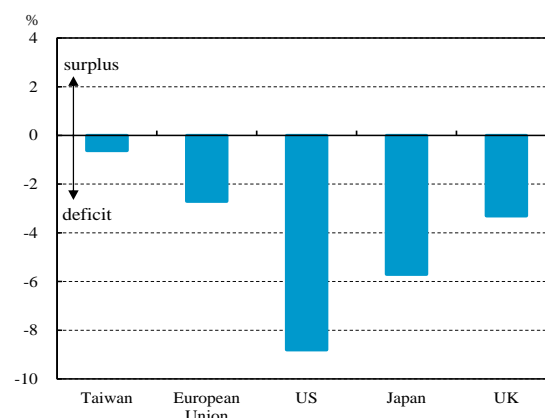
Note: Figures are as of the end of 2023.
Sources: IMF and MOF.

Chart 2.18 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 2023 are preliminary final accounts for the central government and self-compiled final accounts for local governments.
Sources: MOF and DGBAS.

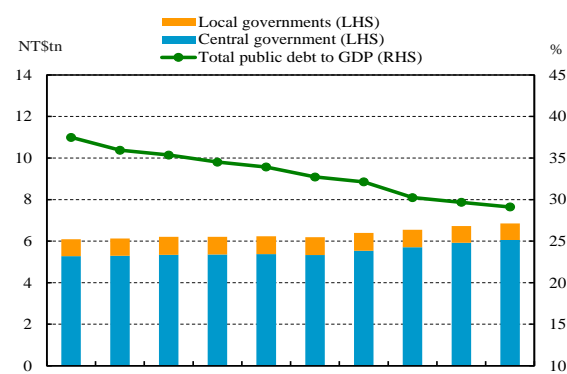Nevertheless, the ratio of total public debt to the year's GDP continued to drop to 29.11% (Chart 2.18), indicating that government debt stayed within a manageable level. [24]

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[21] See Note 4.
[22] See Note 5.
[23] The term "outstanding public 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.
[24] See Note 6.

2.2.2 Corporate sector and household sector

Corporate sector

Since 2023, global economic growth has remained sluggish, resulting in a decline in overall profitability within the corporate sector. By the end of the year, listed companies had improved their financial leverage and maintained strong short-term debt servicing capacity, while their foreign currency debt positions continued to decrease. However, it remains imperative to prudently manage their exchange rate risks. The NPL ratio for corporate loans granted by financial institutions reached a new low at the end of the year, and the credit quality for the corporate sector was satisfactory.

Decline in overall revenue of TWSE- and OTC-listed companies

Affected by continually weak global economic growth in 2023, the corporate sector experienced a significant reduction in annual revenue, leading to a decline in the overall profitability of listed companies. The average ROEs for TWSE- and OTC-listed companies decreased to 14.57% and 12.92%, respectively (Chart 2.19).

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

At the end of 2023, the average leverage ratios for TWSE- and OTC-listed companies decreased from 103.62% and 96.44% at the end of the previous year to 98.44% and 90.88%, respectively (Chart 2.20), indicating a continuous improvement in the overall financial leverage level of listed companies.

Chart 2.19 Return on equity in corporate sector
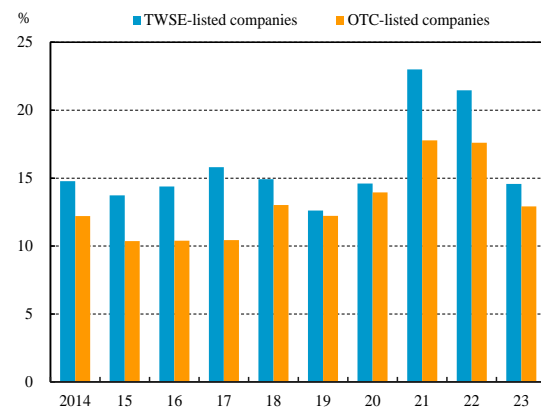
Note: Return on equity = net income before interest and tax/average equity.
Source: TEJ.

Chart 2.20 Leverage ratios in corporate sector

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

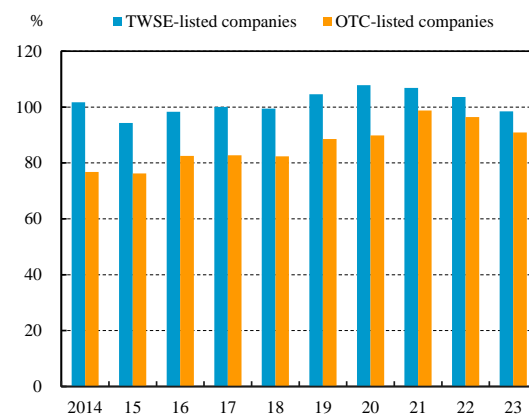Furthermore, the current ratios for TWSE- and OTC-listed companies declined from 163.75% and 189.47% at the end of the previous year to 161.97% and 176.60%, respectively (Chart 2.21). Their average interest coverage ratios both dropped sharply from 22.87 times and 23.79 times at the end of the previous year to 10.83 times and 13.19 times, respectively (Chart 2.22), because of the decrease in net profits. However, the overall short-term debt servicing capacity of listed companies remained sound.

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

With the ongoing reduction in foreign currency liabilities, the foreign currency liability-to-equity ratios of listed companies decreased from 28.12% and 20.01% at the end of the previous year to 26.02% and 16.38%, respectively, as of the end of September 2023 (Chart 2.23). Given the uncertain monetary policies of major economies and the increasing geopolitical risks in recent years, spillover effects could exacerbate volatility in the international foreign exchange market, impacting the ability of listed companies to service their foreign currency liabilities. Therefore, it remains advisable for listed companies to continue prudently managing exchange rate risks.

Chart 2.21 Current ratios in corporate sector
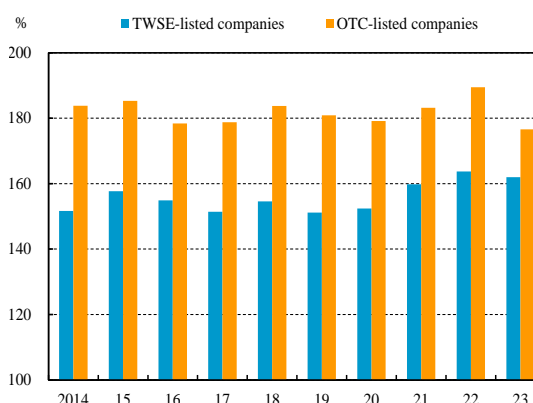
Note: Current ratio = current assets/current liabilities.
Source: TEJ.

Chart 2.22 Interest coverage ratios in corporate sector
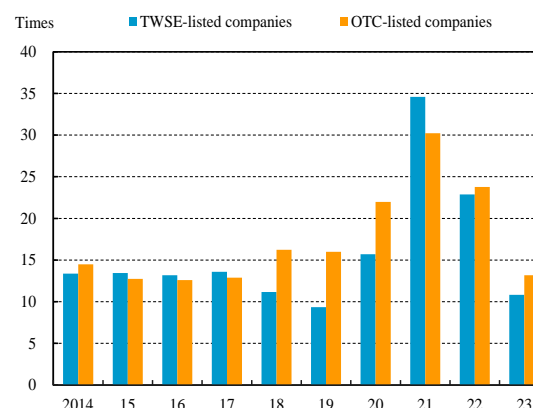
Note: Interest coverage ratio = income before interest and tax/interest expenses.
Source: TEJ.

Chart 2.23 Foreign currency liability-to-equity ratios in corporate sector

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

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

At the end of 2023, the NPL ratio for corporate loans from financial institutions decreased to a new low of 0.18% from 0.21% a year earlier (Chart 2.24). This indicates that the overall credit quality of the corporate sector remained satisfactory.
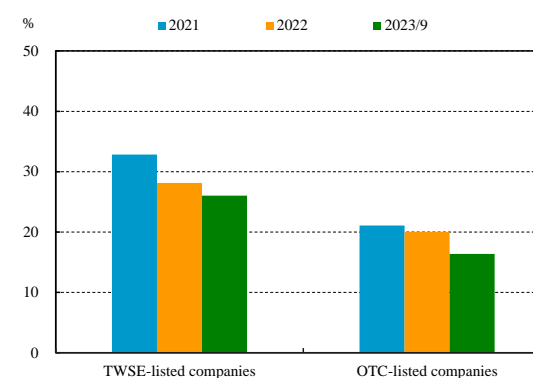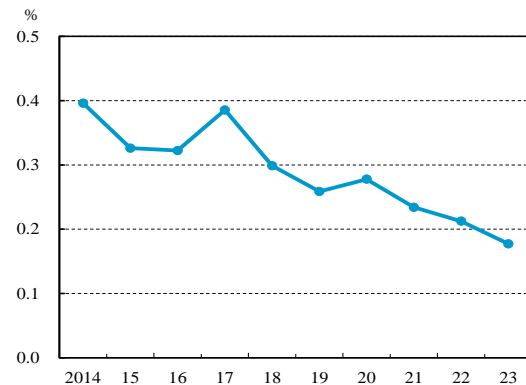
Household sector

Household borrowing expanded continually and the short-term household debt servicing pressure tightened marginally in 2023. However, the household sector held enormous net worth, reflecting that the debt servicing capacity of households remained sound. Moreover, the NPL ratio of household borrowing from financial institutions grew slightly but remained at a low level, indicating sound credit quality of household borrowing. 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.

Household borrowing continually expanded

Household borrowing reached NT$21.25 trillion at the end of 2023, equivalent to 90.27% of annual GDP for the year (Chart 2.25), slightly higher than the 88.10% of the previous year. The main purpose of household

Chart 2.24 NPL ratio of corporate loans

Source: JCIC.

Chart 2.25 Household borrowing to GDP
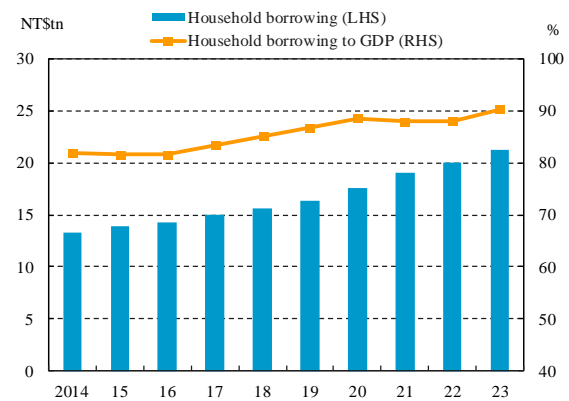
Sources: CBC, JCIC, and DGBAS.

Chart 2.26 Household borrowing by purpose

Note: Figures are as of the end of 2023.
Sources: CBC and JCIC.

borrowing was to purchase real estate, accounting for 62.46% (Chart 2.26).

Household borrowing grew continually with the annual growth rate rebounding to 6.38% in 2023, mainly attributable to the purposes of real estate purchase and working capital needs. Compared to other countries, the household borrowing to GDP in Taiwan was higher than those in the US and Japan, but lower than those in South Korea and Australia. Nevertheless, owing to a higher growth of total household borrowing, the impact of household borrowing growth on household debt burden warrants attention (Chart 2.27).

Chart 2.27 Household indebtedness in selected countries

Note: Figures are as of the end of 2023.
Sources: Fed, BOJ, BOK, ABS, IMF, DGBAS, JCIC, and CBC.

Household indebtedness increased but net worth was high

The ratio of household borrowing to total disposable income[25] slightly increased to 1.55 in 2023, reflecting a rising household debt burden. Mor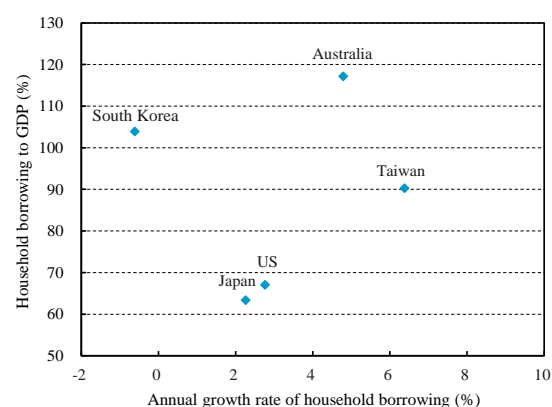eover, with the rise in interest rates on bank loans, the debt servicing ratio also ascended to 48.72% (Chart 2.28), indicating that short-term household debt servicing pressure tightened. However, household net worth[26] in Taiwan has been remarkable and held at more than 8 times the GDP in 2022. Compared 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 2.29), showing that the financial condition of households in Taiwan was sound.

Chart 2.28 Household indebtedness and debt servicing ratio
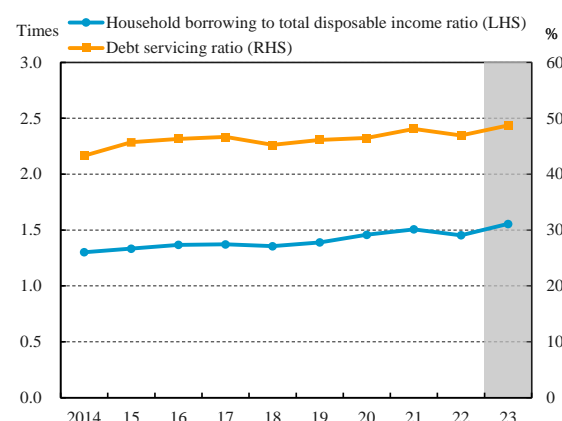
Note: Total disposable income in shaded area is a CBC estimate.
Sources: CBC, JCIC, and DGBAS.

The NPL ratios of household borrowing rose marginally, but remained at a low level, reflecting satisfactory credit quality

The NPL ratio of household borrowing rose marginally to 0.13% at the end of 2023 but remained at a low level. Among the categories, the NPL ratio of loans for purchase of real estate

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[25] Total disposable income = disposable income + rental expenses + interest expenses.
[26] See Note 7.

declined further to a historical low of 0.07%
(Chart 2.30), reflecting satisfactory credit
quality.

As the minimum wage rose in recent years,
monthly regular earnings for employees
registered an annual year on year growth rate
of 2.19% in 2023. However, real monthly
regular earnings for employees in 2023
decreased slightly by 0.05% 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.

2.2.3 Real estate market

Transactions in the housing market grew
quarter by quarter, bolstering the uptrend in
house prices and pushing up the mortgage
burden in 2023. Meanwhile, the number of
newly built surplus housing (for sale)
increased. As a result of the Bank's continuous
implementation of targeted macroprudential
measures, along with measures adopted by
relevant ministries and government agencies to curb speculation in the housing market, the
growth trends of banks' construction loans and house-purchasing loans slowed down. With a
surge in the amount of the Preferential Housing Loans for the Youth,[27] the growth of banks'
house-purchasing loans experienced a rebound in the second half of 2023. However, the related
credit risk management remained sound.

Chart 2.29 Household net worth to GDP
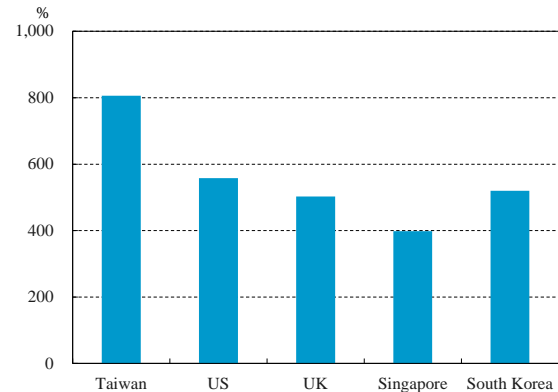
Notes: 1. The household sector herein includes households and
non-profit organizations.
2. Figures are as of the end of 2022.
Sources: DGBAS and official websites of selected countries.

Chart 2.30 NPL ratios of household borrowing
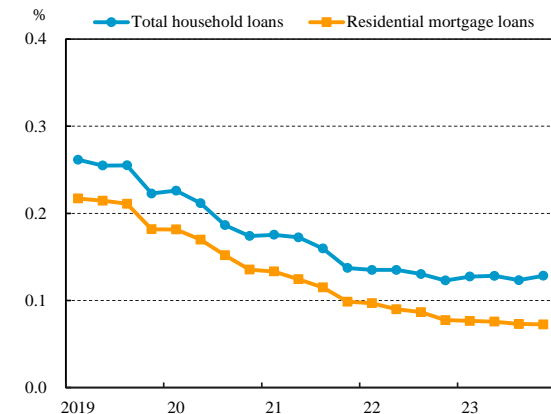
Source: JCIC.

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[27] The enhanced project, new Preferential Housing Loans for the Youth, has been implemented since August 2023.

Transactions in the real estate market recovered

Domestic housing demand remained characterized by a wait-and-see sentiment during the first half of 2023 owing to the government's promulgation of partial amendments of *The Equalization of Land Rights Act* in February. This, coupled with a higher base period in the previous year, resulted in a continuously negative annual growth rate of the total number of building ownership transfers. Nevertheless, the demand for self-occupied residential houses had been stimulated since the implementation of the new Preferential Housing Loans for the Youth in August. Furthermore, coupled with the strong performance of Taiwan's stock markets and lingering inflationary pressures, it drove the demand for property investment. Additionally, there was an increased handover of new houses and a lower base period in the previous year, contributing to the growth rate turning positive with a year-on-year increase of 9.14% in Q3,

Chart 2.31 Number and growth of building transfers
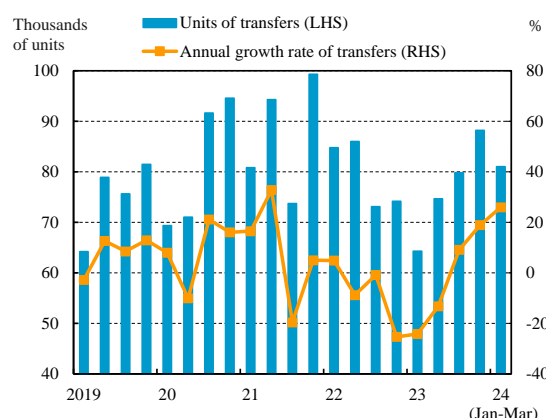
Source: *Monthly Bulletin of Interior Statistics*, MOI.

Chart 2.32 Land transfers for transaction and annual growth rate

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

and further rising to 18.94% in Q4. As a result, the total number of building ownership transfers decreased by 3.50% year on year to 307 thousand units in 2023 (Chart 2.31). In the first quarter of 2024, with a recovery of public confidence in buying houses and an expanding handover of new houses, the total number of building ownership transfers increased to 81 thousand units in Q1. Moreover, owing to a lower base period, the year-on-year growth rate went up to 26.01%.

In terms of land transactions, as a result of the lessening transactions in the housing market, real estate developers adjusted their land inventory downward in the first three quarters of 2023. Additionally, with the decline in exports from January to August, the land demand from manufacturers seeking to expand their factories diminished. Consequently, the total number of land ownership transfers showed negative growth in the first three quarters. As housing market transactions picked up in Q4, the annual growth rate rebounded (Chart 2.32), yet the entire year

still experienced a decrease of 11.02% compared to the previous year.

From early 2024 onwards, as housing market transactions continued to increase, real estate developers became optimistic about the outlook of the housing market. This, coupled with a lower base period in the previous year, led to the total number of land ownership transfers surging to 17.90% in Q1 (Chart 2.32).

Real estate prices remained high

The national housing price index released by the MOI continued to rise gradually in 2023 and reached a new high of 136.20 in Q4 (Chart 2.33). Moreover, the year-on-year growth rate in Q4 rose to 6.82%, ending the downward trend for five consecutive quarters. The Cathay housing price index (for newly built houses) hit a historical high of 188.32 in Q2 before slightly declining. Subsequently, with the housing market rebound, the index rose to 188.93 in 2024 Q1, increasing by 1.39% from the previous quarter, and the annual growth rate also expanded to 6.19%. The Sinyi housing price index (for existing houses) rose

Chart 2.33 House price indices
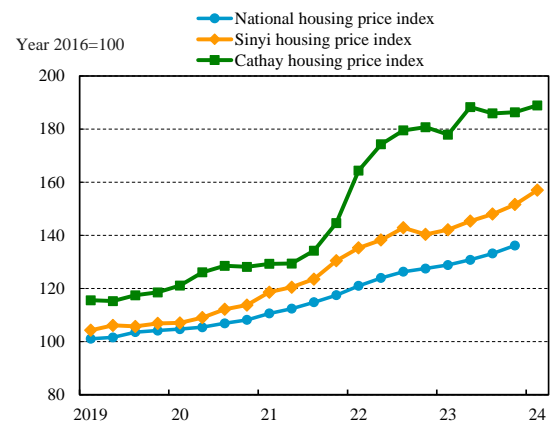
Note: For comparison purposes, all three indices use the same base year of 2016 (2016 average = 100).
Sources: MOI, Cathay Real Estate, and Sinyi Real Estate Inc.

Chart 2.34 Debt servicing ratios for housing loans and house price to income ratios
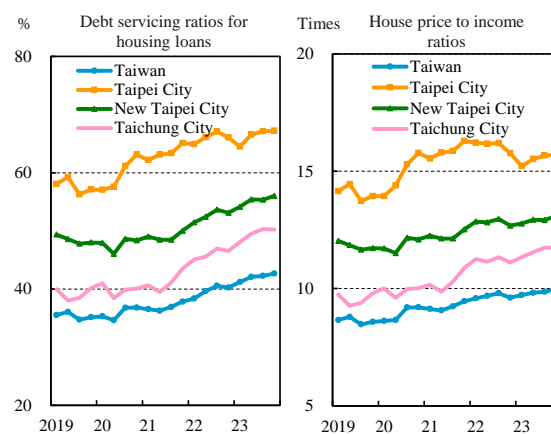
Source: *Statistics on Housing Affordability*, MOI.

quarter by quarter in 2023, reaching a peak of 157.01 in 2024 Q1 (Chart 2.33), with the annual growth rate ascending to 10.48%.

Mortgage burden increased

The debt servicing ratio for housing loans rose gradually quarter by quarter in 2023. Despite a slight decrease in interest rates on housing loans in Q4, the median housing price continued to rise, pushing the debt servicing ratio for housing to a record high of 42.66%. Among the cities in Taiwan, Taipei City showed the heaviest mortgage burden with its ratio registering 67.22% (Chart 2.34, left panel). Similarly, Taiwan's house price to income ratio grew quarter by quarter

and reached a peak of 9.97 times in 2023 Q4 (Chart 2.34, right panel).

Construction licenses issued reduced significantly, and building commencement also kept shrinking, while the newly built surplus housing (for sale) expanded

Owing to the sluggish transactions in the housing market, real estate developers conservatively launched new residential housing projects for pre-sale in the first half of 2023. Coupled with the fallen demand for expanding factories and a higher base period in the previous year, the total floor space of construction licenses issued significantly diminished by 18.30% year on year in 2023. This trend continued with a 19.58% year on year shrinkage in 2024 Q1. Meanwhile, the total floor space of construction commencement also decreased by 8.10% year on year in 2023, and by 8.54% year on year in 2024 Q1 (Chart 2.35).

The total floor space of usage licenses issued consecutively increased by 11.29% year on year in 2023, resulting from successive completion of construction projects in recent years. The aforementioned total floor space increased by 11.51% in 2024 Q1, mainly because completion of those residential buildings surged by 38.44%.

Chart 2.35 Annual growth rates of floor space of construction licenses issued and construction commencement
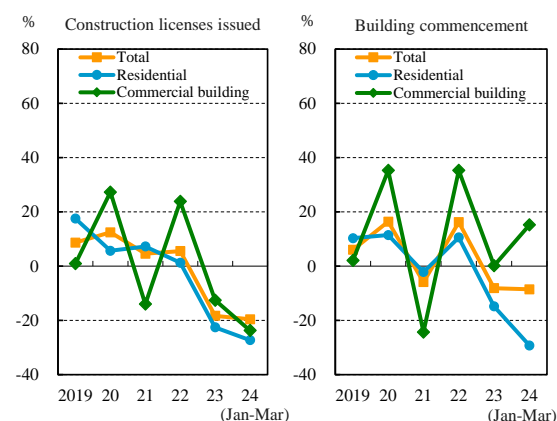
Note: Commercial building includes buildings for commerce, industry, storage, business and service.
Source: *Monthly Bulletin of Interior Statistics*, MOI.

Chart 2.36 New residential buildings and newly built surplus housing (for sale)
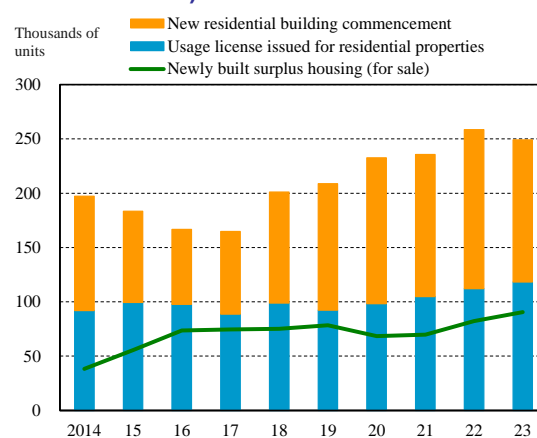
Note: Figures are yearly data, except for figure for 2023 of newly built surplus housing (for sale), which is as of the end of 2023 Q2.
Source: Real Estate Information Platform, MOI.

According to statistics from the MOI, the number of newly built surplus housing (for sale) units has steadily expanded since 2022 Q1. In addition, the number of construction projects commenced for new residential buildings has exceeded 100 thousand units every year since 2008 (Chart 2.36). With the enormous supply, high prices, and no notable improvement in the

sales transaction rate of new residential buildings, the inventory of newly built surplus housing (for sale) might continue to accumulate in the future.

Growth in construction loans slowed, whereas growth in loans for house purchases and house refurbishments rebounded after a decline, while mortgage interest rates slightly rose along with the Bank's interest rate hikes

The implementation of the new Preferential Housing Loans for the Youth has boosted public confidence in the housing market since August 2023. Accordingly, the dominant five banks remarkably extended their provision of new housing loans, with a monthly average amounting to approximately NT$63.9 billion, an increase of 8.4% compared to the previous year. The amount of these loans continued to rise by NT$238.2 billion in 2024 Q1 (Chart 2.37), and with a lower base period in the previous year, the annual growth rate expanded to 68.25%. In the same quarter, state-owned banks offered NT$127.4 billion in the Preferential Housing Loans for the Youth, reflecting an annual growth rate of 560.64% (Chart 2.38).

Chart 2.37 New housing loans by the dominant five banks – amount and interest rate
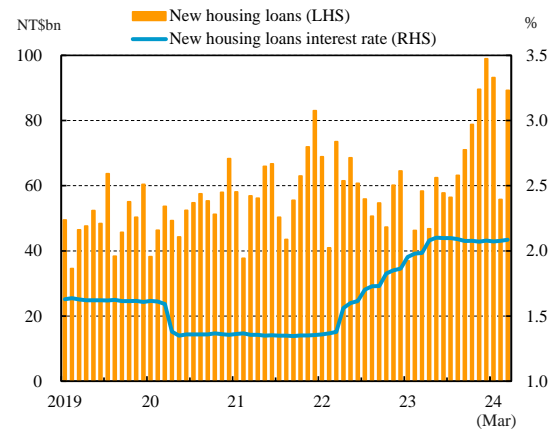
Source: CBC.

Chart 2.38 Preferential Housing Loans for the Youth from state-owned banks – amount and annual growth rate
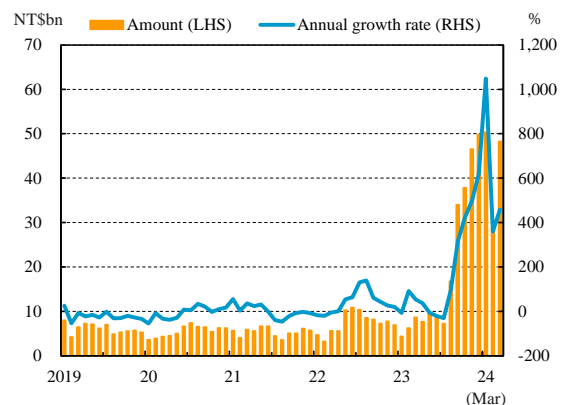
Source: *Statistics on Preferential Housing Loans for the Youth*, MOF.

Regarding the interest rate of real estate loans, as the Bank raised its policy rates in March 2023, the average interest rate for new housing loans granted by the dominant five banks elevated to a new high of 2.101% in May. Afterwards, as the appropriated amounts in the Preferential Housing Loans for the Youth by the dominant five banks increased sharply, the interest rate mildly declined. However, it demonstrated a slight rebound to 2.086% after the Bank raised its policy rates again in March 2024 (Chart 2.37).

As the transactions in the housing market cooled down in the first half of 2023, the annual growth rate of outstanding real estate loans (including loans for house purchases, house refurbishments, and construction loans) granted by banks[28] generally slid month by month. Since the second half of 2023, the annual growth rate of outstanding loans for house purchases and refurbishments has bounced back with the expanding Preferential Housing Loans for the Youth (Chart 2.38). In contrast, the annual growth rate of outstanding construction loans has kept dropping owing to the reduced funding demand from construction companies. The annual growth rate of outstanding real estate loans and construction loans granted by banks were 7.21% and 3.52%, respectively, at the end of March 2024. These figures both stood below the level before the Bank adjusted its targeted macroprudential measures in December 2020. Nevertheless, the aggregate amount of loans for house purchases and house refurbishments grew by 8.44% year on year, higher than the 7.82% at the end of November 2020 (Chart 2.39).

The outstanding real estate loans rose to NT$13.52 trillion, accounting for 37.08% of

Chart 2.39 Annual growth rates of real estate loans
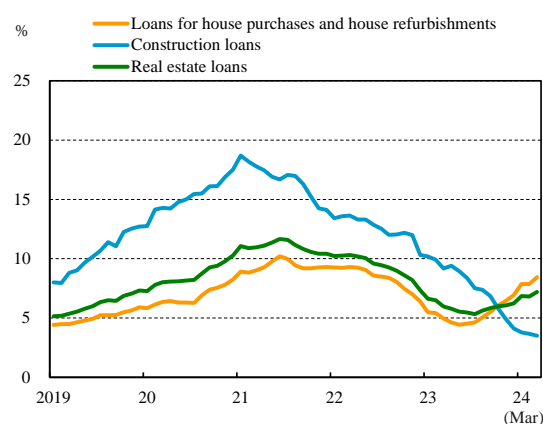
Note: Real estate loans refer to the aggregate amount of loans for house purchases, house refurbishments, and construction loans.
Source: CBC.

Chart 2.40 Real estate loans to total loans

Note: Real estate loans refer to the aggregate amount of loans for house purchases, house refurbishments, and construction loans.
Source: CBC.

total loans at the end of March 2024. Although this ratio had decreased moderately, it was still higher than the low point at the end of 2022 (Chart 2.40). This was mainly due to Taiwan's declining exports, which resulted in slower growth of bank loans to the manufacturing sector, thereby easing the increment of total loans in 2023. However, the demand from the public for loans to purchase residential houses and properties persisted. Combined with the successive completion and release of new houses, this led to an increase in bank loans issued in cooperation with construction companies for housing ownership transfers. Along with the

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

implementation of the new Preferential Housing Loans for the Youth since August 2023, these resulted in the escalation of the outstanding of real estate loans.

Banks' risk management on real estate loans remained satisfactory, with appropriate adjustments to the regulations regarding real estate loans

As a result of the Bank's continuous implemention of targeted macroprudential measures, [29] the annual average of the

Chart 2.41 NPL ratios of housing loans and construction loans
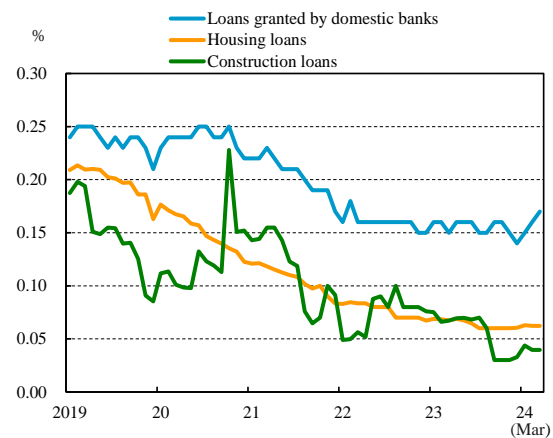
Note: NPLs herein exclude non-accrual loans.
Source: CBC.

weighted average loan-to-value (LTV) ratio for new housing loans registered 71.86% in 2023. The average LTV ratio for the regulated loans newly granted by banks dropped significantly, while high-priced housing loans extended to natural persons registered the lowest level among the loan types, with a ratio of 36.14% in March 2024. Furthermore, the NPL ratios of housing loans and construction loans granted by domestic banks dropped to 0.06% and 0.04%, respectively, at the end of March 2024, both lower than the 0.17% NPL ratio of total loans (Chart 2.41).

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

The Bank and the relevant ministries and agencies have successively enhanced the measures pertinent to the Healthy Real Estate Market Plan since its initiation by the government in December 2020. From then on, the Bank has adjusted its targeted macroprudential measures five times. Additionally, in order to strengthen the risk management of real estate loans, the Bank has actively cooperated with the FSC to launch targeted examinations toward mortgage loans. However, as the new Preferential Housing Loans for the Youth offer easier lending conditions, along with related loans mostly based on floating interest rates, the borrowers will therefore bear the risk of future interest rate fluctuations. Furthermore, the expiration of the grace period for repayment will exacerbate borrowers' debt servicing pressures. If borrowers are unable to repay, the asset quality of financial institutions may be compromised. The Bank

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[29] See the "IV. Measures to promote financial stability" in the *Financial Stability Report*, May 2024.

will closely monitor the future developments and proactively remind borrowers to be aware of associated risks.

In addition, the MOI has carried out partial amendments of *The Equalization of Land Rights Act* since the second half of 2023. The MOF also continues to amend regulations to prevent short-term speculation and non-self-use house hoarding, while urging local governments to adjust the housing tax base, as well as intensifying detection of tax evasion. All of the abovementioned efforts have contributed to fostering a sound real estate market. Notwithstanding, owing to the fact that most measures ensuring the soundness of the housing market involve institutional reforms, the effectiveness of those policies may take time to materialize. Moreover, with part of the authority and responsibility resting with local governments, in the future, a consummate system relies on cooperation between central and local governments to execute relevant measures constantly to achieve the goal of sound development of the real estate market.

2.3 General assessment of international and domestic macro environments

As for international economic and financial conditions, the economic growth rate merely saw a slight decline and remained resilient during the period of global disinflation in 2023. However, economic growth showed divergent paths across countries. In the meantime, financial conditions turned to ease amid market optimism about future interest rate cuts. Looking ahead to 2024, in spite of the fact that global manufacturing and services sectors are expected to recover gradually, with geopolitical tensions, still-high funding costs, and uncertainties about the monetary policies of the US and European central banks, global economic growth is anticipated to remain unchanged, with inflation moderating but staying at elevated levels. In addition, several factors could pose challenges to global financial stability. These include the trajectory of major central banks' monetary policies, the deterioration of credit quality in US CRE loans, and ongoing developments in China's housing and stock markets. Additionally, China's substantial levels of local government debt and elevating geopolitical risks also contribute to these challenges.

Regarding the domestic macro environment, Taiwan's economic growth decelerated in 2023 and the inflation rate maintained a gradual downward trend. Moreover, FX reserves stayed ample with strong external debt servicing capacity. Although the fiscal position registered a deficit, government debt decreased and remained well below internationally recognized minimum levels, which was conducive to weathering uncertainties surrounding international political and economic situations and maintaining economic growth momentum. On the other hand, the overall revenue of TWSE- and OTC-listed companies has declined and profitability in major industries mostly weakened. On the plus side, their leverage ratios kept improving and the short-term debt servicing capacity remained sound. As for households, their borrowing continued to grow, and their short-term debt burden trended upwards mildly. However, the financial health of households was steady, underpinned by their enormous net worth. Even so, close attention should be paid to changes in debt servicing capacity of some households with higher debt burdens. Lastly, the housing market has seen a resurgence in transactions and higher prices, which pushed up the burden on homebuyers. In contrast, the NPL ratios of housing loans remained low, indicating that risk management was still effective. Notwithstanding, it is necessary to monitor the ability of borrowers who applied for the new Preferential Housing Loans for the Youth to withstand future interest rate fluctuations, as well as its impact on financial institutions' asset quality after the grace period expires.

In sum, with the uncertainty surrounding major central banks' monetary policies and

heightened geopolitical risks, global economic downturn risks and financial market volatility have intensified. These factors could affect Taiwan's corporate sector outlook, household debt servicing capacity, and real estate market performance, thereby adding risks to the financial sector, which warrant close attention.

III. Financial system assessment

3.1 Financial markets

In 2023, the outstanding amount and trading volume of interbank call loans both continued to decline, while the markets remained stable. The outstanding amount of bill issuance increased, driven mainly by a substantial rise in the issuance of CP. However, the bill trading volume in the secondary market kept growing, with CP constituting the largest share, as it played a role of facilitating short-term financing for businesses. Meanwhile, the outstanding amount of bond issuance continued to expand, with corporate bonds increasing the most, though the trading volume in the secondary market remained relatively constant. Moreover, in 2023, bolstered by the global stock market recovery and significant foreign capital inflows, the domestic stock market continued to hit record highs. The NT dollar turned to depreciate after appreciating against the US dollar, while its volatility remained relatively stable. Overall, domestic financial markets have remained stable; however, international circumstances such as the monetary policy directions of major central banks, geopolitical risks, and spillover effects from the economic downturn in Mainland China could impact Taiwan's financial markets and their developments and implications are worthy of close attention.

3.1.1 Money and bond markets

Both the outstanding amount and trading volume of interbank call loans kept declining

In 2023, the average daily outstanding amount of interbank call loans was NT$352.0 billion, and dropped by 6.30% year on year, primarily owing to significant decreases in interbank borrowing and lending.[30] Consequently, the trading volume of interbank call loans

Chart 3.1 Interbank call loan market
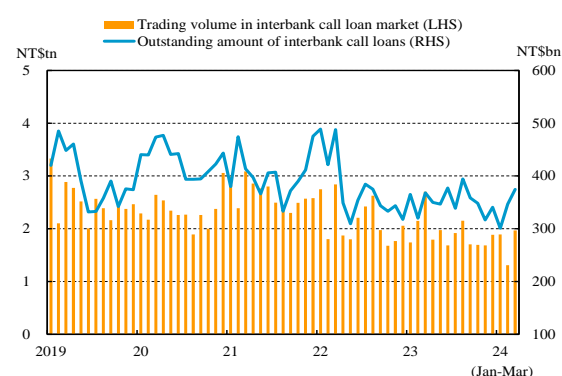
Note: Outstanding amount is the monthly average of daily data.
Source: CBC.

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[30] In 2023, the average daily outstanding amount of interbank lending from domestic banks decreased by 10.72% year on year, while the average daily outstanding amount of interbank borrowing decreased by 15.01% year on year.

decreased by 10.52% year on year in 2023, as the proportion of interbank overnight call loans in the market decreased and financial institutions reduced the frequency with which they rolled over their interbank borrowings because of the extended maturity of these interbank call loans.[31] In 2024 Q1, the average daily outstanding amount and trading volume of interbank call loans both decreased year on year (Chart 3.1).

Chart 3.2 Primary and secondary bill markets

Source: CBC.

Both outstanding amount of bill issuance and the bill trading volume in the secondary market expanded year on year

The outstanding amount of bill issuance in the primary market reached NT$3.35 trillion by the end of 2023, marking a rise of NT$456.9 billion or 15.81% year on year. The main reason for this increase was higher corporate funding needs, bringing about a substantial increase of NT$416.1 billion in the outstanding amount of CP issuance. Moreover,

Chart 3.3 Bonds outstanding in the primary market
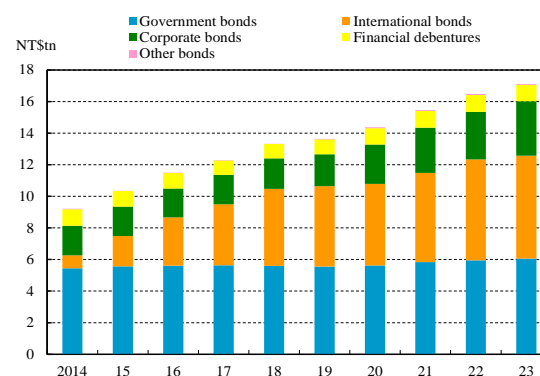
Note: Other bonds include beneficiary securities and foreign bonds.
Source: FSC.

NCDs issued by banks rose by NT$41.3 billion, while treasury bills remained flat. In 2024 Q1, the outstanding amount of bill issuance began to climb year on year as the issuance of CP increased (Chart 3.2).

In 2023, as the outstanding amount of bill issuance edged up, the trading volume in the secondary market increased by 14.50% year on year to NT$55.42 trillion. Among them, CP continued to constitute the largest share of 96.73%, slightly decreasing from a year earlier. In 2024 Q1, the bill trading volume continued its upward trend over the same period of the previous year (Chart 3.2).

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[31] In 2023, the proportion of overnight interbank call loans decreased from 46.21% last year to 45.55%, with these loans' maturities extended.

Outstanding amount of bond issuance continued to expand, while the trading volume remained roughly unchanged; however, the turnover rate of outright bond transactions continued to drop to a record low

The outstanding amount of bond issuance reached a new high of NT$17.11 trillion at the end of 2023 and increased by 3.87% over the end of the previous year. This increase was primarily attributed to a 14.59% rise in corporate bond issuance, as state-owned enterprises such as Taiwan Power Company and Chinese Petroleum Corporation increased bond issuance for the purpose of supplementing operating funds. At the end of 2023, the outstanding amount of international bond and government bond [32] issuance increased by 1.91% and 1.85%, respectively, compared to the end of the previous year (Chart 3.3).

On the other hand, the trading volume in the secondary bond market registered NT$35.41 trillion in 2023, roughly unchanged year on year (Chart 3.4). Analyzed by trading type, outright transaction volume shrunk by 3.26% year on year, while repo transaction volume slightly increased by 0.56% year on year. Nevertheless, the overall trading volume remained at a relatively low level in recent years. As a result, the average monthly outright turnover rate of major bonds decreased continually in December 2023 to 1.45% and declined further to a record low of 1.27% in 2024 Q1 (Chart 3.5).

Chart 3.4 Outright and repo transactions in the bond market
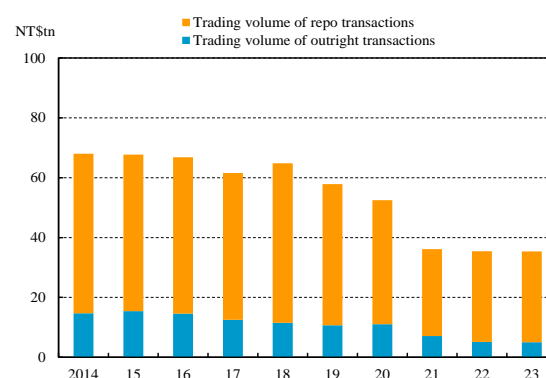
Source: CBC.

Chart 3.5 Outstanding amount in major bond markets and monthly turnover rates of outright transactions
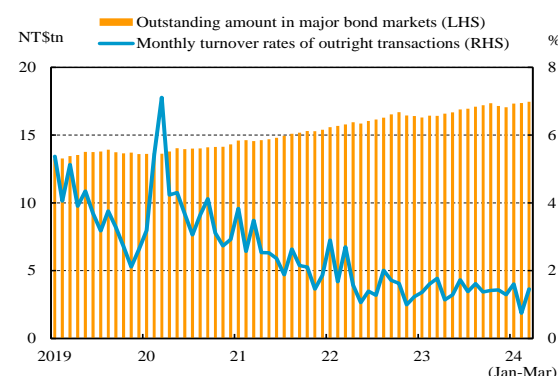
Notes: 1. Major bonds include government bonds, corporate bonds, financial bonds, and international bonds.
2. The monthly turnover rate for outright transactions = total value of outright transactions in the month / average outstanding issuance, where the average outstanding issuance = (the outstanding issuance at the end of the current month + the outstanding issuance at the end of the previous month) / 2 .

Source: FSC.

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[32] Including central and local government bonds.

Long-term and short-term market rates rose

In terms of short-term market rates, after the Bank raised the policy interest rates and the interest rates on the Bank's CDs in March 2023 and March 2024 to curb domestic inflation expectations, the interbank overnight call loan rate trended upwards, stabilizing at around 0.81% from March 22, 2024 onwards (Chart 3.6). Still, market liquidity remained ample.

As for long-term market rates, owing to market expectations that the cycle of rate hikes by major central banks was nearing its end, coupled with ample domestic liquidity, domestic 10-year government bond yields gradually trended downwards during the first three quarters of 2023. Afterwards, following the Fed's cautious stance on future rate cuts, the market adjusted its expectations, reducing the anticipated extent of rate cuts and causing US government bond yields to rise. Consequently, domestic 10-year government

Chart 3.6 Interbank overnight rate and 10-year government bond yield
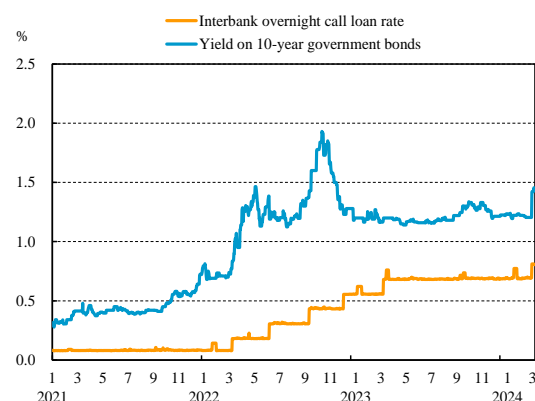
Source: Bloomberg.

Chart 3.7 Taiwan's stock market indices

Sources: TWSE and TPEx.

bond yields gradually increased, reaching 1.34% on October 19 before declining (Chart 3.6). From mid-March 2024 onwards, influenced by the Bank's policy rate hike and the rebound in US government bond yields, domestic 10-year government bond yields rose again, reaching a recent high of 1.71% on April 17. Considering higher inflation driven by both the uncertain future trajectory of monetary policy of major central banks and disruptions in supply chains on account of escalating geopolitical risks, together with the upward pressure on bond yields globally, the domestic 10-year government bond yields are likely to be affected. Therefore, the interest rate risks of bond investments of domestic financial institutions are worthy of close attention.

3.1.2 Equity markets

Stock indices fluctuated with an uptrend and reached historical highs

In 2023, benefiting from international stock markets rising and inflows of foreign capital to invest in domestic stock markets, the TAIEX of the TWSE market went up to 17,931 at year end from 14,224 at the beginning of the year (Chart 3.7), posting an increase of 26.83% year on year and surging higher than the major indices in Germany, Korea, the US, and other international stock markets, except for Japan (Chart 3.8). The Taipei Exchange Capitalization Weighted Stock Index (TPEX) of the OTC market closely tracked the movements of the TAIEX, registering 234 at year end and posting an increase of 29.76% year on year.

From January to April 2024, driven by market expectations that the major central banks will ease monetary policy and a rise in technology stocks driven by applications of AI, the TAIEX went up steadily and kept reaching historical highs. The TPEX also followed the same trend (Chart 3.7).

Volatility in the stock markets rose after falling, while annual turnover rates remained stable

Chart 3.8 Major stock market performance
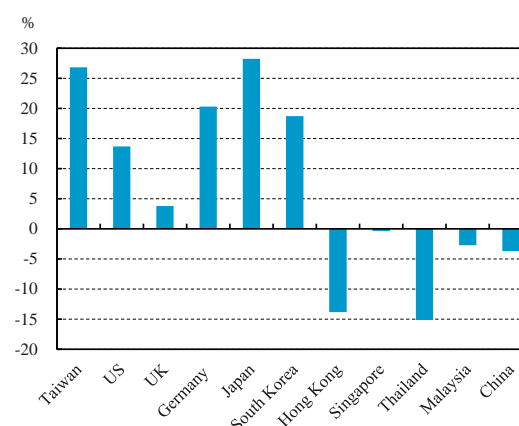
Notes: 1. Changes are figures at the end of 2023 compared to those at the end of 2022.
2. Market performance is based on TWSE Weighted Index for Taiwan, DJIA Index for the US, FTSE-100 Index for the UK, DAX Index for Germany, NK-225 Index for Japan, KOSPI Index for South Korea, Hang Seng Index for Hong Kong, Straits Times Index for Singapore, SET Index for Thailand, Kuala Lumpur Composite Index for Malaysia, and SSE Composite Index for China.

Source: TWSE.

Chart 3.9 Stock price volatility in Taiwan's markets
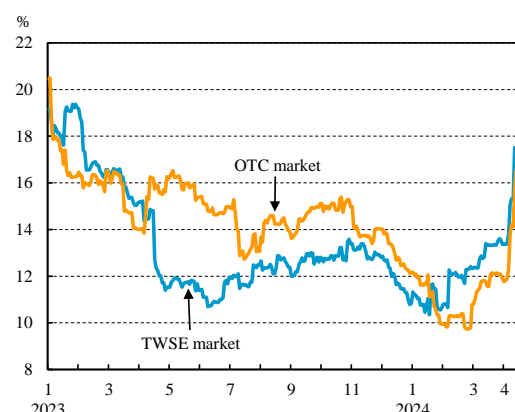
Note: Volatility refers to the annualized standard deviation of 60-day daily index returns.
Sources: TWSE, TPEx, and CBC.

Affected by the rise of domestic stock prices and investor optimism in 2023, the volatility in the TWSE and the OTC markets dropped to 10.78% and 12.12% at the end of the year from 19.17% and 20.48%, respectively, at the beginning of the year. However, since February 2024, the volatility of the TWSE and the OTC markets have surged again owing to the combined effects of various positive and negative factors emerging in both domestic and international markets (Chart 3.9).

Benefiting from the booming trading volume of Taiwan's stock markets, the monthly average trading value in both the TWSE and the OTC markets increased to NT$5.26 trillion and NT$1.4 trillion in 2023 respectively, posting increases of 12.64% and 13.23% year on year. As a consequence, the annual turnover rate in terms of trading value also elevated to 121.19% in the TWSE market (Chart 3.10), which was higher than those in most major international stock markets (Chart 3.11). The annual turnover rate in terms of trading value in the OTC market slightly declined to 313.08%, but still stayed at a high level, indicating that trading in Taiwan's stock markets was quite active and liquidity remained ample.

Domestic stock markets are highly correlated with international stock markets. Considering that rising geopolitical risks and uncertain monetary policy stances by major central banks may affect the global economy and international stock markets and, in turn, impact the performance of domestic stock markets, it is necessary to pay close attention to these developments.

Chart 3.10 Annual turnover rates in Taiwan's stock markets
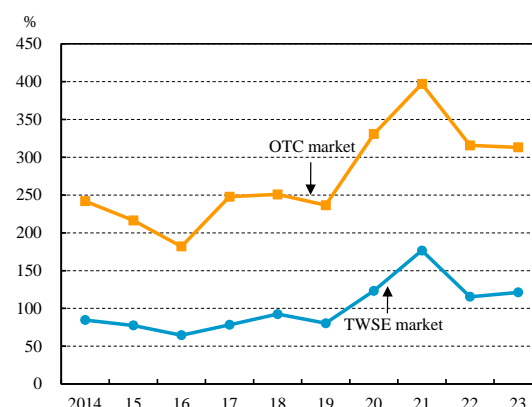
Sources: TWSE and TPEx.

Chart 3.11 Turnover rates in major stock markets
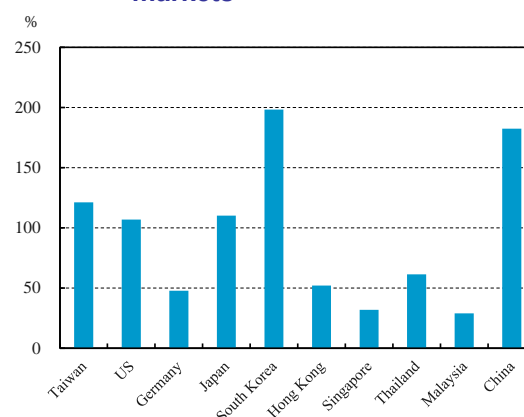
Note: Figures refer to accumulated turnover rates in 2023.
Source: TWSE.

Domestic ETF market has grown rapidly

In the past two years, affected by the excellent performance of domestic stock markets, market expectations for the Fed's policy rate cuts, and the incentive of high dividends, the domestic ETF market has grown rapidly. The number of funds and aggregated fund size of ETFs went up to 234 and NT$4.75 trillion, respectively, as of the end of April 2024 (Chart 3.12), accounting for 60.96% of total onshore mutual funds worth NT$7.8 trillion. The aggregated fund size of ETFs increased by NT$2.02 trillion, a rise of 73.65% year on year. In addition, ETF beneficiaries rose to 11.62 million and reached a historical high.

ETF investments have many advantages, but investors also face multiple risks such as price risks, tracking error risks, and liquidation risks. When trading volume of ETFs surges sharply, it may lead to stock price co-movement, which is worth paying more attention to. [33] Furthermore, recently there have been several incidents such as abuse of income equalization, trading frequently for high dividend distribution, and improper marketing by internet celebrities in the domestic equity ETF market. Therefore, the FSC has successively implemented relevant regulatory measures to address these issues.[34]

3.1.3 FX market

The NT dollar broadly depreciated against the US dollar, while the trading volume of the FX market increased

At the beginning of 2023, owing to the Fed slowing its pace of interest rate hikes and inflows of foreign capital to invest in domestic stock markets, the NT dollar exchange rate against the US dollar appreciated to below 30 in February. In the second half of 2023, the strong US dollar led to the NT dollar reversing and sharply depreciating against the US dollar. Subsequently, as the US government bond yields and the US dollar declined from November, the NT dollar exchange rate rebounded to 30.735 against the US dollar at the end of 2023 (Chart 3.13), depreciating by 0.09% from the end of the previous year. At the beginning of 2024, considering the decrease in US inflation was slower than expected, the Fed continued its tight monetary policies. This, coupled with escalating geopolitical risks, led to a stronger US dollar. Therefore, the NT dollar turned to depreciate and stood at 32.542 against the US dollar at the end of April 2024 (Chart 3.13), depreciating by 5.55% compared to the end of 2023.

Chart 3.12 ETF fund size and number of funds in Taiwan
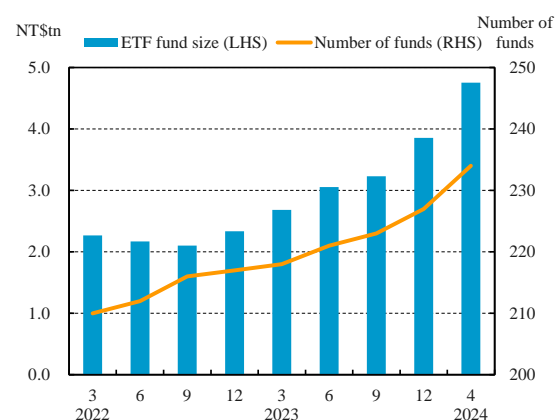
Note: Offshore ETFs, futures ETFs and leveraged/ inverse futures ETFs were not included.
Source: SITCA.

Chart 3.13 NTD/USD exchange rate

Source: CBC.

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[33] For the advantages and risks of ETF investments, please see CBC (2021), Box 2, *Financial Stability Report.*
[34] See the "Measures undertaken by the FSC to maintain financial stability" in the *Financial Stability Report*, May 2024.

In 2023, most major Asian currencies depreciated against the strong US dollar except for the SGD. The extent of the NT dollar depreciation against the US dollar was lower than other major Asian currencies. As the US dollar kept strengthening from January to April 2024, most major Asian currencies continued to depreciate against the US dollar (Chart 3.14).

The average daily trading volume in Taiwan's FX market amounted to US$37.8 billion in 2023, rising by 9.72% compared to a year earlier primarily because of an increase in interbank transactions (Chart 3.15). The daily trading volume in March 2024 amounted to US$46 billion and increased by 19.48% over the same period of the previous year.

NT dollar exchange rate volatility remained relatively stable

The volatility of the NT dollar exchange rate against the US dollar fluctuated between 1.72% and 6.83% in 2023 and registered an annual average of 3.6%, which was relatively low compared to those of other major currencies. From January to April 2024, the volatility of the NT dollar exchange rate registered between 2.27% and 5.74%, which was lower than those of the Japanese yen, the euro, and the Korean won, but slightly higher than the Singapore dollar (Chart 3.16).

Chart 3.14 Exchange rate changes of major Asian currencies against the US dollar
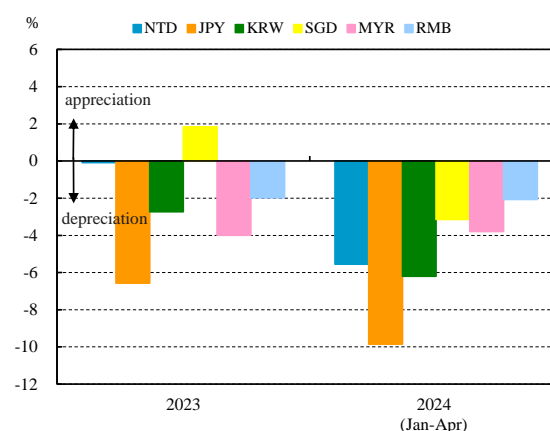
Note: Changes in 2023 are figures at the end of the year compared to those at the end of 2022; changes in the period of Jan-Apr 2024 are figures at the end of April 2024 compared to those at the end of 2023.
Source: CBC.

Chart 3.15 FX market trading volume
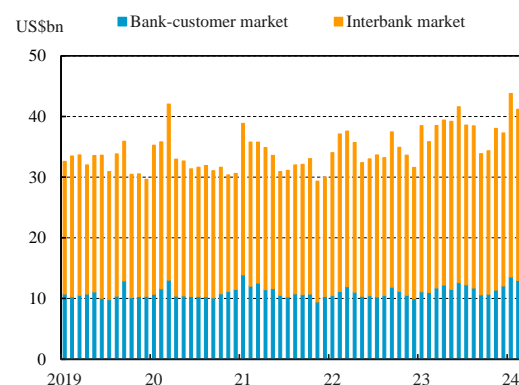
Notes: 1. Trading volume is the monthly average of daily data.
　　　 2. The latest data for trading volume are as of March 2024.
Source: CBC.

The nominal and real effective exchange rate indices of the NT dollar fluctuated within a narrow range

In 2023, as the applications of AI promoted the growth of related supply chain demand and, in turn, made exports rebound, coupled with inflows of foreign capital to invest in domestic stock markets, the NEER index of the NT dollar increased slightly and registered 103.05 at year end, an increase of 2.15% compared to 100.88 registered at the end of 2022. The NEER of the NT dollar fluctuated within a narrow range and remained relatively stable compared to other major Asian currencies. However, because of the strong US dollar, the NEER of the NT dollar dropped to 100.4 at the end of April 2024, a slight decrease of 2.57% compared to the end of 2023 (Chart 3.17). During the same period, the real effective exchange rate (REER) index of the NT dollar also fluctuated within a limited range and stood at 99.42 in December 2023, an increase of 0.24% compared to 99.18 registered in December 2022. The volatility of the NT dollar's REER remained relatively stable compared to other major Asian currencies. In April 2024, the NT dollar's REER declined to 97.95, a decrease of 1.48% compared to December 2023.

Chart 3.16 Exchange rate volatility of various currencies versus the US dollar
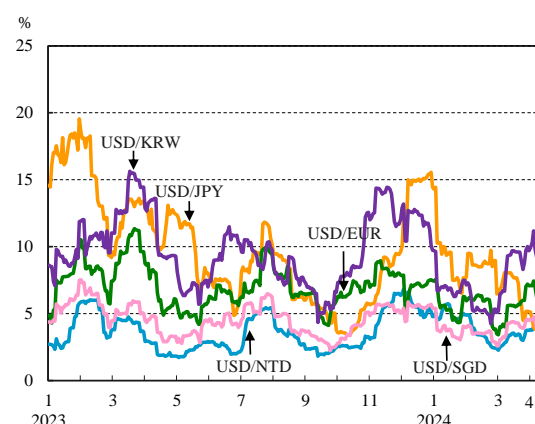
Note: Volatility refers to the annualized standard deviation of 20-day daily returns.
Source: CBC.

Chart 3.17 NT dollar nominal effective exchange rate index
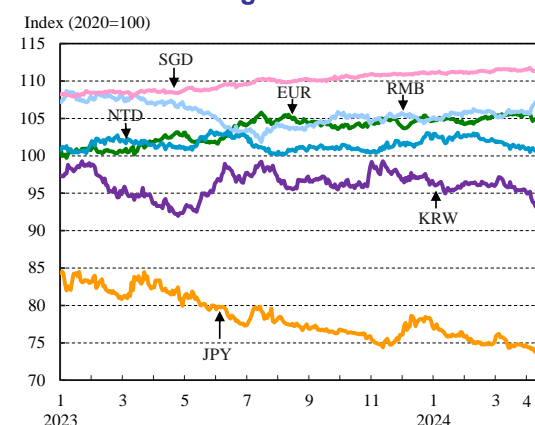
Source: BIS.

3.2 Financial institutions

In 2023, the performance of domestic financial institutions varied. Domestic banks achieved record-high profits, with improvements in asset quality and capital adequacy ratios. Life insurance companies saw a notable rebound in profits after experiencing a significant decline, and overall capital levels remained adequate, yet they still faced higher market risk. Bills finance companies suffered a drop in profits and continued to face elevated liquidity risk, while their capital adequacy ratios increased. Overall, domestic banks, life insurance companies, and bills finance companies were able to operate stably.

3.2.1 Domestic banks

In 2023, the total assets of domestic banks[35] continued to expand, while asset quality improved.

The sectoral concentration in corporate loans declined marginally, and exposures to China continued to decline. However, real estate-secured credit remained at a high level, and credit quality of overseas real estate-secured credit deteriorated. The estimated value at risk (VaR) of market risk exposures slightly increased, but its impacts on capital adequacy ratios were limited. Liquidity in the banking system was ample, and overall liquidity risk remained relatively low. The profitability of domestic banks continuously increased in 2023 and reached a historical high. The average capital adequacy ratio rose and maintained an adequate capital level, suggesting satisfactory capacity to bear losses.

Total assets kept growing

The total assets of domestic banks kept growing, albeit at a slower pace, and reached NT$68.03 trillion at the end of 2023, with an annual growth rate of 5.66% compared to

Chart 3.18 Total assets of domestic banks
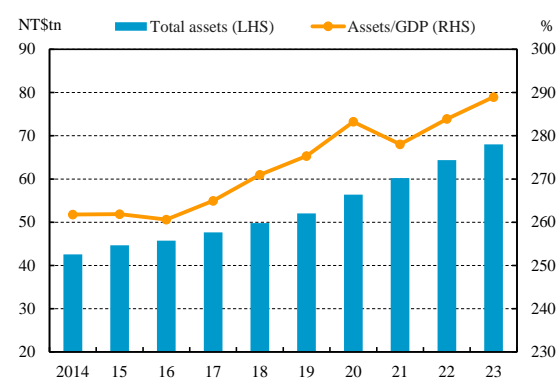
Sources: CBC and DGBAS.

Chart 3.19 Total assets of domestic banks by sector
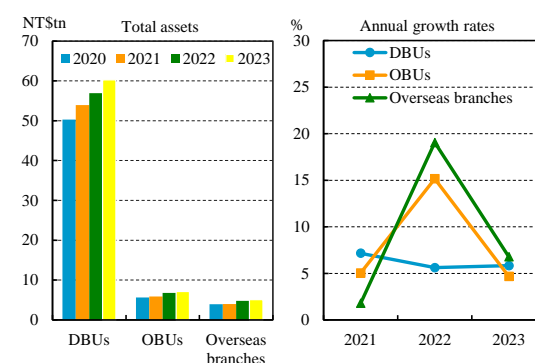
Note: Figures for total assets include interbranch transactions.
Source: CBC.

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[35] Includes the Agricultural Bank of Taiwan.

6.91% a year earlier. The ratio of total assets to annual GDP continuously rose to 288.95% (Chart 3.18). Broken down by sector, the annual asset growth rates of domestic banking units (DBUs) rebounded slightly, whereas the rates of offshore banking units (OBUs) and overseas branches experienced sharp drops (Chart 3.19).

Credit risk

Customer loan growth slowed

Customer loans were the major source of credit risk for domestic banks. The outstanding customer loans of DBUs stood at NT$34.37 trillion at the end of 2023, accounting for 50.52% of total assets with its annual growth rate decreasing to 5.83% (Chart 3.20). Among them, the annual growth rate of household borrowing rose marginally to 7.03%, while the growth rate of corporate loans declined to 5.61% owing to decreasing corporate funding demand amid international and domestic economic downturns. Moreover, the annual growth rate of government loans continued to drop to -5.91%, mainly because increasing government tax revenues reduced borrowing demand from banks.

Chart 3.20 Outstanding loans in domestic banks
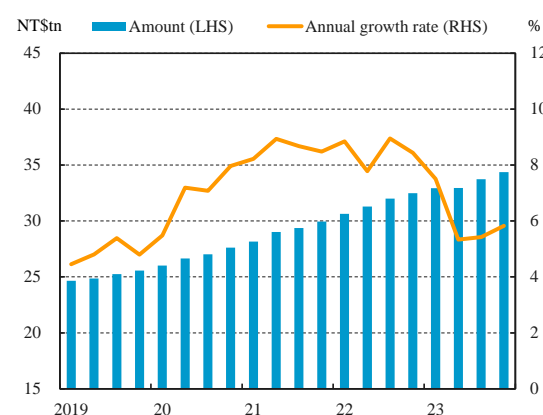
Note: Loans of OBUs and overseas branches are excluded.
Source: CBC.

Chart 3.21 Classified assets of domestic banks
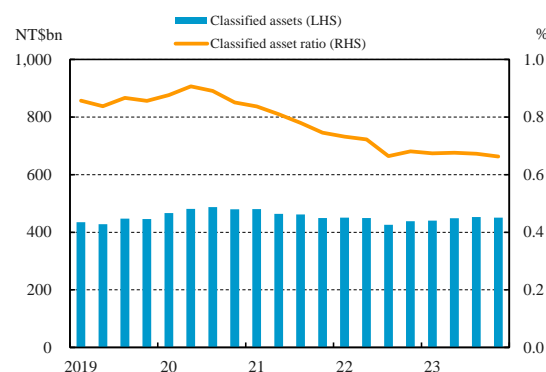
Note: Classified asset ratio = classified assets/total assets.
Source: CBC.

Asset quality improved

The outstanding classified assets[36] of domestic banks increased by 2.85% from a year earlier to NT$450.9 billion at the end of 2023. However, the average classified asset ratio slightly decreased by 0.02 pps from the end of the previous year and stood at 0.66% (Chart 3.21), showing that the asset quality of domestic banks improved. Although the expected losses of classified assets[37] increased by NT$0.3 billion from a year earlier to NT$50.4 billion, they

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[36] Assets of domestic banks are broken down into five categories: normal, special mention, substandard, doubtful, and loss. The term "classified assets" herein includes all assets classified under the latter four categories.

[37] Loss herein refers to losses from loans, acceptances, guarantees, credit cards, and factoring without recourse.

only accounted for 8.62% of allowances for doubtful accounts and loss provisions, indicating sufficient provisions to cover expected losses without eroding equity.

The outstanding NPLs of domestic banks registered NT$56.0 billion at the end of 2023, decreasing by 1.84% from the end of the previous year. The average NPL ratio also declined and reached a record low of 0.14% (Chart 3.22). In addition, at the end of 2023, the loan coverage ratio and the NPL coverage ratio increased to 1.38% and 960.96% (Chart 3.23), respectively, owing to a greater increase in total provisions. The overall ability of domestic banks to cover potential loan losses remained satisfactory.

The share of real estate-secured credit increased

At the end of 2023, real estate-secured credit granted by domestic banks amounted to NT$23.44 trillion, accounting for 57.99% of total credit.[38] The ratio increased over the previous year, indicating a rise in concentration (Chart 3.24). As the government lanched the enhanced program of Preferential Housing Loans for the Youth, transactions in the housing market gradually gained momentum and housing prices remained high. However, owing to owner-occupant homebuyers' limited ability to chase market prices as well as a continual increase in unsold newly built residential housing units from

Chart 3.22 NPLs of domestic banks
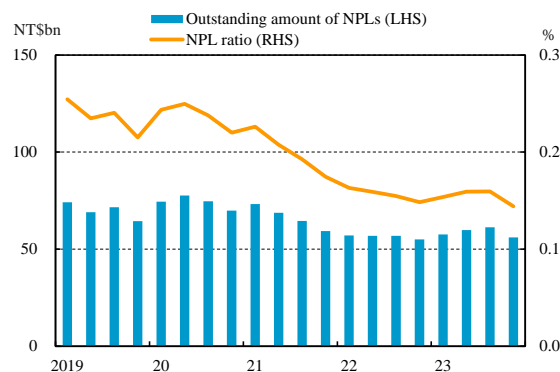
Note: Excludes interbank loans.
Source: CBC.

Chart 3.23 NPL coverage ratio and loan coverage ratio of domestic banks
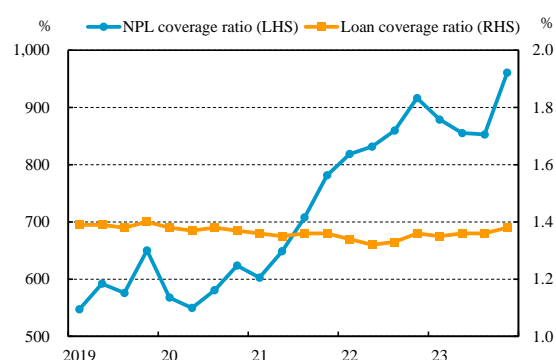
Notes: 1. NPL coverage ratio = total provisions/non-performing loans.
2. Loan coverage ratio = total provisions/total loans.
3. Excludes interbank loans.
Source: CBC.

Chart 3.24 Credit by type of collateral in domestic banks
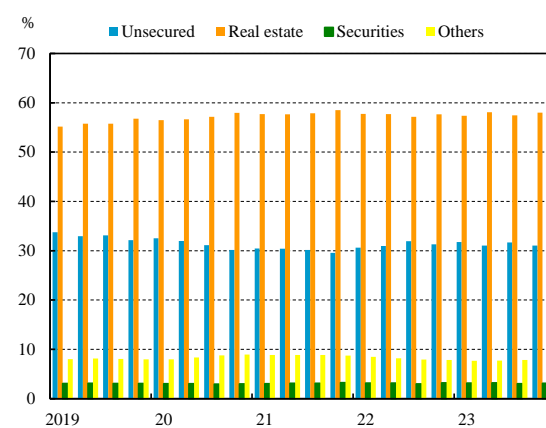
Source: CBC.

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[38] The term "credit" herein includes loans, guarantee payments receivable, and acceptances receivable.

2022 Q1, the impact from changes in housing supply and destocking of unsold residential housing units on banks' credit quality merits close attention.

Credit concentration in corporate loans slightly decreased

Corporate loans granted by the DBUs of domestic banks stood at NT$15.18 trillion at the end of 2023. Among the borrowers, the largest three industries combined accounted for 70.52%, slightly lower than the 70.90% of

Chart 3.25 Shares of corporate loans of the three largest industries
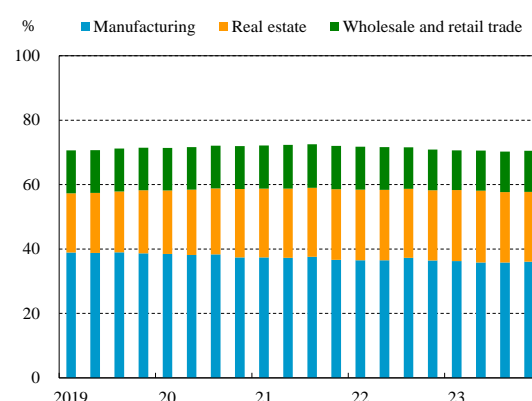
Note: Exposures of OBUs and overseas branches were excluded.
Source: CBC.

the previous year (Chart 3.25), indicating that credit concentration in corporate loans decreased modestly. Among loans to the manufacturing sector,[39] which represented the largest segment, loans to the electronics industry constituted the largest share at 32.36%, slightly increasing from 31.88% the previous year.

Credit quality of overseas CRE deteriorated

In 2023, affected by serveral factors such as the rising trend of working from home after the pandemic, the Fed's rapid rate hikes, high inflation, and worsening CRE market conditions, the credit quality of US and Euporean CRE loans granted by domestic banks deteriorated. Nonetheless, the risk was manageable because CRE loans were less than 0.5% of total loans.

Given that the IMF and regulatory authorities such as the US Fed and the Financial Stability Oversight Council recently all regarded the vulnerability related to the CRE industry as one of the main financial stability risks,[40] changes in credit quality of overseas CRE loans still require close attention.

Exposures to China continued to decrease, but potential risks remained high

At the end of 2023, the exposures of domestic banks to China stood at NT$0.96 trillion, representing a 10.66% decrease from the previous year, mainly attributed to a 14.53% reduction in credit granted. The above exposures as a percentage of net worth also reached

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[39] Loans to the manufacturing sector are divided into five categories by industry, including: (1) electronics, (2) mining of metals and non-metals, (3) petrochemicals, (4) traditional manufacturing, and (5) others.
[40] For more details, please refer to Federal Reserve (2023), *Financial Stability Report*, May; IMF (2023), *Global Financial Stability Report*, October; FSOC (2023), *Annual Report*, December.

a new record low of 23% (Chart 3.26).

China's economy is currently experiencing a contraction in the real estate market, subdued domestic demand, and a worsening local government debt crisis, all contributing to a protracted economic deceleration. In addition, with escalating global geopolitical risks, it is essential to closely monitor how these evolving conditions might affect the quality of credit risk exposure.

Chart 3.26 Exposures of domestic banks to China
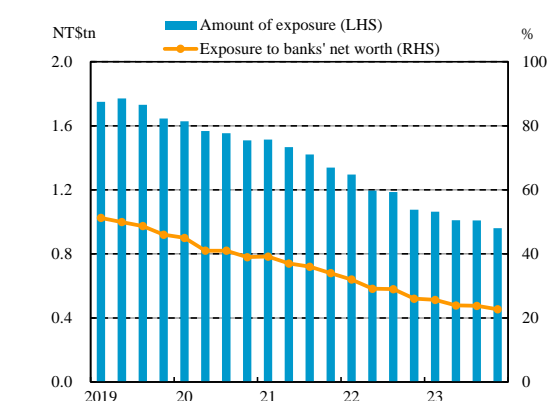
Source: FSC.

Market risk

Estimated value-at-risk for market risk exposures witnessed a marginal increase

Based on the Bank's VaR model,[41] the estimated total VaR for market risk exposures of domestic banks stood at NT$172.5 billion at the end of 2023, increasing by NT$3.2 billion or 1.89% compared to a year earlier. Among the market risk exposures, the interest rate VaR rose slightly by 1.11% year on year due to higher net positions in debt securities. The equities VaR climbed by 19.66% as banks significantly expanded their net positions in equity securities. The

Table 3.1 Market risks in domestic banks

Unit: NT$bn

Type of risk	Item	End-Dec. 2022	End-Dec. 2023	Changes	
				Amount	pps
Foreign exchange	Net position	200.5	178.5	-22.0	-10.97
	VaR	4.4	3.6	-0.8	-18.18
	VaR/net position (%)	2.19	2.02		-0.17
Interest rate	Net position	1,760.9	2,034.1	273.2	15.51
	VaR	153.2	154.9	1.7	1.11
	VaR/net position (%)	8.70	7.62		-1.08
Equities	Net position	59.2	95.1	35.9	60.64
	VaR	11.7	14.0	2.3	19.66
	VaR/net position (%)	19.76	14.72		-5.04
Total VaR		169.3	172.5	3.2	1.89

Source: CBC.

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[41] For more details about the Bank's VaR model, please see CBC (2016), Box 2, *Financial Stability Report*.

FX VaR diminished by 18.18% compared to the end of the previous year, owing to a reduction in net positions and a notable decline in the volatility of the NT dollar exchange rate against the US dollar (Table 3.1).

The impact of market risk on capital adequacy ratios was limited

According to the estimation mentioned above, the total VaR would lead to a decrease of 0.42 pps[42] in the average capital adequacy ratio of domestic banks, causing the ratio to drop from the current 15.33% to 14.91%. Nevertheless, it would still be higher than the statutory minimum standard of 10.5%. Considering the uncertainty surrounding the pace of interest rate cuts by the Fed and central banks in other advanced economies, along with potential heightening of financial market volatility resulting from the spillover effects of global geopolitical risks, market risk could further increase, which warrants close attention.

Liquidity risk

Liquidity in the banking system remained ample

Chart 3.27 Asset/liability structure of domestic banks

Other assets 4.48%
Investments 28.42%
Interbank loans 3.80%
Cash and due from banks 6.41%
Customer loans 56.89%

Equity 7.85%
Other liabilities 4.36%
Interbank deposits and borrowings 6.64%
Debt securities 2.24%
Customer deposits 78.91%

Assets   Liabilities and Equity
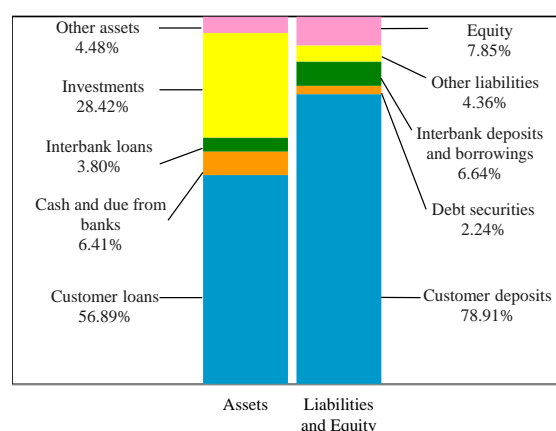
Notes: 1. Figures are as of end-December 2023.
2. Equity includes loss provisions. Interbank deposits include deposits with the CBC.
Source: CBC.

Chart 3.28 Deposit-to-loan ratio of domestic banks

Deposit-to-loan (LHS)
Gap between deposits and loans (RHS)

Source: CBC.

The asset and liability structure of domestic banks remained roughly unchanged in 2023. For the sources of funds, customer deposits, which tend to be relatively stable, still made up the largest share with 78.91% of the total, followed by equity at 7.85%. As for the uses of funds, customer loans accounted for the biggest share with 56.89%, followed by security investment at 28.42% (Chart 3.27).

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[42] Domestic banks had already set aside capital for market risk in accordance with relevant regulations. To avoid double counting, the impacts of market risk on the capital adequacy ratio herein were estimated using capital shortfalls after considering the aforementioned market risk capital.

At the end of 2023, the average deposit-to-loan ratio of domestic banks slightly rose to 141.46%, higher than the end of the previous year, and the funding surplus (i.e., deposits exceeding loans) was NT$16.12 trillion (Chart 3.28). The overall liquidity of domestic banks remained abundant.

Overall liquidity risk remained relatively low

The average NT dollar liquid reserve ratio of domestic banks was much higher than the statutory minimum standard of 10% in every month of 2023 and stood at 28.19% in December (Chart 3.29), a slight decrease compared to the same period of the previous year, while the ratios of individual banks were each higher than 15%. At the end of 2023, the average liquidity coverage ratio (LCR) of domestic banks dropped marginally to 133%; the net stable funding ratio (NSFR) of domestic banks remained at 138% (Chart 3.30). The overall liquidity risk of domestic banks was relatively low.

Profitability

Profits in 2023 hit new historical highs

Benefiting from increases in investment profits , gains on disposal, and valuation from FX swap transactions, the net income before tax of domestic banks kept rising to a new historical high of NT$472.6 billion in 2023, increasing by 20.30% over the previous year. The average ROE and ROA also went up to 10.33% and 0.70%, respectively (Chart 3.31).

Chart 3.29 Liquid reserve ratio of domestic banks
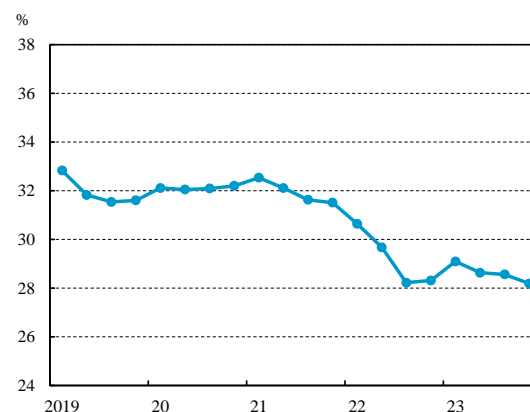
Note: Figures are the average daily data in the last month of each quarter.
Source: CBC.

Chart 3.30 LCR and NSFR of domestic banks
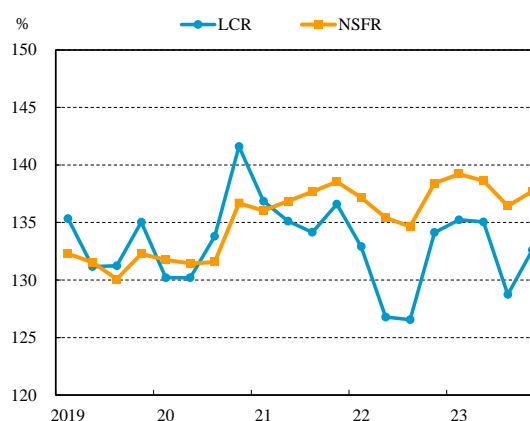
Source: CBC.

Chart 3.31 Net income before tax of domestic banks
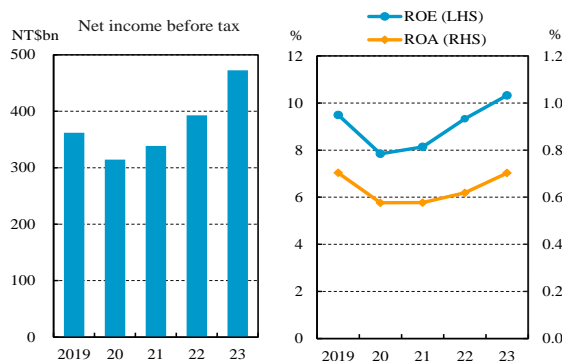
Notes: 1. ROE = net income before tax/average equity.
       2. ROA = net income before tax/average assets.
Source: CBC.

In 2023, three internet-only banks, which officially began operations in recent years, posted operating losses, whereas all the other banks made profits. Most banks' ROEs and ROAs were higher than the previous year. Sixteen banks achieved a profitable ROE of 10% or more, compared to fourteen banks in 2022. Meanwhile, five banks recorded ROAs above the international standard of 1%, more than the three banks in 2023 (Chart 3.32).

Chart 3.32 Domestic banks classified by ROE and ROA

Source: CBC.

Factors that might affect future profitability

Affected by the policy rate hikes, the average interest rate spread between deposits and loans of domestic banks continued to widen to 1.39% at the end of 2023 from 1.36% a year earlier (Chart 3.33), which helped to raise the profitability of domestic banks. However, there are still some uncertainties warranting close attention, including: (A) In 2024, gains from FX swap transactions have gradually decreased owing to subdued market demand. Additionally, relatively high lending interest rates may affect corporate loan demand. Both of the aforementioned could be detrimental to banks' future profit growth. (B) The escalation of geopolitical risks and the resultant global supply chain disruptions and trade fragmentation could drag down global economic growth. This, in turn, may impact corporate profits and real household income, ultimately threatening banks' profitability and loan quality.

Chart 3.33 Interest rate spread of domestic banks
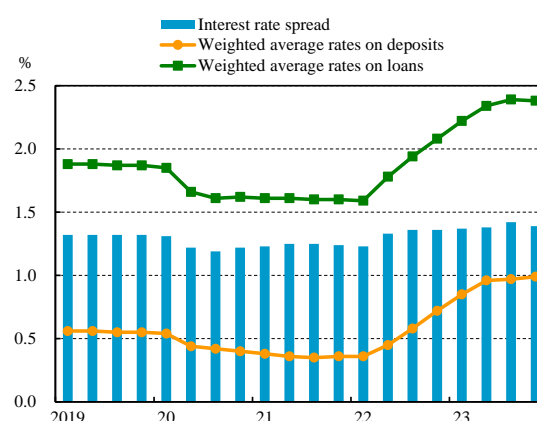
Notes: 1. Interest rate spread = weighted average interest rates on loans - weighted average interest rates on deposits.
2. The weighted average interest rates on deposits and loans exclude preferential deposits of retired government employees and central government loans.

Source: CBC.

Capital adequacy

Capital ratios rose

In 2023, benefiting from accumulated earnings, an increase in valuation gains on financial assets and capital injections in cash by several banks, the average common equity ratio, Tier 1

capital ratio, and capital adequacy ratio rose to 11.93%, 13.22%, and 15.33%, respectively, at the end of 2023 (Chart 3.34). Among them, the Tier 1 capital ratio and capital adequacy ratio both reached new record highs in 20 years.

Among the components of regulatory capital, common equity Tier 1 (CET1) capital accounted for 77.83%. The high share of CET1 capital, which features the best loss-bearing capacity, showed that the capital quality of domestic banks was satisfactory. Furthermore, according to the latest regulatory stress tests requested by the FSC, [43] domestic banks maintained sound capital adequacy, reflecting satisfactory risk management capability.

Moreover, the average leverage ratio of domestic banks stood at 6.63% at the end of 2023 (Chart 3.34), higher than 6.28% a year earlier and well above the 3% statutory standard, indicating that financial leverage remained sound.

All domestic banks had capital ratios and leverage ratios higher than the statutory minimum standards

At the end of 2023, the capital ratios of six domestic systemically important banks (D-SIBs) and non-D-SIBs were all above statutory minimum standards or the relevant capital buffer requirements set by the FSC in 2023.[44] Leverage ratios of all domestic banks also exceeded the statutory minimum standard of 3% (Chart 3.35).

Chart 3.34 Capital ratios and leverage ratios of domestic banks
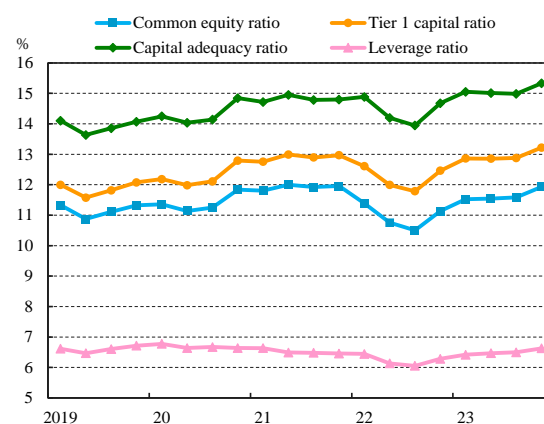
Notes: 1. Common equity ratio = common equity Tier 1 capital/risk-weighted assets.
2. Tier 1 capital ratio = Tier 1 capital/risk-weighted assets.
3. Capital adequacy ratio = regulatory capital/risk-weighted assets.
4. Leverage ratio = Tier 1 capital/total exposure.
Source: CBC.

Chart 3.35 Capital ratios and leverage ratios of domestic banks
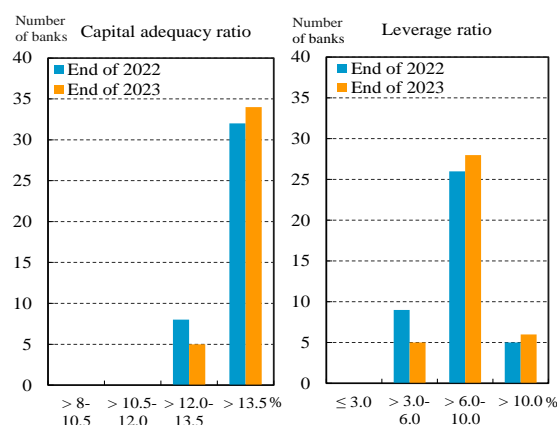
Source: CBC.

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[43] According to the press release published by the FSC on September 14, 2023, 38 domestic banks carried out regulatory stress tests. The result revealed that in the serious scenario, the average common equity ratio, Tier 1 capital ratio, capital adequacy ratio and leverage ratio of domestic banks were all higher than the statutory minimum standards, reflecting that domestic banks have sound risk management and capital adequacy in the face of changes in the global economy and financial environment.

[44] The statutory standards for the common equity ratio, Tier 1 capital ratio, and capital adequacy ratio of non-D-SIBs are 7%, 8.5% and 10.5%, respectively. D-SIBs are required to set aside an additional 2% of buffer capital and 2% of internal management capital according to the requirement of the FSC. The additional capital must be achieved before the end of each of the four years equally starting from the next year after the designated date (the enforcement of the internal management capital requirement was postponed for one year and must be achieved before each year-end of the four years equally from 2022 onwards).

Credit ratings

Average credit rating level remained steady

Of the overall risk assessments of Taiwan's banking system made by credit rating agencies, Standard & Poor's kept Taiwan's Banking Industry Country Risk Assessment (BICRA) [45] unchanged at Group 4 with moderate risk. Compared to other Asian economies, the systemic risk level of Taiwan was the same as that of Malaysia, but much lower than those of the Philippines, China, Thailand and Indonesia. Moreover, the assessment of Taiwan's banking system by Fitch Ratings in its Banking System Indicator/ Macro-Prudential Indicator (BSI/MPI)[46] also remained unchanged at level bbb/2 (Table 3.2).

In addition, the weighted average credit rating index[47] was broadly the same as the end of the previous year (Chart 3.36). Overall, the credit rating level remained steady.

Rating outlooks for most domestic banks remained stable or positive

As of the end of 2023, most of the 39 domestic banks[48] maintained credit ratings of twAA/twA (Taiwan Ratings) or AA(twn)/A(twn) (Fitch Ratings) and none had credit ratings lower than

Table 3.2 Systemic risk indicators for the banking system

Banking System	Standard & Poor's		Fitch	
	BICRA		BSI/MPI	
	2023/2	2024/2	2022/7	2023/7
Singapore	2	2	aa/2	aa/2
Hong Kong	2	2	a/2	a/2
Japan	3	3	a/3	a/3
South Korea	3	3	a/2	a/2
Taiwan	**4**	**4**	**bbb/2**	**bbb/2**
Malaysia	4	4	bbb/1	bbb/1
Philippines	5	5	bb/1	bb/1
China	6	6	bb/1	bbb/1
Thailand	7	7	bbb/1	bbb/1
Indonesia	6	6	bb/1	bb/1

Sources: Standard & Poor's and Fitch Ratings.

Chart 3.36 Credit rating index of domestic banks
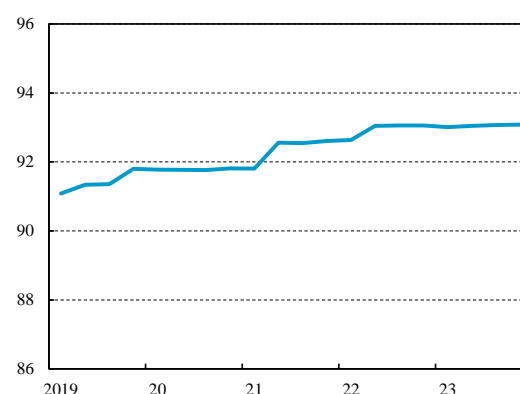
Sources: Taiwan Ratings, Fitch Ratings and CBC.

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[45] BICRA is scored on a scale from 1 to 10, ranging from the lowest-risk (group 1) to the highest-risk (group 10), which indicates the assessment results by Standard & Poor's of economic and industry risks of a country's banking system.

[46] Fitch Ratings assesses banking system vulnerability with two complementary measures, the BSI and the MPI. These two indicators are brought together in a Systemic Risk Matrix. The BSI represents banking system strength on a scale from aaa (strongest), aa, a, bbb, bb, b, ccc, cc, c to f (fail). The MPI indicates the vulnerability of the macro environment on a scale from 1 (lowest vulnerability), 2, 2* to 3 (highest vulnerability).

[47] The credit rating index is an asset-weighted average rating score of rated domestic banks, measuring the overall creditworthiness of those banks on a scale from 1 (weakest) to 100 (strongest). The rating score for banks is determined according to their long-term issuer ratings from Taiwan Ratings or national long-term ratings from Fitch Ratings. The higher the index is, the better the bank's overall solvency.

[48] With JihSun Bank (AA-(twn)) merged into Taipei Fubon Bank (twAA+) on April 1, 2023, the number of domestic banks dropped to 39, and all of them received credit ratings.

twBB/BB(twn) (Chart 3.37). [49] In terms of rating outlooks, except for one bank whose rating outlook was negative, those of the rest remained stable or positive.

Taiwan Ratings projected that Taiwan's banking industry outlook would remain stable in 2024 and indicated that credit costs would stay at a low level amid the stable domestic economic situation and a cautious overseas growth environment. This, together with banks' adequate capital levels, could support their business growth and ability to withstand unexpected market fluctuations.[50]

3.2.2 Life insurance companies

In 2023, the total assets of life insurance companies continued to increase. The average equity to asset ratio improved, and overall credit ratings remained stable. Although their profits significantly declined, there was a notable rebound in 2024 Q1. With the expansion of foreign investment positions, life insurance companies still faced higher FX risk, interest rate risk and equity risk. In addition, considering their premium income is generally lower than their benefit payment, their future cash flows warrant continuous attention.

Chart 3.37 Number of domestic banks classified by credit ratings
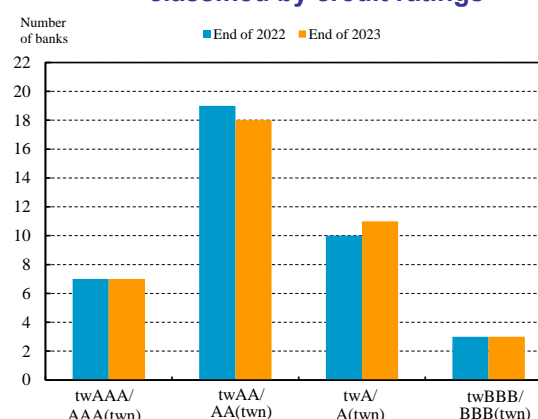
Sources: Taiwan Ratings and Fitch Ratings.

Chart 3.38 Total assets of life insurance companies

Sources: FSC and DGBAS.

Assets kept growing

The total assets of life insurance companies reached NT$34.90 trillion at the end of 2023, equivalent to 148.24% of annual GDP (Chart 3.38). The annual growth rate of total assets increased to 3.81% from 0.84% a year earlier, indicating continuous asset growth. The market

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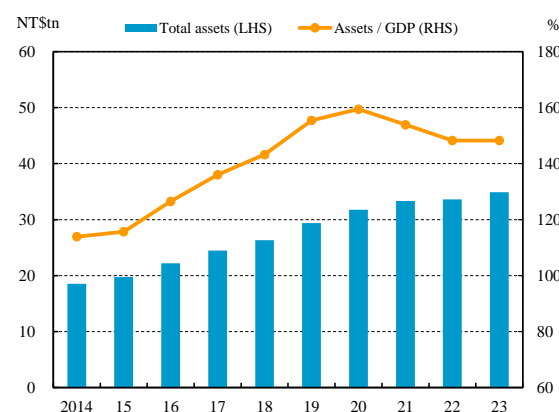
[49] Since Line Bank was rated BBB+(twn) for the first time, Hwatai Bank's credit rating changed from twBBB+ to A-(twn) as of changing the rating agency, and JihSun Bank merged into Taipei Fubon Bank, the number of domestic banks with credit ratings of twAA/AA(twn) decreased by one, twA/A(twn) increased by one, and twBBB/BBB(twn) remained unchanged as of the end of 2023.

[50] Press release by Taiwan Ratings on December 14, 2023.

structure of the life insurance industry remained roughly unchanged at the end of 2023, as the top three companies in terms of assets held a combined market share of 54.67%.

Investment positions continued to grow

In terms of the usage of funds of life insurance companies as of the end of 2023, investments continued to take up the primary share of total assets, with the share rising to 82.74% owing to an increase in foreign investments.[51] As for the sources of funds, insurance liabilities accounted for the largest share of 82.69%. Meanwhile, the share of equity increased to 6.43% mainly owing to the reclassification of financial assets by some life insurers and a substantial reduction in unrealized valuation losses from financial assets (Chart 3.39).

Pretax income slumped in 2023 but rebounded substantially in 2024 Q1

Life insurance companies reported a net

Chart 3.39 Asset/liability structure of life insurance companies
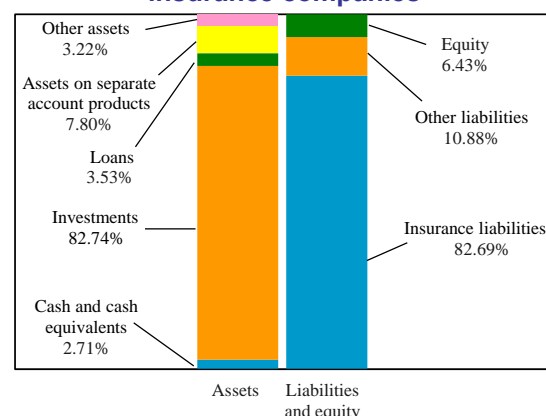
Note: Figures are as of the end of 2023.
Source: FSC.

Chart 3.40 Net income before tax of life insurance companies

Source: FSC.

income before tax of NT$80.6 billion in 2023, a considerable year-on-year decrease of 53.09% from NT$171.9 billion a year earlier (Chart 3.40). This mainly resulted from a huge drop in FX gains and a rise in hedging costs.[52] Their average ROE and ROA reached near 10-year lows after dropping to 4.20% and 0.24%, respectively, from 7.97% and 0.51% a year earlier (Chart 3.41). In 2024 Q1, driven primarily by improvements in FX gains and investment revenue, the net income before tax totaled NT$96.0 billion, indicating a significant increase from the same period of the previous year.

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[51] Foreign investments and domestic portfolio investments (including investments in insurance-related enterprises) made up 62.62% and 17.14% of total assets, respectively.

[52] In 2023, the NT dollar depreciated by 0.09% against the US dollar compared to a depreciation of 9.83% in 2022, leading to a plunge of NT$1,275.1 billion in FX gains. Hedging costs in 2023 amounted to NT$360.2 billion, a rise of NT$210.6 billion or 140.78% compared to the previous year.

Average RBC ratio and equity to asset ratio both rebounded

At the end of 2023, mainly because of a marginally larger increase in total capital than in risk-based capital, the average RBC ratio slightly rose to 298.09% from 297.82% a year earlier (Chart 3.42).[53] Among life insurers, two life insurance companies were below the minimum statutory ratio of 200% (Chart 3.43).

Furthermore, with some life insurance companies conducting financial asset reclassification, as well as a surge in US government bond prices and stock rallies, the average equity to asset ratio climbed to 7.12% at the end of 2023, much higher than the 5.27% registered a year earlier (Chart 3.44). Nonetheless, there was still one life insurance company with the ratio below the statutory minimum of 3%.

Overall credit ratings remained stable

Among the 15 life insurance companies rated by credit rating agencies in 2023, only one was downgraded to twA- by Taiwan Ratings owing to its weakened profitability and a capital level below the industry average, while ratings for other companies remained unchanged. At the year-end, except for one company rated twA-, all the other life insurance companies maintained credit ratings above twA or its equivalent. Among them, the top three companies in terms of assets all retained twAA ratings, representing a strong capacity to meet their financial commitments. As for rating prospects, most of them were rated with a stable outlook, except for two being rated with a negative outlook.

Taiwan Ratings indicated[54] that life insurers' profitability in 2024 would continue to face

Chart 3.41 ROE & ROA of life insurance companies
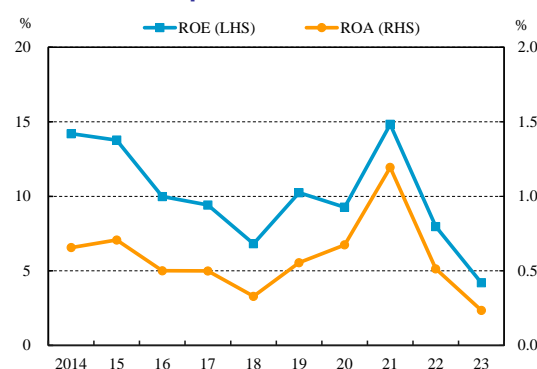
Notes: 1. ROE = net income before tax/average equity.
2. ROA = net income before tax/average assets.
Source: FSC.

Chart 3.42 RBC ratio of life insurance companies
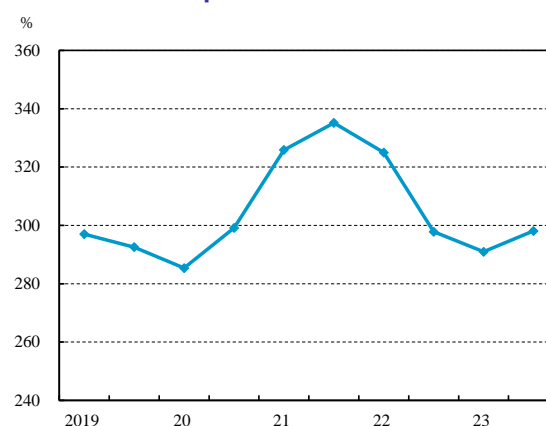
Notes: 1. RBC ratio = regulatory capital/risk-based capital.
2. Figures are exclusive of life insurance companies in receivership.
Source: FSC.

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[53] Life insurance companies are required to report their capital adequacy ratio data to the regulatory authority every six months.
[54] Taiwan Ratings (2023), "2024 Taiwan Credit Outlook," December.

challenges, such as the elevation of FX hedging costs and the difficulty of timely disposal of investment positions amid drastic volatility in financial markets. As these factors could lead to weakening capital buffers, the rating outlook was maintained as negative.

Foreign investment positions faced higher market risk

Foreign investment positions of life insurance companies grew continuously and reached NT$21.86 trillion at the end of 2023. Securities investments constituted the largest share, of which about 90% went to bills and bonds and 10% to equities. As the FOMC continued to be cautious about cutting interest rates, the future direction of its monetary policy remained uncertain. Additionally, the Russia-Ukraine war and ongoing tensions in the Middle East could affect the performance of domestic and foreign stock and bond markets. As a result, life insurance companies still faced higher equity risk and interest rate risk.

Furthermore, more than 90% of foreign investment positions of life insurance companies were in US dollars. In order to alleviate the impacts of exchange rate fluctuations, life insurance companies actively used derivative financial instruments for FX hedging, as well as building up FX valuation reserves in compliance with the relevant regulations. However, as the FX risk inherent in large-value open FX positions of life insurance companies remained high, it warrants constant close attention. Given the recent surge in FX hedging costs for life insurance companies, the FSC amended the regulations related to FX valuation reserves in March 2023. These amendments aimed to help life insurers to improve exchange rate risk management in a more flexible manner and stabilize hedging costs, thereby strengthening their solvency and financial soundness.

Chart 3.43 Number of life insurance companies classified by RBC ratios
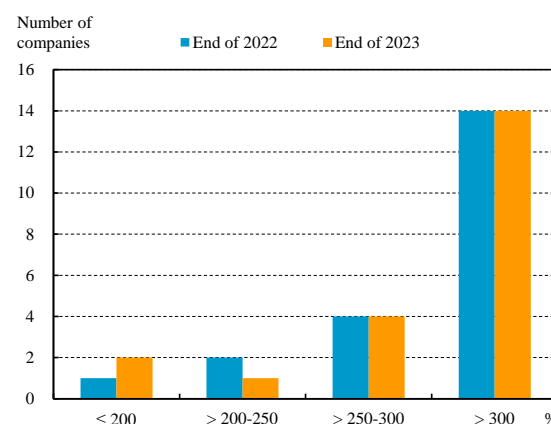
Source: FSC.

Chart 3.44 Equity to asset ratios of life insurance companies
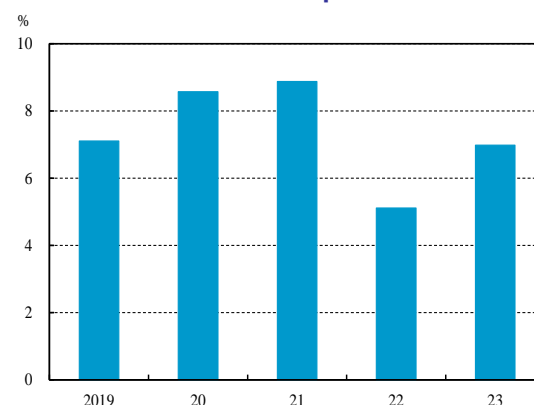
Notes: 1. Equity to asset ratio of 2023 is audited figure.
2. For assets, the assets of investment-linked insurance products in separate accounts are excluded.
Source: FSC.

Decline in premium income narrowed, but future cash flow changes warrant continuous monitoring

Affected by a slump in the sales of interest-sensitive policies and continued shrinkage in the sales of investment-linked annuities, the monthly premium income has been mostly lower than benefit payment since July 2022 (Chart 3.45). In 2023, premium income amounted to NT$2.19 trillion with a 6.27% year-on-year decrease, representing a more moderate decline than the 21.43% drop experienced the year before. After deducting

Chart 3.45 Premium income and benefit payment of life insurance companies
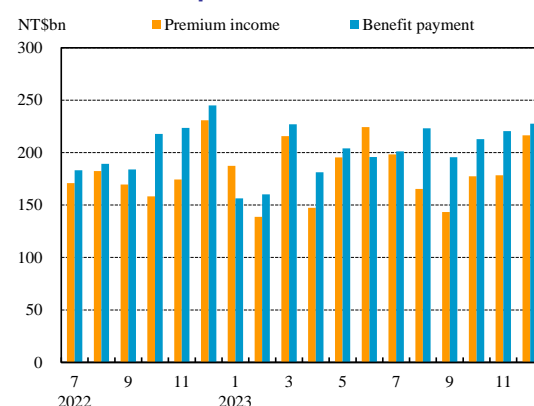
Note: Benefit payment includes maturity, survival repayment and termination.
Source: Taiwan Insurance Institute.

benefit payment from premium income, the net cash outflow for the entire year was approximately NT$217.5 billion. Nevertheless, cash and cash equivalents reached NT$944.3 billion at the end of December 2023, which was sufficient to cover the cash outflows. Furthermore, the FSC actively monitored the cash flows of life insurance companies and relaxed the types of bonds and notes with reverse repurchase agreements (reverse repo) or repo agreements that insurance enterprises may engage in, which should help alleviate funding pressure on these companies. However, some life insurance companies have had their financial assets reclassified to be measured at amortized cost, which potentially limited their ability to realize the capital gains from bond investments. [55] Additionally, with benefit payment continuing to increase in 2024 Q1, it remains crucial to monitor the evolving cash flow dynamics of life insurance companies.

To smoothly transition towards the new generation solvency regime, large life insurance companies have been issuing long-term subordinated bonds

To enhance fundraising flexibility, the FSC relaxed the regulations on the issuance of long-term corporate bonds by the insurance industry in April 2023.[56] Large life insurance companies have successively issued long-term subordinated bonds since the second half of 2023, with a total issuance amount surpassing NT$105 billion for the year. This initiative was aimed at a

[55] In accordance with the FSC Insurance Bureau's meeting resolution on July 23, 2020, regarding the "Constant Materiality Standards for Early Sale of 'Financial Assets Measured at Amortized Cost (AC)'," the insurance industry is not allowed to sell AC bonds annually at a ratio exceeding 5% of the bonds initially classified as AC. Should this threshold be surpassed, from the following year until the implementation of IFRS 17 (i.e., before the effective date in 2025), no newly acquired bonds are permitted to be classified as AC assets.
[56] The primary amendment was to lift the restriction to allow insurers to issue long-term corporate bonds with maturities of 10 years or more, and to include these bonds in Tier 2 capital.

smooth transition toward compliance with the Insurance Capital Standard (ICS), as well as strengthening the financial structure, enriching self-owned capital, and improving the capital adequacy ratio of the insurance industry.

3.2.3 Bills finance companies

In 2023, the total assets of bills finance companies rose, along with an increase in their guarantee business. Meanwhile, the concentration of credit secured by real estate declined, and the quality of credit assets improved. Although profitability continued to subside and liquidity risk and interest rate risk were still high, the capital adequacy ratio went up.

Total assets increased

The total assets of bills finance companies stood at NT\$1.12 trillion at the end of 2023, an increase of 7.84% compared to a year earlier mainly owing to greater investments in corporate bonds and in negotiable certificates of deposit.

Chart 3.46 Total assets of bills finance companies
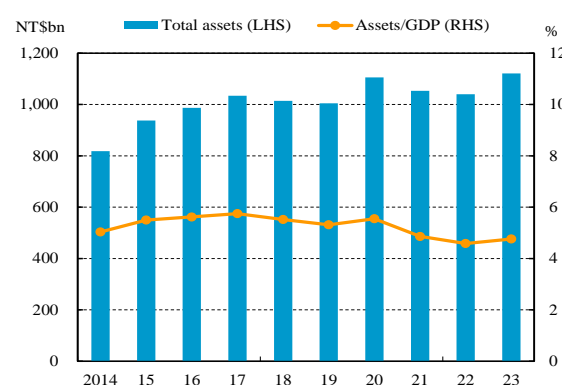
Sources: CBC and DGBAS.

Chart 3.47 Asset/liability structure of bills finance companies

Note: Figures are as of the end of 2023.
Sources: CBC and FSC.

The ratio of their total assets to annual GDP rebounded to 4.76% over the same period (Chart 3.46).

In terms of the asset and liability structure of bills finance companies, bill and bond investments constituted the largest share of 96.46% of total assets as of the end of 2023. On the liability side, bills and bonds sold under short-term repo transactions as well as borrowings accounted for 86.57% of total assets, while the proportion of equity increased to 12.23% (Chart 3.47). The asset and liability structure remained roughly unchanged compared to a year earlier.

Credit risk

Guarantee liabilities increased, while the concentration of credit secured by real estate declined

The amount of CP guaranteed by bills finance companies registered NT$577.7 billion at the end of 2023 (Chart 3.48), increasing by 5.28% year on year. This was because of a lower base effect as bills finance companies reduced their risky asset positions for CP guarantees in the previous year to maintain an adequate capital ratio. Consequently, the average ratio of guarantee liabilities to equity increased to a multiple of 4.96 times, and the ratio for each company remained below the regulatory ceiling of 5.5 times.

At the end of 2023, guarantees granted to the real estate and construction industries decreased from 31.45% a year earlier to 29.48% of the total credit of bills finance companies. Among these, the proportion of real estate industry guarantees regulated by the FSC shrunk to 25.57%, still below the regulatory ceiling of 30%. In addition, the share of credit secured by real estate also decreased from 42.05% a year earlier to 38.78%. Considering the recent resurgence in domestic real estate market transactions, still-high house prices, and an increase in unsold newly built residential housing units, bills finance companies should monitor closely the above-mentioned impacts on the asset quality of mortgage-related credit.

Chart 3.48 Outstanding CP guaranteed by bills finance companies
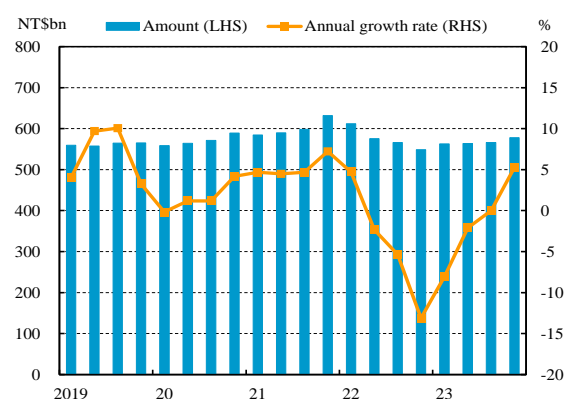
Sources: CBC.

Chart 3.49 Guaranteed advances ratio of bills finance companies
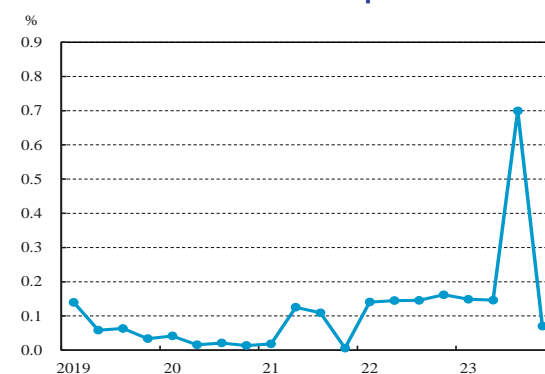
Note: Guaranteed advance ratio = overdue guarantee advances/(overdue guarantee advances + guarantees).
Source: CBC.

Guaranteed advances ratio declined, while credit quality improved

At the end of 2023, the guaranteed advances ratio of bills finance companies was 0.07% (Chart 3.49), reflecting improved credit quality. Consequently, the credit loss reserves to guaranteed

advances ratio[57] increased to 18.68 times, with the provision sufficient to cover potential credit losses.

Investment in non-guaranteed CP issued by the leasing industry shrank, but its potential credit risk warrants attention

The non-guaranteed CP investment of bills finance companies stood at NT$120.7 billion at the end of 2023, representing an increase of 5.39% year on year (Chart 3.50). This was because the positions of their non-guaranteed CP had been increased to expand yield spreads between their long-term bonds and short-term reverse repos amid ample liquidity in the money market in the fourth quarter. Each company's ratio of non-guaranteed CP investment to equity remained below the self-disciplinary ceiling of 2 times.[58] However, the investment in non-guaranteed CP issued by the leasing industry kept decreasing, reaching NT$30.8 billion at the end of 2023. The leasing industry could pose a higher potential credit risk owing to the fact that it tends to rely on short-term sources for funding long-term investments, hence warranting close attention to such impact on the asset quality of bills finance companies.

Chart 3.50 Outstanding amount of non-guaranteed CP investments of bills finance companies

NT$bn
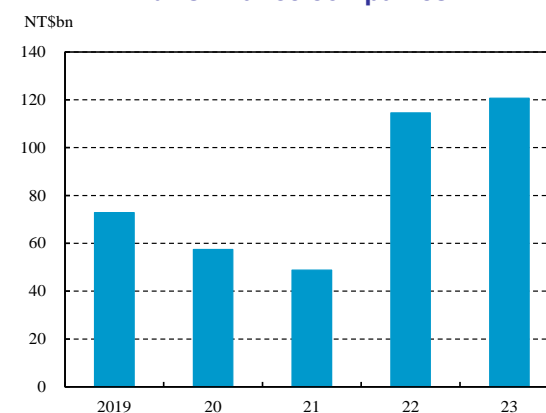
Source: CBC.

Chart 3.51 0-30 day maturity gap ratio of bills finance companies

%
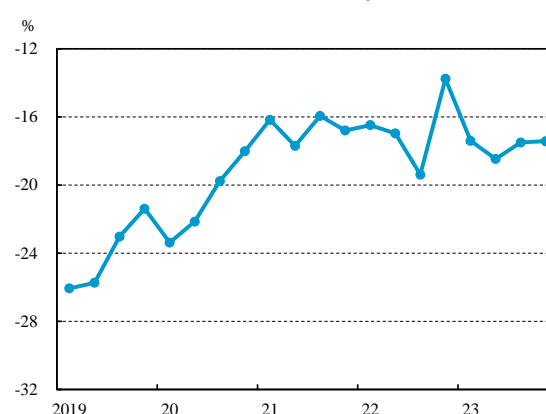
Note: 0-30 day maturity gap ratio = net NTD cash flow within 0-30 days/total assets denominated in NTD.
Source: CBC.

Liquidity risk increased

The business models of bills finance companies are characteristic of deploying short-term funds for long-term objectives. At the end of 2023, more than 80% of their funding sources relied on short-term interbank borrowing and repurchase agreements with financial institutions,

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[57] Credit loss reserves to guaranteed advances ratio = (provisions + loss reserves to guarantees)/guaranteed advances.
[58] According to the *"Self-Disciplinary Rules for Members of the R.O.C. Bills Finance Association on Handling Non-Guaranteed Commercial Paper Transactions,"* a bills finance company shall hold non-guaranteed commercial paper (including those of state-owned enterprises) to no more than twice its net worth.

while more than 90% of their assets were invested in bills and bonds, 44.10% of which were long-term bonds, continually showing maturity mismatch between assets and liabilities. Nevertheless, the average ratio of 0-30 day maturity gap to total NTD-denominated assets increased further and registered -17.43% at the end of the year (Chart 3.51), highlighting an escalating liquidity risk.

Moreover, the average ratio of major liabilities[59] to equity rose to 8.34 times at the end of 2023 because the expansion in bill and bond repo transactions conducted resulted in an increase in major liabilities and led to a higher degree of overall financial leverage. However, the leverage ratios of all bills finance companies stayed below the regulatory ceilings of 10 or 12 times.

Interest rate risk of bond investments rose

In 2023, the outstanding amount of fixed-rate bond investments of bills finance companies increased by 14.65% to NT$478.0 billion with the average duration lengthening to 4.21 years (Chart 3.52). Although the Fed has adopted a more cautious stance towards interest rate cuts recently, if US government bond yields continue to stay at a high level, with the strong correlation of government bond yields between domestic and US markets, the interest rate risk of bond investments would still be high, meriting close attention.

Chart 3.52 Outstanding amount of fixed-rate bond investments and bond duration of bills finance companies
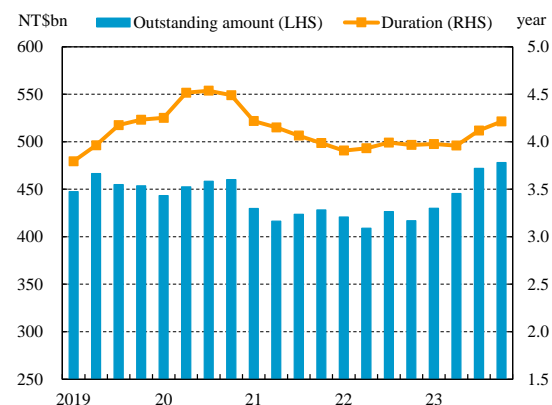
Source: FSC.

Chart 3.53 Net income before tax of bills finance companies
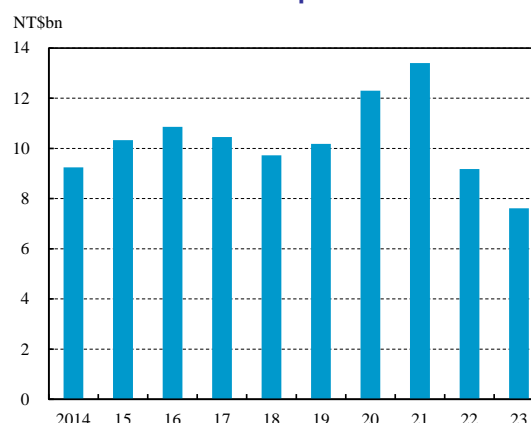
Source: CBC.

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[59] Major liabilities include call loans, repo transactions, as well as issuance of corporate bonds and CP.

Profitability declined continuously

The net income before tax of bills finance companies decreased by 17.05% year on year to NT$7.6 billion in 2023 (Chart 3.53). This was due to a reduction in net interest income resulting from a narrowing yield spread by way of hoarding bills for arbitrage and an increase in reserves against guarantee liabilities. Thus, the average ROE and ROA decreased to 5.93% and 0.71% (Chart 3.54), respectively, reflecting declining profitability.

Average capital adequacy ratio rose

Benefiting from a decrease in unrealized valuation losses on investments in marketable securities and an injection of earnings, the average Tier 1 capital ratio and capital adequacy ratio rose to 13.66% and 13.91%, respectively, at the end of 2023 (Chart 3.55). The capital adequacy ratio stayed well above the statutory minimum of 8% for each company.

Chart 3.54 ROE & ROA of bills finance companies
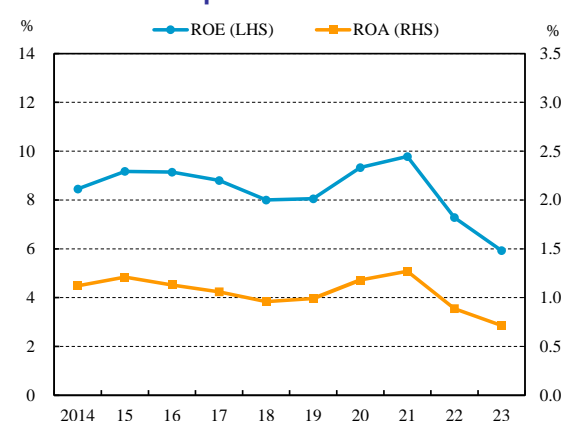
Notes: 1. ROE = net income before tax/average equity.
2. ROA = net income before tax/average assets.
Source: CBC.

Chart 3.55 Average capital adequacy ratios of bills finance companies
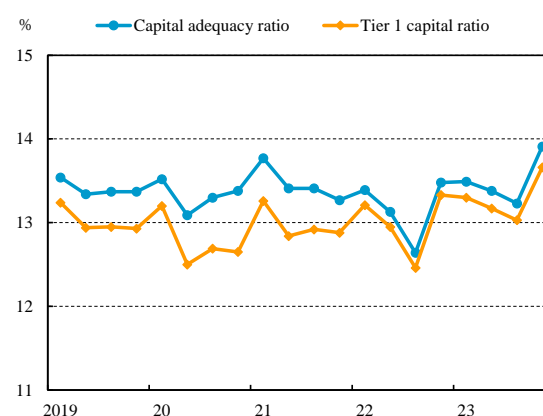
Source: CBC.

3.3 Financial infrastructure

In 2023, Taiwan's payment and settlement systems operated smoothly, and the shared infrastructure for retail payments was further strengthened, thereby promoting the development of electronic payments. Meanwhile, the FSC assisted Taiwan's insurance industry in aligning with international standards, continually promoted the early identification and assessment of climate change-related risks in the financial industry, enhanced the management of crypto asset platforms, and persistently amended regulations to facilitate the stable development of the financial sector.

Chart 3.56 Funds transferred via the CIFS
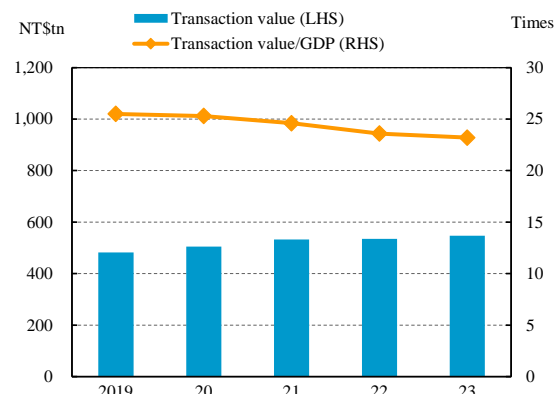
Note: Figure for GDP in 2023 is published by DGBAS on May 30, 2024.
Sources: CBC and DGBAS.

3.3.1 Payment and settlement systems

In 2023, the operation of the CBC's CIFS and the FISC's IFIS both functioned smoothly, along with steady growth in their transaction values. The FISC continued to strengthen the shared infrastructure for retail payments. With an increase in the public's willingness to use e-payment instruments, consumer spending related to these instruments has also been expanding.

Overview of the CIFS's operation

The CIFS deals with large-value fund transfers among financial institutions and the final settlements for domestic securities, bills, bonds, and retail payments. In 2023, the amount of funds transferred via the CIFS was approximately NT$547 trillion, nearly 23.2 times the size of the GDP for the year (Chart 3.56).

In terms of retail payments, they are primarily processed by the IFIS, which utilizes the funds deposited by financial institutions in the Interbank Funds Transfer Guarantee Special Account (hereinafter the Guarantee Account)[60] under the CIFS to clear and settle interbank payment

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[60] The Guarantee Account, established jointly by financial institutions with the Central Bank, holds funds for clearing interbank transactions. When the public makes interbank withdrawals or transfers, the FISC system promptly deploys these funds to clear transactions between financial institutions.

transactions on a trade-by-trade basis.[61] In 2023, approximately 1.28 billion transactions were processed by the IFIS, with the value totaling NT$202 trillion (Chart 3.57), representing increases of 7.48% and 2.63%, respectively, compared to 2022.

Development of shared infrastructure for retail payments

To enhance the convenience of using mobile payments for the public, the Bank had urged the FISC to establish a common QR Code payment standard, which had successively offered various functions such as transfers, bill payments, and shopping payments. From its launch in September 2017 to the end of 2023, 41 banks, nine e-payment institutions, and over 390,000 affiliated merchants had joined this initiative. The accumulated volume of transactions processed through this common standard exceeded 260 million transactions, with a total value of approximately NT$1.05 trillion. The value and volume of transactions

Chart 3.57 Transaction value and volume processed by the IFIS
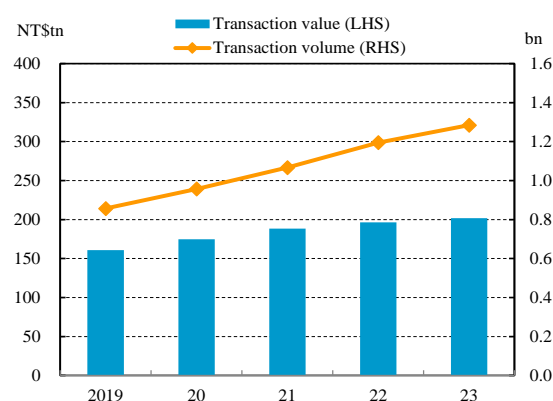
Source: CBC.

Chart 3.58 Transaction value and volume via QR Code payment standard

Source: CBC.

in 2023 increased by 26.09% and 18.41%, respectively, compared to the previous year (Chart 3.58).

Additionally, to facilitate the interconnection of information flows and cash flows between banks and e-payment institutions, the FISC established a shared platform for cross-institution e-payments in October 2021. This platform subsequently added various functions, such as transfers, utility bill payments, and tax payments. In October 2023, the function of "e-payments for shopping" on the platform went live. Meanwhile, Taiwan's common QR Code payment standard was officially labeled as "TWQR." Through the apps of e-payment institutions, the public can seamlessly conduct transfers, bill payments, tax payments, and shopping transactions across different e-payment and financial institutions (Box 1).

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[61] Interbank payment transactions include remittances, automated teller machine (ATM) withdrawals, transfers (including online and mobile transfers), tax payments and corporate funds transfers.

Domestic consumption via e-payment instruments

In 2023, the overall expenditure via e-payment instruments reached NT$7.21 trillion (Chart 3.59), an increase of 18.67% year on year. Among these payment instruments, spending via credit cards, debit cards, and e-payment accounts increased by NT$695.8 billion, NT$281.3 billion, and NT$83.6 billion, respectively. This growth can be mainly attributed to an enhancement in convenience of e-payments, supported by the continuous improvement of the shared infrastructure for retail payments.

Chart 3.59 Consumption via non-cash payment tools
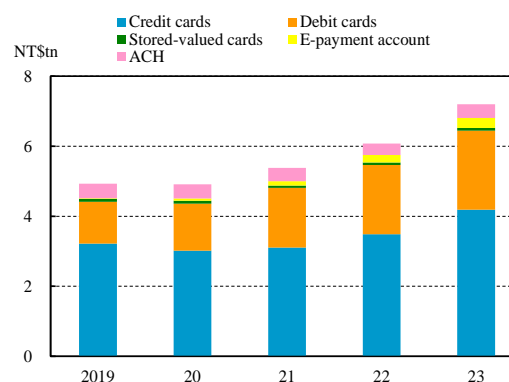
Notes: 1. The consumption statistics of debit cards include consumer purchases with domestic chip bank cards, VISA and other international debit cards, UnionPay cards, and ATM transfers for shopping payments.
2. ACH interbank collection refers to the handling by payment institutions of funds deducted from and transferred to the relevant accounts through the ACH system of the TCH on behalf of customers.

Sources: CBC, FSC and FISC.

Box 1
Taiwan's common QR code payment standard

Riding the wave of rapid growth in electronic payments, a large number of payment institutions have entered the market, providing consumers with more diverse payment options. The payment function is an integral part of financial businesses, and promoting security and efficiency of the payment system helps sustain financial stability. Particularly, QR code payment has been increasingly popular in recent years. Many countries have successively launched national common QR code payment standards. Taiwan also established such a standard as early as 2017, allowing customers of different financial institutions to make payments and transfers via QR codes, thereby contributing to a more convenient and secure mobile payment environment.

1. Many countries have launched common QR code payment standards

Payment services exhibit "network effects," where the more people use the services, the higher the value for themselves. Therefore, payment services should be made as accessible as possible to take full advantage of network effects. However, considering operating profits and business competition, payment institutions tend to develop independent, closed and non-interoperable systems individually, which only serve their own customers and provide no cross-institutional services, leading to a phenomenon of "fragmentation" in the payment market. Not only does it cause inconvenience for users but hinders healthy competition in the market. Over time, the market may even be dominated by a small number of payment institutions, thus becoming monopolistic or oligopolistic, which is detrimental to healthy market development. In addition, in a fragmented market structure where payment institutions are allowed to develop their own systems separately without collectively adopting secure and efficient common platforms and standards, once an anomaly or failure occurs in the system of a payment institution, it could disrupt the operation of the payment market as a whole and impact financial stability, and would potentially be more serious if it's one of the few dominant payment institutions.

In order to bring the network effects of payment services into full play, preserve the long-term competitiveness in payment markets, and ensure financial stability, international efforts have been aimed at actively implementing policies to enhance the interoperability of payment systems, mainly by urging payment institutions to adopt secure and efficient

common platforms and standards. Therefore, aside from establishing retail "fast payment systems"[1] to provide real-time settlement services year-round by integrating the movement of messages and funds among various payment institutions on the back end, many countries have recently also introduced national standardized QR code payment standards on the front end of payment interfaces (Table B1.1).[2] These initiatives have addressed challenges such as incompatible QR code specifications that hindered interoperability, where merchants had to interface with individual payment institutions, leading to increased operational costs and inconvenience for the public to identify and use.

Table B1.1 Launch of common QR code payment standards in selected countries in recent years

Country/ jurisdiction	QR standard	Time of launch
India	BharatQR	September 2016
Taiwan	TWQR	September 2017
Thailand	Thai QR	October 2017
Singapore	SGQR	September 2018
Hong Kong	HKQR	September 2018
Indonesia	QRIS	August 2019
Australia	NPP QR Code Standard	June 2019
Malaysia	DuitNow QR	July 2019
Japan	JPQR	August 2019
Philippines	QR Ph	November 2019
Vietnam	VietQR	June 2021

Sources: Yulius et al. (2023) and websites of selected countries.

2. Development of Taiwan's common QR code payment standard

While other countries only began to launch fast payment systems in recent years (for example, the FedNow service introduced by the US in 2023), Taiwan established the IFIS, operated by the FISC, as early as in 1987. Later, the IFIS began to offer 24-hour payment services in 1991. Then, coordinated efforts among financial institutions led by the FISC were made to introduce the common QR code payment standard in September 2017, which preceded those in many neighboring countries, and enabled financial institutions' customers to make payments and transfers by scanning QR codes.

In October 2021, the FISC established a shared platform for cross-institution e-payments to facilitate the interconnection of information and cash flows between e-payment institutions, as well as between financial institutions and e-payment institutions, which further expanded the scope of retail fast payment services. This platform subsequently served various additional functions, such as cross-institutional e-transfers, e-payments for taxes and utility bills. In October 2023, the function of e-payments for shopping went live on the platform. Meanwhile, Taiwan's common QR code payment standard was officially

labeled as "TWQR" (Chart B1.1), and the FISC collaborated with financial institutions as well as e-payment institutions to jointly promote TWQR on the platform, marking the beginning of participation by both financial institutions and e-payment institutions in the TWQR payment ecosystem.

Chart B1.1 TWQR label

Source: Official TWQR website.

3. Future development of TWQR

In the future, the FISC will continue to extend the usage scenarios of TWQR, including facilitating its adoption by the transportation industry so that the public can use TWQR on e-payment or mobile banking apps when taking public transportation. Furthermore, in December 2021, the FISC teamed up with its Japanese counterpart and launched a TWQR-based cross-border e-payment for shopping services, which was later expanded to South Korea in January 2024. Taiwanese citizens are expected to benefit from enhanced security and convenience of mobile payment through this service when traveling abroad.

Notes: 1. A fast payment system refers to a system in which the transmission of the payment message and the availability of the final funds to the payee occur in real time or near real time on a 24/7 basis. For more detail, please see Bech, Morten and Jenny Hancock (2020), "Innovations in Payments," *BIS Quarterly Review*, March.
2. See Yulius, Davids Tjhin et al. (2023), "Interoperable QR Code Payment Ecosystem in ASEAN: What It Means for the World," BCG and ASEAN Business Advisory Council, September.

3.3.2 Taiwan set out to align with IFRS Sustainability Disclosure Standards

To increase comparability of cross-country sustainability information and prevent greenwashing, the IFRS Foundation's International Sustainability Standards Board (ISSB) issued IFRS Sustainability Disclosure Standards S1 General Requirements for Disclosure of Sustainability-related Financial Information and S2 Climate-related Disclosures in June 2023. The above-mentioned standards require an entity to provide sustainability disclosures about governance, strategy, risk management, and metrics and targets. Among them, IFRS S1 emphasizes the connection between sustainability information and financial statement information, including the consistency of reporting entity, materiality criteria, and disclosure timing. S2 highlights that an entity should develop transition plans, use climate-related scenario analysis to assess its climate resilience, and disclose climate-related information relevant to the cross-industry and industry-based metrics and targets, as well as the targets set by itself.

After gathering stakeholder feedback, the FSC released the Roadmap for Taiwan Listed Companies to Align with the IFRS Sustainability Disclosure Standards in August 2023, which aimed for direct adoption of the IFRS Sustainability Disclosure Standards.[62] According to the Roadmap, starting from 2026 (financial year), the FSC will take a phase-in approach for listed companies to adopt the IFRS Sustainability Disclosure Standards in three phases depending on capital size.[63] Moreover, in line with the spirit of information connectedness between S1 and disclosures in the financial statements, listed companies are required to disclose sustainability information in a dedicated chapter in their annual reports and to publish ahead of time the sustainability information in concurrence with their financial statements. Meanwhile, the FSC also set up a task force to promote the adoption of the IFRS Sustainability Disclosure Standards to help companies with smooth adoption of the Standards.

3.3.3 The Bank and the FSC strengthened the research and action related to climate change scenario analysis of the banking industry

Since the release of the CBC Strategic Plan to Address Climate Change Issues in December 2022, the Bank has initiated research on climate risk assessment and measurement methodologies. The international practices and experiences of major economies (e.g., the US,

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[62] Starting from 2026, the initial application of IFRS Sustainability Disclosure Standards will include S1 and S2, and the FSC will continue assessing and endorsing each upcoming set of standards issued by the ISSB, based on the development of IFRS Sustainability Standards.

[63] Listed companies with capital over NT$10 billion, over NT$5 billion and less than NT$10 billion, and other listed companies will be required to adopt from 2026, 2027, 2028, respectively.

UK, EU, France, Japan and Australia) in developing climate risk-related macro-stress tests have been collected and studied to serve as an important reference in the future.

Meanwhile, to review the risks and capabilities of the domestic financial industry, the FSC required domestic banks to disclose climate-related financial information from 2023 onwards. Furthermore, the FSC took climate-related factors into account for prudential supervision in the Green Finance Action Plan 2.0. It also commissioned the BAROC to develop a climate change scenario analysis module applicable to all domestic banks.

Following international practices, the aforementioned module assumes three stress scenarios (Table 3.3) covering two physical risk factors (i.e., extreme torrential rain /flood and drought) and one transition risk factor (i.e., carbon price). Risk assessment for all the three scenarios is made for two horizons, 2030 and 2050, using bottom-up and static balance sheet approaches for analysis.

Table 3.3 Scenarios used in domestic banks' climate change scenario analysis modules

Scenarios	Corresponding scenarios	Analysis objectives
Orderly transition	The NGFS Net Zero 2050 scenario and the IPCC RCP 2.6 scenario	To assess the potential risks of the gradual implementation of global transition policies to achieve net zero emissions by 2050
Disorderly transition	The NGFS delayed transition scenario and the IPCC RCP 2.6 scenario	To assess the potential risks of meeting the 2050 net zero emissions target despite the delayed transition
No policy	The NGFS current policies scenario and the IPCC RCP 8.5 scenario	To assess the potential risks of no transition policies (only physical risks in this scenario)

Notes: 1. The corresponding scenarios in this Table refer to the NGFS Phase II and IPCC AR5 scenarios.
    2. Based on the severity of climate change at the end of the century, the IPCC AR5 scenarios divide the trends of greenhouse gas concentrations into Representative Concentration Pathway (RCP) 8.5, RCP 6.0, RCP 4.5 and RCP 2.6 scenarios, where the RCP 8.5 scenario represents no transition policies and the highest physical risks, and the RCP 2.6 represents the most aggressive transition scenario to control carbon emissions.

Source: FSC.

The banking industry completed a pilot climate change scenario analysis in 2023 and reported their results. In the "deployment" aspect of the Green Finance Action Plan 3.0, the FSC planned to urge individual financial institutions to conduct and modify their stress tests or scenario analyses associated with climate change. In 2024, the BAROC was commissioned to further improve the existing scenario analysis modules, including how to incorporate the scenarios of the Network for Greening the Financial System (NGFS) Phase IV and of the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6) into the existing modules, so as to improve the granularity of the modules and make the assessment more closely represent the real situation.

3.3.4 The FSC announced transitional measures for the adoption of IFRS 17 and TW-ICS for insurers

In order to assist domestic insurers to smoothly adopt the IFRS 17 (Insurance Contracts) and the new-generation solvency regime for the insurance industry, referred to as TW-ICS, by 2026, the FSC has successively released transitional measures aligned with the international system. In July 2023, the FSC devised the localization and transitional measures pertaining to the adoption of market risk components within TW-ICS, specifically addressing equity, real estate, and policy-based infrastructure for insurers (as shown in Table 3.4).

Table 3.4 The investment items for the adoption of the localization and transitional measures aligned with TW-ICS

Investment items	RBC risk factor	TW-ICS risk factor
Stocks listed on TWSE/TPEx	TWSE stocks: 21.65% TPEx stocks: 30%	35% (Average increment and alignment over 15 years starting from 2026)
Real estate	7.81%	15% (Average increment and alignment over 15 years starting from 2026)
Policy-based infrastructure	1.28%	Years 2026-2030: 1.28% (Localized risk factor will be separately mulled with reference to international standards and local conditions, by an average increment over 10 years)

Source: FSC.

Furthermore, the FSC proposed an interest rate shift measure for the adoption of IFRS 17 and Phase 2 transitional measures of TW-ICS by insurers in November 2023. The content of the measure included the following: (1) a 50 bps illiquidity premium is given to liability discount rates on interest rate policies with reserve rates above 6% or higher (i.e., high interest rate policies); (2) setting a 15-year phase-in period starting from the date of TW-ICS adoption (i.e., 2026) for insurers to increase through linear increment the interest rate risk factor from 50% of the TW-ICS risk factor to 100%; (3) allowing insurers to recognize the net asset effect (i.e., the net effect resulting from the recognition of assets and liabilities at fair value) in a 15 year period starting from the date of adoption.

To encourage domestic insurers to continuously improve their financial and business development and asset-liability management capabilities, the FSC proposed Phase 3 localization and transitional measures, as well as differentiated management measures in April 2024 as follows: (1) allowing callable bonds, held by insurers prior to the end of 2023, to be

included in eligible assets; (2) allowing insurers to linearly increase their capital charge for emerging risks[64] (including longevity, policy surrender, expenses and catastrophe risks) from 0% to 100% over the course of 15 years; (3) adding a support measure of increasing insurer's asset allocation flexibility and an incentive measure of decreasing the risk factor for insurers who endeavor to increase both capital and the contractual service margin (CSM), so as to help insurers gradually align with international standards.

In the future, the FSC will conduct system reviews based on the actual implementation status of insurers every 5 years after the adoption of TW-ICS. In addition, the FSC will continue to pay attention to the latest development of international systems as published by the International Association of Insurance Supervisors (IAIS) and will accordingly adjust and review the relevant systems in a timely manner.

3.3.5 Strengthening the management of platforms involving crypto assets and digital lending

In light of foreign crypto asset service providers successively filing for bankruptcy in recent years, such as the collapse of the crypto asset exchange FTX in November 2022 that took a financial toll on domestic investors, the Executive Yuan designated the FSC as the competent authority for platforms involving financial investments or payment-related crypto assets in March 2023. Accordingly, the FSC released the *Guiding Directions for the Administration of Virtual Asset Platform or Transaction Service Providers (VASPs)* (hereinafter the *Guiding Directions*) in September 2023. The *Guiding Directions* covers transaction information transparency, the methods for custody of customer assets, VASP internal controls and audits, and assistance from external experts.[65] Moreover, the FSC encouraged VASP-related industry associations to formulate self-disciplinary rules in compliance with the aforementioned *Guiding Directions*, so as to lead VASPs to strengthen internal controls and thereby enhance protections for the rights and interests of their customers. In addition, the *Guiding Directions* confine virtual assets, which can be issued through the platforms, to non-stablecoins first. Should stablecoins be used widely as payment tools, they could influence Taiwan's currency sovereignty, monetary and FX policies, and financial stability. In this view, the management of domestic stablecoins will be discussed as appropriate in the future.

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[64] Longevity risk refers to the risk of adverse effects such as insufficient premium income and inadequate reserves resulting from average life expectancies exceeding expectations. Policy surrender risk refers to the risk of policies becoming invalid or being surrendered prematurely.
[65] The *Guiding Directions* consists of 10 items, including (1) management of crypto assets issuance; (2) review procedures for listing and delisting of crypto assets; (3) separate custody of VASP assets and customer assets; (4) transaction fairness and transparency; (5) making contracts, advertising solicitation, and complaints handling; (6) operating systems, information security, and cold/hot wallet management; (7) information disclosures; (8) internal control systems and institutional audits; (9) individual VASPs; and (10) foreign VASPs.

Moreover, after reviewing relevant domestic operational practices and taking reference at regulatory requirements internationally, the FSC issued the *Guidelines for Peer-to-Peer Lending Platform Operators* (hereinafter referred to as the *Guidelines*) in October 2023. The *Guidelines* serve as a reference for P2P platform operators in conducting business, for financial institutions and platform operators in engaging in business transactions, and for consumers in assessing and choosing transaction platforms. The primary scope covered by the *Guidelines* is as follows: (1) stipulating that services provided by a P2P operator may not involve any financial business for which special approval is required, such as accepting deposits or receiving stored funds; (2) risk management mechanisms to be adopted by P2P operators, such as a real-name account system for borrowers and lenders, segregation of P2P operators' own funds from customer funds, control of borrowing caps, and measures to prevent illegal activities; (3) consumer protection measures required of P2P operators, such as a mechanism for confirming the veracity of creditor claims, protection of personal data, information disclosure, security of data transmission, and customer dispute handling mechanisms. Furthermore, in order to assist P2P operators in enhancing their risk management mechanisms and consumer protection measures, the FSC mandates that financial institutions should understand P2P operators' actual situation in operation, assess their risks, and conduct anti-money laundering reviews when engaging in transactions (e.g., deposits, loans, payment services, and fund custody) with them.

3.3.6 The FSC published the core principles and guidelines for AI applications of financial institutions

In recent years, financial institutions have increasingly used AI. Although AI technology brings benefits to financial institutions and consumers, it has also given rise to many problems and risks. Consequently, how to appropriately supervise AI usage to ensure consumer rights and financial stability has become a key issue for supervisory authorities around the world. In order to help financial institutions leverage the benefits of AI technology while effectively managing related risks, international organizations and major central banks have successively proposed regulatory requirements or guidelines for the use of AI by financial institutions. The FSC also published the *Core Principles and Policies for AI Applications in the Financial Industry* in October 2023, which outlined six core principles and eight supporting policies. In December 2023, the FSC released a draft of the *Guidelines for AI Applications in the Financial Industry* based on the aforementioned six principles. The aforementioned draft *Guidelines* lay out the key points and feasible measures to serve as a reference for financial institutions to follow when using AI, so as to encourage them to introduce, use and manage AI systems in the context of controllable risks (Box 2).

Box 2
Potential risks and supervision trends in the use of artificial intelligence (AI)
technology by financial institutions

In recent years, financial institutions have increasingly used artificial intelligence (AI). AI technology can effectively improve operational efficiency and customer service experience and thereby benefit financial institutions and consumers, but it may also pose problems such as financial exclusion,[1] privacy infringement, black box operations, high outsourcing concentration and herd behavior, which could affect financial stability. Therefore, while AI technology innovation is encouraged, how to appropriately regulate AI to ensure consumer rights and stability of the financial system has become an important issue for supervisory authorities across the world. The following section briefly describes the benefits and potential risks of AI, introduces the international trends in the supervision of the use of AI in the financial industry, and gives account of Taiwan's policies and guidelines for AI usage in financial institutions devised by referencing international supervision trends.

1. Benefits and potential risks of AI

At present, there is no consistent definition of AI accepted by supervisory agencies around the world. The most commonly cited one is from the Financial Stability Board (FSB):[2] "the theory and development of computer systems able to perform tasks that traditionally required human intelligence." Generative Artificial Intelligence (GenAI), which has been booming recently, refers to related AI systems that can generate content simulating human intelligence. The content in GenAI includes articles, images, audio, videos, and program codes, but it is not limited to the above-mentioned applications.

AI technology can process large amounts of data quickly through strong computing power and produce great benefits such as improving forecasting capabilities, optimizing operations and customizing services. Related applications include automating internal processes, analyzing customer information to provide customized suggestions, and streamlining the processes of customer services through technologies such as facial recognition and image recognition. GenAI technology, which has emerged in recent years, has also brought substantial changes to human life. People are able to obtain results in a very short time by simply inputting their needs and related data into the GenAI system, significantly reducing manual work time.

Although the use of AI technology has many benefits, its applications in the financial

industry may bring about the following potential risks, which, if not properly supervised and managed, could harm financial consumer rights and financial stability.

(1) For financial consumers: There are concerns such as breach of personal privacy, bias or discrimination in prediction results.

(2) For financial institutions: They face risks such as AI black-box operations, unclear responsibilities, and concentration in operations outsourced to a limited number of third-party providers.

(3) For financial markets: AI applications such as high-frequency program trading may cause herd behavior or increase market connectivity.

In addition, "The Global Risk Report 2024"[3] (hereinafter referred to as the Report) released by the World Economic Forum (WEF) in January 2024 listed "AI-generated misinformation and disinformation" as the second largest risk in the world in 2024 and the top risk in the next two years. The Report pointed out that if AI is not properly managed and thus misused, it might cause concerns such as hate crimes and terrorism, loss of job opportunities, crime and cyber-attacks, prejudice and discrimination, and even impact the global political system, economic markets and national security.

2. International supervisory trends in the use of AI in the financial industry

As the use of AI in the financial industry becomes increasingly popular, how to regulate it appropriately to safeguard consumer rights and financial stability has caused greater attention from international organizations and financial authorities around the world. In 2019, the Organization for Economic Cooperation and Development (OECD) first proposed the "Recommendation of the Council on Artificial Intelligence,"[4] listing five important principles, including: (1) inclusive growth, sustainable development and well-being, (2) human-centered values and fairness, (3) transparency and explainability, (4) robustness, security and safety, and (5) accountability. The five principles have been adopted by the G20 members. Since then, international financial organizations have successively issued supervisory recommendations for AI usage by financial institutions, and the EU has passed the *Artificial Intelligence Act*. Major countries have also successively proposed supervisory principles or guidelines for AI applications by taking reference from the recommendations of international organizations.

2.1 International financial organizations proposed principles or recommendations for the use of AI by financial institutions

The International Organization of Securities Regulators (IOSCO) issued a guidance document in September 2021,[5] proposing six supervisory measures for the use of AI by market intermediaries and asset management institutions. The six measures included requiring financial institutions to: (1) establish appropriate governance, control and supervision structures; (2) continuously monitor the development, testing, operation and performance of AI; (3) ensure that personnel have sufficient knowledge, skills and experience to use and supervise the outputs from AI systems; (4) understand their dependence on third-party AI service providers and establish appropriate management and supervision mechanisms; (5) provide sufficient transparency and information disclosure to investors, competent authorities and stakeholders; and (6) establish appropriate control mechanisms to ensure that bias in data and system performance is minimized.

Moreover, the Financial Stability Institute (FSI) under the BIS released an AI supervision report in August 2021,[6] recommending that financial supervisory agencies should adopt AI-related supervision measures based on four principles: (1) transparency, (2) trustworthiness and soundness, (3) accountability, and (4) fairness and ethics, and should consider proportionality. The report also recommended that the use of AI in the financial sector should be divided into two categories based on whether it interacts with customers. For AI systems that face customers, supervisory agencies should adjust the intensity of supervision based on the systems' impacts on consumers (for instance, chatbots have a lower impact and credit scores have a higher impact). If AI systems do not face customers, supervisory agencies should strengthen supervision of systems requiring approval (such as statutory capital adequacy assessment), while adopting moderate supervision of those without requirement (such as internal operations).

2.2 Major countries/regions published supervision principles or guidelines for AI applications in the financial industry

In December 2023, the EU passed the *Artificial Intelligence Act*,[7] dividing AI systems into four supervision levels according to risk levels. The government can supervise AI systems with specific risk levels when necessary and should appropriately retain space for technological innovation. The four supervision levels are as follows: (1) unacceptable risk level, (2) high risk level, (3) limited risk level, and (4) low risk level: not subject to mandatory regulation.

Many developed countries or regions, such as the US, the UK, Singapore, Hong Kong, France, and the Netherlands, have issued relevant principles or guidelines for AI applications in the financial sector, taking into account the recommendations of

international organizations. These guidance documents include five common principles: (1) reliability and robustness, (2) accountability, (3) transparency, (4) fairness, and (5) ethics. The first three principles are similar to the traditional model supervision concepts, allowing supervisory agencies to fine-tune based on the standards of traditional models. The principles of "fairness" and "ethics," whose concepts are to prevent AI models from producing discriminatory or biased results, may require newly-formulated standards. Moreover, "data privacy," "third-party dependency," and "operational resilience" are also key concerns in many guidance documents.

In addition, in order to establish a risk management framework for the use of GenAI in the financial industry, the Monetary Authority of Singapore (MAS) released an executive summary of the "Emerging Risks and Opportunities of GenAI for Banks" whitepaper in November 2023,[8] which is the world's first guidance document for GenAI applications in the financial industry. The whitepaper covered seven dimensions of risks while using GenAI in the financial industry: (1) fairness and bias, (2) ethics and impact, (3) accountability and governance, (4) transparency and explainability, (5) legal and regulatory, (6) monitoring and stability, and (7) cyber and data security, aiming to enable the banking industry to use GenAI in a responsible manner. The MAS will gradually apply the seven-dimension risk framework to the entire financial system in the future.

3. Taiwan's FSC also looked at related international principles and published the core principles and guidelines for AI applications in the financial industry

According to a survey conducted by the FSC in May 2023, about 36% (63 financial institutions) of the 175 financial institutions surveyed have adopted AI technology. The application fields included customer relationship management (such as intelligent customer service), risk management and legal compliance (such as suspicious transaction analysis), process optimization (such as back-office process automation), and data analysis. As for GenAI applications, most financial institutions and related units were in the evaluation stage. Only a few planned to introduce GenAI into their financial business or internal operations, but these plans have not yet been officially executed.

In order to assist financial institutions leverage the advantages of AI technology and effectively manage potential risks therefrom, the FSC, taking into account the recommendations of international organizations such as the OECD, released the *Core Principles and Policies for AI Applications in the Financial Industry* in October 2023,[9] which outlined six core principles for the use of AI in the financial industry, including: (1) establishing governance and accountability mechanisms; (2) emphasizing fairness and

human-centric values; (3) safeguarding privacy and customer rights; (4) ensuring system robustness and security; (5) emphasizing transparency and explainability; and (6) promoting sustainable development. The document also included eight supporting policies, such as formulating guidelines, adjusting regulations, and supervising the development of self-regulatory norms.

In addition, the FSC further issued a draft of the *Guidelines for AI Applications in the Financial Industry* (hereinafter referred to as the *Guidelines*) in accordance with the six core principles mentioned above in December 2023. Based on the AI life cycle[10] and the assessed risks, the *Guidelines* proposed key concerns and feasible measures so as to encourage financial institutions to introduce, use, and manage AI systems under the premise of controllable risks. The regulatory direction of the *Guidelines* is broadly the same as the FSI and IOSCO recommendations and the practices of major countries. The FSC also called for relevant associations in the financial industry to formulate new self-disciplinary rules for AI by consulting the FSC's *Guidelines*, or to incorporate the concept into their existing rules.

4. Conclusion

AI technology has great potential in improving the efficiency of financial services, promoting financial inclusion, and deepening customer relationships. However, it should be used properly, and potential risks need to be sufficiently addressed to safeguard consumer rights and financial stability. In response to the increasing influence of AI on the financial system, the FSC has taken into account the recommendations of international organizations and the practices of major countries to gradually strengthen the supervision of AI usage in the financial industry. Based on macro-prudential supervision purposes, the Bank will continue to pay close attention to the development of international supervision, and study and analyze the application and possible impact of AI in the domestic financial industry to ensure a balance between the benefits and risks of AI applications so as to maintain sound development of the financial sector.

Notes: 1. Financial exclusion refers to the phenomenon of economically disadvantaged groups being unable to access mainstream financial products and services. Take credit granting for example: groups that are underrepresented in the AI model dataset may find it difficult to obtain a favorable credit score because the model has learned that these applicants did not obtain enough loans in the past.
2. FSB (2017), "Artificial Intelligence and Machine Learning in Financial Services," November.
3. WEF (2024), "The Global Risks Report 2024," January.
4. See OECD (2019), "Recommendation of the Council on Artificial Intelligence," May. In May

2024, the OECD proposed an updated version. See OECD (2024), "Recommendation of the Council on Artificial Intelligence," May.

5. IOSCO (2021), "The use of artificial intelligence and machine learning by market intermediaries and asset managers," September.

6. Jermy Prenio and Jeffery Yong (2021), "Humans keeping AI in check – emerging regulatory expectations in the financial sector," *FSI Insights on policy implementation No. 35*, BIS, August.

7. Council of the European Union (2024), "Artificial Intelligence Act," January.

8. MAS (2023), "Emerging Risks and Opportunities of Generative AI for Banks – Executive Summary," November.

9. FSC (2023), "Core Principles and Policies for AI Applications in the Financial Industry," October.

10. The life cycle of an AI system can be divided into four stages: (1) system planning and design, (2) data collection and input, (3) model establishment and verification, and (4) system deployment and monitoring.

3.4 General assessment of Taiwan's financial system

From the beginning of 2023 onwards, various factors such as the banking crises in the US and Europe, ongoing tightening monetary policies by major central banks, a downturn in China's real estate market, and the heightened geopolitical risks from the Israel-Palestine conflict, have caused significant turbulence in global financial markets. Nonetheless, the abovementioned impacts on Taiwan's financial system have been relatively moderate.

In Taiwan's financial markets, the outstanding amount of bill issuance expanded, and that of bond issuance reached a historical high. The secondary markets for bills kept growing, while the bond trading volumes remained roughly unchanged. The stock indices fluctuated upward, repeatedly hitting historical highs, with volatility rising after falling, and saw brisk trading. The FSC has successively adopted relevant supervisory measures to address issues in the ETF market. Meanwhile, the foreign exchange market reported an increase in trading volumes and the NT dollar exchange rate remained relatively stable.

Regarding financial institutions, domestic banks' asset quality improved, and their profits reached a new high. The capital adequacy ratio continued to rise with liquidity risk remaining relatively low. Yet, the overhang of hiking loan rates and the clearance of unsold newly built residential houses on banks' real estate credit quality deserves close attention. Meanwhile, insurance companies' profitability recovered from a substantial decline, accompanied by an improvement in their average capital adequacy ratio. Nonetheless, they faced higher market risk in foreign investment positions. On the other hand, considering that insurers' premium income was mostly lower than insurance benefits, their future cash flows are worthy of continual close attention. Bills finance companies' guarantee business recovered and the concentration of credit secured by real estate declined; however, they saw substantial reductions in profitability, along with higher liquidity and interest rate risks.

The domestic payment and settlement systems operated smoothly and the shared infrastructure for retail payments was further strengthened. In order to promote sustainable financial development, the FSC advanced climate change scenario analysis in domestic banks, released the adoption of IFRS Sustainability Disclosure Standards in Taiwan, and strengthened self-management of platforms involving crypto assets and digital lending. Moreover, the FSC launched the policies and guidelines for AI applications of financial institutions so as to enhance transaction security and effectively manage risks.

Overall, financial markets in Taiwan kept functioning smoothly, with financial institutions maintaining robust operations, and domestic systemically important payment systems functioning in an orderly manner. In general, the financial system remained stable.

Nevertheless, some direct and indirect effects on the financial markets and financial institutions, which could arise from factors such as the trajectory of major central banks' monetary policies, geopolitical risks, the spillover effect of economic downturn in China, global economic fragmentation and climate change risks, deserve closer attention.

IV. Measures to promote financial stability

4.1 Measures taken by the Bank and the FSC to promote financial stability

4.1.1 Measures taken by the Bank to promote financial stability

From the beginning of 2023 onwards, Taiwan's inflation rate has broadly followed a trend of coming back down. Nevertheless, in order to contain domestic inflation expectations, the Bank continued to conduct monetary tightening in a gradual manner, announcing its sixth rate hike in March 2024. Furthermore, to prevent excessive credit resources from gushing into the real estate market, the Bank adjusted its selective credit control measures for the fifth time and added a regulation imposing a cap on the LTV ratio for a second outstanding home loan of a natural person for housing in the designated specific areas. The Bank also continued to adopt flexible FX rate policies to maintain the dynamic stability of the NT dollar exchange rate, so as to ensure sound development of the domestic financial system and sustainable growth of the whole economy.

The Bank raised the policy rates and conducted open market operations

The ongoing effects of monetary policy tightening by major central banks led global inflation to gradually come down, while Taiwan's CPI and core CPI inflation rates also showed a downward trend. However, considering that a proposed electricity rate hike could shift inflation expectations upwards, the Bank raised the policy rates by 0.125 percentage points on March 22, 2024,[66] taking the discount rate, the rate on refinancing of secured loans, and the rate on temporary accommodations to 2%, 2.375%, and 4.25%, respectively. The policy move was judged to be conducive to containing domestic inflation expectations, sustaining price stability and fostering sound economic and financial development.

Furthermore, based on its assessment of international and domestic economic and financial conditions, the Bank conducted open market operations and managed reserve money at an

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[66] The Bank raised the policy rates six times by a total of 0.875 percentage points from March 18, 2022 to March 22, 2024. Among them, the Bank raised the discount rate, the rate on refinancing of secured loans, and the rate on temporary accommodations by 0.25 pps on March 18, 2022. In addition, the policy rates were adjusted upward by 0.125 pps on each of the quarterly meetings on June 17, 2022, September 23, 2022, December 16, 2022, March 24, 2023 and March 22, 2024, respectively.

appropriate level by issuing NCDs. At the end of 2023, the total outstanding amount of NCDs issued was NT$8,135.9 billion, while the average annual growth rate of reserve money registered 5.55% for the year. The weighted average overnight call loan rate trended upwards in line with the Bank's policy rate hikes, rising from 0.556% at the end of 2022 to 0.692% at the end of 2023 and further increasing to 0.808% at the end of March 2024.

The Bank continued to adopt selective credit control measures to guide efficient allocation of bank credit

The Bank adjusted selective credit control measures four times in December 2020 and March, September, and December 2021. Nevertheless, real estate lending still made up a large proportion in total bank lending, the number of second home loans taken out by natural persons was increasing, and the already high average LTV ratio granted to second home loans taken out by natural persons in specific areas continued rising. Against this backdrop, the Bank amended the *Regulations Governing the Extension of Mortgage Loans by Financial Institutions* for the fifth time in June 2023. The amendments, taking effect on June 16, 2023 (Table 4.1), included the introduction of a 70% cap on the LTV ratio for a second home loan of a natural person for housing in one of the specific areas. These measures are judged to have helped prevent excessive credit resources from flowing into the real estate market and enhance banks' risk management of real estate lending.

Table 4.1 The key points of the amendments to the *Regulations Governing the Extension of Mortgage Loans by Financial Institutions* in June, 2023[1]

Loan types		Loan conditions	
		Before	**After**
Housing loans borrowed by corporates		LTV ratio capped at 40%, no grace period	(unchanged)
Natural persons	High-value housing loans	LTV ratio capped at 40%, no grace period	(unchanged)
	Second home loan for housing in specific areas[2]	No grace period	LTV ratio capped at 70%, no grace period
	Third home (and more) loans	LTV ratio capped at 40%, no grace period	(unchanged)

Loan types	Loan conditions	
	Before	After
Land loans	● LTV ratio capped at 50%, with 10% withheld for disbursement until construction commences ● Requiring the borrower to submit a substantive development plan for the land purchased, and to undertake in writing a specific time frame to commence construction[3]	(unchanged)
Unsold housing unit loans	LTV ratio capped at 40%	(unchanged)
Mortgage loans for idle land in industrial districts	LTV ratio capped at 40%[4]	(unchanged)

Notes: 1. The amendment was announced on June 15, 2023 and took effect on June 16, 2023.
    2. Specific areas include Taipei City, New Taipei City, Taoyuan City, Taichung City, Tainan City, Kaohsiung City, Hsinchu County, and Hsinchu City.
    3. Regarding the determination of a "specific time frame," financial institutions should carefully verify and assess the actual time required for the borrower to commence construction, with a maximum period of up to 18 months.
    4. It shall not apply if the mortgaged land is already under construction, or if the borrower already submits a substantive plan for construction and pledges that construction will begin within one year.
Source: CBC.

To achieve the objectives of adjusting selective credit control measures and to consider the funding needs of homebuyers with actual need for moving, the Bank announced complementary measures to assist owner-occupant home movers in July 2023. For natural persons who already have a first home loan and intend to apply for a second home loan in a specific area because of actual need for moving from an existing home to a new one, they will not be subject to the cap of the LTV ratio after signing affidavits with their lending financial institution. Additionally, the Bank regularly publishes reports on the status of banks' newly-extended loans under the credit controls and has continuously conducted targeted examinations on real estate lending businesses to ensure compliance among financial institutions.

Furthermore, the Bank had conducted monetary tightening in a moderate and gradual manner, which was judged to help strengthen the effectiveness of selective credit control measures. In the future, the Bank will pay close attention to the potential impacts of real estate-related policies on the real estate market, continue to review the status of real estate loans and the effectiveness of selective credit control measures, and fine-tune the regulatory measures as needed, so as to foster financial stability and guide sound banking business.

Adopting a flexible FX rate policy to maintain the dynamic stability of the NT dollar exchange rate

As Taiwan is a small open economy that is highly interconnected through trade with other economies, excessive exchange rate fluctuations could have adverse impacts. Therefore, the Bank adopts a managed float exchange rate regime, where the exchange rate of the NT dollar is, in principle, determined by market forces. When disorderly movements (such as massive inflows or outflows of short-term capital) or seasonal factors lead to excess volatility and disorderly movements in the NT dollar exchange rate with adverse implications for domestic economic and financial stability, the Bank will, in line with its mandate, maintain the FX market order as warranted.

In recent years, huge and frequent movements of international short-term capital flows have superseded international trade and macroeconomic fundamentals and become the key factor influencing the volatility of exchange rates. To prevent the abovementioned factors from disrupting the domestic FX market, the Bank conducts "leaning against the wind" operations to maintain order in the FX market when necessary so as to mitigate volatile movements of the NT dollar exchange rate and foster FX market efficiency. The dynamic stability of the NT dollar exchange rate is conducive to the long-term sound development of the domestic economy as a whole.

In addition, the Bank continued to undertake appropriate administrative measures to safeguard FX market order and promote its sound development. These measures mainly included: (1) monitoring up-to-date transaction information in the FX market through the Real-Time Reporting System for Large-Amount FX Transactions; (2) reinforcing off-site monitoring efforts to ensure that forward transactions are based on genuine needs so as to curb FX speculation; (3) urging authorized FX banks to enhance their exchange rate risk management, thereby reducing FX exposures of individual banks and systemic risks in the FX market; and (4) strengthening targeted examinations of FX businesses in order to maintain the discipline of the FX market.

4.1.2 Measures undertaken by the FSC to maintain financial stability

From the second half of 2023 onwards, in order to bolster the sound development of the financial sector, the FSC planned for the domestic adoption of the IFRS Sustainability Disclosure Standards, assisted the insurance industry to smoothly align with the IFRS 17 and TW-ICS, strengthened the management of platforms involving digital lending and crypto assets,

and guided financial institutions to properly use AI. In addition, the FSC continued to strengthen the risk bearing capacity of the insurance industry and management of the ETF market, to pay attention to financial innovation technologies and investment tools, and to actively help the insurance industry align with relevant international standards. In the meantime, the FSC continued to strengthen risk management and other supervisory measures in the financial industry to preserve financial stability.

Strengthening the risk bearing capacity of the insurance industry

(1) In order to understand the risk bearing capacity and the impacts on the capital adequacy of insurers under extreme conditions, the FSC required non-life and life insurers to conduct stress tests based on their financial statements at the end of 2022, covering insurance risks, market risks, and climate change risks. According to the results,[67] the overall capital adequacy ratio and net worth ratio of the insurance industry were higher than the statutory minimums, showing that Taiwan's insurance industry still has the ability to deal with the changes of economic and financial conditions as well as the impacts of climate change.

(2) To facilitate a smooth adoption of the internationally-applied system by insurers in 2026, the FSC reviewed and amended the existing formula for calculating insurers' RBC ratio on a gradual and orderly basis as follows: (A) from December 31, 2023 onwards, an insurer's adjusted net capital must be divided into Tier 1 Unlimited, Tier 1 Limited, and Tier 2 when calculating its RBC ratio; and (B) the risk factors for domestic private equity funds and venture capital funds have been adjusted, and an additional FX risk capital surcharge of 6.61% is applied to any domestic private equity fund that is partially invested overseas.

(3) Considering the limited depth of Taiwan's domestic bond market, the FSC amended the *Directions for Issuance of Bonds with Capital Characteristics by Insurance Companies* in March 2024 in order to increase the fundraising channels available to insurers. The amended directions provided that an insurer may, with approval, establish a special-purpose overseas fundraising enterprise and act via that enterprise to issue corporate bonds overseas as capital instruments, and may also provide guarantees for those bonds.

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[67] The results of stress tests carried out by insurers showed the following: (1) insurance risk: the life and non-life insurance industries as a whole would have average capital adequacy ratios of 266.2% and 337.2%, respectively, and average net worth ratios of 5.66% and 19.62%; (2) market risk: the life and non-life insurance industries as a whole would have average capital adequacy ratios of 203.7% and 390.4%, respectively, and average net worth ratios of 3.35% and 23.57%; (3) climate change risk: the non-life insurance industry as a whole would have an average capital adequacy ratio of 337.2%, and an average net worth ratio of 20.52%.

Allowing banks to adopt the IRB approach for calculating credit risk capital

To enhance banks' internal risk management by measuring and managing credit risk and credit assets more precisely, the FSC allowed banks of an asset size over NT$2.5 trillion and meeting the criteria of financial soundness, regulatory compliance, and minimum operational requirements to apply, by the end of June 2024, for using the IRB approach for calculating credit risk capital. And the FSC may review the accuracy of data systems, the rationality of risk models, and the appropriateness and implementation of the applicant's corporate governance and monitoring mechanisms.

Strengthening supervisory measures of the ETF market

In order to protect the interests of investors and promote sound development of the ETF market, the FSC has successively adopted relevant supervisory measures since the second half of 2023, including: (1) requiring the TWSE and the TPEx to review whether the constituent stocks of an index change frequently and to control the turnover rate in the early stage through review procedures; (2) requiring securities investment trust companies (SITCs) to disclose the composition of source of funds for dividend distribution, where the priority order for distribution shall be dividends from constituent stocks, capital gains, and income equalization funds; (3) enhancing the pre-review and post-audit mechanisms of ETF sales documents, and requiring the Securities Investment Trust & Consulting Association to strengthen the review of content appropriateness of ETF advertising and to formulate self-disciplinary rules; (4) supervising the performance of SITCs in enhancing their assessment of the concentration and liquidity of constituent stocks in the ETFs that they issue and the indices that they track; (5) overseeing the TWSE and the TPEx evaluating ETF shareholdings regularly and building transaction databases, and adding ETFs as a focus in the examinations on SITCs; and (6) publishing press releases to enhance the financial knowledge of ETFs among retail investors. In addition, the FSC, consulting international supervisory practices, planned to gradually launch six enhanced supervisory measures in three aspects, namely product structure, information disclosure and liquidity provision.[68]

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[68] The six enhanced measures include: (1) requiring ETF issuers to enhance the management and disclosure when engaging external service providers to calculate ETF indicative net asset values (iNAVs); (2) enhancing the management of participating securities firms and liquidity providers; (3) enhancing information disclosures on custom indexes and Smart Beta indexes ETFs; (4) enhancing disclosures regarding ETF dividend distributions from income equalization funds; (5) adding new penal provisions to deal with an ETF that fails to comply with the requirement to select a liquidity provider; (6) taking measures to prevent and monitor ETFs from trading at excessive discounts or premiums, and collecting data on ETF net asset values (NAVs), assets under management, discounts/premiums, and other information for supervisory reference, so as to enhance the efficacy of risk management.

Strengthening financial institutions' risk management for outsourcing operations

In response to financial institutions' growing demand for outsourcing operations and for third-party cloud services, as well as considering the trend of international regulations for outsourcing being moved towards the risk-based approach (RBA), the FSC amended the *Regulations Governing Internal Operating Systems and Procedures for the Outsourcing of Financial Institution Operation* (hereinafter referred to as the *Regulations*) and relevant requirements in August 2023.[69] The main changes included: (1) stipulating the adoption of the RBA to manage outsourcing risks and establishing a comprehensive risk management framework; (2) simplifying the outsourcing application procedures and document requirements; and (3) adjusting the scope of cross-border and cloud service outsourcing where application to the competent authority is required and stipulating relevant enhanced regulations, in order to reinforce the resilience of financial institutions' outsourcing operations, facilitate digital transformation, and improve supervisory efficiency.

Deliberating preventive measures against illegal offshore funds

In view of recent cases of consumers suffering losses from purchasing illegal offshore fund products, the FSC announced four new measures aiming to strengthen the protection of financial consumers' rights. The measures include: (1) requiring the Taiwan Securities Association, the Chinese National Futures Association, and the Securities Investment Trust & Consulting Association to each establish an "investor alert" section on their respective websites for public inquiries; (2) when people report an illegal offshore fund with concrete evidence, the matter will be immediately forwarded to the Ministry of Justice's Investigation Bureau for further action, and the FSC will meet in a joint working session with the Ministry of Justice for collaboration on following up the case; (3) offering higher whistleblower rewards and coordinating with securities and futures industry associations to study the set-up of whistleblower reward systems; and (4) requiring wealth managers at financial institutions to assist in raising public awareness by reminding customers of investing in funds via legitimate distributors to protect their own interests.

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[69] In line with the amendment of the *Regulations Governing Internal Operating Systems and Procedures for the Outsourcing of Financial Institution Operation*, the FSC has simultaneously amended the *Directions for Operation Outsourcing by Insurance Enterprises* and the *Regulations Governing the Establishment of Internal Control Systems by Service Enterprises in Securities and Futures Markets*, and requires a service enterprise to incorporate the management of outsourcing operations into its internal control system.

4.2 The Bank will continue to adopt measures to promote financial stability when necessary

In 2023, central banks in the United States and European countries continued with monetary tightening. The cumulative effect of interest rate hikes along with an escalating geopolitical risk owing to the Israel-Hamas conflict have weakened global economic growth momentum. Against this backdrop, Taiwan's financial institutions still maintained robust operations, and the financial infrastructure operated smoothly. As a whole, Taiwan's financial system remained stable. The Bank continued to adopt appropriate monetary, credit and FX policies in response to changes in the global and domestic economic and financial conditions to promote financial stability. Meanwhile, the FSC revamped relevant financial regulations and enhanced financial supervisory measures to facilitate sound operations of financial institutions and preserve financial stability.

Since early 2024, global inflation has moderated, with market expectations for interest rate cuts increasing. In addition, post-pandemic inventory adjustments by the manufacturing sector also gradually concluded. Against this backdrop, the global economy is expected to rebound. However, ongoing geopolitical conflicts such as the Red Sea crisis pose a potential risk to global supply chains, compounding the uncertainties over global economic prospects. Looking ahead, the trajectory of monetary policy stances by major central banks may affect global economic growth and financial stability. Geopolitical risks and climate change would add to the uncertainties over global inflation as well as trade and economic development. Moreover, the high interest rate environment and the spillover effect of economic downturn in China still exist. These, coupled with supply chain restructuring and fragmentation of the global economy stemming from the ongoing US-China competition and the rise of national security awareness influencing the context of globalization, could pose adverse impacts on global economic development and financial stability.

As the international economic outlook remains surrounded by many downside risks, the Bank will continue to pay close attention to the impacts of the subsequent developments on domestic economic and financial conditions and take appropriate response measures in a timely manner with a view to promoting financial stability.

Appendix: Financial soundness indicators[70]

Table 1: Domestic Banks Unit: %

Items / Year (end of year)	2018	2019	2020	2021	2022	2023
Asset size						
Assets to GDP	270.98	275.32	283.23	r 278.02	r 283.90	288.95
Earnings and profitability						
Return on assets (ROA)	0.68	0.70	0.58	0.58	0.62	0.70
Return on equity (ROE) (Pretax)	9.34	9.49	7.84	8.14	9.33	10.33
Return on equity (ROE) (After tax)	8.09	8.11	6.82	7.11	7.92	8.59
Net interest income to gross income	59.33	56.59	59.95	62.11	66.08	55.92
Non-interest expenses to gross income	51.55	51.30	53.93	53.88	51.89	49.75
Gains and losses on financial instruments to gross income	11.23	18.78	17.06	12.93	1.29	24.62
Employee benefits expenses to non-interest expenses	57.15	56.76	57.05	58.36	56.01	54.85
Spread between lending and deposit rates (basis points)	1.35	1.32	1.22	1.24	1.36	1.39
Spread between the highest and the lowest interest rates of interbank O/N lending	0.13	0.11	0.12	0.22	0.14	0.32
Asset quality						
Non-performing loans to total loans	0.24	0.22	0.22	0.17	0.15	0.14
Provision coverage ratio	573.67	650.30	623.74	781.47	916.53	960.96
Capital adequacy						
Regulatory capital to risk-weighted assets	13.99	14.07	14.84	14.80	14.68	15.33
Tier 1 capital to risk-weighted assets	11.86	12.08	12.79	12.97	12.46	13.22
Common equity Tier 1 capital to risk-weighted assets	11.19	11.32	11.84	11.96	11.13	11.93
Non-performing loans net of provisions to equity	-1.86	-1.78	-0.51	0.09	-0.06	-0.39
Leverage ratio	6.56	6.71	6.82	6.46	6.28	6.63

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[70] In consideration of the IMF *2019 Financial Soundness Indicators Compilation Guide (FSI Guide)*, two categories of indicators comprising life insurance companies and bills finance companies have been added to the financial soundness indicators while the category of market liquidity has been removed since 2020. Thus, the number of indicators increased from 42 to 58. The time series data of removed and pre-adjusted indicators are available on the CBC's website (https://www.cbc.gov.tw/en/cp-486-862-AE8D1-2.html).

Table 1: Domestic Banks (cont.)

Unit: %

Items　　　　　Year (end of year)	2018	2019	2020	2021	2022	2023
Liquidity						
Customer deposits to total loans	135.75	137.27	142.04	144.30	141.14	141.46
Liquid assets to total assets	9.46	9.05	9.44	9.74	8.89	8.68
Liquid assets to short-term liabilities	13.36	12.53	13.19	13.37	12.20	11.86
Liquidity coverage ratio	133.89	134.82	141.60	136.60	134.13	132.60
Net stable funding ratio	132.44	132.71	136.51	138.56	138.41	137.71
Credit risk concentration						
Loan concentration by economic activity	70.94	71.43	71.95	72.04	70.90	70.52
Large exposures to tier 1 capital*	-	-	8.60	8.06	5.88	4.25
Gross asset positions in financial derivatives to regulatory capital	6.38	6.53	8.75	4.32	11.00	8.69
Gross liability positions in financial derivatives to regulatory capital	8.64	7.66	9.36	4.51	10.06	9.86
Geographical distribution of claims to total claims						
Domestic economy	80.33	79.49	80.96	81.23	79.64	79.21
Advanced economies	13.49	14.01	12.66	12.45	14.32	15.08
Emerging economies						
Emerging Asia	5.12	5.42	5.31	5.30	5.05	4.77
Emerging Europe	0.04	0.04	0.02	0.02	0.01	0.01
Latin America and the Caribbean	0.44	0.40	0.37	0.31	0.31	0.26
Middle East and Central Asia	0.27	0.35	0.42	0.47	0.46	0.46
Sub-Saharan Africa	0.31	0.29	0.26	0.22	0.21	0.21
Credit of private sector to GDP	150.92	155.13	159.23	r 159.87	r 160.72	166.11

Table 1: Domestic Banks (cont.)

Unit: %

Items \ Year (end of year)	2018	2019	2020	2021	2022	2023
Sensitivity to market risk						
Net open position in foreign exchange to capital	3.78	3.20	3.45	3.58	2.47	1.80
Foreign-currency-denominated loans to total loans	20.14	20.67	18.80	18.06	18.48	17.84
Net open position in equities to capital	22.51	24.56	26.93	31.71	28.37	29.11
Foreign-currency-denominated liabilities to total liabilities	29.21	26.57	26.53	25.80	29.90	28.78

Notes: 1. Item with "*" is a new indicator to be disseminated from 2020 onward.

2. Figures for "Spread between lending and deposit rates" exclude the data of preferred deposits rates of retired government empolyees and central government lending rates.

3. Non-performing loans net of provisions to equity:

(1) For data before 2019, specific provisions for credit losses refers to minimum provisions that a bank should allocate for classified loans and liabilities on guarantees in accordance with *Regulations Governing the Procedures for Banking Institutions to Evaluate Assets and Deal with Non-performing/Non-accrual Loans.*

(2) Starting from 2020, specific provisions for credit losses, based on the IFRSs 9, refers to the provisions for expected credit losses of financ assets whose credit is impaired.

4. Credit risk concentration:

(1) For the data before 2019, large exposures prior refer to the total amount of credit exposures to the first 20 private enterprises at domestic banks (after integration).

(2) Starting from 2020, large exposures are revised to the total amount of credit exposures to an enterprise at domestic banks (after integrati exceeding 10% of its Tier 1 capital.

5. Figures preceded with "r" use revised data based on GDP statistics updated by DGBAS.

Table 2: Life Insurance Companies

Unit: %

Items \ Year (end of year)	2018	2019	2020	2021	2022	2023
Assets to GDP	143.22	155.44	159.45	r 153.91	r 148.25	148.24
Return on assets (ROA)	0.33	0.55	0.67	1.19	0.51	0.24
Return on equity (ROE) (pretax)	6.82	10.24	9.27	14.83	7.97	4.20
Return on equity (ROE) (after tax)	7.81	9.65	9.38	13.78	6.77	4.60
Risk based capital (RBC) ratio	268.43	292.54	299.13	335.17	297.82	298.09
Equity to investment assets	4.60	7.29	8.80	9.10	5.34	7.27

Notes: 1. Investment assets include financial assets such as cash, bank deposits, loans, securities, derivatives, and non-financial assets for investment.

2. Figures preceded with "r" use revised data based on GDP statistics updated by DGBAS.

Table 3: Bills Finance Companies

Unit: %

Items / Year (end of year)	2018	2019	2020	2021	2022	2023
Assets to GDP	5.52	5.31	5.55	r 4.86	r 4.58	4.76
Return on assets (ROA)	0.96	0.99	1.18	1.27	0.89	0.71
Return on equity (ROE) (pretax)	8.00	8.05	9.33	9.78	7.28	5.93
Return on equity (ROE) (after tax)	6.72	6.67	7.56	8.01	5.92	4.90
Capital adequacy ratio	13.63	13.37	13.38	13.27	13.48	13.91
0-30 day maturity gap to assets (NTD)	-26.66	-21.39	-18.01	-16.80	-13.76	-17.43

Note: Figures preceded with "r" use revised data based on GDP statistics updated by DGBAS.

Table 4: Non-financial Corporate Sector

Units: %, times

Items / Year (end of year)	2018	2019	2020	2021	2022	2023
Total liabilities to equity						
TWSE-listed companies	99.48	104.61	107.85	106.85	103.65	98.44
TPEx-listed companies	82.36	88.55	89.88	98.81	96.79	90.88
Return on equity (ROE)						
TWSE-listed companies	14.92	12.62	14.60	23.01	21.44	14.57
TPEx-listed companies	13.02	12.23	13.95	17.78	17.49	12.92
Net income before interest and tax / interest expenses (times)						
TWSE-listed companies	11.18	9.35	15.70	34.58	23.17	10.83
TPEx-listed companies	16.23	15.99	21.99	30.23	24.91	13.19
Foreign-currency-denominated liabilities to equity*						
TWSE-listed companies	-	-	32.48	32.62	30.78	26.02
TPEx-listed companies	-	-	20.11	21.64	19.10	16.38

Notes: 1. Data of TWSE-listed and TPEx-listed companies are from TEJ.
    2. Item with "*" is a new indicator to be disseminated from 2020 onward and the reference date of figures in 2023 is the end of September 2023.

Table 5: Household Sector

Units: %, times

Items Year (end of year)	2018	2019	2020	2021	2022	2023
Household debt to GDP	85.11	86.70	88.52	r 87.88	r 88.10	90.27
Debt service and principal payments to total disposable income	45.23	46.13	46.48	r 48.11	r 46.92	48.72
Household debt to total disposable income (times)	1.36	1.39	1.46	r 1.51	r 1.45	1.55

Notes: 1. Figures for "total disposable income" are the sum of household disposable income, rent expense and interest expense.

2. Figure for "total disposable income" for 2023 is a CBC estimate.

3. Figures preceded with "r" use revised data based on GDP and disposable income statistics updated by DGBAS.

Table 6: Real Estate Market

Units: index, %

Items Year (end of year)	2018	2019	2020	2021	2022	2023
National housing price index	100.80	104.14	108.17	117.50	127.51	136.20
Residential real estate loans to total loans	29.73	29.44	32.04	32.52	31.79	33.54
Commercial real estate loans to total loans	17.78	17.73	19.37	19.69	19.54	19.77

Explanatory notes:
Compilation of financial soundness indicators

I. General notes

To facilitate international comparison, most items listed in "Appendix: Financial Soundness Indicators" are compiled in accordance with the compilation guide on financial soundness indicators issued by the IMF. Based on its revision of the guide, some of the indicators were added or removed, and the explanatory notes were revised in 2020. All the data were traced back to 2016 for inter-period comparison application unless otherwise stated. However, a few new indicators are not incorporated for analysis in this report owing to incomplete time series data.

Unless otherwise stated, the data of all indicators are on a year-end (stock data) or year-to-date (flow data) basis.

Compilation of Financial Institutions' Indicators

1. Coverage of Financial Institutions (As of the end of 2023)
    1.1 Domestic Banks include Bank of Taiwan, Land Bank of Taiwan, Taiwan Cooperative Bank, First Commercial Bank, Hua Nan Commercial Bank, Chang Hwa Commercial Bank, The Shanghai Commercial & Savings Bank, Taipei Fubon Commercial Bank, Cathay United Bank, The Export-Import Bank of the Republic of China, Bank of Kaohsiung, Mega International Commercial Bank Co., Agricultural Bank of Taiwan, Citibank Taiwan, O-Bank, Taiwan Business Bank, Standard Chartered Bank (Taiwan), Taichung Commercial Bank, King's Town Bank, HSBC Bank (Taiwan), Taipei Star Bank, Hwatai Bank, Shin Kong Commercial Bank, Sunny Bank, Bank of Panhsin, Cota Commercial Bank, Union Bank of Taiwan, Far Eastern International Bank, Yuanta Commercial Bank, Bank SinoPac, E.Sun Commercial Bank, KGI Bank, DBS Bank (Taiwan) Ltd., Taishin International Bank, EnTie Commercial Bank, CTBC Bank Co., Ltd., Next Bank, Line Bank, and Rakuten International Commercial Bank Co., Ltd., amounting to 39 banks.
    1.2 Life Insurance Companies include Bank Taiwan Life Insurance, Taiwan Life Insurance, PCA Life Assurance, Cathay Life Insurance, China Life Insurance, Nan Shan Life Insurance, Shin Kong Life Insurance, AIA International, BNP Paribas Cardif TCB Life Insurance, Mass Mutual Mercuries Life Insurance, Far Glory Life Insurance, Hontai Life Insurance, Allianz Taiwan Life Insurance, Cardif Assurance Vie, Chubb Life Insurance Taiwan Company, Taishin Life Insurance, TransGlobe Life Insurance, Yuanta Life Insurance, Life Insurance Department of Chunghwa Post, Fubon Life Insurance, and First Life Insurance, amounting to 21 companies.
    1.3 Bills Finance Companies include Mega Bills Finance, China Bills Finance, International Bills Finance, Dah Chung Bills Finance, Taiwan Finance, Grand Bills Finance, Ta Ching Bills Finance, and Taiwan Cooperative Bills Finance Co., Ltd., amounting to 8 companies.
2. The financial institutions' related indicators are calculated using unaudited data submitted regularly for each category by financial institutions. The submitted data are different from those posted on these institutions' websites, which are audited and certified by certified public accountants or adjusted after the

reporting period. The statistical basis for these two types of data is different.

3. Domestic banks' related indicators are calculated by aggregating the numerators and denominators of each ratio, and then dividing the total numerator by the total denominator to obtain the peer-group ratios. This methodology differs from the Winsorized mean method used in the quarterly "Condition and Performance of Domestic Banks" report compiled by the Department of Financial Inspection of the Central Bank of the Republic of China (Taiwan).

II. Explanatory notes on the indicators

1. Domestic banks' indicators

1.1 Asset Size

This indicator is to analyze the level of domestic banks' total assets to GDP.

- GDP: annual nominal gross domestic product.

1.2 Earnings and profitability

1.2.1 Return on assets (ROA)

This indicator is to analyze domestic banks' efficiency in using their assets.
- ROA = net income before tax/average assets
  - Net income before tax: net income before income tax.
  - Average assets: the daily average of total assets as of the end of reference date in current year.

1.2.2 Return on equity (ROE)

This indicator is to analyze banks' pre-tax (after-tax) efficiency in using their capital.
- ROE = net income before (after) tax/average equity
  - Average equity: the daily average of equity as of the end of reference date in current year.

1.2.3 Net interest income to gross income

This indicator is a measure of the relative share of net interest earnings within gross income.
- Net interest income: interest income less interest expenses.
- Gross income: net interest income plus non-interest income.

1.2.4 Non-interest expenses to gross income

This indicator is a measure of the size of administrative expenses to gross income.
- Non-interest expenses include operating expenses other than interest expenses as follows:
  - Employee benefits expenses.
  - Other expenses related to operations.
    - Expenses for property and equipment, including: purchasing, ordinary and regular maintenance and repair, depreciation, and rental thereof.
    - Other expenditure related to operations, including: purchases of goods and services

(e.g., advertising costs, staff training expenses, and royalties paid for the use of other produced or non-produced assets).

• Taxes other than income taxes less any subsidies received from general government.

• Gross income: (same as in 1.2.3).

1.2.5 Gains and losses on financial instruments to gross income

This indicator is to analyze business revenues from financial market activities as a share of gross income.

• Gains and losses on financial instruments include the following items:

• Realized and unrealized gains and losses arising on all financial instruments which are held at fair value through profit or loss, excluding fair value through other comprehensive income and amortized cost.

• Foreign exchange gains and losses.

• Excluding bond interest and dividend income.

• Gross income: (same as in 1.2.3).

1.2.6 Employee benefits expenses to non-interest expenses

This indicator is to analyze employee benefits expenses as a share of non-interest expenses.

• Employee benefits expenses: including wages and salaries, profit sharing and bonuses, allowances, pensions, social insurance, and medical insurance.

• Non-interest expenses: (same as in 1.2.4).

1.2.7 Spread between lending and deposit rates

This indicator is to analyze the effect of the interest rate spread upon net interest revenues and profitability.

• Spread between lending and deposit rates: the weighted-average loan interest rate less the weighted-average deposit interest rate. The annual interest rate spread is the average of four quarters' spreads.

1.2.8 Spread between the highest and the lowest interest rates of interbank overnight lending

This indicator is to analyze the risk of interbank overnight lending.

• Spread between the highest and the lowest interest rates of interbank overnight lending: The highest interbank rate less the lowest interbank rate of the financial sector.

1.3 Asset quality

1.3.1 Non-performing loans to total loans

This indicator is to analyze asset quality in the loan portfolio.

• Non-performing loans:

According to the *Regulations Governing the Procedures for Banking Institutions to Evaluate Assets and Deal with Non-performing/Non-accrual Loans*, non-performing loans include the following items:

• Loans for which repayment of principal or interest has been overdue for three months or more.

• Loans for which the bank has sought payment from primary/subordinate debtors or has

disposed of collateral, although the repayment of principal or interest has not been overdue for more than three months.

- Total loans: Total loans include bills purchased, discounts, accrual and non-accrual loans, but excluding interbank loans.

1.3.2 Provision coverage ratio

This indicator is to analyze the provision policy for loan losses.

- Provision coverage ratio: Loan loss provisions/non-performing loans

1.4 Capital adequacy

1.4.1 Regulatory capital to risk-weighted assets

This indicator is to analyze the capital adequacy of domestic banks. The minimum statutory ratio of regulatory capital to risk-weighted assets of a bank shall not be less than a certain ratio, based on the *Regulations Governing the Capital Adequacy Ratio and Capital Category of Banks*.

- Regulatory capital: the aggregate amount of net Tier 1 Capital and net Tier 2 Capital.
- Risk-weighted assets: the aggregate amount of the risk-weighted assets for credit risk together with the capital requirements for market risk and operational risk multiplied by 12.5.

1.4.2 Tier 1 capital to risk-weighted assets

This indicator is to analyze the capital adequacy of domestic banks based on the core capital concept.

- Tier 1 capital: the aggregate amount of net common equity Tier 1 and net additional Tier 1 capital (as defined by the *Regulations Governing the Capital Adequacy Ratio and Capital Category of Banks*).

1.4.3 Common equity Tier 1 capital to risk-weighted assets

This indicator is to analyze the capital adequacy of domestic banks based on the high quality capital concept.

- Common equity Tier 1 capital: includes common stock and additional paid-in capital in excess of par value of common stock, capital collected in advance, capital reserves, statutory surplus reserves, special reserves, accumulated profit or loss, non-controlling interests, and other items of interest, less supervisory deductions (as defined by the Article 9 of the *Regulations Governing the Capital Adequacy Ratio and Capital Category of Banks*).

1.4.4 Non-performing loans net of provisions to equity

This indicator is to analyze the potential impact on equity of non-performing loans.

- Non-performing loans net of provisions to equity = (non-performing loans - specific loan loss provisions)/equity
  - The provisions for expected credit losses of financial assets were estimated by the historical loss experiences of banks prior to 2019; loan loss provisions are on the IFRSs 9 basis from 2020 onward, referring to the provisions for expected credit losses of financial assets whose credit is impaired.

1.4.5 Leverage ratio

This indicator is to analyze the capital adequacy of domestic banks based on the core capital

relative to total non-risk weighted exposure.

- Leverage ratio = Tier 1 capital/total exposure
- Total exposure: the sum of on-balance sheet exposures, derivative exposures, securities financing transaction exposures and off-balance-sheet exposures.

1.5 Liquidity

1.5.1 Customer deposits to total loans

This indicator is a measure of liquidity to indicate the degree of dependence on more stable sources of funds (customer deposits) to illiquid assets (loans).

- Customer deposits: including checking deposits, demand deposits, time deposits, savings deposits, and money remittances.

1.5.2 Liquid assets to total assets

This indicator is to analyze the liquidity available to meet expected and unexpected demands for cash.

- Liquid assets: the core liquid assets comprising cash, checks for clearing, amounts due from the Central Bank, amounts due from banks, and assets with remaining maturity of no more than three months, which can be converted into cash quickly and with minimal impact to the price received.
- Total assets: the sum of financial and non-financial assets.

1.5.3 Liquid assets to short-term liabilities

This indicator is to analyze liquidity mismatch of assets and liabilities, and provide an indication of the extent to which banks could meet short-term demand for funds without facing liquidity problems.

- Short-term liabilities: liabilities with remaining maturity of no more than one year, including deposits, borrowings, debt securities issued, and the net market value of financial derivatives positions (liabilities less assets).

1.5.4 Liquidity coverage ratio

This indicator is to analyze the resilience of short-term liquidity.

- Liquidity coverage ratio = stock of high quality liquid assets/total net cash outflows over the next 30 calendar days
  - High quality liquid assets: assets with high liquidity under stress scenarios, such as cash, central bank reserves, government bonds, and qualified securities.
  - Net cash outflows over the next 30 calendar days: expected cash outflows minus expected cash inflows within the subsequent 30 calendar days under specific stress scenarios.

1.5.5 Net stable funding ratio

This indicator is to quantify long-term liquidity of banks.

- Net stable funding ratio = available stable funding/required stable funding
  - Available stable funding: the portion of capital and liabilities expected to be available to the bank to fund its operations over a one-year period.
  - Required stable funding: The amount of stable funding that is required, reflecting the

liquidity characteristics and residual maturities of each type of the bank's assets and off-balance-sheet exposures.

1.6 Credit risk concentration

1.6.1 Loan concentration by economic activity

This indicator is to analyze the concentration of credit in a specific industry or economic activity by domestic banks.

- Loan concentration by economic activity = corporate loans of domestic banks to the largest three industries/corporate loans
  - Corporate loans of domestic banks to the largest three industries: the aggregate of corporate loans of domestic banks to the largest three industries.

1.6.2 Large exposures to Tier 1 capital

This indicator is to analyze credit vulnerabilities of domestic banks arising from the concentration of credit risk on a single individual or corporate borrower.

- Large exposures: an amount of credit extended by a domestic bank to an enterprise after account integration exceeding 10% of the bank's Tier 1 capital at the end of the previous quarter.

1.6.3 Gross asset positions in financial derivatives to regulatory capital

This indicator is to analyze the effect of price changes on gross asset positions in financial derivatives relative to regulatory capital.

- Gross asset positions in financial derivatives: the aggregate amount of positive fair value in hedged and non-hedged financial derivatives such as swap, forward, and option contracts, excluding embedded derivatives inseparable from the underlying instruments.

1.6.4 Gross liability positions in financial derivatives to regulatory capital

This indicator is to analyze the effect of price changes on gross liability positions in financial derivatives relative to regulatory capital.

- Gross liability positions in financial derivatives: the aggregate amount of negative fair value in hedged and non-hedged financial derivatives such as swap, forward, and option contracts, excluding embedded derivatives inseparable from the underlying instruments.

1.6.5 Geographical distribution of claims to total claims

This indicator is to analyze the concentration of domestic banks' claims by regional grouping of countries.

- The regional grouping of countries is based on the classification provided in the IMF's *World Economic Outlook*, which divides countries into different groups including advanced economies, emerging Asia, emerging Europe, Latin America and the Caribbean, Middle East and Central Asia, and Sub-Saharan Africa.
  - Claims on the domestic economy: the local claims in Taiwan (on an immediate counterparty basis) in the Country Exposure Report of the CBC.
  - Claims on other regions: the total foreign claims (on an immediate counterparty basis) in the Country Exposure Report of the CBC.
  - Total claims: the sum of claims on the domestic economy, advanced economies,

emerging Asia, emerging Europe, Latin America and the Caribbean, Middle East and Central Asia, and Sub-Saharan Africa.

1.6.6 Credit of private sector to GDP

This indicator is to analyze whether credit of the private sector is overly expanded or faces a credit crunch.

- Credit of private sector: the loans to domestic private NFCs, HHs, and NPISHs; holdings of stocks issued by private NFCs, corporate bonds, commercial paper, acceptances, and beneficiary certificates; long-term investment in private NFCs' equities by main financial institutions.
- GDP: moving sum of the last four quarterly nominal gross domestic product figures.

1.7 Sensitivity to market risk

1.7.1 Net open position in foreign exchange to capital

This indicator measures the mismatch of foreign currency asset and liability positions at domestic banks to assess the potential vulnerability of capital to exchange rate movements.

- Net open position in foreign exchange: the open foreign currency positions in balance sheets and financial derivatives, which are converted into NT dollars using the exchange rates as of the reporting date.
- Capital: equity interest of owners in a bank (i.e., the difference between total assets and liabilities).

1.7.2 Foreign-currency-denominated loans to total loans

This indicator is to analyze the share of foreign currency loans within total gross loans.

- Foreign currency-denominated loans: the loans to other financial institutions, corporate entities, and individuals that are payable in foreign currency, or in domestic currency but with the amount to be paid linked to a foreign currency.
- Total loans: including loans to customers and other financial institutions, but excluding export bills purchased.

1.7.3 Net open position in equities to capital

This indicator is to analyze the effect of price changes of banks' net positions in equities compared with own equity.

- Net open position in equities: the sum of on-balance-sheet holdings of equities and notional positions in equity derivatives.

1.7.4 Foreign-currency-denominated liabilities to total liabilities

This indicator is to analyze the proportion of foreign currency funding within total liabilities.

- Foreign-currency-denominated liabilities: the liabilities that are payable in foreign currency, or booked in domestic currency but paid in an agreed foreign currency.
- Total liabilities: the total amounts of current, non-contingent liabilities, and the liabilities positions in financial derivatives.

2. Life Insurance Companies

2.1 Assets to GDP

This indicator is used to analyze the level of life insurance companies' total assets relative to GDP.

2.2 Return on assets (ROA)

This indicator is to analyze life insurance companies' efficiency in using their assets.

- ROA = net income before tax/average assets
  - Average total assets: the mean of total assets at the end of the previous and current year.

2.3 Return on equity (ROE)

This indicator is to analyze life insurance companies' pre-tax (after-tax) efficiency in using their capital.

- ROE = net income before (after) tax/average equity
  - Average equity: the mean of equity at the end of the previous and current years.

2.4 Risk based capital (RBC) ratio

This indicator is to analyze the capital adequacy of life insurance companies. The minimum statutory RBC ratio of a life insurance company shall not be less than 200%, pursuant to the *Regulations Governing Capital Adequacy of Insurance Companies*.

2.5 Equity to investment assets

This indicator is to analyze the capital adequacy and financial leverage of life insurance companies.

- Investment assets: including financial assets such as cash, deposits, loans, securities, and financial derivatives and non-financial assets held for investment purposes.

3. Bills Finance Companies

3.1 Assets to GDP

This indicator is used to analyze the level of bills finance companies' total assets relative to GDP.

3.2 Return on assets (ROA)

This indicator is to analyze bills finance companies' efficiency in using their assets.

- ROA = net income before tax/average assets
  - Average total assets: (same as in 2.2).

3.3 Return on equity (ROE)

This indicator is to analyze bills finance companies' pre-tax (after-tax) efficiency in using their capital.

- ROE = net income before (after) tax/average equity
  - Average equity: (same as in 2.3).

3.4 Capital adequacy ratio

This indicator is to analyze the capital adequacy of bills finance companies. The minimum statutory ratio of regulatory capital to risk-weighted assets of a bills finance company shall not be less than 8%, based

on the *Act Governing Bills Finance Business*.

- Regulatory capital: the aggregate amount of net Tier 1 capital, eligible Tier 2 capital, and eligible used Tier 3 capital.
- Risk-weighted assets: (same as in 1.4.1).

3.5 0-30 day maturity gap to assets (NTD)

This indicator is to analyze the short-term liquidity of bills finance companies' NTD funds.

- 0-30 day maturity gap to assets: maturity gaps of expected NTD cash flow over the next 30 days to total NTD assets.
- Maturity gaps of expected NTD cash flow over the next 30 days: total expected NTD cash inflows net of total expected NTD cash outflows with remaining maturity of 30 days or less.

4. Non-financial corporate sector indicators

4.1 Total liabilities to equity

This indicator is a leverage ratio which is used to analyze the extent of activities that are financed through liabilities other than own funds.

- Total liabilities: including short-term and long-term liabilities.
- Equity: including funds contributed by owners, capital surpluses, retained earnings, and other items related to owners' equity.

4.2 Return on equity (ROE)

This indicator is to analyze profitability of non-financial corporations in using their capital.

- Return on equity = net income before interest and tax/average equity (the "net income before interest and tax" is based on the FSIs of the IMF).
  - Net income before interest and tax: net income before tax plus interest expenses from continuing operation units.
  - Average equity: the mean of the equity at the beginning and the end of the current year.

4.3 Net income before interest and tax/interest expenses

This indicator is to analyze how well non-financial corporate income covers interest expenses.

- Interest expenses: the interest payments on debt within the specified time period of the statement.

4.4 Foreign-currency-denominated liabilities to equity

This indicator is to analyze the effect of exchange rate movements on equity.

- Foreign-currency-denominated liabilities: (same as in 1.7.4).

5. Household sector indicators

5.1 Household debt to GDP

This indicator is to analyze the level of household debt to GDP.

- Household debt: outstanding household loans and credit card revolving balances borrowed from financial institutions. Financial institutions include depository institutions and other financial

institutions (investment trust companies, life insurance companies, securities finance companies, and securities firms).

5.2 Debt service and principal payments to total disposable income

This indicator is to analyze the capacity of households to service their debts.

- Debt service and principal payments: interest and principal payments made on outstanding loans and credit card revolving balances within the specified time period of the statement.
- Total disposable income: net disposable income (i.e., the aggregate of the wages and salaries from employment, property and corporate income, and transfer receipts, less taxes on income and wealth and other transfer payments) plus expenses of interest and rent.

5.3 Household debt to total disposable income

This indicator is to analyze the degree of indebtedness in the household sector.

6. Real estate market indicators

6.1 National housing price index

This indicator is used to analyze the price movement of national housing prices.

- National housing price index: the index of national housing prices released quarterly by the Ministry of the Interior.

6.2 Residential real estate loans to total loans

This indicator analyzes the extent of concentration of domestic banks' loans in residential real estate-related lending.

- Residential real estate loans: individual loans that are collateralized by residential real estate. Residential real estate includes houses, apartments, and associated land (including owner–occupied and rental properties).
- Total loans: (same as in 1.3.1).

6.3 Commercial real estate loans to total loans

This indicator analyzes the extent of concentration of domestic banks' loans in commercial real estate-related lending.

- Commercial real estate loans: loans to corporate entities and individuals that are collateralized by commercial real estate, loans to construction companies, and loans to companies involved in the development of real estate. Commercial real estate includes buildings and associated land used by enterprises for retail, wholesale, manufacturing, or other purposes.
- Total loans: (same as in 1.3.1).

Abbreviations

ABS	Australian Bureau of Statistics
AC	Amortized cost
ACH	Automated clearing house
AI	Artificial intelligence
AR6	Sixth Assessment Report
ATM	Automated teller machine
BAROC	Bankers Association of the Republic of China
BICRA	Banking Industry Country Risk Assessment
BIS	Bank for International Settlements
BoE	Bank of England
BOJ	Bank of Japan
BOK	Bank of Korea
BSI	Banking system indicator
CBC	Central Bank of the Republic of China (Taiwan)
CD	Certificate of deposit
CET 1	Common Equity Tier 1
CIFS	CBC Interbank Funds Transfer System
COVID-19	Coronavirus disease 2019
CP	Commercial paper
CPI	Consumer price index
CRE	Commercial real estate
CSM	Contractual service margin
DBU	Domestic banking unit
DGBAS	Directorate-General of Budget, Accounting and Statistics of the Executive Yuan
D-SIB	Domestic systemically important bank
ECB	European Central Bank
ETF	Exchange Traded Fund

EU	European Union
EUR	Euro
Fed	Federal Reserve System
FISC	Financial Information Service Co., Ltd.
FOMC	Federal Open Market Committee
FSB	Financial Stability Board
FSC	Financial Supervisory Commission
FSI	Financial Stability Institute
FSIs	Financial soundness indicators
FSOC	Financial Stability Oversight Council
FX	Foreign exchange
GDP	Gross domestic product
GenAI	Generative Artificial Intelligence
G-SIB	Global systemically important bank
IAIS	International Association of Insurance Supervisors
ICS	Insurance capital standard
IFIS	Inter-bank Financial Information System
IFRS	International Financial Reporting Standard
IMF	International Monetary Fund
IOSCO	International Organization of Securities Regulators
IPCC	Intergovernmental Panel on Climate Change
IRB	Internal ratings-based
ISSB	International Sustainability Standards Board
JCIC	Joint Credit Information Center
JPY	Japanese yen
KRW	Korean won
LCR	Liquidity coverage ratio
LGFV	Local government financing vehicle
LTV	Loan-to-value
MAS	Monetary Authority of Singapore
MOF	Ministry of Finance
MOI	Ministry of the Interior
MPI	Macro-Prudential Indicator

MYR	Malaysian ringgit
NAV	Net asset value
NCD	Negotiable certificates of deposit
NEER	Nominal effective exchange rate
NGFS	Network for Greening the Financial System
NPL	Non-performing loan
NSFR	Net stable funding ratio
NTD	New Taiwan dollar
OBU	Offshore banking unit
OECD	Organization for Economic Cooperation and Development
OPEC+	Organization of the Petroleum Exporting Countries and its allies
OTC	Over-the-counter
PBOC	People's Bank of China
PPI	Producer price index
PPS	Percentage points
P2P	Peer-to-Peer
QR	Quick Response
RBA	Risk-based approach
RBC	Risk Based Capital
RCP	Representative Concentration Pathway
REER	Real effective exchange rate
Repo	Repurchase agreement
RMB	Renminbi
ROA	Return on assets
ROE	Return on equity
RS	Reverse repurchase agreement
SGD	Singapore dollar
SITCA	Securities Investment Trust & Consulting Association
SITCs	Securities investment trust companies
TAIEX	Taiwan Stock Exchange Weighted Index
TCH	Taiwan Clearing House
TEJ	Taiwan Economic Journal Co., Ltd.
TPEx	Taipei Exchange

TPEX	Taipei Exchange Capitalization Weighted Stock Index
TWSE	Taiwan Stock Exchange
USD	US dollar

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