Central Bank of the Republic of China (Taiwan)

Financial Stability Report

May 2020 | Issue No. 14

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Table of contents

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, 2020.***

Abstract

In 2019, Taiwan's financial markets operated smoothly in the context of a slowdown in economic growth and mild inflation both domestically and abroad. Domestic financial institutions experienced sharp increases in profitability and higher capital levels. The major payment systems also functioned along an orderly trajectory. However, in the beginning of 2020, with the outbreak of the coronavirus disease 2019 (COVID-19) pandemic which has quickly spread globally, the downside risks of domestic and international economic conditions increased dramatically. The pandemic triggered further bouts of global financial market turmoil. However, thanks to a sound domestic financial system, coupled with an appropriate government response to the pandemic, the impact on Taiwan's financial system was relatively limited.

International and domestic macro environment and impacts arising from the COVID-19 pandemic

With regard to global economic and financial conditions, the momentum of international economic growth slowed in 2019. In response, major economies adopted accommodative monetary policy stances. As a consequence, most of the global stock markets trended upwards and government bond yields trended downwards before bouncing back. Since early 2020, global economic growth has seriously lost momentum amid the outbreak of COVID-19 and its spread across the world. As predicted by IHS Markit, the global economic outlook would fall into a slowdown. On the back of heightened anxiety of investors, global stock markets slumped and the spreads of high-yield corporate bonds surged; hence, financial conditions significantly tightened. The economic growth in Mainland China also waned, along with rising potential risks. To mitigate the impact of the COVID-19 pandemic on the economy, major economies consecutively adopted accommodative monetary policy stances such as interest rate cuts and expansion of asset purchasing plans, in conjunction with the implementation of unprecedented fiscal stimulus packages.

In 2019, Taiwan's economy grew soundly and consumer prices rose moderately with mild inflation. External debt shrank and foreign exchange (FX) reserves remained ample, implying

that external debt-servicing capacity remained strong. The government's fiscal deficits and public debt expanded, but stayed within a manageable range. The profitability of listed companies decreased, while household financial conditions remained sound. Real estate market trading volume and house prices both surged; nevertheless, the mortgage burden remained heavy. Starting from early 2020, the impact of the global COVID-19 pandemic on the momentum of domestic economic growth could undermine the debt-servicing capacity of the corporate and household sectors. Real estate market outlook may also turn conservative. In addition, the implementation of large-scale relief and revitalization plans by the government, which will be partially financed by debt, could increase its fiscal deficits and outstanding public debt.

Financial markets, institutions, and infrastructures operated smoothly

In 2019, bill and bond issuance in the primary market rose, whereas the trading volume in the secondary market shrank. Stock prices fluctuated with an upward trend; FX markets remained dynamically stable. The profitability and capital levels of domestic banks increased and loss-bearing capacity remained sound. Life insurance companies exhibited a substantial increase in profitability, underpinning a rebound in their capital levels apparently. Bills finance companies showed rising profits, though liquidity risks remained high. Furthermore, the major systemically important payment systems operated smoothly.

From early 2020, with the spread of the COVID-19 pandemic around the world, the yields on Taiwan's government bonds sharply fluctuated, and the stock indices plunged and then turned to rebound. The NT dollar exchange rate against the US dollar remained relatively stable. On the other hand, domestic banks could see a compression of interest rate spreads between deposits and loans and deteriorated credit quality amid the pandemic. However, domestic banks, supported by their sound financial conditions and improving risk-bearing capacity, were able to weather the adverse impacts deriving from the pandemic. The securities investments of life insurance companies were severely affected by the COVID-19 outbreak, resulting in a significant decline in their equities. Nevertheless, given that life insurance companies have continuously injected their profits into capital in recent years, their resilience to withstand adverse shocks has improved. The credit quality of bills finance companies could be affected; however, the impacts should be limited. Domestic systemically important financial infrastructures, which were not affected by the pandemic, functioned orderly. As a whole, domestic financial systems operated smoothly.

Taiwan's government actively took measures in response to the COVID-19 pandemic

From 2019 onwards, the Bank successively adopted appropriate monetary, credit, and FX policy measures. Meanwhile, the Financial Supervisory Commission (FSC) persistently revised financial regulations and strengthened financial supervisory measures, so as to maintain sound operation of financial institutions and to promote financial stability. To contain the impact of COVID-19 on the domestic economy and society, in early 2020, the Executive Yuan launched an NT$1.05 trillion relief and revitalization plan, providing various types of assistance in three major directions of epidemic prevention, relief, and revitalization of the economy. In addition, in order to mitigate the impact of the pandemic on the domestic financial system, the Bank lowered policy rates, together with supporting the liquidity of the financial system and maintaining the stability of the FX market. Meanwhile, the FSC also adopted a number of measures to stabilize financial markets.

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

In 2019, financial markets operated smoothly and financial conditions of financial institutions were sound, while all payment systems functioned orderly. Overall, the financial system in Taiwan remained stable. From early 2020 onwards, global financial markets fluctuated drastically following the COVID-19 outbreak. In response, Taiwan's government launched a series of relief and revitalization measures which are expected to help maintain the stability of the domestic labor market and support the momentum of economic growth. Nevertheless, considering that the COVID-19 pandemic has not yet eased and international economic and financial developments are still surrounded by many uncertainties, the Bank will continue to pay close attention to the impacts of relevant subsequent developments on domestic economic and financial conditions so as to take pertinent response measures in a timely manner to promote financial stability.

I. Overview

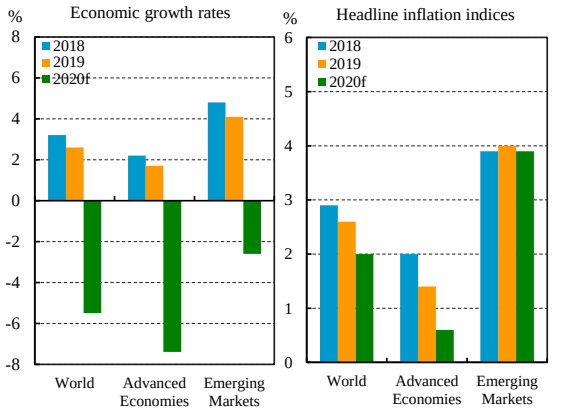
Potential macro environmental risk factors

International economic and financial conditions

COVID-19 pandemic would dip global economy into recession, along with heightened volatility in financial markets

The global gross domestic product (GDP) growth rate decelerated to 2.6% in 2019 owing to the fact that the trade uncertainty between the US and Mainland China has hurt business confidence and jeopardized exports. Meanwhile, the downward trend of commodity prices moderated the global consumer price index (CPI) inflation rate to 2.6%. Moreover, affected by a global economic slowdown, monetary policies in major economies shifted towards a more dovish stance. Against this backdrop, most economies saw rises in their stock markets and the government bond yields in major economies descended before trending upwards. Moreover, the movements of exchange rates in advanced and emerging economies diverged. Among them, exchange rates in most advanced economies fluctuated within a narrow range, while the US dollar index of emerging economies trended upwards before dropping.

Chart 1.1 Global economic growth rates and headline inflation indices



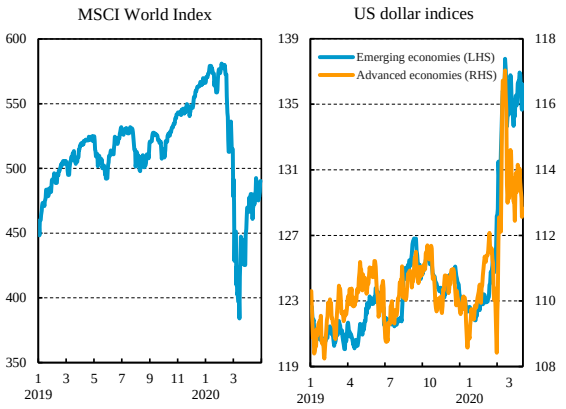
Note: Figures for 2020 are IHS Markit estimates.
Source: IHS Markit (2020/5/15).

In the beginning of 2020, COVID-19 first broke out in Mainland China and rapidly spread around the world. Considering that the COVID-19 pandemic has battered the momentum of global economic growth, IHS Markit predicts[1] that the global economy will dip into recession with the GDP growth rate

[1] IHS Markit estimate on May 15, 2020.

weakening to -5.5%. Economic growth in advanced economies is projected to contract to -7.4%, while that in emerging economies is forecast to decrease to -2.6% (Chart 1.1, left panel). Moreover, affected by the pandemic, IHS Markit predicts that commodity prices will stay at a low level throughout 2020 and the global CPI inflation rate will fall to 2.0% (Chart 1.1, right panel), reflecting a declining trend in global inflation.

Chart 1.2 Performance of international stock and FX markets



Notes: 1. The MSCI World Index, maintained by Morgan Stanley, is a weighted index of stocks from large companies throughout the world.
2. The US dollar indices of advanced and emerging economies were developed by the Fed, and are weighted exchange rates of 7 and 19 trading partners, respectively. Base period is January 2016 (=100).
Sources: Bloomberg and Fed.

In March 2020, the Chicago Board Options Exchange Volatility Index (VIX)[2] once hit an all-time closing high of 82.69 and global stock markets crashed (Chart 1.2, left panel), with US stocks triggering multiple circuit breakers[3] amid intensifying fears that the pandemic continued spreading, international oil prices collapsed, and global financial leverage remained high. In addition, government bond yields in major economies, driven by surging demand for hedging, plummeted to a five-year low, while interest rate spreads of US high-yield corporate bonds jumped to a new high since the 2008 financial crisis. These factors all contributed to tightening financial conditions. However, after major economies successively adopted preemptive measures in response to COVID-19, financial conditions attenuated moderately.

In the beginning of 2020, affected by COVID-19 and efforts of the Federal Reserve System (Fed) to ease financial conditions, global FX markets fluctuated dramatically (Chart 1.2, right panel). Among them, emerging economies experienced large capital outflows and saw their currencies depreciate markedly. As emerging economies are excessively indebted, continuing capital outflows could further weaken their currencies and expose them to higher financial vulnerabilities.

[2] The VIX Index (also known as the fear index) refers to the Chicago Board Options Exchange Volatility Index that represents the market's expectation of 30-day forward-looking volatility of S&P 500 index options. On March 16, 2020, the S&P 500 posted its record drop of 324.89 points, while the VIX Index jumped to 82.69, higher than the level seen in the 2008 financial crisis, reflecting the market's irrational fear towards the future.

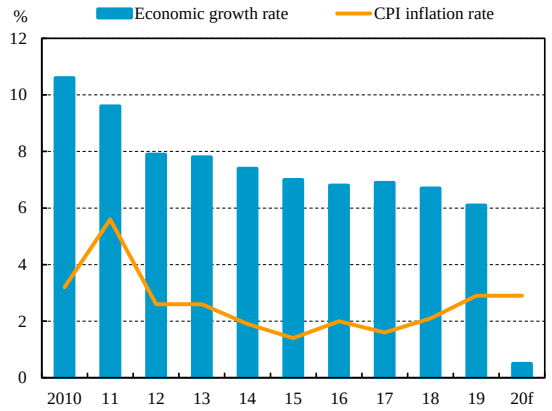
[3] The US stock market circuit breaker mechanism was put in place after October 19, 1987, also known as "Black Monday." It aims to reduce panic selling, give traders time to consider related risks and trading strategies calmly, and restore market liquidity. There are three thresholds for circuit breakers to kick in. If the S&P 500 index declines by 7%, level one circuit breaker would be triggered and trading would be halted for 15 minutes. If the S&P index declines by 13% after trading resumes, level two circuit breaker would be triggered and trading would be halted for another 15 minutes. If the S&P index declines by 20% after trading resumes, trading would be suspended for the remainder of the day.

Mainland China experienced a significant economic slowdown with elevated potential risks

Mainland China's economic growth continued at a moderate pace and registered 6.1% in 2019 with the annual CPI inflation rate climbing to 2.9%. IHS Markit projects that the economic growth rate will fall dramatically to 0.5% in 2020 amid the COVID-19 pandemic, while the annual CPI inflation rate is forecast to remain at 2.9% (Chart 1.3).

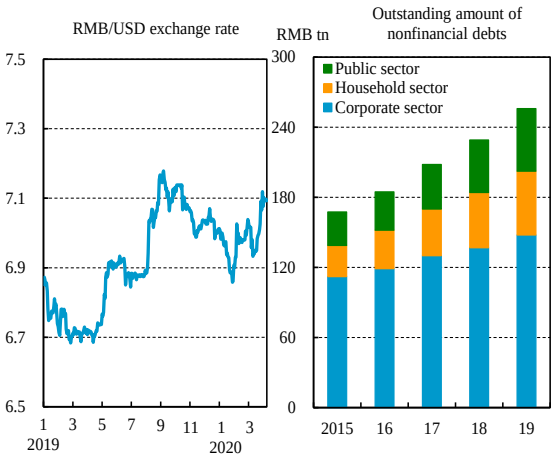
From May 2019 onwards, affected by the escalation of the US-China trade dispute, as well as Mainland China's designation as a currency manipulator by the US, the renminbi against the US dollar depreciated substantially before turning to appreciate in September (Chart 1.4, left panel). Meanwhile, the Shanghai Stock Exchange (SSE) Composite Index trended upwards before dropping. In the beginning of 2020, the renminbi depreciated sharply against the US dollar driven by mounting panic sentiment in global financial markets. The SSE Composite Index also trended downwards following a slump in international stock markets; however, the decline was relatively moderate.

Chart 1.3 Economic growth rate and CPI inflation rate of Mainland China



Note: Figures for 2020 are IHS Markit projections.
Sources: National Bureau of Statistics of China and IHS Markit (2020/5/15).

Chart 1.4 RMB/USD exchange rate and outstanding amount of nonfinancial debts in Mainland China



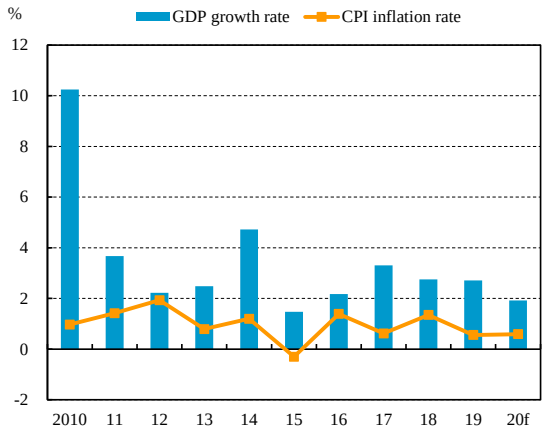
Sources: CBC and BIS.

In Mainland China, the aggregate financing to the real economy expanded continually in 2019, but the credit quality of banks deterioated. Their credit risk could further increase if the COVID-19 pandemic continues to spread. The outstanding debt for nonfinanical sectors, including corporate, household, and government sectors, reached a record high at the end of the year (Chart 1.4, right panel), reflecting a rise in potential risks.

Major economies have successively adopted accommodative monetary policy stances and expansionary fiscal policies to alleviate the impacts of the COVID-19 pandemic

To alleviate the substantial impacts from the spread of the COVID-19 pandemic, the Fed made emergency interest rate cuts twice by a total of 150 basis points (bps) in March 2020, announced an unprecedented limitless asset purchase program, and provided up to US$2.3 trillion in loans. With the aim of maintaining liquidity for the real economy, other major central banks also promptly adopted accommodative monetary policy stances. Furthermore, in response to meeting market needs for US dollars, the Fed and central banks of major economies reactivated or set up new temporary swap lines, so as to relieve strains in global US dollar funding markets.

Chart 1.5 Economic growth rate and CPI inflation rate of Taiwan



Note: Figures for 2020 are CBC forecasts released on March 19, 2020.
Source: CBC.

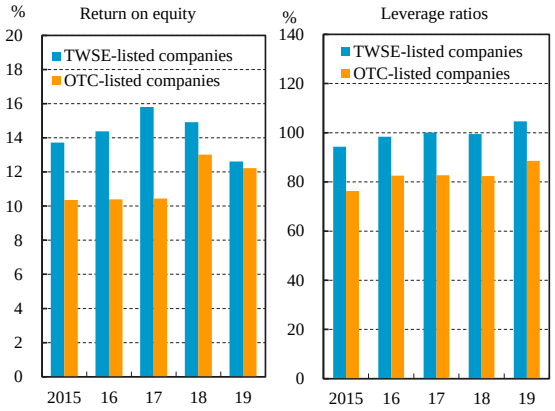
In addition, major economies consecutively launched large-scale fiscal stimulus packages to facilitate virus prevention and vaccine development, offer credit guarantees to and bail out the most affected industries and firms, and provide direct cash transfers to support vulnerable households. Among them, the US has passed fiscal stimulus bills totaling US$2.9 trillion, far higher than the US$0.79 trillion made available during the global financial crisis (GFC) in 2008. The Japanese government put forth a 117 trillion yen economic stimulus package, the largest fiscal stimulus package in history.

Domestic macro environment

In 2019, the domestic economy grew mildly, while consumer prices rose moderately and external debt servicing capacity remained sound

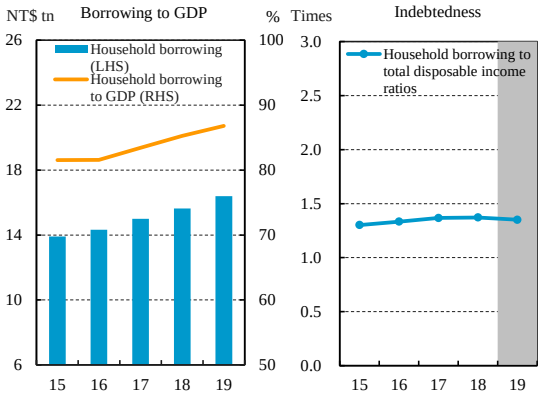
In 2019, thanks to the three major investment programs promoted by the government[4] and steady growth momentum in private consumption, the annual economic growth rate in Taiwan reached 2.71%, slightly lower than the 2.75% of the previous year. Meanwhile, domestic prices rose mildly throughout the year with the annual CPI inflation rate registering 0.56%, lower than the 1.35% of the previous year (Chart 1.5). In addition, Taiwan's external debt contracted to US$184.6 billion at the end of the year, and FX reserves remained at a sufficient level of US$478.1 billion, implying a robust capacity to service external debt.[5] The amount of the fiscal deficit saw a rebound, equivalent to 0.94%[6] of annual GDP in 2019. The outstanding public debt at all levels of government slightly increased at the end of the year, but the ratio of total public debt to annual GDP slightly fell to 33.93%,[7] indicating that total government debt stayed within a manageable level.

Chart 1.6 Return on equity and leverage ratios in 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 1.7 Household indebtedness



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

[4] The Executive Yuan launched the *Action Plan for Welcoming Overseas Taiwanese Businesses to Return to Invest in Taiwan* in January 2019, and approved the *Action Plan for Accelerated Investment by Domestic Corporations* and the *Action Plan for Accelerated Investment by SMEs* in June 2019. These programs attracted overseas corporates to invest in Taiwan and enhanced the transformation and upgrade of domestic enterprises.

[5] 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. The term "public external debt" refers to debt that the public sector is either obligated to repay directly or has guaranteed. The term "private external debt" refers to private-sector foreign debt not guaranteed by the public sector.

[6] The figure of GDP used in the ratios cited in this report is based on a DGBAS press release on February 12, 2020. 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*.

[7] As a comparison, outstanding 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*.

Corporate sector saw declined profitability, while household sector remained in a healthy financial condition

In 2019, the protracted US-China trade dispute and subdued momentum in major economies induced waning market demand. Against this backdrop, the profitability of Taiwan Stock Exchange (TWSE) listed and over-the-counter (OTC) listed companies abated (Chart 1.6, left panel) alongside increasing financial leverage ratios (Chart 1.6, right panel). However, their short-term debt servicing capacity remained at an adequate level. The non-performing loan (NPL) ratio for corporate loans from financial institutions fell to a record low of 0.27% at the end of the year, reflecting that overall credit quality for the corporate sector strengthened.

At the end of 2019, total household borrowing expanded and reached NT$16.39 trillion, equivalent to 86.74% of annual GDP (Chart 1.7, left panel). The ratio of household borrowing to total disposable income leveled off at 1.35 times, reflecting a stable household debt burden (Chart 1.7, right panel). Furthermore, in Taiwan, household net worth[8] has been remarkable, which has hovered around 8.2 times the GDP in recent years, reflecting a healthy financial condition and a sustained debt servicing capacity of households. Meanwhile, the NPL ratio of household borrowing decreased to a new low of 0.22%, indicating a satisfactory credit quality.

Real estate market saw an increase in both trading volume and housing prices, while mortgage burden stayed high

In 2019, trading volume in the housing market increased, as the total number of building ownership transfers for transaction increased to 300 thousand units, the highest since 2015. Meanwhile, the Sinyi housing price index (for existing residential buildings) rose gradually, while the Cathay housing price index (for new residential buildings) increased significantly.

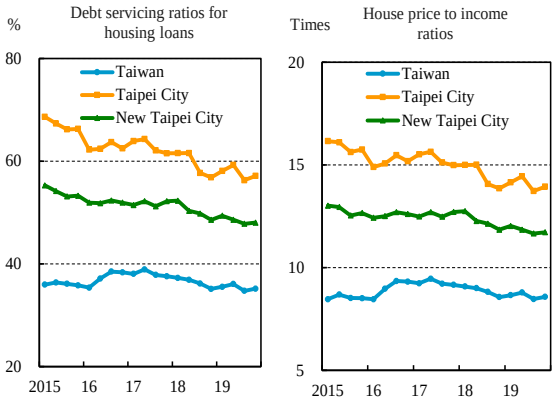
In 2019 Q4, the debt servicing ratio for housing loans and the house price to income ratio in Taiwan ascended marginally year on year to 35.15% and 8.58, respectively, demonstrating a high mortgage burden. Among the six metropolitan areas, the ratios in Taipei City registered 57.11% and 13.94, respectively (Chart 1.8), showing that the mortgage burden remained heavy.

[8] 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.).

The COVID-19 pandemic could pose a negative impact on domestic economic growth momentum and, in turn, affect the debt servicing capacity of the corporate and household sectors

Since the COVID-19 pandemic spread around the world in the beginning of 2020, global travel has almost ground to a halt and domestic tourism has also shrunk substantially. Moreover, Taiwan's private consumption weakened and exports faced pressures as the COVID-19 pandemic intensified concerns over global demand contraction. According to the Directorate-General of Budget, Accounting and Statistics of the Executive Yuan (DGBAS), the preliminary estimate of Taiwan's economic growth rate dropped to 1.59%[9] in 2020 Q1. Although the rate reflected weakened economic growth momentum, it was still higher than those in the US (0.2%) and Mainland China (-6.8%). Based on a more conservative growth forecast in private consumption and investment, combined with the adverse impact on export momentum, the Bank lowered its earlier forecast for Taiwan's economic growth to 1.07% for the first half of 2020. Given an improvement in the situation of the COVID-19 pandemic in the second half of the year, domestic economic growth is expected to pick up. The supporting factors include a rebound of private consumption, regaining export momentum deriving from emerging technologies, and the government's relief and revitalization measures to bolster domestic demand. Accordingly, the Bank forecasts the domestic economy to expand by 1.92%[10] in 2020, a decrease of 0.79 percentage points (pps) compared to the 2.71% reported in 2019 (Chart 1.5).

Chart 1.8 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.

The impact of the pandemic on individual industries was diverse. Among them, the industries of the manufacturing sector were vulnerable to the suspension of production in Mainland China and the order cancellation triggered by weakened global demand. As for the services sector, the spread of the pandemic has chilled consumers' willingness to travel and ravaged the revenue

[9] The figure is based on a DGBAS press release on May 28, 2020.
[10] The figure is based on a CBC press release on March 19, 2020. In addition, according to a DGBAS press release on May 28, 2020, the domestic economic growth rate is forecast to be 1.67% in 2020.

for some industries, including the wholesale trade industry, retail trade industry, transportation & storage industry, and accommodation & food services industry. In addition, the pandemic hit the local labor market, which could pose an impact on households' income sources and, in turn, affect their debt-servicing capacity in the future. It also provoked a wait-and-see attitude for the real estate market. In response to the COVID-19 pandemic, the government launched relief and revitalization measures totaling NT$1.05 trillion. Since some of the measures would be financed by debt,[11] the government's fiscal deficits and outstanding debt could expand further.

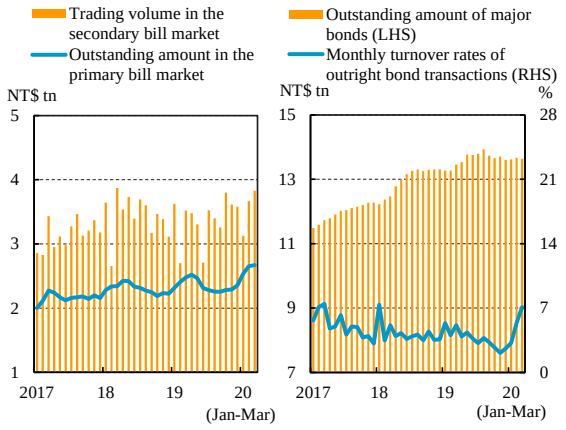
Financial system assessment

Financial markets

Bill and bond issuance in the primary market expanded, while their trading volume in the secondary market contracted

At the end of 2019, the outstanding amount of bill issuance in the primary market increased by 5.85% year on year, while trading volume in the secondary bill market decreased by 1.82% (Chart 1.9, left panel). As for the bond market, the outstanding amount of bond issuance increased marginally by 2.35% year on year. Trading volume in the secondary bond market [12] decreased by 10.70%, as repo transactions and outright transactions both saw diminishing trading volumes. The average monthly outright turnover rate of major bonds [13] in the secondary market declined further in 2019 to a record low of 3.68%, but rebounded in 2020 Q1 (Chart 1.9, right panel).

Chart 1.9 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.

In 2019, the interbank overnight call loan rate stabilized at a low level, while 10-year government bond yields roughly trended downwards.

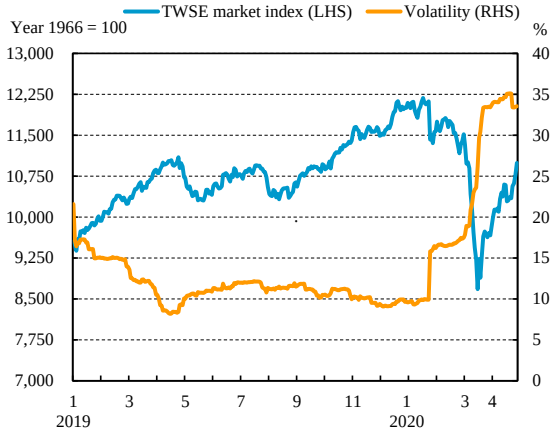
[11] The increased budget comprised a special budget of NT$210 billion, of which NT$30 billion would be financed by the surplus of the previous fiscal years and NT$180 billion by debt.
[12] Includes repo and outright transactions.
[13] Includes government bonds, international bonds, corporate bonds, and financial debentures.

In the beginning of 2020, the yields dipped consecutively and dropped to a historical low level of 0.44%, driven by the COVID-19 pandemic outbreak and the pressure arising from the replenishment of bonds by life insurance companies. Afterwards, as market sentiment worsened, a wave of selling hit the bond market and propelled bond yields to jump abruptly. However, with the Bank's interest rate cut, the interbank overnight call loan rate dropped to a low level of 0.074%, and bond yields fell back again. Considering that volatility in the bond market exacerbated amid the pandemic, interest rate risks related to bond investments are still high, which warrant close attention.

Stock indices fluctuated with an upward trend, and volatility increased dramatically since the beginning of 2020

In 2019, the Taiwan Stock Exchange Weighted Index (TAIEX) of the TWSE market fluctuated with an upward trend, registering 11,997 at the end of the year and posting an annual increase of 23.33%. Starting from late January in 2020, affected by a slump in international stock markets, the TAIEX reversed to trend downwards. In March, as the US stock market collapsed and triggered multiple circuit breakers, the TWSE market plunged to 8,681. Afterwards, the TAIEX rebounded gradually and reached 10,992 at the end of April (Chart 1.10), decreasing by 8.38% compared to the level at the end of 2019. However, the decline in the TAIEX was more moderate than those in the major indices of the US and European stock markets.

Chart 1.10 TWSE market index and volatility



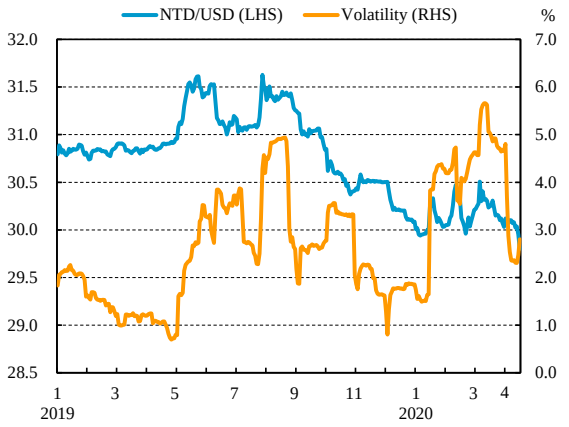
Note: Volatility refers to the annualized standard deviation of 60-day daily index returns.
Sources: TWSE and CBC.

In 2019, volatility in the TWSE market was moderate and registered merely 9.71% at the end of the year. From the beginning of 2020 onwards, the volatility surged sharply on the back of a plunge in local stock indices, and registered 33.54% at the end of April (Chart 1.10).

The NT dollar exchange rate by and large oscillated along an appreciating path, and its volatility remained relatively stable

In 2019, affected by the US-China trade dispute and the interest rate cuts by the Fed after September, the NT dollar exchange rate against the US dollar depreciated before appreciating, and registered 30.106 at the end of the year, appreciating by 2.08% year on year. In 2020 Q1, as the COVID-19 pandemic hit market sentiment and net foreign capital outflows surged in March, the NT dollar exchange rate turned to depreciate against the US dollar. However, owing to remittances from overseas investments of domestic funds and the selling of US dollars by exporters, the NT dollar exchange rate reversed to appreciate and stood at 29.802 at the end of April (Chart 1.11), appreciating by 1.02% compared to the end of 2019.

Chart 1.11 Movements of NT dollar exchange rate against US dollar



Note: Volatility refers to the annualized standard deviation of 20-day daily returns.
Source: CBC.

In 2019, volatility in the NT dollar exchange rate against the US dollar shifted between 0.70% and 4.94%, and registered an annual average of 2.39%. Afterwards, global financial markets fluctuated dramatically under the huge impacts of the COVID-19 pandemic, fueling volatility in the NT dollar exchange rate against the US dollar to increase between 1.50% and 5.66% during January to April 2020 (Chart 1.11). Compared to major currencies such as the Japanese yen, the euro, and the Korean won, the NT dollar exchange rate has been relatively stable against the US dollar.

Financial institutions

Domestic banks maintained a healthy financial condition, but the impacts of the COVID-19 pandemic warrant close attention

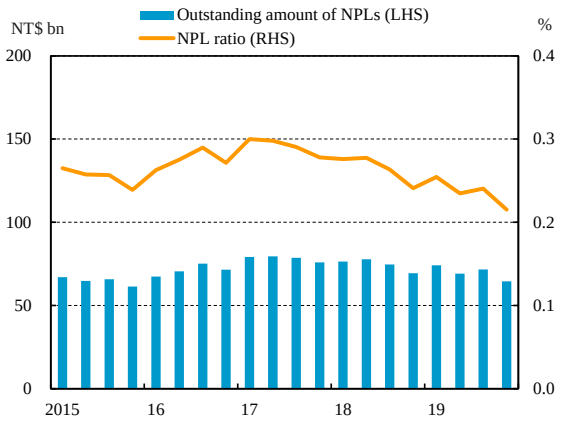
In 2019, customer loans of domestic banks kept rising. The credit concentration of corporate loans slightly diminished, but that in real estate loans went up marginally. The NPL ratio continued decreasing to a record low of 0.22% at the end of the year (Chart 1.12), along with sufficient provisions. Meanwhile, the aggregate amount of exposure to Mainland China

contracted, and the ratio of the exposures to banks' net worth dropped to 46% at the end of the year, hitting the lowest level in recent years.

The net income before tax of domestic banks increased by 7.94% year on year to NT$362.1 billion in 2019 (Chart 1.13, left panel). The average return on equity (ROE) and return on assets (ROA) also increased to 9.49% and 0.70% (Chart 1.13, right panel), respectively, showing improved profitability. In addition, at the end of 2019, the average capital adequacy ratio of domestic banks ascended to 14.07% with satisfactory capital quality.

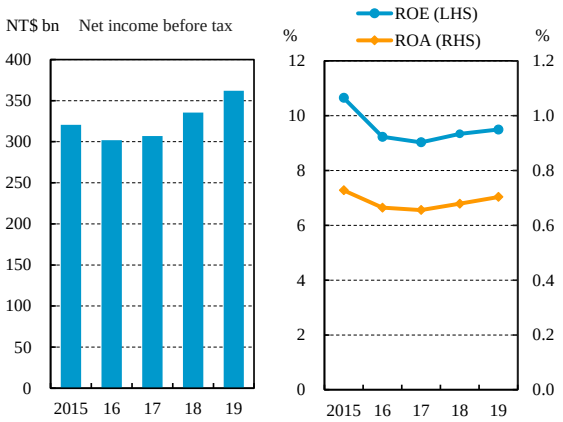
From early 2020 onwards, the COVID-19 pandemic could impair the debt servicing capacity of some industries, which might deterioate domestic banks' asset quality and, in turn, undermine their profitability in the future. Moreover, domestic banks faced drastically higher market risk as financial markets became more volatile amid the spread of the pandemic, which might pose a negative impact on their capital levels and warrants close attention.

Chart 1.12 NPLs of domestic banks



Note: Excludes interbank loans.
Source: CBC.

Chart 1.13 Profitability of domestic banks



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

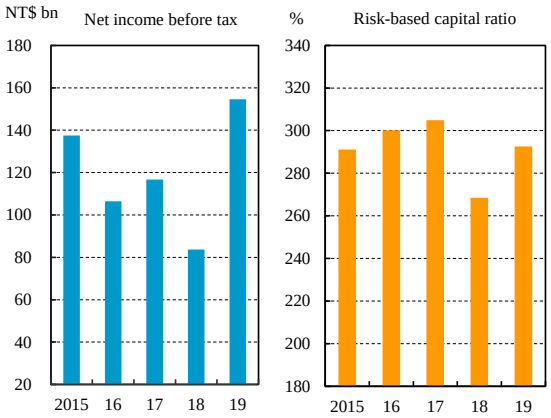
Life insurance companies posted elevated profitability and capital levels, but faced higher market risk

Life insurance companies reported net income before tax of NT$154.6 billion in 2019, increasing dramatically by 84.74% year on year (Chart 1.14, left panel). This was chiefly contributed to by a higher gain on investments. Owing to an increase in pretax income and unrealized equity and bond investment profits, the average risk-based capital (RBC) ratio and the average equity to asset ratio[14] of life insurance companies both significantly rebounded to 292.54% (Chart 1.14, right panel) and 7.10%, respectively, at the end of the year.

[14] Assets are exclusive of the assets of investment-linked insurance products in separate accounts.

Since the beginning of 2020, life insurance companies have faced higher reinvestment risk as major economies successively cut interest rates. Moreover, owing to a global stock market crash and the international oil price collapse in March 2020, global financial market volatility fluctuated dramatically. Therefore, investment risks related to equity and corporate bonds with a rating of BBB or below remained high and warrant close attention.

Chart 1.14 Net income before tax and risk-based capital ratio of life insurance companies

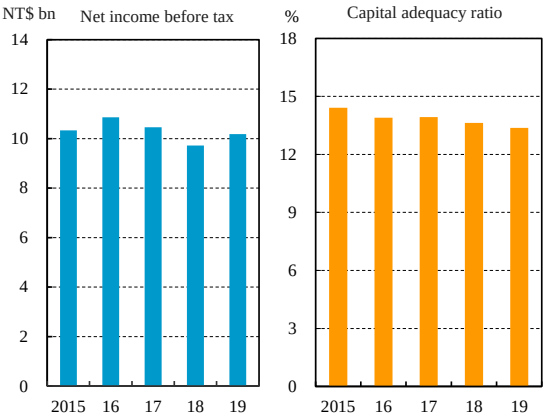


Note: Figures for risk-based capital ratios exclude insurance companies taken into receivership by the FSC.
Source: FSC.

Liquidity risk of bills finance companies remained high and the impact of the COVID-19 pandemic warrants attention

In 2019, commercial paper (CP) guaranteed by bills finance companies expanded, mainly owing to interest rates in the money market remaining at a low level, which attracted corporates to increase the issuance of CP for the purpose of fund raising. The non-performing credit ratio of bills finance companies remained low, but the impact of the pandemic on their credit quality warrants close attention. Meanwhile, maturity mismatches between long-term assets and short-term liabilities persisted, reflecting a still high liquidity risk in bills finance companies.

Chart 1.15 Net income before tax and capital adequacy ratio of bills finance companies



Source: CBC.

Bills finance companies posted a net income before tax of NT$10.2 billion in 2019, increasing by 4.71% year on year (Chart 1.15, left panel). This was mainly driven by an increase in gains from sales of bond investments. The average capital adequacy ratio of bills finance companies moderately descended to 13.37% at the end of 2019 (Chart 1.15, right panel), while the capital adequacy ratio for each company remained well above the statutory minimum of 8%.

Financial infrastructure

The amount of mobile payments has grown steadily, and BigTechs in the payment field could pose a significant impact on markets

In 2019, the CBC Interbank Funds Transfer System (CIFS) functioned smoothly, transferring funds worth a total of 25.9 times the GDP for the year. The electronic retail payment market saw a prosperous development, with the electronic retail payment ratio[15] climbing to 43.7%. The amount of mobile payment transactions has also grown rapidly, exceeding NT$110 billion in 2019. With an aim to increase the penetration of mobile payments, the Bank urged the Financial Information Service Co., Ltd. (FISC) to set up a "Common Platform for Electronic Payment Institutions," which allows banks and non-bank payment providers to connect and communicate across institutions so as to jointly expand the territory of mobile payments.

In recent years, large technology companies (BigTechs) have begun to enter the payment field, which has had a significant impact on the market. For example, Facebook plans to use blockchain technology to issue a stable currency, Libra, to provide global payment services. However, at present, there are still many challenges in the implementation of blockchain technology in practical applications. Only in the field of cross-border payment may blockchain technology have room to develop.

Other measures to strengthen the financial system

In 2019, to ensure a sound development of the domestic financial system and comply with international standards, the FSC established an assessment framework for domestic systemically important banks (D-SIBs) in Taiwan. It requires the D-SIBs to set aside 2% additional regulatory capital buffer and 2% bank's internal capital buffer, submit contingency plans, and pass stress tests with an aim to reinforce their risk-bearing capacity. Meanwhile, in order to promote the sound development of the insurance industry and protect the rights and interests of policyholders, the FSC proposed various reinforcing measures for life insurance companies regarding their usage of funds and the structure and sales of products, etc.

In response to the third-round mutual evaluations by the Asia/Pacific Group on Money

[15] The electronic retail payment ratio is the quotient of total consumption via electronic payment instruments (including credit cards, debit cards, electronic tickets, and electronic payment accounts) divided by total private consumption expenditure.

Laundering (APG), Taiwan actively implemented corresponding measures. Through close cooperation between the public and private sectors, Taiwan reached the best "regular follow-up"[16] category of the anti-money laundering and combating the financing of terrorism (AML/CFT) evaluation, the best result among member jurisdictions in the Asia-Pacific region. In addition, in response to repatriation of offshore funds to Taiwan, the FSC promulgated the *Regulations Governing the Financial Investment, Management, and Utilization of Repatriated Offshore Funds* in August 2019. The regulations, governing the scope and method of management and utilization of the inflow of offshore funds engaged in financial investments, are expected to help the development of domestic financial markets.

Impacts of the COVID-19 pandemic on the domestic financial system

Since the outbreak of COVID-19 in early 2020, Taiwan's government has actively implemented prevention, relief, and revitalization measures in response to the pandemic. Moreover, domestic financial markets, financial institutions, and financial infrastructures exhibited sound fundamentals. As a result, the COVID-19 pandemic posed only limited impacts on the domestic financial system. Against this backdrop, the TAIEX plunged before a rebound and the decline in stock prices was relatively moderate. Meanwhile, the NT dollar exchange rate remained relatively stable. As for financial institutions, domestic banks could see compression of interest rate spreads between deposits and loans and deteriorated credit quality. However, supported by healthy financial conditions and sound risk-bearing capacity, domestic banks shall withstand the financial shocks brought by the pandemic. Life insurance companies, suffering quite a few impacts on their securities investments, experienced significant declines in their equities. Considering that the abovementioned impacts were relieved in April, coupled with the fact that life insurance companies have continuously injected profits as capital in recent years, their resilience to weather unfavorable impacts was enhanced. Meanwhile, the COVID-19 pandemic might impair the credit quality of bills finance companies, but the impacts are expected to be moderate. Important financial infrastructures, which are equipped with system and data backup plans as well as split operation mechanisms, functioned smoothly without being affected by the pandemic.

[16] The assessment categories from high to low are "regular follow-up" (follow up once every two years), "enhanced follow-up" (follow up once a year), "transitional follow-up" (the frequency of follow-up is up to the APG member meeting, could be quarterly or monthly), and "high-risk and non-cooperative jurisdiction list" identified by the Financial Action Task Force (FATF).

Measures to promote financial stability and respond to the COVID-19 pandemic in Taiwan

In 2019, Taiwan's financial markets operated smoothly in the context of a slowdown in economic growth and mild inflation both domestically and abroad. Domestic financial institutions experienced sharp increases in profitability, benign asset quality, and higher capital levels. The major payment systems also functioned along an orderly trajectory. By and large, the financial system in Taiwan remained stable. On the back of a stable economic and financial environment, the Bank adopted appropriate monetary, credit, and FX policies, while the FSC continued to revamp financial regulations and enhance financial supervision measures so as to guide the sound operations of financial institutions and promote financial stability.

Following the global spread of the COVID-19 pandemic in the beginning of 2020, economic downside risks increased dramatically worldwide and global financial markets became volatile. To mitigate the impacts of the COVID-19 pandemic on domestic economic and financial conditions, Taiwan's government (including the Bank) have launched a series of measures related to relief, revitalization, and financing totaling NT$1.05 trillion. In addition, the Bank cut policy rates and, together with the FSC, adopted a number of measures to stabilize the financial market as follows:

1. Monetary policy: (1) the Bank cut the discount rate, the rate on accommodations with collateral, and the rate on accommodations without collateral by 0.25 pps to 1.125%, 1.50%, and 3.375%, respectively; and (2) the Bank provided domestic banks, cooperative organizations as well as farmers' and fishermen's associations with an NT$200 billion (up to NT$400 billion depending on the pandemic situation) special accommodation facility to support credit extensions to small and medium enterprises (SMEs).

2. Measures for financial market stability: (1) with the aim of providing liquidity to the financial system, the Bank decreased issuing certificates of deposits (CDs) in a timely manner so as to release funds into the market, and domestic banks could use their holdings of CDs issued by the Bank to request early withdrawals or to obtain funds from the Bank with CDs as collateral whenever necessary. Moreover, the Bank closely monitored cross-border capital flows so as to maintain an orderly FX market, and could expand the repurchase agreement (repo) facility under emergency situations; and (2) with an aim to maintain stability of securities markets, the FSC lowered the cap on the total volume of securities lending for short selling transactions during trading sessions, relaxed the scope

of collateral to cover margin deficiency, implemented a short-selling ban on certain stocks, and encouraged listed companies to buy back treasury shares.

3. Relief loans, assistance in easing tax burden, and subsidy schemes: (1) the FSC encouraged financial institutions to carry out relief measures adopted by the government and urged the banking industry to provide loan assistance to enterprises and individuals affected by the COVID-19 outbreak; (2) the Ministry of Finance (MOF) urged government-owned banks to provide loan assistance and deferred reporting and payment periods of income taxes; (3) the Ministry of Labor (MOL) adopted measures such as providing subsidy schemes, launching an employment assistance program, and extending labor relief loans; and (4) the Ministry of Economic Affairs (MOEA), the Ministry of Health and Welfare (MOHW), the Ministry of Transportation and Communications (MOTC), and some other ministries and commissions provided enterprises, individuals, or groups affected by the pandemic with loan assistance and subsidies for operations, loan interest payments, taxes, payroll, and fees.

Considering that the COVID-19 pandemic has not yet eased and international economic and financial developments are still surrounded by many uncertainties, the Bank will continue to pay close attention to the impacts of relevant subsequent developments on domestic economic and financial conditions so as to take pertinent response measures in a timely manner to promote financial stability.

II. Potential macro environmental risk factors

2.1 International economic and financial conditions

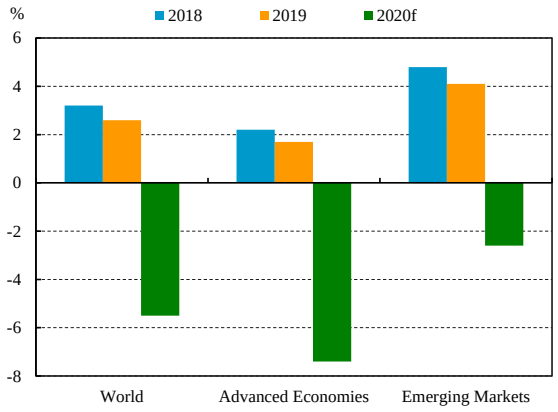
2.1.1 International economic and financial conditions

From 2020 onwards, the US and Mainland China reached an agreement on phase one of the trade deal, and the UK officially left the European Union and immediately entered an 11-month transition period. Nevertheless, the outbreak of the COVID-19 pandemic in Mainland China not only put downward pressure on its own economy, but also caused severe spillover effects to other economies. The pandemic has spread globally, resulting in excessive volatility in international financial markets. In response to threats to economic growth and financial stability driven by the COVID-19 crisis, major economies have adopted accommodative monetary policies, expansionary fiscal policies, and other measures to stabilize financial markets.

The pandemic significantly jeopardized global growth momentum and the great plunge in oil prices would suppress inflation

In 2019, rising US-China trade tensions[17] led to lower global trade and investment growth. Although trade tensions eased in the end of 2019,[18] uncertainties over US-China trade talks have aggravated business confidence and exports. As a result, the global economic growth rate decreased from 3.2% recorded in 2018 to 2.6% (Chart 2.1).

Chart 2.1 Global economic growth rates



Note: Figures for 2020 are IHS Markit estimates.
Source: IHS Markit (2020/5/15).

[17] In May and August 2019, the US respectively imposed tariffs on US$200 billion and US$300 billion worth of Chinese goods. Mainland China also increased tariffs or lodged a complaint against the US with the World Trade Organization as a response.

[18] The US and Mainland China reached an agreement on phase one of the trade deal in December 2019 and it was signed in January 2020. The deal stipulated that Mainland China should purchase an additional US$200 billion of US goods and services before 2021. In exchange, the US agreed to cut partial tariffs.

In the beginning of 2020, the COVID-19 pandemic broke out in Mainland China and has rapidly spread across the world, derailing global economic growth momentum. To cope with the outbreak, Mainland China adopted measures such as lockdown and production shutdown, resulting in a dramatic drop in its international and domestic tourism and import demand. The unprecedented confinement measures caused a supply-side shock with major disruptions to supply chains. In the meantime, with the aim of curbing the pandemic, other major economies also enhanced crowd management, which posed threats to corporate operation and consumption that could trigger demand-side shocks with outright cancellation of orders. Considering the aforementioned factors, IHS Markit predicts[19] that the global economy will experience a recession with growth forecast at -5.5% in 2020. Economic growth in advanced economies, including the US, the euro area, and Japan, is projected to reduce to -7.4%. Meanwhile, in view of the oil price collapse and weakening global demand, the average growth rate in emerging economies is forecast to decrease to -2.6% (Chart 2.1).

In 2019, affected by subdued momentum in global trade and unresolved US-China trade tensions, economic growth in most Asian emerging economies weakened. Looking ahead to 2020, since COVID-19 has disrupted Mainland China's demand and manufacturing production, IHS Markit anticipates that its economic growth will drop dramatically to 0.5%. For other Asian economies, any significant slowdown in Mainland China's economic growth arising from the pandemic could have negative spillovers to them. For instance, travel by tourists from Mainland China makes a key contribution to economic growth in both Thailand and the Philippines. Trade and industry chains in Hong Kong, South Korea, and Indonesia are all deeply connected with Mainland China. Therefore, IHS Markit projects that the economic growth rates in Hong Kong, South Korea, and the ten members and countries of the Association of South East Asian Nations (ASEAN-10) will markedly fall to -6.6%, -0.9%, and -2.6%, respectively.

A sharp drop in commodity prices will pull down global inflation

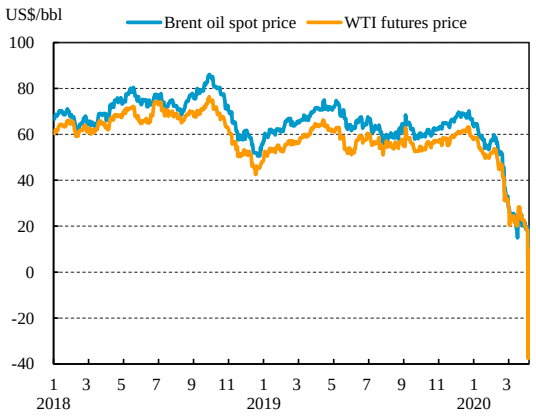
International oil prices fluctuated within a narrow range in 2019 (Chart 2.2). The average annual Brent crude oil spot price dropped to US$64.37 per barrel from US$71.19 registered in 2018, while the West Texas Intermediate (WTI) futures price showed a similar trend. In the meantime, metal prices fell, while food prices trended upwards. As a whole, with most commodity prices oscillating along a downward path, the global CPI inflation rate decelerated to 2.6% in 2019. The headline inflation rate in advanced economies decreased to 1.4%. On the other hand, although

[19] See Note 1.

inflation rates in most emerging markets moderated, the average rate in all emerging economies accelerated to 4.0% amid the rapid spread of African swine fever throughout Mainland China (Chart 2.3).

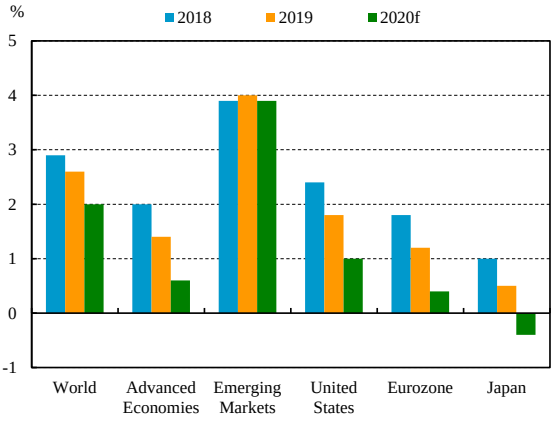
From early 2020 onwards, oil prices turned to a downward trend driven by a decline in oil demand amid an escalation of the COVID-19 pandemic. Additionally, following the collapse of the supply cut agreement between the Organization of the Petroleum Exporting Countries (OPEC) and Russia, some oil suppliers planned to boost production. This, together with lower oil demand stemming from tightened travel bans in Europe and the US, induced an oil price collapse.[20] Afterwards, despite the fact that the oil-producing nations reached a historic production cut agreement, the extent of the oil production cut was far below the decline in demand. Reflecting this, the May WTI futures price plummeted to a record low of US$-37.63 per barrel on April 20, 2020. Since the acceleration of the pandemic also caused a decrease in demand and prices for other commodities, IHS Markit predicts that the global headline inflation rate will drop to 2.0% in 2020. The headline inflation rate in advanced economies will sharply decrease to 0.6%, whereas the rate in emerging economies will fall slightly to 3.9%[21] (Chart 2.3).

Chart 2.2 Global commodity prices



Sources: EIA, Bloomberg.

Chart 2.3 Global headline inflation indices



Notes: 1. Figures for 2020 are IHS Markit estimates.
2. Japan's inflation rate is projected to drop into negative territory owing to weaker tourism revenue resulting from the coronavirus pandemic.

Source: IHS Markit (2020/5/15).

[20] Brent oil spot price plunged by more than 70% from a high of US$70.25 per barrel on January 6, 2020, to a low of US$19.19 at the end of March.

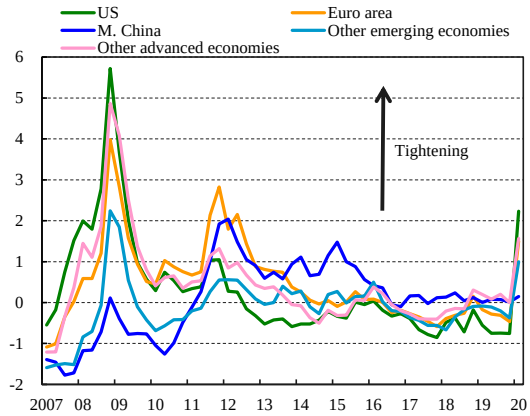
[21] IHS Markit anticipates that the CPI inflation rate in Mainland China will remain unchanged at 2.9% in 2020 compared to a year earlier.

With the outbreak of the COVID-19 pandemic, global financial conditions have tightened abruptly alongside exacerbating financial market turmoil

Financial conditions were getting tighter

In 2019, with uncertainties arising from US-China trade tensions and a global economic slowdown, major central banks adopted a more dovish stance. More accommodative monetary policies brought about an easing of financial conditions in advanced economies, particularly in the US and the euro area. In contrast, financial conditions in other advanced economies continued to tighten. In Mainland China, financial conditions were marginally tighter as a result of a stock market plunge, while financial conditions in other emerging markets roughly remained unchanged (Chart 2.4).

Chart 2.4 Global financial conditions indices



Notes: 1. Financial conditions indices are gauged by standard deviations from mean.
2. Other advanced economies comprise 11 economies, such as Australia, Canada and the UK, etc.
3. Other emerging economies include 6 economies, such as Brazil and India, etc.

Source: IMF (2020), *Global Financial Stability Report*, April.

From early 2020 onwards, the escalation of the COVID-19 pandemic put selling pressure on risky assets in global financial markets, resulting in stock market crashes and widening corporate bond spreads. Therefore, financial conditions in major economies, excluding Mainland China, tightened abruptly (Chart 2.4). Consequently, the corporate sectors would reduce investment because of rising funding costs and individuals would postpone their consumption amid a tightening of financial conditions. This, along with the impact of the pandemic that would entail a sharp slowdown in global economic activity,[22] could increase economic and financial risks globally.

Since the beginning of 2020, volatility of global financial markets has spiked along with mounting market panic sentiment

Global stock markets reported severe contractions in response to the COVID-19 pandemic, and US stock markets hit multiple circuit breakers

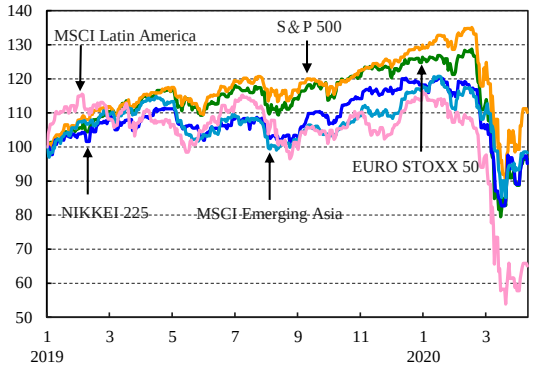
In 2019, global stock markets were only hammered temporarily in May and August as the US announced new tariffs on Chinese imports. Besides that, the markets mostly delivered gains

[22] According to the model estimation from the IMF, there is a 5% probability that global growth could fall below -7.4% in 2020. See IMF (2020), *Global Financial Stability Report*, April.

(Chart 2.5).

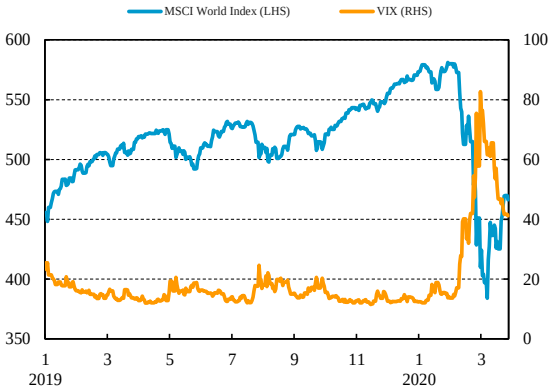
In January 2020, global stock markets followed their upward trend of 2019. However, from late February onwards, the spread of COVID-19 and plummeting oil prices induced mounting panic sentiment among investors and a sharp fall in global stock market values (Chart 2.5). Accordingly, the US stock market's circuit breakers were triggered several times and the VIX Index once surged to close at a record high of 82.69 in March (Chart 2.6). On March 23, the MSCI World Index fell to 384.04 (Chart 2.6), the lowest level recorded since 2016. Afterwards, with major economies successively introducing measures to combat the pandemic,[23] the VIX Index marked a decline to 40 or so and global stock markets recovered marginally (Chart 2.6).

Chart 2.5 Performance of key international equity indices



Notes: 1. January 1, 2019 = 100.
2. The Euro STOXX 50 refers to a stock index consisting of the largest 50 stocks in the 11 major economies of the euro area.
Source: Bloomberg.

Chart 2.6 MSCI World Index and VIX Index



Notes: 1. The MSCI World Index, maintained by Morgan Stanley, is a weighted index of stocks from large companies throughout the world.
2. The VIX Index is a standardized measure of market volatility created by the Chicago Board Options Exchange. It is used to gauge investor confidence in the stock market. When the VIX Index is high, market participants expect that the volatility will increase.
Source: Bloomberg.

Exchange rate volatility in most economies abruptly trended upward lately, and emerging market currencies faced sharp depreciations

In 2019, the movements of local currency exchange rates per US dollar diverged in advanced and emerging economies. Among them, exchange rates in advanced economies fluctuated within a narrow range. In contrast, the US dollar index of emerging economies oscillated with an upward trend in the first three quarters before reversing to decrease since 2019 Q4 (Chart 2.7).

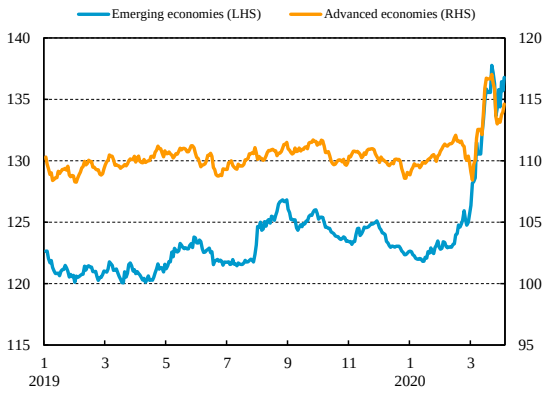
The US dollar index of advanced economies has declined since February 2020 as the spillovers of COVID-19 led to market expectations for interest rate cuts by the Fed. Nonetheless, against the backdrop of rapid spread of the pandemic, the index rebounded from lows after mid-March.

[23] See "Policy responses to COVID-19 in major economies" in this chapter.

Thereafter it dropped again after the Fed's announcement of unlimited bond buying. Reflecting repeated ups and downs of the dollar index, the volatility has risen in 2020 compared to that of the previous year[24] (Chart 2.7).

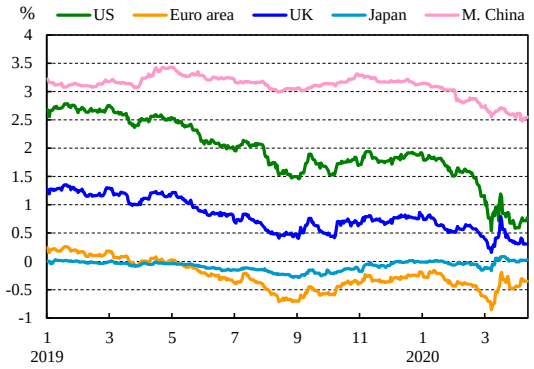
Over the same period, a combination of the impact of the COVID-19 pandemic and an oil price plunge triggered a sharp depreciation of currencies and skyrocketing US dollar index in emerging economies. Afterwards, as the Fed announced it would purchase bonds in the amounts needed to support smooth market functioning and effective transmission of monetary policy, the index turned to descend (Chart 2.7).

Chart 2.7 The US dollar indices of advanced and emerging economies



Note: The US dollar indices of advanced and emerging economies were developed by the Fed, and are weighted exchange rates of 7 and 19 trading partners, respectively. Base period is January 2016 (=100).
Source: Fed.

Chart 2.8 10-year government bond yields in major economies



Source: Bloomberg.

Government bond yields in major economies sank to a record low

In 2019, affected by the fact that major central banks hinted at easier monetary policy stances owing to concerns about a global economic slowdown and subdued inflation prospects, long-term government bond yields initially trended downwards. The yields bounced back thanks to some positive news: for example, the agreement on the US-China phase one trade deal. Nevertheless, bond yields in major economies headed in the opposite direction since February 2020 amid the COVID-19 crisis. In light of the deteriorating COVID-19 pandemic, together with an oil price plunge, government bond yields in the US, the UK, and the euro area fell to a 5-year low on March 9. Subsequently, the yields surged slightly as national authorities successively implemented fiscal stimulus packages (Chart 2.8).

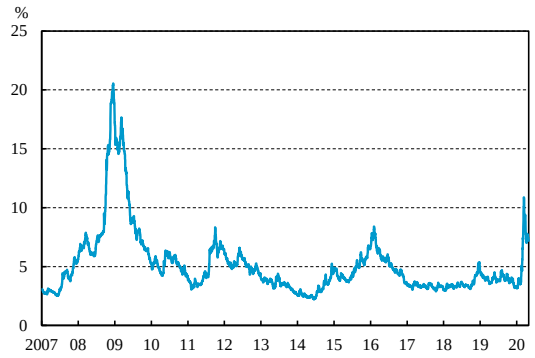
[24] The standard deviation of the US dollar index in advanced economies surged from 0.74 in 2019 to 2.22 in 2020 Q1.

With widened high-yield corporate spreads, the default rate was forecast to be revised upward

After the 2008 GFC, the influence of expansionary monetary policy on lowering borrowing costs has provided stronger incentives for countries to increase leverage. According to the statistics of the Institute of International Finance (IIF), global debt across all sectors hit US$255 trillion at the end of 2019, topping 322% of GDP, and was 40 pps higher than that of 2007. Among its components, non-financial corporate debt has surged over 70% since 2007 to US$74.2 trillion.[25]

Since late February 2020, the COVID-19 pandemic, coupled with elevating market, credit, and liquidity risks, raised market concerns about a large share of BBB corporate bonds being downgraded. As a result, high-yield bond spreads have widened dramatically. In the risky credit market segments,[26] US high-yield corporate bond spreads rose to post-GFC highs (Chart 2.9), which could pose an adverse shock to financial markets.

Chart 2.9 US high-yield corporate bond spreads



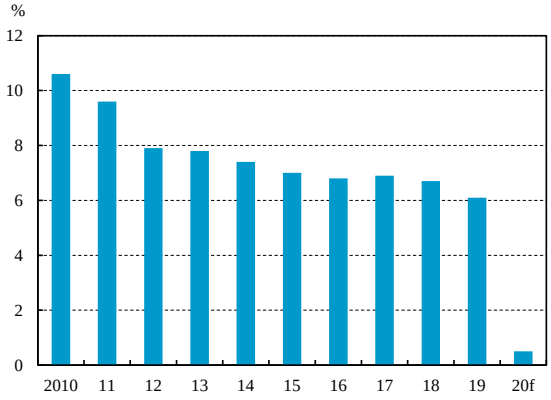
Source: Bloomberg.

2.1.2 Mainland China's economic and financial conditions

Economic growth slowed down significantly and continued to reach a record low

In 2019, owing to an escalation of the US-China trade dispute, Mainland China's trade growth dropped substantially.[27] Meanwhile, affected by weakening private consumption and investment momentum, the economic growth rate dropped to 6.1% in 2019 from 6.7% a year earlier (Chart 2.10) and continued to reach a record low.

Chart 2.10 Economic growth rate of Mainland China

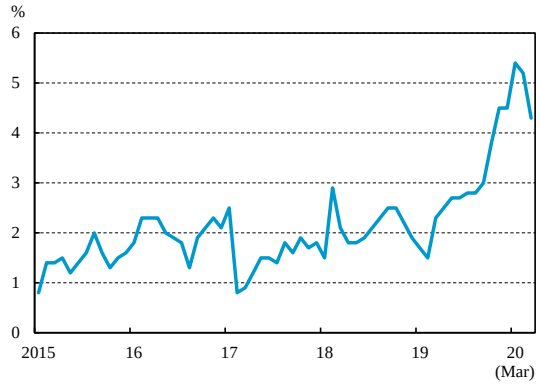


Note: Figure for 2020 is an IHS Markit estimate.
Sources: National Bureau of Statistics of China and IHS Markit (2020/5/15).

[25] IIF (2020), *Global Debt Monitor: COVID-19 Lights a Fuse*, April.
[26] The risky credit market includes high-yield bonds, leveraged loans, and private debt markets. According to the IMF estimates, these markets have reached US$9 trillion globally.
[27] According to the statistics of the National Bureau of Statistics of China, the annual growth rate of China's total trade volume in US dollars significantly reduced to -1.0% in 2019 from 12.6% a year before.

In the beginning of 2020, Mainland China's economic growth rate was battered severely by the outbreak of the COVID-19 pandemic and declined to -6.8% in 2020 Q1. IHS Markit sharply downgraded its forecast for the economic growth rate to 0.5% in 2020 (Chart 2.10).

Chart 2.11 CPI inflation rate of Mainland China

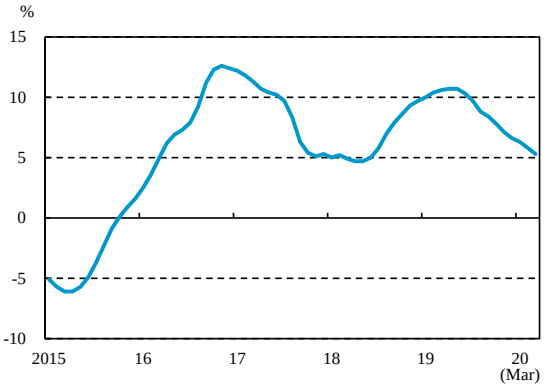


Source: National Bureau of Statistics of China.

CPI inflation rate expanded, while housing prices trended upwards

Affected by a sharp surge in pork and fresh fruit prices, the CPI inflation rate of Mainland China was 2.9% throughout 2019, an increase of 0.8 pps compared to a year earlier. In the beginning of 2020, the food inflation rate continued to rise owing to seasonal factors and a lower base period of the previous year. As a result, the annual CPI inflation rate reached 4.3% in March 2020 (Chart 2.11). IHS Markit projects the annual CPI inflation rate throughout 2020 will remain unchanged at 2.9%.

Chart 2.12 Average annual growth rate of new building sales prices in 70 medium-large cities of Mainland China



Source: Refinitiv Datastream.

With regard to the housing market, an accommodative monetary policy constantly adopted by the People's Bank of China (PBC) led to speculative trading, fueling a rise in the annual growth rate of housing prices in 70 medium-large cities in the first half of 2019. However, the growth of housing prices trended downwards in the second half of 2019 (Chart 2.12).

The PBC continued to implement sound monetary policies aiming to provide market liquidity

From 2019 onwards, in response to US-China trade tensions, the PBC adopted sound monetary policy tools, such as targeted or across-the-board cuts in reserve requirement ratios and the

medium-term lending facility (MLF),[28] along with short-term reverse repo operations in the open market, to keep ample liquidity in the financial system. In early 2020, the escalation of the COVID-19 pandemic triggered financial market turmoil. In response, the PBC further cut its reserve requirement ratios and expanded the volume of reverse repo operations in the open market, so as to inject capital into the market.

Mainland China's government actively adopted expansionary fiscal policies

In 2019, Mainland China's government actively implemented expansionary fiscal policies, including expansion of government spending, tax breaks, and fee reductions. Nevertheless, Mainland China still faced greater downward pressure on the economy. In late May 2020, in order to mitigate the severe impact on the economy arising from the COVID-19 pandemic, the government further adopted policies to expand domestic demand, such as raising the caps on the budget deficit to GDP ratio and the quota of special local government bonds, along with the issuance of special government bonds for containing the COVID-19 pandemic and the extension of tax breaks and fee reductions.

SSE Composite Index and RMB FX rate both trended upwards before fluctuating with a downward trend

In the beginning of 2019, the SSE Composite Index rebounded dramatically. Nevertheless, intensified US-China trade tensions led to a drop in the stock market in early May. Afterwards, the index fluctuated within a narrow range. In March 2020, the SSE Composite Index trended downwards driven by the plunge of global stock markets (Chart 2.13).

Chart 2.13 Shanghai Stock Exchange Composite index

Source: Bloomberg.

Regarding the FX market, affected by the escalation of the US-China trade dispute in early May 2019, coupled with Mainland China's designation as a currency manipulator by the US in early August, the renminbi exchange rate against the US dollar depreciated substantially. Afterwards, supported

[28] The MLF was introduced by the PBC, which provides funds for those commercial and policy banks that meet the PBC's macroprudential requirements and offer qualified collateral to it. This facility adjusts financial institutions' medium-term funding costs so that they can offer funds with lower costs to the real economy. As a result, the funding costs of the corporate sector will decrease.

byincreased optimism about a US-China trade deal, the renminbi turned to appreciate against the US dollar. However, in early 2020, the exchange rate depreciated sharply amid mounting market panic sentiment (Chart 2.14).

The continual increase in aggregate financing to the real economy pushed up the credit risks

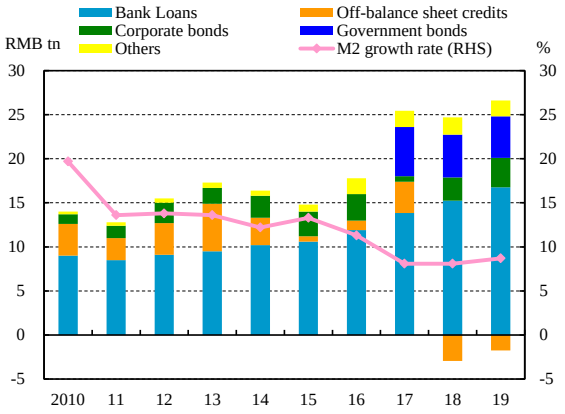
In 2019, against a backdrop of a shift towards easier monetary policy by the PBC, the annual growth rate of broad money supply M2 rose to 8.7% from 8.1% a year before. Meanwhile, the increment in aggregate financing to the real economy reached RMB25.7 trillion. Among them, the increment in bank loans increased to RMB16.8 trillion, accounting for the largest share. Off-balance sheet credit continued to shrink by RMB1.8 trillion amid more stringent supervision, but the decline narrowed (Chart 2.15).

At the end of 2019, the NPLs of commercial banks in Mainland China stood at RMB2.41 trillion, an annual increase of 19.16%, while the NPL ratio rose to 1.86% from 1.83% a year before (Chart 2.16), reflecting a deterioration in credit quality. Additionally, the outstanding amount of special-mention loans also rose to RMB3.77 trillion. In sum, the outstanding amount of classified assets expanded to RMB6.18 trillion. Given that the COVID-19 outbreak has inflicted severe damage on Mainland China's economic and financial

Chart 2.14 RMB/USD exchange rate

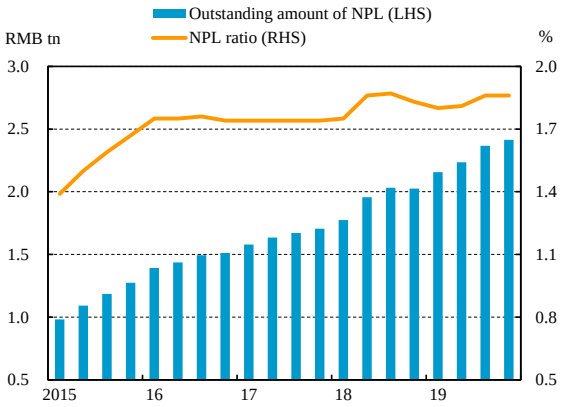
Source: CBC.

Chart 2.15 Increment of financing to the real economy and annual growth rate of M2 in Mainland China



Source: PBC.

Chart 2.16 NPLs of Mainland China's commercial banks



Source: China Banking and Insurance Regulatory Commission.

conditions, a persistent spread of the pandemic in the future could further increase the credit risks, which warrants close attention.

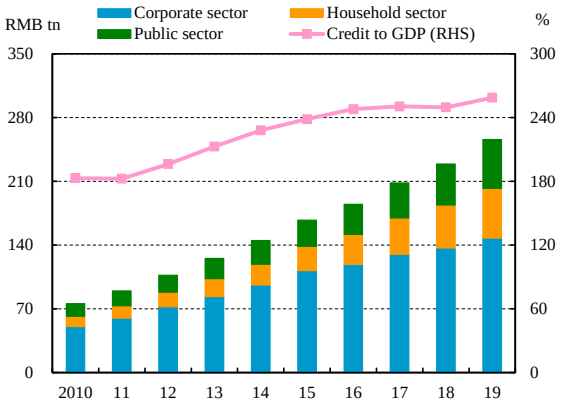
Mainland China's potential risks mounted with rising debt

According to the statistics of the Bank for International Settlements (BIS), the outstanding debt for nonfinancial sectors in Mainland China reached a record high of RMB255.9 trillion, equivalent to 258.7% of annual GDP, at the end of 2019 (Chart 2.17). Among them, the outstanding debt for the corporate sector, which is the main focus of deleveraging efforts, continually increased and stood at RMB147.7 trillion at the end of 2019.

With regard to the household sector, the outstanding debt, which was highly concentrated in mortgages,[29] reached RMB54.6 trillion at the end of 2019 (Chart 2.17). Excessive financing of the household sector may increase the bubble risk in the real estate market.

The outstanding amount of government debt reached RBM53.6 trillion at the end of 2019 (Chart 2.17). Affected by the recent policy that encouraged local governments to use special bonds for infrastructure construction in response to the downward risk of the economy, the debt service pressure on local governments may further surge in the future.

Chart 2.17 Outstanding amount of nonfinancial debts and credit-to-GDP ratio in Mainland China



Source: BIS.

[29] According to the statistics of the PBC, the outstanding amount of personal house-purchasing loans stood at RMB30.2 trillion at the end of 2019, accounting for more than 50% of total household loans.

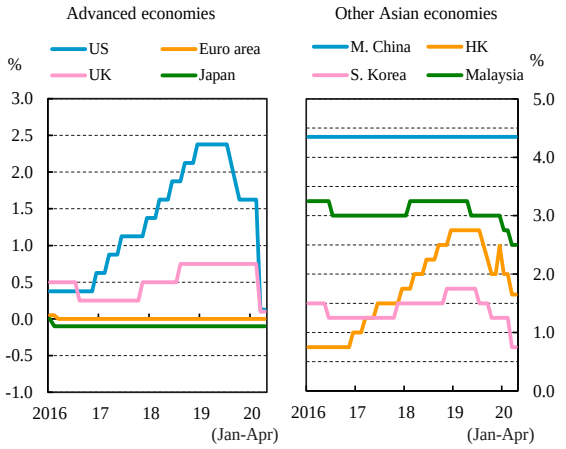
2.1.3 Policy responses to COVID-19 in major economies

With regard to the global COVID-19 issue, the International Monetary Fund (IMF) recommends[30] that individual countries should secure adequate resources for the health care system and enhance international cooperation. Besides this, in order to avoid the COVID-19 pandemic inducing sharp damage on economic activity, central banks should ensure sufficient provision of liquidity and credit to markets, and expand easing monetary policies. Moreover, financial supervisors should encourage banks to renegotiate loan terms for distressed borrowers, and governments should implement targeted fiscal stimulus.

Major economies have recently adopted accommodative monetary policy stances

To contain economic damage following the rapid spread of the COVID-19 pandemic, major central banks have promptly introduced a series of actions, such as policy rate cuts (Chart 2.18), large asset purchase programs, and active open market operations. These measures have provided massive liquidity to curb market panic. For example, the Fed has made emergency rate cuts twice throughout March 2020, lowering the federal funds rate by a total of 150 bps, and announced an unlimited asset purchase program in an unprecedented move. Additionally, the Fed provided up to US$2.3 trillion in loans to increase the flow of credit to households and corporations. With the aim of maintaining liquidity for the real economy, other major central banks also adopted easing monetary policy stances focusing on quantitative easing (QE), and offered funding for banks to lend to corporations.

Chart 2.18 Policy rates in major economies



Notes: 1. Advanced economies: figure for the US is based on the target federal funds rate; for the euro area, the main refinancing operations fixed rate; for the UK, official bank rate; for Japan, interest on excess reserves (before 2016/2/16, uncollateralized overnight call rate).
2. Other Asian economies: figure for Mainland China is based on financial institution one-year lending base rate; for Hong Kong, base rate; for South Korea, Bank of Korea base rate; for Malaysia, overnight policy rate.
3. Figures are as of April 30, 2020.
Sources: Central bank and monetary authority websites.

Furthermore, to better meet market needs for US dollars, the Fed and five central banks—namely, the Bank of Canada, the Bank of England, the European Central Bank (ECB), the Bank

[30] IMF (2020), *World Economic Outlook*, April.

of Japan, and the Swiss National Bank—agreed to reactivate unlimited US dollar liquidity swap facilities. Thereafter, the Fed set up temporary swap lines worth US$450 billion with nine additional central banks. The provision amounted to up to US$60 billion or US$30 billion for each central bank, so as to relieve strains in global US dollar funding markets. For more detailed monetary policy responses to COVID-19 in major economies, please see Table 2.1.

Major economies have launched expansionary fiscal policies

Movement restrictions on products and crowds amid the COVID-19 outbreak have resulted in serious impacts on the real economy and posed downside risks to the global economic outlook. In order to assist households and corporations to weather the COVID-19 crisis, major economies successively launched fiscal stimulus packages, including raising expenses for virus prevention and vaccine development, as well as offering credit guarantees and subsidies to the most affected industries and firms, and providing direct cash transfers to support vulnerable households. For example, the US has passed four fiscal stimulus bills totaling US$2.9 trillion,

Table 2.1 Monetary and fiscal policy responses to COVID-19 in major economies in 2020

Monetary policies

Policies	Economies	Contents
Interest rate cut	US, UK, M. China, S. Korea and HK	The Fed lowered its target band for the federal funds rate by a total of 150 bps to 0-0.25%.
Lowering required reserve ratios	M.China	The maximum cut to the required reserve ratios was 2%.
Expanding asset purchase programs	US, euro area, Japan, UK and S. Korea	Asset purchases included bonds, commercial paper, ETFs or REITs. Among the economies, the US announced an unlimited asset purchase program.
Actions to facilitate lending from banks	US, euro area, M. China and Japan	Actions were operated mainly through loan guarantees or refinancing operations rate cuts. The Fed provided US$2.3 trillion in loans.
Repo	US, UK and Japan	The Fed established a temporary repurchase agreement facility for foreign and international monetary authorities.
Dollar liquidity swap lines and emergency lending facilities	US	The Fed authorized dollar liquidity swap lines with 14 central banks and adopted multiple emergency lending facilities.

Fiscal policies

Policies	Economies	Contents
Financial aid or subsidies to households and corporations	US, UK, Japan, M. China, S. Korea, Singapore and HK	The authorities provided cash, vouchers, unemployment assistance, tax reductions, rent relief, and industrial development funds for vulnerable industries.
Bailout loans or loan guarantees	US, UK, Japan, S. Korea and HK	The US government passed an estimated US$2.2 trillion CARES Act and a US$483 billion Paycheck Protection Program and Health Care Enhancement Act.
Enhancing pandemic control	US, EU, M. China, HK and Japan	The measures included funding packages for COVID-19 containment, vaccine development, free COVID-19 testing and support to health care workers.
Suspending budget restriction rules and extending use of bonds	EU and M. China	The European Commission proposed maximum flexibility for budgetary requirements, and Mainland China accelerated the use of special local government bonds.

Note: Data related to US fiscal policies are as of May 2020. Other data are as of April 2020.
Sources: Official websites of selected economies, IMF and relavant news/reports. Summarized by the CBC.

far higher than the US$0.79 trillion made available during the GFC in 2008. The Japanese government approved a record 117 trillion yen economic stimulus package. Other major economies deployed substantial fiscal stimulus as well (Table 2.1).

2.2 Domestic macro environment

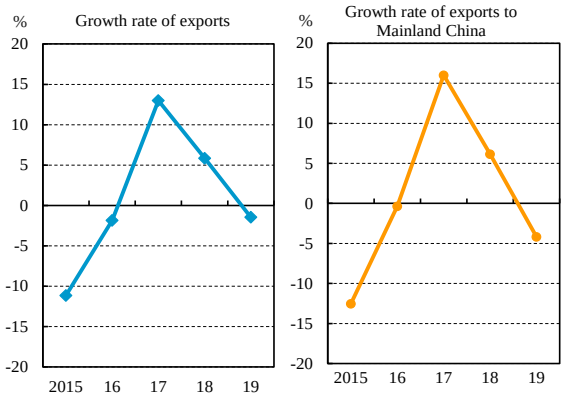
2.2.1 Domestic economic and fiscal conditions

Although exports reported a negative growth rate in 2019, the domestic economy grew moderately and inflation remained stable thanks to the three major investment programs promoted by the government[31] and steady growth momentum in private consumption. External debt servicing capacity stayed robust on the back of a persistent surplus in the balance of payments and ample FX reserves. While the government's fiscal deficits rebounded and outstanding government public debt marginally expanded, total government debt stayed within a manageable level.

Domestic economy remained on a mild growth path

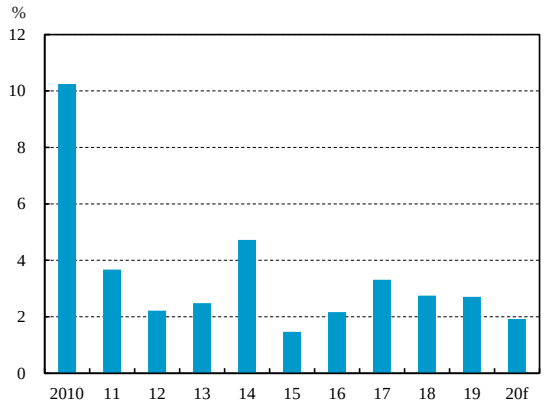
In 2019, affected by international trade disputes and falling international prices of raw materials, the growth rate of Taiwan's exports decreased by 1.44% year on year. Among Taiwan's major trading partners, the growth rate of exports to Mainland China (including Hong Kong) slid to negative territory at -4.17% (Chart 2.19). However, the domestic economy sustained a mild growth rate, underpinned by the three major programs for investing in Taiwan promoted by the government, expanding capital expenditures contributed by domestic semiconductor manufacturers, and modest momentum in private consumption. As a result, the annual economic growth rate in Taiwan reached 2.71%, slightly lower than the 2.75% of the previous year (Chart 2.20).

Chart 2.19 Annual growth rates of exports



Source: MOF.

Chart 2.20 Economic growth rate in Taiwan



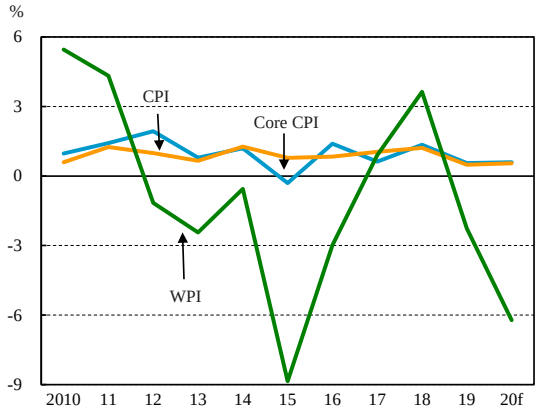
Note: Figure for 2020 is a CBC forecast released on March 19, 2020; other figures are released by DGBAS.
Sources: DGBAS and CBC.

[31] See Note 4.

Domestic prices rose moderately

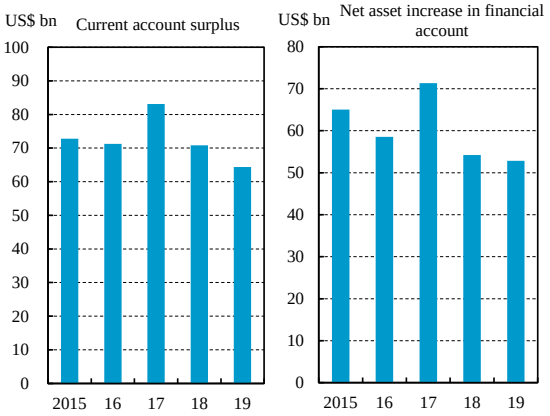
In 2019, on account of the US-China trade dispute and a decline in international crude oil prices, the annual wholesale price index (WPI) inflation rate registered -2.26%, much lower than the 3.63% recorded in 2018. The DGBAS projects the annual WPI inflation rate to continually fall to -6.22%[32] in 2020. With regard to consumer prices, the annual CPI inflation rate registered 0.56% in 2019, lower than the 1.35% of the previous year, owing to a decline in prices of fuel, communication fees, and garments. Meanwhile, the core CPI inflation rate in 2019 also increased mildly and reached 0.49%, lower than the 1.21% of the previous year (Chart 2.21). In 2020, in view of the COVID-19 pandemic weakening domestic consumer demand alongside a drop in the international prices of raw materials such as crude oil, the Bank forecasts the annual CPI and core CPI inflation rates to rise to 0.59% and 0.55%, respectively.

Chart 2.21 Consumer and wholesale price indices (% change, yoy)



Note: Figure for WPI in 2020 is a DGBAS forecast released on May 28, 2020; other figures for 2020 are CBC forecasts released on March 19, 2020.
Sources: DGBAS and CBC.

Chart 2.22 Current account surplus and net asset increase in financial account



Source: CBC.

Current account displayed a sustained surplus and FX reserves stayed abundant

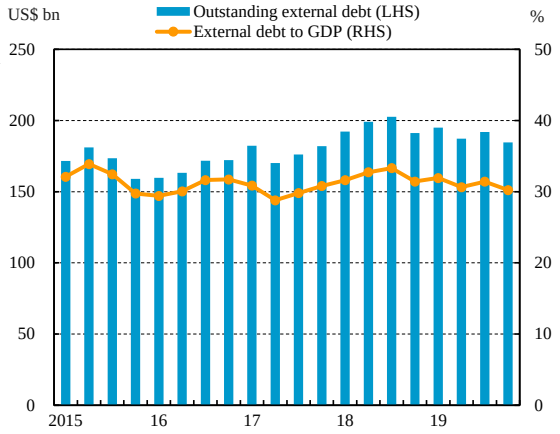
In 2019, the merchandise trade surplus trended down, causing the annual current account surplus to decline to US$64.4 billion, or 10.53%[33] of annual GDP, a decrease of 9.17% compared to 2018. Although the financial account showed continued outflows owing to the expansion in foreign securities investments by domestic securities investment trust funds and insurance companies, the movement was partially offset by a rise of inflows resulting from a sharp increase in investments by foreign institutional investors in Taiwan's stock markets (Chart 2.22). Accordingly, the financial account posted an increase of US$52.9 billion

[32] See Note 9.
[33] For the ratio of current account deficit to GDP, the cutoff point for risk 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.

throughout the year. In sum, the Bank's reserve assets increased by US$16.7 billion in 2019, mainly fueled by earnings from portfolio investment operations of FX reserve assets.

FX reserves climbed to US$478.1 billion at the end of 2019, rising by 3.54% from a year earlier, mainly supported by the accumulation of earnings from portfolio investment operations of FX reserve assets. At the end of April 2020, the FX reserves continuously increased to US$481.8 billion.

Chart 2.23 External debt servicing capacity

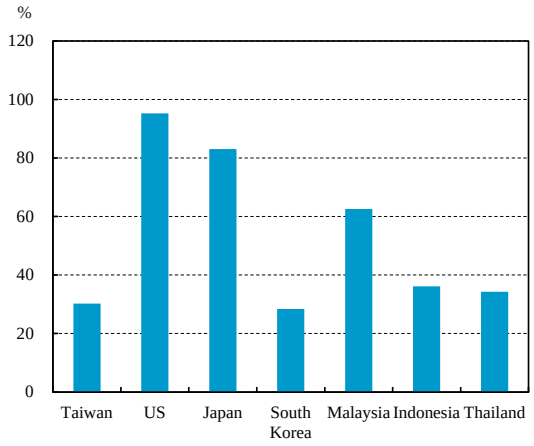


Notes: 1. Figures for outstanding external debts are on an end-of-period basis.
2. Figures for GDP are on an annualized basis
Sources: CBC and DGBAS.

Scale of external debt contracted, and debt-servicing capacity remained strong

Because of a shrinkage in the short-term external debt of the banking sector, Taiwan's external debt[34] fell to US$184.6 billion at the end of 2019 (Chart 2.23), decreasing by 3.40% compared to a year earlier. The largest share of external debt went for private external debt registering US$184.0 billion, while public external debt only reached US$0.6 billion.

Chart 2.24 External debt to GDP in selected countries



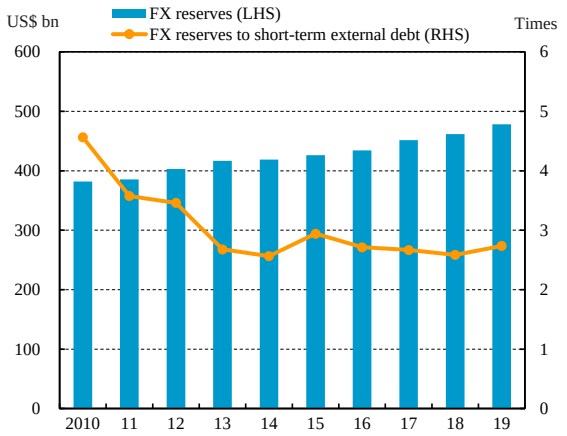
Note: Figures are as of the end of 2019.
Source: CEIC.

Taiwan's external debt stood at 30.21% of annual GDP at the end of 2019, lower than internationally recognized minimum levels.[35] Compared to the US and neighboring Asian countries, Taiwan's external debt was slightly higher than that in South Korea, but much lower than those in the US, Japan, and Malaysia (Chart 2.24).

[34] See Note 5.
[35] 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.

Furthermore, at the end of 2019, the ratio of FX reserves to short-term external debt rose to 2.74 times owing to an increase in FX reserves and a decline in short-term external debt. It was much higher than internationally recognized minimum levels,[36] implying that Taiwan's FX reserves have a robust capacity to meet payment obligations (Chart 2.25).

Chart 2.25 Short-term external debt servicing capacity

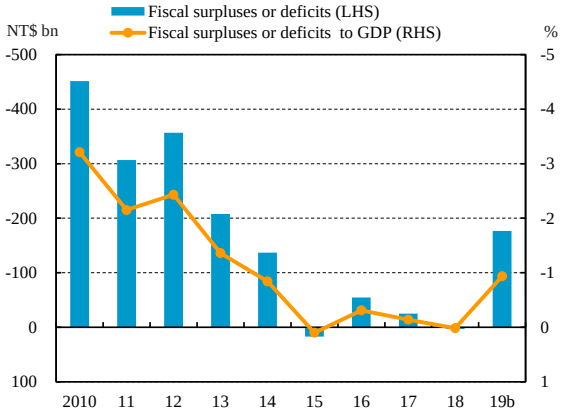


Source: CBC.

Fiscal deficits rebounded and government debt marginally increased

In 2019, the government actively promoted several measures in response to the economic situation, such as the second phase of the *Forward-looking Infrastructure Development Program*, technological development, industrial innovation, and an increase in educational spending, leading to an expansion of annual expenditures for both central and local governments. As a result, fiscal deficits rebounded to NT$176.7 billion or 0.94%[37] of annual GDP (Chart 2.26).

Chart 2.26 Fiscal deficits



Notes: 1. Fiscal position data include those of central and local governments.
2. Figures for 2019 are final accounts and budgets for the central government and local governments, respectively.

Sources: MOF and DGBAS.

At the end of 2019, the outstanding public debt at all levels of government[38] slightly rebounded to NT$6.41 trillion. However, the ratio of total public debt to annual GDP slightly fell to 33.93%[39] owing to a greater rise in GDP growth (Chart 2.27). In general, total government debt stayed within a manageable level.

[36] 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.
[37] See Note 6.
[38] The term "outstanding debt at all levels of government" as used in this report refers to outstanding non-self-liquidating debt with a maturity of one year or longer.
[39] See Note 7.

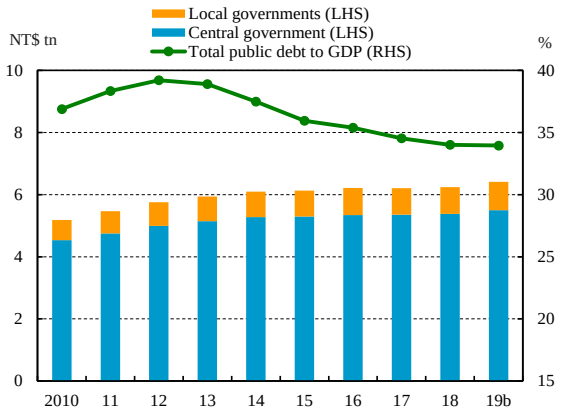
2.2.2 Corporate sector [40]

In 2019, profitability of TWSE-listed companies and OTC-listed companies abated alongside increasing financial leverage ratios, while short-term debt servicing capacity remained adequate. The NPL ratio for corporate loans granted by financial institutions as of the end of the year hit a record low in recent years, indicating sound credit quality of corporate loans.

Profitability of both TWSE-listed and OTC-listed companies abated

In 2019, the US-China trade war and subdued momentum in major economies induced weak market demand. Accordingly, the profitability of TWSE-listed and OTC-listed companies abated as their average ROEs declined to 12.62% and 12.23% from 14.92% and 13.02%, respectively, in the previous year (Chart 2.28). The ROEs of major industries mostly declined compared to a year earlier. Among them, the profitability of TWSE-listed electronic parts and components companies plunged deriving from falling panel prices and weak demand for passive components. This, coupled with mounting process costs in the semiconductor industry owing to lower equipment utilization, revealed a reduction in the ROE of the TWSE-listed electronics industry relative to the prior year. Conversely, the ROE of the OTC-listed electronics industry was slightly higher than that of the previous year. The increased ROE mainly benefited from the disposal of land and

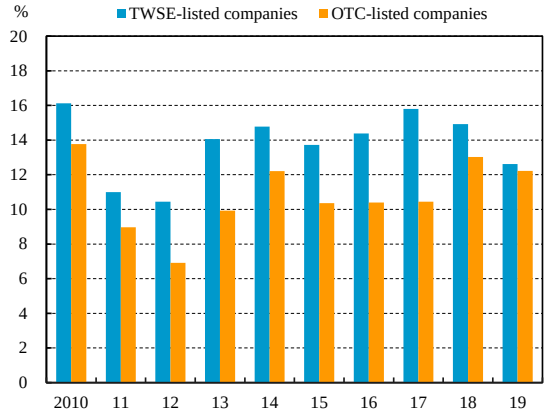
Chart 2.27 Public debt



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 2019 are preliminary final accounts and budgets for the central government and local governments, respectively.

Sources: MOF and DGBAS.

Chart 2.28 Return on equity in corporate sector



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

Source: TEJ.

[40] Corporate sector section only includes the non-financial industrial data of TWSE-listed companies and OTC-listed companies. Throughout this section, figures for listed companies are consolidated financial data; prior to 2011, the data are on the basis of generally accepted accounting principles in the Republic of China (Taiwan) (ROC GAAP), while from 2012, the data are on the basis of International Financial Reporting Standards as endorsed for use in Taiwan (TIFRSs). In light of changes in accounting treatment and presentation, readers should interpret these figures prudently when comparing statistics before and after IFRSs adoption.

factories by the optoelectronics industry, despite poor profitability in the electronic parts and components industry.

Leverage ratios increased, while short-term debt servicing capacity held at an adequate level for listed companies

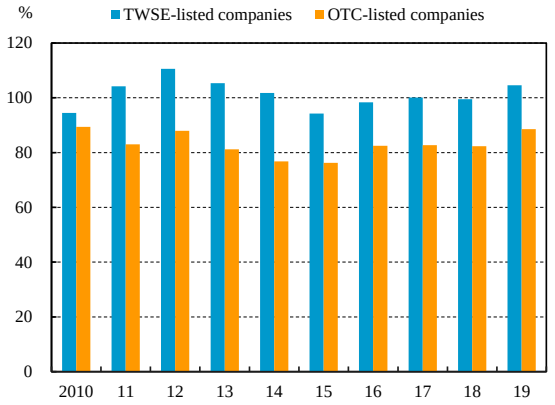
At the end of 2019, the average leverage ratios for TWSE-listed companies and OTC-listed companies rose marginally to 104.61% and 88.55%, respectively (Chart 2.29). Leverage ratios increased mainly because of a rise in the total liability, contributed to by increasing lease liability from lessee listed companies that applied the International Financial Reporting Standard (IFRS) 16 Leases from 2019 onwards, as well as a mild increase in the issuance of commercial paper by listed companies.

Meanwhile, the current ratios for TWSE-listed companies and OTC-listed companies dropped to 151.19% and 180.88% (Chart 2.30), and the interest coverage ratios also declined to 9.35 and 15.99 (Chart 2.31), respectively. However, for listed companies as a whole, short-term debt servicing capacity remained at an adequate level in 2019.

Credit quality of corporate loans remained satisfactory

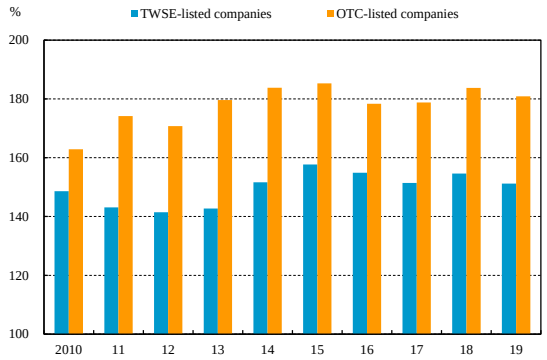
At the end of 2019, the NPL ratio for corporate loans[41] from financial institutions fell to a

Chart 2.29 Leverage ratios in corporate sector



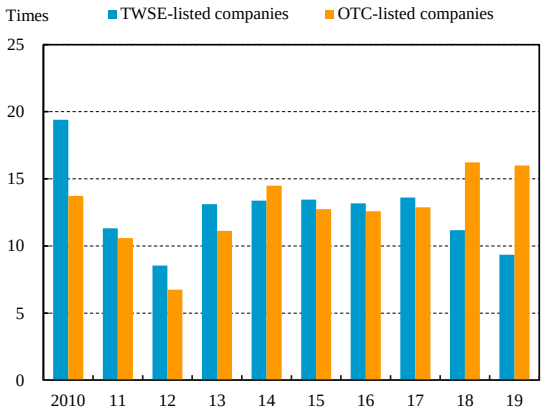
Note: Leverage ratio = total liabilities/total equity.
Source: TEJ.

Chart 2.30 Current ratios in corporate sector



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

Chart 2.31 Interest coverage ratios in corporate sector



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

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

record low of 0.27% from 0.3% a year earlier. The overall credit quality for the corporate sector strengthened (Chart 2.32).

2.2.3 Household sector

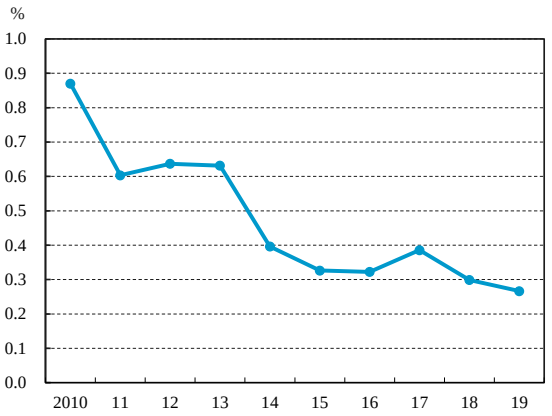
The balance of total household borrowing expanded continually in 2019. However, the household debt burden leveled off and the household net worth to GDP ratio was high, reflecting that the debt servicing capacity of households remained sound. Moreover, credit quality of household borrowing from financial institutions remained satisfactory.

Household borrowing increased continually

At the end of 2019, total household borrowing expanded and reached NT$16.39 trillion, equivalent to 86.74% of annual GDP (Chart 2.33). The largest share of household borrowing went for the purchase of real estate (62.88%), followed by current operation loans (34.60%).

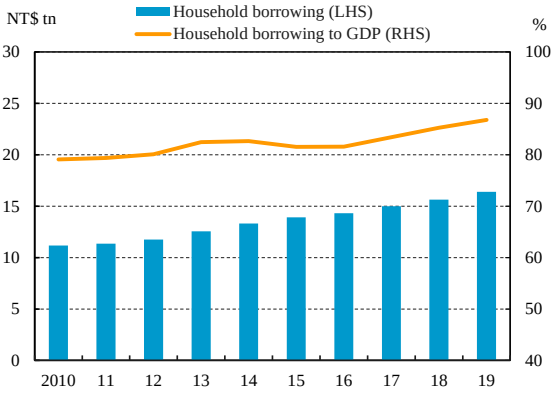
In 2019, household borrowing grew continually, with the annual growth rate slightly rising to 4.82%, mainly contributed to by the build-up in the purchase of real estate and current operation loans. Compared to other countries, the growth of total household borrowing in Taiwan was lower than that in South Korea, but higher than those in Australia, the US, and Japan. As to household borrowing to GDP, Taiwan's ratio was lower than those in Australia and South Korea, but higher than those in the US and Japan (Chart 2.34).

Chart 2.32 NPL ratio of corporate loans



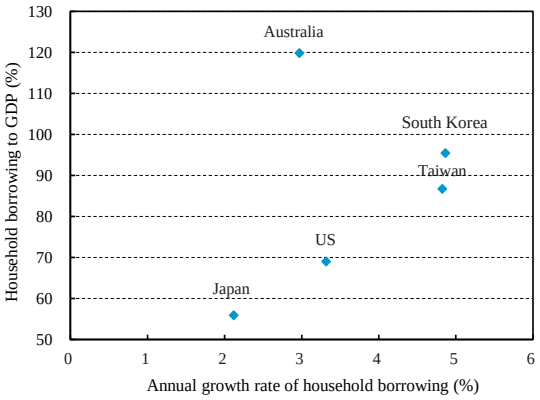
Source: JICC.

Chart 2.33 Household borrowing to GDP



Sources: CBC, JCIC and DGBAS.

Chart 2.34 Household indebtedness in selected countries



Note: Figures are as of the end of 2019.
Sources: Fed, BOJ, BOK, ABS, IMF, DGBAS, CBC and JCIC.

Household debt burden leveled off, while net worth was high

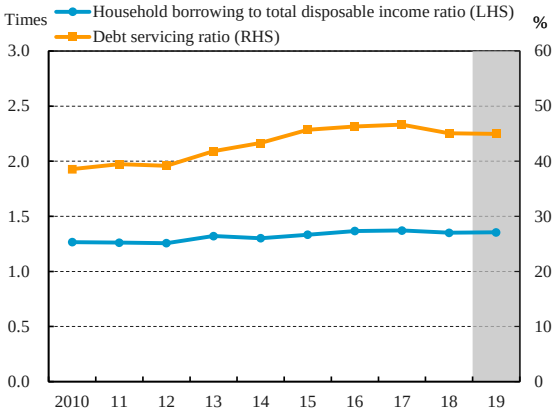
As disposable income grew at a faster pace than total household borrowing in 2019, the ratio of household borrowing to total disposable income[42] leveled off at 1.35 at the end of the year, reflecting a stable household debt burden. Moreover, the debt servicing ratio also declined to 44.98% (Chart 2.35), thereby indicating that household short-term debt servicing pressure relieved slightly.

Furthermore, in Taiwan, household net worth[43] has been remarkable over the past decades, which was more than 8.2 times the GDP in recent years. Compared to other countries, the household net worth to GDP in Taiwan was higher than those in the UK, US, South Korea, and Singapore (Chart 2.36), reflecting the sustained debt servicing capacity of households.

Credit quality of household borrowing remained satisfactory

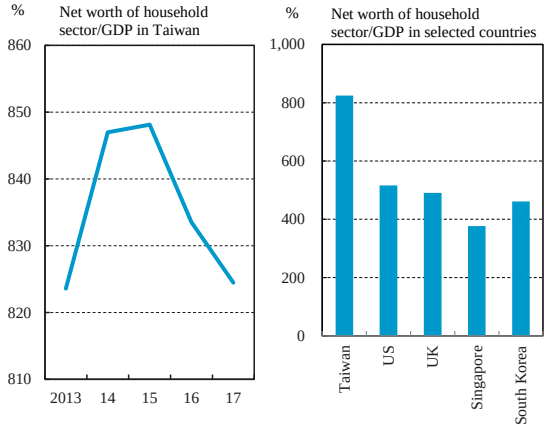
In 2019, the NPL ratios of household borrowing and loans to purchase real estate decreased to a new low of 0.22% and 0.18% at the end of the year (Chart 2.37), respectively, reflecting satisfactory credit quality.

Chart 2.35 Household indebtedness and debt servicing ratio



Notes: 1. Total disposable income in shaded area is a CBC estimate.
2. Debt servicing ratio = borrowing service and principal payments/total disposable income.
Sources: CBC, JCIC and DGBAS.

Chart 2.36 Household net worth to GDP



Notes: 1. The household sector herein includes households and non-financial groups.
2. On the right panel, figures are as of the end of 2017 in Taiwan and as of the end of 2018 in other countries.
Sources: DGBAS and official websites of selected countries.

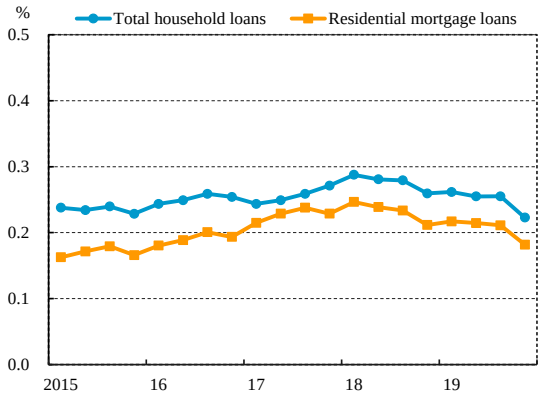
[42] Total disposable income = disposable income + rental expenses + interest expenses.
[43] See Note 8.

2.2.4 Real estate market

Trading volume in the housing market increased and house prices rose in 2019. In addition, new housing loans and construction loans grew remarkably, and the mortgage burden slightly increased. Building ownership transfers for transaction continued to grow moderately from January to March 2020; however, the housing market turned conservative amid the COVID-19 pandemic. As a result, building ownership transfers for transaction of the six metropolitan areas started to decline in April.

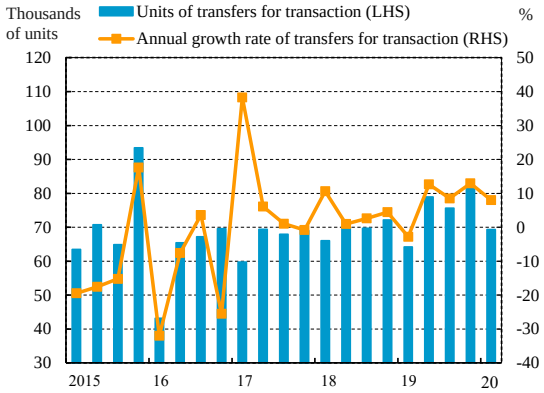
Box 1 analyzes the factors that may affect housing prices and indicates that the interest rate is not the best policy tool to address housing price problems. Instead, taxation measures to stabilize housing prices seem to be more effective. Therefore, the relevant ministries and departments under Taiwan's cabinet should fully cooperate with local governments to alleviate high housing price problems.

Chart 2.37 NPL ratios of household borrowing



Source: JCIC.

Chart 2.38 Building transfers for transaction and annual growth rate



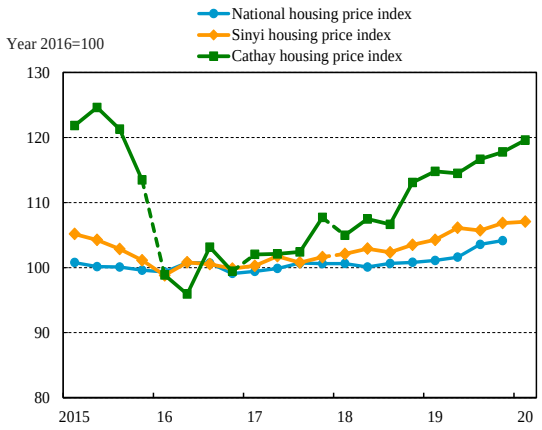
Source: Monthly Bulletin of Interior Statistics, MOI.

Trading volumes in the real estate market increased

In 2019 Q1, the total number of building ownership transfers for transaction turned to decrease by 2.78% year on year. The main reasons were a slowdown in the delivery of new buildings, elevated housing prices, and a gap regarding the views of housing prices between buyers and sellers. From Q2 onwards, the housing market gathered momentum. It was supported by the steady expansion of the domestic economy, together with a rebound in property purchase sentiment deriving from a rising demand for offices and production plants as well as buoyant market expectations as Taiwanese enterprises abroad reinvested in Taiwan. These, coupled with an increase in the delivery of new buildings, boosted a rebound of the total number of building ownership transfers for transaction with an annual growth rate of 12.96% in Q4 (Chart 2.38).

For the period of January to March 2020, the total number of building ownership transfers for transaction recorded an annual growth rate of 8.00%. However, with the acceleration of the COVID-19 pandemic, the housing market turned conservative and building ownership transfers for transaction of the six metropolitan areas decreased by 8.05% year on year in April. As a result, the average trading volume for the period of January to April was slightly less than the monthly average trading volume in 2019.

Chart 2.39 House price indices



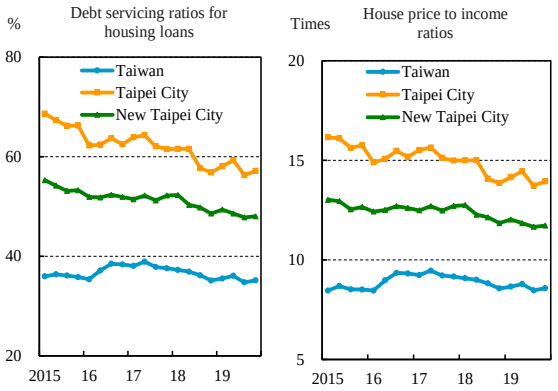
Notes: 1. The Cathay housing price index adjusted the possible transaction price model from 2016 Q1. In 2018 Q1, the model's parameters were revised, and from January 2017 the opening price, transaction price, and index of each quarter were recalculated.
2. For comparison purposes, all four indices use the same base year of 2016 (2016 average = 100).
Sources: MOI, Cathay Real Estate, and Sinyi Real Estate Inc.

Real estate prices trended upwards but increased at a moderate pace

The national housing price index rose gradually from early 2019 onwards. As of the end of Q4, the index reached a record high of 104.14, increasing by 3.31% year on year (Chart 2.39).

The Sinyi housing price index also rose moderately in 2019. In 2020 Q1, the index was close to the historical high level of 2013 Q2. The Cathay housing price index increased significantly. In 2020 Q1, the index rose and reached the level of 2015 Q4, but the annual growth rate fell to 4.19% from the 9.39% of 2019 Q3.

Chart 2.40 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.

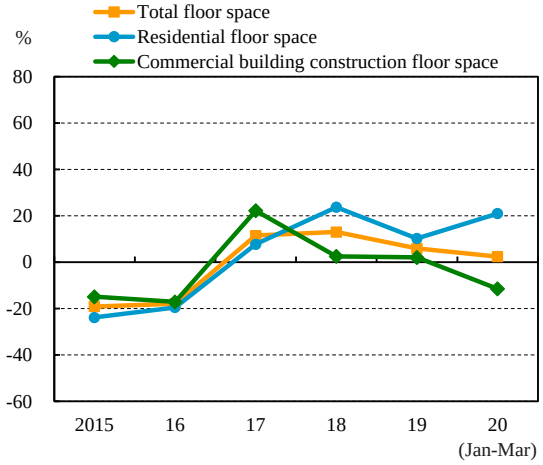
Mortgage burden remained heavy

The debt servicing ratio for housing loans slightly rose in the first half of 2019 and then declined to 34.73% in Q3. In Q4, following a rise in median house prices, the ratio rebounded to 35.15% (Chart 2.40). The house price to income ratio in 2019 also fluctuated within a narrow range. The ratio was 8.58 in Q4, marginally increasing 0.01 year on year. The mortgage burden remained heavy.

The total floor space of building commencement expanded, and pressure from the expansion of unsold new residential properties remained

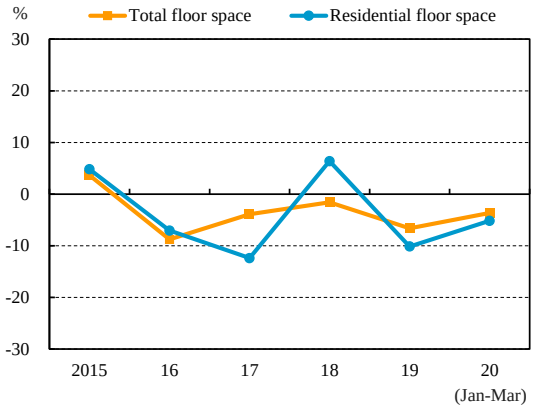
In 2019, the total floor space of building commencement increased by 6.02% year on year, with residential properties and commercial buildings construction increasing by 10.28% and 2.08%, respectively. It was mainly underpinned by a rebound in construction companies' confidence in investing in the real estate market as well as continual commencement of social housing and industrial and commercial buildings construction. For the period of January to March 2020, total floor space continued to increase by 2.46% year on year, mainly because of a substantial increase in residential properties construction with an annual growth rate of 21.05%. Nonetheless, owing to a higher base period resulting from firms' expansion in factories a year earlier, the floor space of industrial and commercial buildings construction turned to decrease by 11.43% year on year, partially offsetting an increase in total floor space (Chart 2.41).

Chart 2.41 Annual growth rates of floor space of building commencement



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

Chart 2.42 Annual growth rates of floor space of usage licenses issued



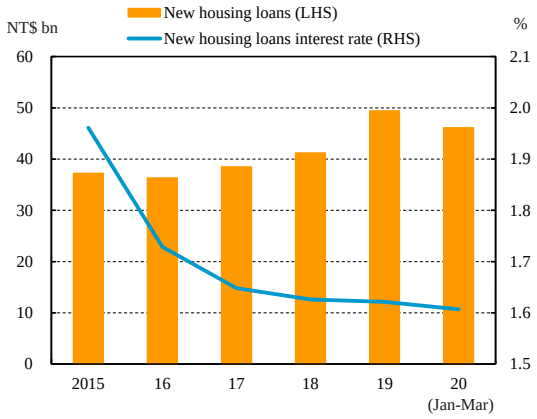
Source: Monthly Bulletin of Interior Statistics, MOI.

The annual growth rate of the total floor space of usage licenses issued was -6.62% in 2019, mainly because of a higher base period resulting from the gradual delivery of new buildings in 2018. Meanwhile, the annual growth rate of the floor space of residential properties turned to -10.12%. However, for the period of January to March 2020, the annual growth rate of the total floor space was -3.63%. The narrower decrease was mainly because residential properties also recorded a smaller decline of -5.15% year on year (Chart 2.42).

Unsold new residential properties construction registered 75.2 thousand units in 2018 Q4. In 2019, usage licenses issued for residential properties amounted to 92.3 thousand units, less than the previous year. Nevertheless, new residential buildings commencement reached 116.5

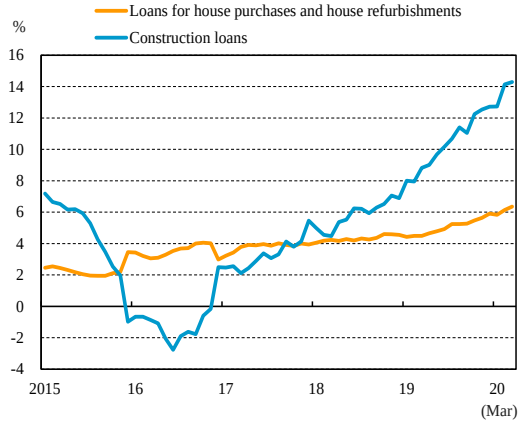
thousand units, an annual increase of 14.3 thousand units over 2018. Given high prices of new residential buildings and no improvement in their sale rates, the pressure on reducing the mounting number of unsold new residential properties remained high.

Chart 2.43 New housing loans – amount and interest rate



Source: CBC.

Chart 2.44 Annual growth rates of real estate loans



Source: CBC.

Real estate loans grew as mortgage interest rates trended downward

With transactions in the housing market expanding, the total new housing loans granted by the top five banks[44] registered NT$592.6 billion in 2019, substantially increasing by 19.92% year on year. In the first three months of 2020, the average figure was around NT$46.1 billion, an increase of 5.95% compared to the same period of 2019; nevertheless, it was lower than the annual average figure throughout 2019 (Chart 2.43).

In 2019, the interest rate for new housing loans granted by the top five banks trended downward and dropped to 1.608% in December. Afterwards, the interest rate slightly rebounded to 1.617% in January 2020 and then dropped to a low point of 1.593% in March following the interest rate cut by the Bank (Chart 2.43).

From early 2019 onwards, outstanding loans for house purchases and house refurbishments granted by banks[45] grew steadily and registered an annual growth rate of 6.36% at the end of March 2020. Meanwhile, owing to a rise in land purchases and construction projects by construction companies, outstanding construction loans continued to expand with double digit growth from June 2019 onwards and reached an annual growth rate of 14.29% at the end of March 2020 (Chart 2.44).

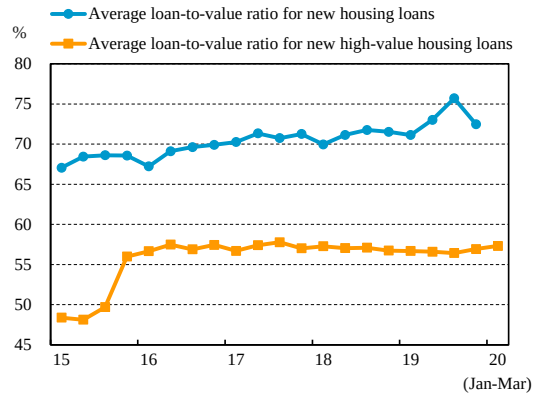
[44] The top five banks refer to the Bank of Taiwan, Taiwan Cooperative Bank, First Commercial Bank, Hua Nan Commercial Bank, and Land Bank of Taiwan.
[45] Refers to domestic banks and the local branches of foreign and Mainland China's banks.

Banks' risk management on real estate loans remained satisfactory

In 2019, with the housing market rebounding, the average loan-to-value (LTV) ratio for new housing loans registered 73.09%, slightly higher than that in 2018. Moreover, the ratio for high-value housing loans fell moderately to 56.66% throughout 2019 but then slightly rose to 57.31% for the period of January to March 2020 (Chart 2.45).

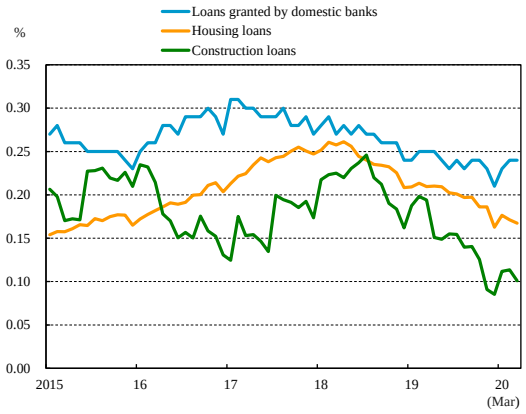
From the second half of 2018 onwards, the NPL ratios of housing loans and construction loans decreased moderately and reached 0.16% and 0.08%, respectively, at the end of 2019. At the end of March 2020, the ratios rose slightly to 0.17% and 0.10%, respectively, but remained at a low level and were both lower than the overall 0.24% NPL ratio of total loans granted by domestic banks (Chart 2.46). This reveals that the risk management of domestic banks to cope with potential mortgage loan losses remained satisfactory.

Chart 2.45 Average LTV ratios for new housing loans



Notes: 1. Figures are calculated by using the LTV ratios for new housing loans granted by all financial institutions.
2. Figures are calculated by using the LTV ratios for new high-value housing loans granted by all banks.
Sources: JCIC and CBC.

Chart 2.46 NPL ratios of housing loans and construction loans



Source: CBC.

2.2.4 COVID-19 impact on domestic macro economy

Lower economic growth is forecast owing to a slowdown in consumption and exports

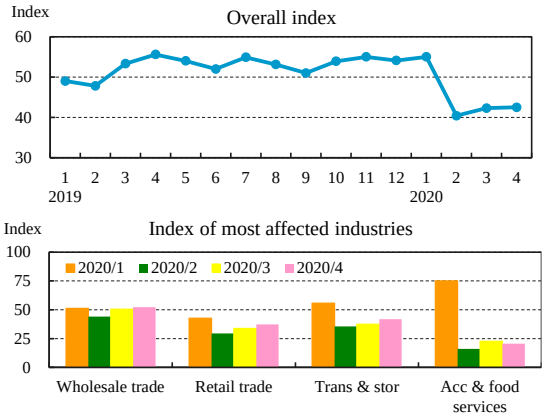
Since the beginning of 2020, global travel has almost ground to a halt amid the COVID-19 pandemic. Moreover, shrinking domestic tourism and weakened consumption have battered Taiwan's tourism industry. As a result, the Taiwan Non-Manufacturing Index (NMI) dropped significantly to 40.4 in February 2020. Despite the fact that the index rebounded slightly to 42.5 in April, it was still below the 50 "boom-bust" threshold. The accommodation & food

services, transportation & storage, and retail trade categories were the three most affected industries (Chart 2.47).

In 2020 Q1, Taiwan's exports remained resilient, despite a decline in most merchandise exports. The main products contributing to the growth momentum in exports were integrated circuits and network communication products, supported by the development of emerging technologies, including 5G networks, and the emergence of the stay-at-home economy. However, the annual growth rate has dropped into negative territory in March. With COVID-19 spreading around the world, mounted concerns over global demand contraction will put pressure on Taiwan's exports.

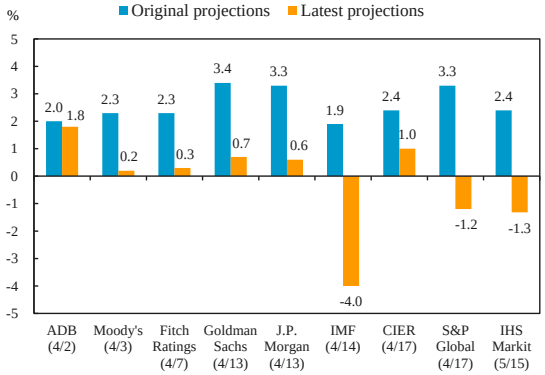
Against a backdrop of an exacerbating COVID-19 pandemic in major countries in Europe and North America, global trade and economic growth are set to plunge. Considering that Taiwan is a small open economy that is highly vulnerable to global external demand, major institutions have consecutively downgraded their projections for Taiwan's growth rate to a wide range of -4.0%~1.8% (Chart 2.48).

Chart 2.47 NMI in Taiwan



Note: Trans & stor = Transportation & storage, Acc & food services = accommodation & food services.
Source: CIER.

Chart 2.48 Taiwan's economic outlook projections



Notes: 1. Numbers in parentheses are release dates of the projections by each institution in 2020.
2. Original projections are forecast without considering the impact of COVID-19.
Sources: Institutions in the chart.

According to a preliminary estimate of the DGBAS, Taiwan's GDP decreased by 1.59%[46] in 2020 Q1. Although growth momentum weakened, the growth rate was still higher than those in the US (0.2%) and Mainland China (-6.8%). Based on a more conservative growth forecast in private consumption and investment amid the COVID-19 pandemic, combined with the adverse impact on export momentum, the Bank lowered its earlier forecast for Taiwan's economic growth to 1.07% for the first half of the year. If the situation of the COVID-19 pandemic improves in the second half of the year, global supply chains will gradually resume production and deferred private consumption will have a rebound effect on the economy. In

[46] See Note 9.

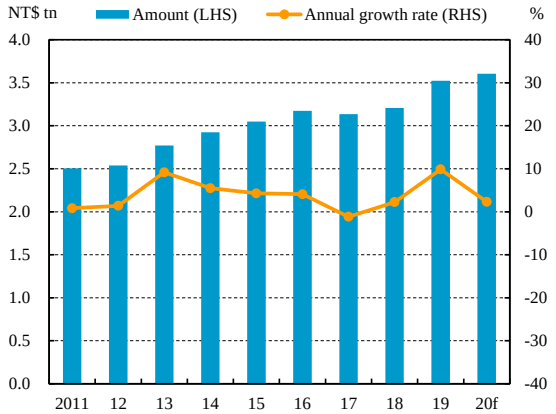
addition, export momentum expected to be regained from more business opportunities in emerging technologies, such as 5G networks and artificial intelligence (AI), along with the government's relief and revitalization measures to bolster domestic demand, point to a possible pickup in domestic economic growth in the second half of the year. The Bank forecasts the domestic economy to expand by 1.92% in 2020, a decrease of 0.79 pps compared to a year earlier (Chart 2.20).[47]

Companies whose operations were harmed by COVID-19 could have weaker financial health

In the corporate sector, the impact of the pandemic on individual industries was diverse. Among them, the industries of the manufacturing sector that are highly connected to Mainland China's supply chain could be vulnerable to the suspension of production and weaker logistic networks from Mainland China. Some of Taiwan's manufacturers (e.g., the petrochemical industry, machine tool industry, and electronic parts and components industry) are likely to benefit from the positive order-transfer effect. Nevertheless, the effect would not be enough to offset the negative shock arising from supply chain disruptions and order cancellation as the ongoing COVID-19 turmoil has weakened global demand. When it came to the services sector, the spread of the pandemic ravaged the revenue for some industries (e.g. the wholesale trade industry, retail trade industry, transportation & storage industry, and accommodation & food services industry) owing to a chilling of consumers' willingness to travel, eat out or participate in outdoor activities.

Furthermore, the COVID-19 crisis would reduce local firms' willingness to invest in Taiwan. Given a higher base period, the DGBAS forecast that the growth rate in real private fixed capital formation will decrease to 2.31% in 2020 (Chart 2.49), which may influence the growth momentum of corporate profits in the future.

Chart 2.49 Private investment



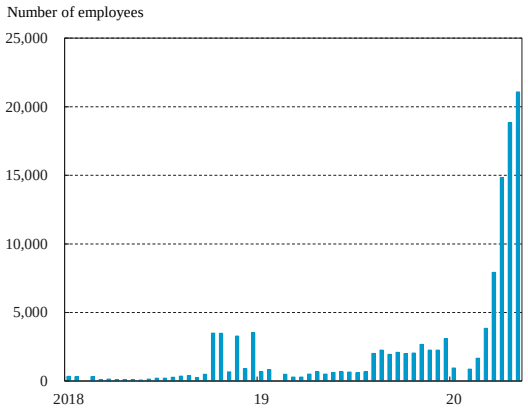
Notes: 1. The amount and the annual growth rate of private investment are expressed in real terms.
2. Figures for 2020 are forecast by DGBAS.
Source: DGBAS (2020/5/28).

[47] See Note 10.

The worsening labor market could hit households' earnings and debt servicing capacity

Taiwan's unemployment rate stood at 3.67% in December 2019, indicating a stable job market. Nonetheless, the unemployment rate climbed to 4.03% in April 2020 amid the COVID-19 outbreak. Moreover, some firms in the manufacturing sector and the services sector have taken different measures to curb the adverse shock, including encouraging their employees to take leaves or apply for furlough as well as adopting flexible working hours and salary reductions. Some companies even closed their businesses temporarily or permanently. As of May 15, 2020, a total of 21,067 Taiwanese employees, an increase of 17,993 workers compared to the end of 2019, agreed on negotiated reductions of working hours with their employers (Chart 2.50). Of the employees with reduced working hours, labor in the accommodation & food services industry, wholesale trade industry, and retail trade industry accounted for 37.40%. The worsening labor market could pose risks to households' income sources and further build up household debt servicing pressure. The aforementioned situation warrants close attention.

Chart 2.50 Number of employees who agreed on negotiated reductions of working hours with their employers



Note: The data are released in the middle and the end of the month. There are no data available during the Chinese New Year (mid-February 2018, mid-February 2019, and end-January 2020).
Source: MOL.

Other effects

In 2019, fiscal deficits and the outstanding government public debt mounted owing to a number of infrastructure projects promoted by the government. In April 2020, in an effort to mitigate the COVID-19 impact on the domestic economy, the government passed an expanded economic stimulus package totaling NT$1.05 trillion, or 5.4% of 2019 nominal GDP. The package comprised a special budget of NT$210 billion, of which NT$180 billion would be financed by debt (see Chapter 4). Accordingly, the government's fiscal deficits and outstanding debt could expand further.

On the other hand, although the pandemic has made little impact on trading volume and prices

in the real estate market so far, diminished home buyer interest to visit properties has been reported. This, coupled with the pandemic-induced job and income losses, could reduce some potential self-use buyers' willingness to purchase properties and result in a wait-and-see attitude towards the real estate market.

Box 1
Issues regarding interest rates, taxes and housing prices

In Taiwan, the problem of high housing prices results from a number of factors across various facets and thus can not be single-handedly addressed by one authority. With the aim of promoting a sound domestic housing market, government agencies would need to work together from the standpoints of demand, supply, and regulations of the real estate market.

1. The interest rate is only one of the many factors affecting house prices

1.1 The determinants of housing prices include supply, demand, and related regulations, while the interest rate is only one of the factors

Real estate trading volume and prices are determined by supply and demand factors, with an interplay of various forces, including taxation, household income, wealth effects, land supply, market expectations about home prices, and accessibility of real estate loans. Among those forces, real estate loans are affected not only by interest rates but also by loan restrictions such as loan-to-value (LTV) ratio caps as well as volume and prices of housing transactions.

1.2 International empirical research findings indicate that interest rates are not the crucial factor driving housing market booms

Cross-country empirical research findings[1] indicate that prior to the global financial crisis (GFC), a link between low interest rates and housing price bubbles was tenuous. After the 2008 GFC, housing prices in major cities in the US, the UK, Australia, and New Zealand have soared, mostly fueled by an increase in migrants alongside a slow adjustment in housing supply.

1.3 Taiwan's home price rises in the recent decade, albeit showing regional disparity, are partly due to a surge of capital inflows from residents repatriating offshore funds and foreigners investing in the local market

After the GFC, poor returns from offshore financial investments, coupled with a sharp reduction in estate and gift tax in 2009, led to massive offshore funds being repatriated by Taiwanese residents. In addition, excess domestic savings and low real estate holding costs caused those funds to flow into the housing market and, in turn, pushed up housing prices. From 2010 onwards, owing to a surge of capital inflows from residents repatriating offshore funds and foreigners investing in the local market, interest rates on new housing loans granted by domestic banks trended downwards. However, the movements in housing

prices varied among cities, indicating that interest rates were not the key driver pushing up housing prices, but factors such as supply and demand in the region and market expectations were responsible.

2. Multi-faceted policy tools should be used to address housing price issues

2.1 Charged with achieving a variety of policy objectives by means of different monetary policy instruments, the Bank does not set interest rates based solely on concerns over housing prices

Rather than aiming the interest rate tool at housing prices, the Bank's policy rate decisions take into account a wide range of factors such as output, inflation, and domestic and foreign economic and financial conditions. Therefore, macro-prudential tools, such as LTV ratio caps, would be more suitable to contain financial risks associated with housing prices.

2.2 Addressing housing price issues with interest rate tools could have widespread impact on the economy but has a limited effect on curbing rising house prices

Given that interest rates do not directly affect housing prices, if central banks want to impact housing prices, they have to raise interest rates to a significant extent. However, a substantial rise in interest rates would hammer normal economic activities. Moreover, in view of the fact that financial supervisors are unable to regulate the behavior of major investors who provide their own capital for domestic real estate, it is hard to effectively contain growth in housing prices through interest rate hikes. The experience of Sweden, which failed to address housing price problems with interest rate hikes in 2010, showed that the effectiveness of interest rate tools in stabilizing housing prices was limited, for which the costs were much higher than the benefits.

3. LTV ratio caps could productively contain the risk associated with real estate lending, while taxation measures are relatively effective in reducing housing price volatility

3.1 LTV ratio limits could effectively control the increase in housing loans, and taxation would be more appropriate for containing the volatility in volume and prices in housing markets

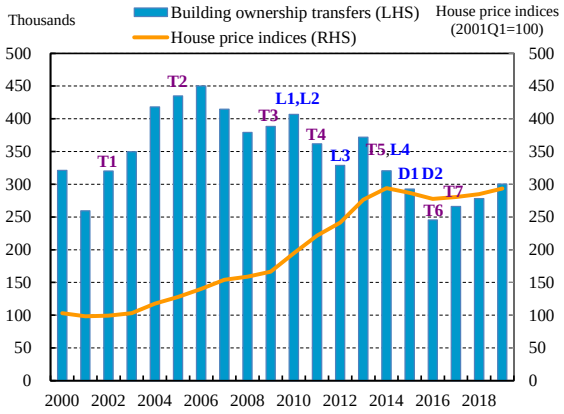
Studies[2] by the IMF and the Bank for International Settlements (BIS) indicated that measures such as LTV ratio caps could effectively control the growth of banks' housing loans and mitigate systemic financial risks. As for reducing housing price volatility, taxation on real estate would be more appropriate.

3.2 The Bank's mortgage-related regulations effectively controlled the expansion of mortgage credit, while taxation on housing had a more significant effect on curbing trading volume and prices

To cope with elevated housing prices, the Bank has introduced several pieces of rules on real estate loans since June 2010 (L1-L4 in Chart B1.1 and Table B1.1), and relevant ministries and agencies have also taken measures to promote a sound housing market (T4, T5 in Chart B1.1 and Table B1.2). After the consolidated tax on income from transactions of housing and land was implemented in 2016, relevant authorities and local governments successively adjusted related measures amid the downturn in the housing market. Meanwhile, the Bank gradually relaxed housing loan restrictions (D1-D2 in Chart B1.1, Table B1.1).

Domestic empirical research[3] suggested that capping the LTV ratio on real estate loans helped mitigate the impact of low interest rates on housing prices in Taiwan and real estate taxation measures affected the trading prices and volume in the housing market (T1-T7 in Chart B1.1, Table B1.2).[4] In particular, the consolidated tax on income from transactions of housing and land, adopted in 2016, had the most notable effect on reducing the trading volume in the housing market.

Chart B1.1 Building ownership transfers and house price indices



Note: L1 to L4 were the Bank's measures to restrict LTV ratios for real estate loans since 2010; D1 and D2 were measures to relax LTV ratios for real estate loans; T1 to T7 were major tax reforms adopted since 2000, detailed in Table B1.1 and Table B1.2.

Sources: CBC, MOF and MOI.

Table B1.1 Real estate loan measures since 2010

Year	Code	LTV ratios on real estate loan measures
Introducing LTV ratio restrictions		
2010	L1	• For second or more house-purchase loans in Specific Areas, capping the LTV ratio at 70%.
2010	L2	• Expanding the scope of Specific Areas, lowering the LTV ratio cap to 60%. • For land collateralized loans, capping the LTV ratio at 65%.
2012	L3	• For high-value housing loans, capping the LTV ratio at 60%.
2014	L4	• Further expanding the scope of Specific Areas. • For third or more house-purchase loans, capping the LTV ratio at 50%. • Adjusting the standards for high-value housing loans, lowering the LTV ratio cap to 50%. • For house-purchase loans granted to corporate legal entities, capping the LTV ratio at 50%.
Relaxing LTV ratio restrictions		
2015	D1	• Repealing restrictions on six Specific Areas. • Raising the LTV ratio cap of various real estate loans to 60%.
2016	D2	• Repealing LTV ratio limits on various real estate loans, except for high-value housing loans

Source: CBC.

4. Solution to elevated housing prices depends on the cooperation among relevant government agencies

4.1 High housing price problems should be addressed with coordinated efforts through policies related to taxation, land, real estate and finance

From 2018 onwards, housing prices stayed high and the mortgage burden remained heavy. As factors affecting housing prices and mortgage affordability are complicated, coordination among different policy areas involving taxation, land, housing and finance is necessary. In sum, the issue of elevated housing prices cannot be solved by a single agency.

Table B1.2 Real estate-related taxation measures since 2002

Year	Code	Real estate-related taxation measures
Measures to reduce tax burden		
2002	T1	• Land value increment tax: levying general land transaction at half the original tax rate.
2005	T2	• Reducing the applicable tax rates for general land to 20%, 30%, and 40%. • Granting real estate owners of long-term holding tax reductions and exemptions.
2009	T3	• Revising estate and gift tax from a progressive tax rate (up to 50%) to a single tax rate (10%).
Measures to increase tax burden		
2011	T4	• Levying a specifically selected goods and services tax.
2014	T5	• Introducing housing tax reforms, including an increase in the base tax rate for non-self-use housing.
2016	T6	• Levying a consolidated housing and land tax.
2017	T7	• Revising estate and gift tax from a single tax rate (10%) to a progressive tax rate (up to 20%).

Source: MOF.

4.2 Tax burden for real estate was low in Taiwan, which tended to fuel real estate investment

In recent years, local governments have successively increased the land value tax base; however, in 2020, the publicly announced land value only accounted for about 19.8% of the normal transaction prices. Moreover, many tax reduction and exemption regulations could easily lead to ineffective use of land, such as vacant land and land hoarding. This, together with a lower property tax burden and other favorable measures (e.g., a 50% reduction on land value increment tax effective from February 2002), have greatly reduced the tax burden on real estate transactions, which had possibly fueled demand for real estate investment.

4.3 Owing to large fluctuations in housing prices resulting from frequent movements of international capital, the Bank adopted appropriate management measures

Since 2019, overseas Taiwanese enterprises had increased investment in Taiwan. In order to avoid a rise in housing prices triggered by the large inflows of offshore funds, the government formulated measures to guide such funds towards non-speculative, industrial investments and limit capital flows into the housing market. The Bank also continued to regulate high-value housing loans by keeping the cap on the LTV ratio at 60%.

5. Conclusion

In 2016, Taiwan implemented consolidated taxation on income from transactions of housing and land with the aim of curbing short-term speculation. However, on the back of a low level of tax burden on holding real estate, it was still difficult to deter property owners from hoarding houses or land. From 2019 onwards, housing prices in Taiwan have stayed at a high level; nevertheless, this is an issue that cannot be solved by a single agency. Instead, it relies on the cooperation among ministries and agencies under the central and local governments to achieve a sound real estate market.

Notes: 1. IMF (2009), "Lessons for Monetary Policy from Asset Price Fluctuations," *World Economic Outlook*, October; Kuttner, Kenneth N. (2013), "Low Interest Rates and Housing Bubbles: Still No Smoking Gun," in Evanoff et al. (eds.), *The Role of Central Banks in Financial Stability: Has It Changed?* World Scientific, December.

2. Kuttner, Kenneth N. and Ilhyock Shim (2013), "Can Non-Interest Rate Policies Stabilise Housing Markets? Evidence from a Panel of 57 Economies," *BIS Working Papers*, No. 433, November; Zhang, Longmei and Edda Zoli (2014), "Leaning Against the Wind: Macroprudential Policy in Asia," *IMF Working Paper*, WP/14/22, February; Richter, Bjorn, Moritiz Schularick, and llHyock Shim (2018), "The Macroeconomic Effects of Macroprudential Policy," *BIS Working Papers*, No. 740, August.

3. Wang, Hong Ren, Chen, Nan Guang and Lin, Zi Yu (2017), "The Impact of LTV ratio on Taiwan's Real Estate Prices and Credits," *Quarterly Bulletin, Central Bank of the ROC (Taiwan)*, Volume 39, Issue 3, September.

4. Measures included: (1) the land value increment tax was cut by half, from February 2002 to January 2005, and general land was levied at half the original tax rate (40%, 50%, 60%); (2) since February 2005, the applicable tax rates for general land have been reduced to 20%, 30%, and 40%. In addition, landowners with long-term holdings were granted reductions and exemptions; (3) from January 2010, considering the increasing demand for changing to different types of homes, the applicable preferential tax rates for self-use residential land have been relaxed.

III. Financial system assessment

3.1 Financial markets

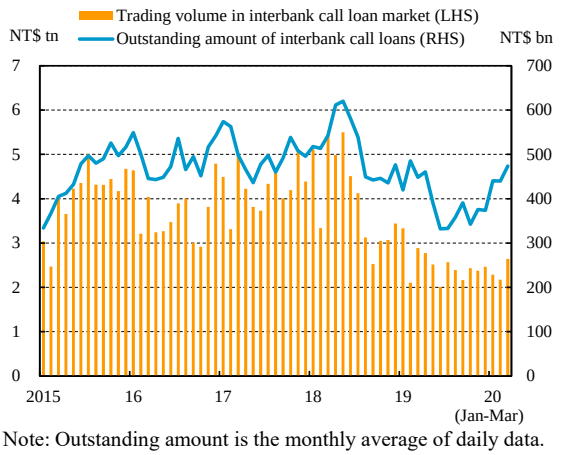
With respect to money and bond markets from 2019 onwards, the interbank call loan market contracted, while the primary bill market expanded and the bill trading volume in the secondary market decreased moderately. The outstanding amount of bond issuance also increased, while the turnover rate of outright transactions in the secondary bond market hit a new low in 2019 before it began to rebound in early 2020. Short-term market rates decreased marginally after the Bank cut the policy rates in March 2020, while long-term interest rates became volatile owing to the COVID-19 pandemic. As for stock markets, stock prices oscillated and trended upwards in 2019, but they slumped and fluctuated dramatically following the spread of the global COVID-19 pandemic in 2020. In the FX market, the NT dollar appreciated slightly against the US dollar in 2019 and remained on an appreciating path from January to April 2020. However, the volatility was relatively low.

3.1.1 Money and bond markets

Interbank call loan market contracted

The average daily outstanding amount of interbank call loans registered NT$392.5 billion in 2019, decreasing by 23.71% year on year. The main reasons were that higher demand by Taiwanese enterprises for loans decreased banks' willingness to provide call loans and bills finance companies reduced interbank borrowing. These, together with a decreasing turnover rate of call loans reflecting longer loan tenors, led the trading volume of interbank call loans to decrease markedly by 37.74% year on year. In 2020 Q1, the outstanding amount of interbank call loans rebounded, while their trading volume continued to stay at a low level (Chart 3.1).

Chart 3.1 Interbank call loan market



Note: Outstanding amount is the monthly average of daily data.
Source: CBC.

Outstanding amount of bill issuance increased, while the bill trading volume in the secondary market decreased

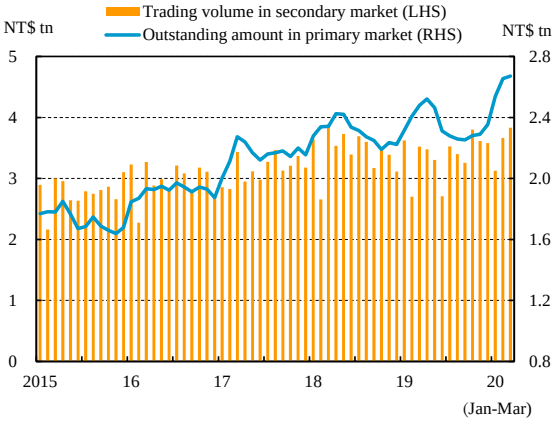
The outstanding amount of bill issuance in the primary market reached NT$2.35 trillion at the end of 2019, increasing by 5.85% year on year, owing to the expansion in treasury bill and CP issuance. In 2020 Q1, the outstanding amount of bill issuance continued to grow because of the increase in the issuance of treasury bills and CP (Chart 3.2).

Regarding the secondary bill market, the trading volume decreased marginally by 1.82% year on year and amounted to NT$40.51 trillion in 2019 because the trading volume of negotiable certificates of deposit (NCD) contracted with their shrinking issuance. However, the bill trading volume rebounded slightly in 2020 Q1 (Chart 3.2).

Bond issuance expanded marginally, while the turnover rates of outright transactions rebounded after hitting a new low

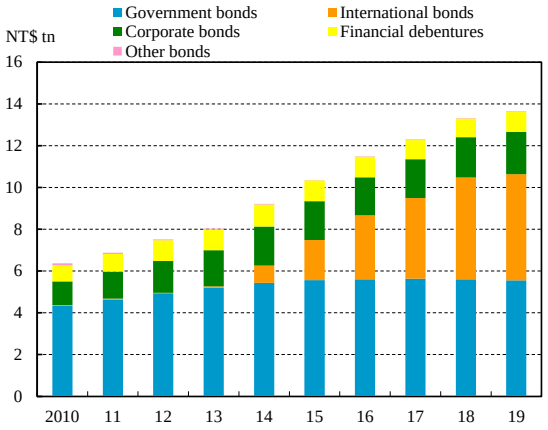
At the end of 2019, the outstanding amount of bond issuance stood at NT$13.64 trillion and increased slightly by 2.35% year on year. Analyzed by categories, the annual growth rate of international bond issuance [48] dropped significantly to 4.41% from 26.23% a year earlier, owing to reasons that the FSC imposed a

Chart 3.2 Primary and secondary bill markets



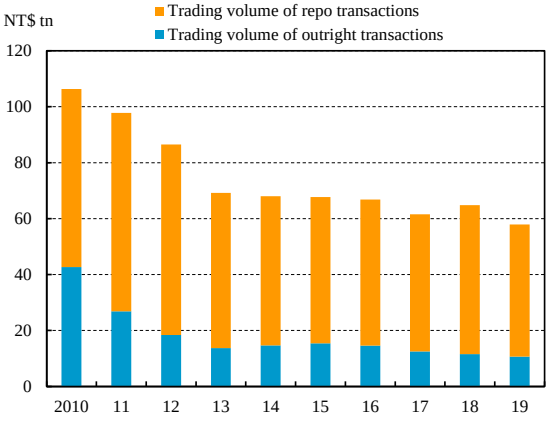
Source: CBC.

Chart 3.3 Total amount of bonds outstanding in the primary market



Note: Other bonds include beneficiary securities and foreign bonds.
Source: FSC.

Chart 3.4 Outright and repo transactions in the bond market

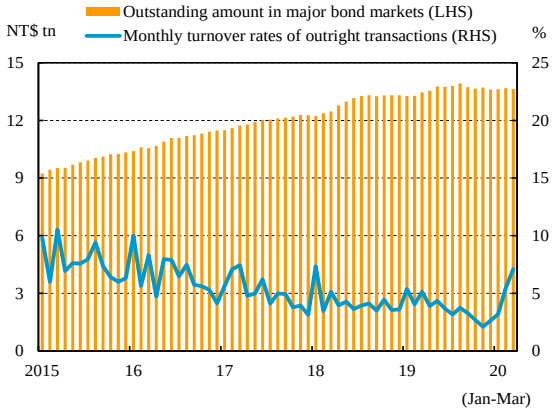


Source: CBC.

[48] International bonds refer to bonds denominated in foreign currencies and issued in Taiwan by domestic and overseas issuers.

limit on the amount of international bond investments by insurance companies and massive amounts of international bonds were called back by their issuers following the Fed's rate cuts. Meanwhile, the outstanding amount of corporate bond issuance increased by 4.69% year on year because low interest rates attracted corporates to increase bond issuance for fund raising. In addition, the outstanding amount of government bond issuance decreased by 0.92% year on year as the government implemented a policy of regular and moderate bond issuance and maintained fiscal discipline (Chart 3.3).

Chart 3.5 Outstanding amount in major bond markets and monthly outright turnover rate

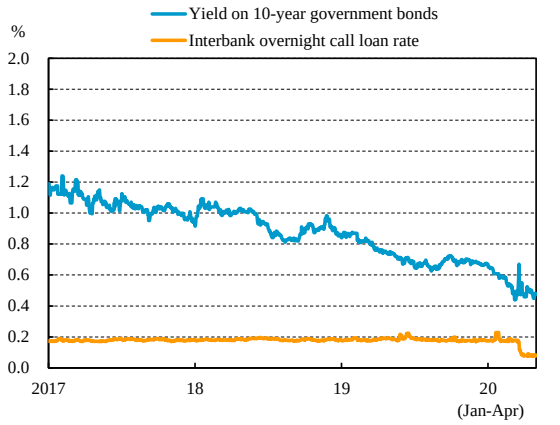


Notes: 1. Major bonds include government bonds, international bonds, corporate bonds, and financial debentures.
2. Monthly turnover rate = trading value in the month/ average outstanding amount of bonds issued. Average outstanding amount of bonds issued = (outstanding amount at the end of the month +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

Source: FSC.

In the secondary bond market, trading volume decreased by 10.70% year on year to NT$57.89 trillion in 2019 (Chart 3.4), as repo transactions and outright transactions both saw diminishing trading. The average monthly outright turnover rate of major bonds in the secondary market declined further in 2019 to a record low of 3.68%, but rebounded in 2020 Q1 (Chart 3.5).

Chart 3.6 10-year government bond yield and interbank overnight rate



Source: Bloomberg.

Short-term market rates descended marginally, while volatility of long-term market rates exacerbated

In 2019, the interbank overnight call loan rate stabilized at a low level, reflecting ample liquidity in financial markets. After the Bank cut interest rates in March 2020, the interbank overnight call loan rate also trended downwards gradually and fluctuated at a low level after hitting a recent low of 0.074% on April 9 (Chart 3.6).

As for long-term market rates, 10-year government bond yields, following the downward trend of US government bond yields, fluctuated downwards in 2019. From 2020 onwards, the yields declined consecutively and dropped to a historical low level of 0.44% on March 9, driven by the facts that US government bond yields fell significantly amid the COVID-19 pandemic outbreak and the life insurance industry was under increasing pressure to replenish bond

investments. Although the yields, propelled by worsened market sentiment, saw an abrupt jump to 0.67% on March 19, they fell back following the Bank's rate cut (Chart 3.6). Considering that volatility in the bond market exacerbated amid the pandemic, interest rate risks related to bond investments are still high and warrant close attention.

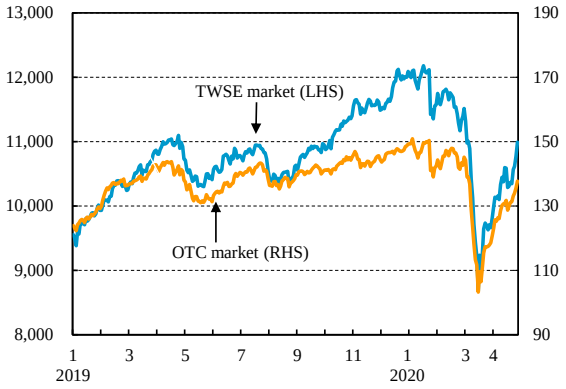
3.1.2 Equity markets

Stock indices fluctuated with an upward trend in 2019; but volatility increased dramatically since the beginning of 2020 as global stock markets plunged

In the first three quarters of 2019, the TAIEX of the TWSE market fluctuated above 10,000 most of the time. Thereafter, induced by Fed interest rate cuts and quantitative monetary easing policies implemented by central banks of major countries, the TAIEX surged above 12,000 in Q4, before dropping slightly to 11,997 at the end of the year, posting an increase of 23.33% year on year. The Taipei Exchange Capitalization Weighted Stock Index (TPEX) of the OTC market closely tracked the movements of the TAIEX (Chart 3.7).

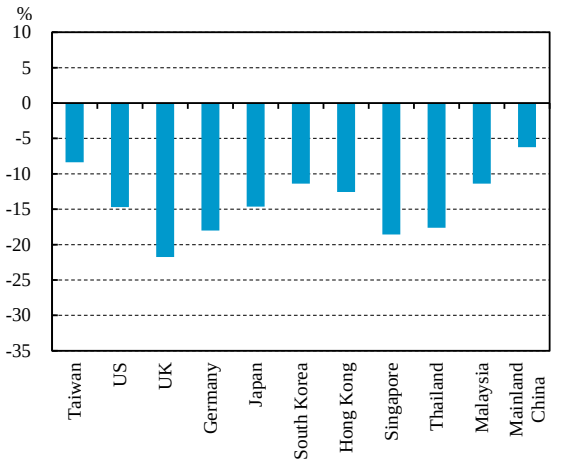
In the beginning of 2020, the TAIEX continued fluctuating at a high level. Nevertheless, in late January, the COVID-19 pandemic led to a huge decline in the TWSE market. Coupled with a collapse in crude oil prices and the US stock crash in March, the TWSE market plunged. Afterwards, the TAIEX rebounded and reached 10,992 at the end of April. In the same period, the TPEX also closely tracked the movements of the TAIEX (Chart 3.7).

Chart 3.7 Taiwan's stock market indices



Sources: TWSE and TPEx.

Chart 3.8 Major stock market performance



Notes: 1. Changes are figures at the end of April 2020 compared to those at the end of 2019.
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 Mainland China.

Source: Bloomberg.

For the first four months of 2020, owing to the measures implemented by the FSC to maintain market stability and the support from the National Financial Stabilization Fund, together with the advantage of high yields of Taiwanese stocks, the domestic stock markets tended to be more resilient than those in other countries. The TAIEX dropped by 8.38% for the first four months in 2020, falling less than the major indices in the US and European stock markets (Chart 3.8).

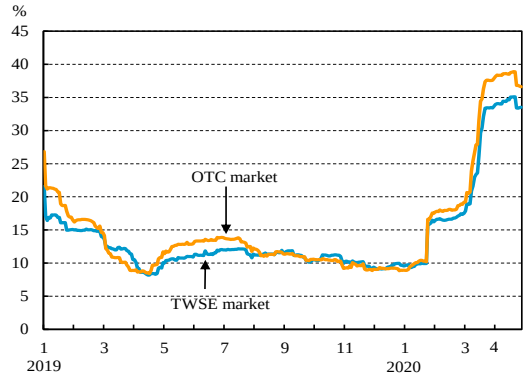
The COVID-19 pandemic caused volatility in the stock markets to increase sharply

Excluding 2019 Q1, volatility in the TWSE and the OTC markets in 2019 moved around 10%, registering 9.71% and 8.91% at the end of December. At the beginning of 2020, owing to the plunge in local stock indices, volatility surged sharply and registered 33.54% and 36.60%, respectively, at the end of April (Chart 3.9).

Annual turnover rates decreased in 2019, but reversed to trend upwards in early 2020

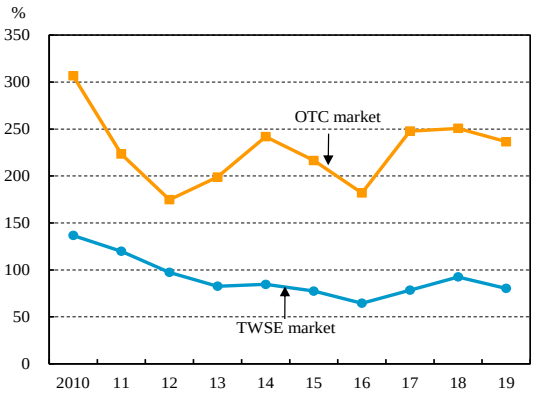
The annual turnover rates in terms of trading value in both the TWSE and the OTC markets fell to 80.36% and 236.49%, respectively (Chart 3.10), still higher than many major stock markets around the world. This showed that Taiwan's stock market liquidity remained high (Chart 3.11). The annual turnover rates in both markets rose to 12.51% and 29.79%, respectively, in March 2020, owing to surging volatility.

Chart 3.9 Stock price volatility in Taiwan's markets



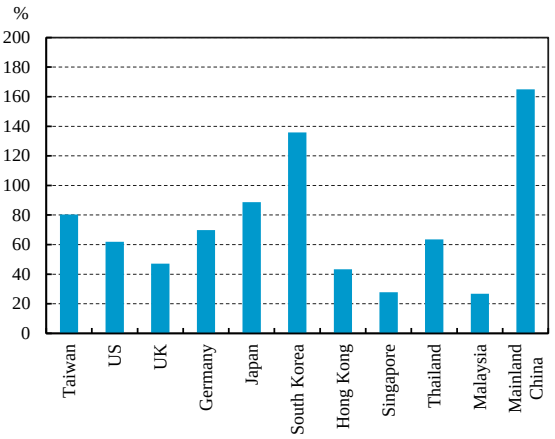
Note: Volatility refers to the annualized standard deviation of 60-day daily index returns.
Sources: TWSE, TPEx and CBC.

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 2019.
Sources: TWSE and WFE.

3.1.3 FX market

The NT dollar strengthened against the US dollar, while the trading volume of the FX market increased moderately

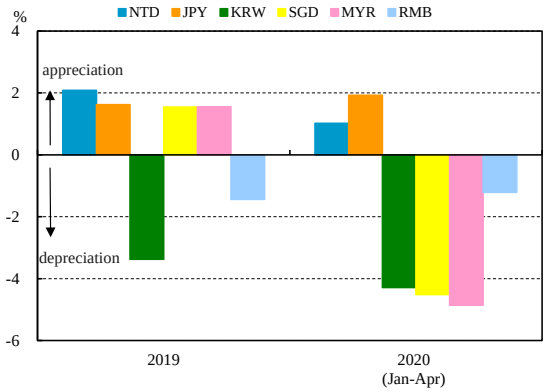
In the first four months in 2019, the NT dollar exchange rate against the US dollar fluctuated within a narrow range. From May onwards, owing to the intensified US-China trade dispute, the NT dollar depreciated. However, the NT dollar turned to appreciate against the US dollar from September and stood at 30.106 at the end of 2019, appreciating by 2.08% for the year. The NT dollar turned to depreciate against the US dollar in 2020 Q1. The reasons behind this were the COVID-19 pandemic, the Fed's rate cuts, and massive outflow of foreign capital in March. The NT dollar exchange rate stood at 29.802 at the end of April (Chart 3.12) owing to inbound remittances of overseas investments by onshore funds and the selling of US dollars by exporters, representing an appreciation of 1.02% compared to the end of 2019.

Compared to major Asian currencies, the NT dollar appreciation against the US dollar was more than the Japanese yen, the Singapore dollar and the Malaysian ringgit in 2019. From January to April in 2020, the NT dollar appreciated moderately against the US dollar and was relatively stable compared to other currencies (Chart 3.13). In the same period, the NT dollar appreciated by 6.47%, 5.54%, and 4.05% against the British pound, the Korean won and the euro, respectively, but depreciated by 0.89% against the Japanese yen (Chart 3.14).

Chart 3.12 NTD/USD exchange rate

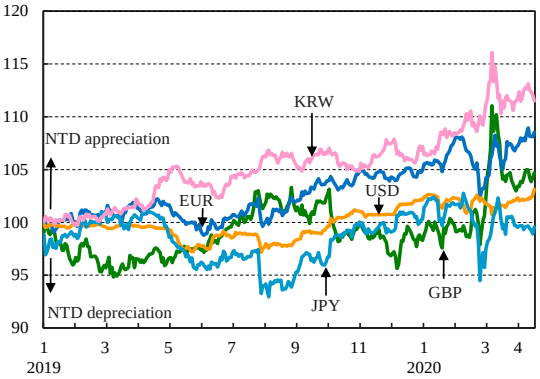
Source: CBC.

Chart 3.13 Exchange rate changes of major Asian currencies against the US dollar



Note: Changes in "2019" are figures at the end of 2019 compared to those at the end of 2018; and changes in "Jan-Apr 2020" are figures at the end of April 2020 compared to those at the end of 2019.
Source: CBC.

Chart 3.14 Movements of NT dollar exchange rate against key international currencies



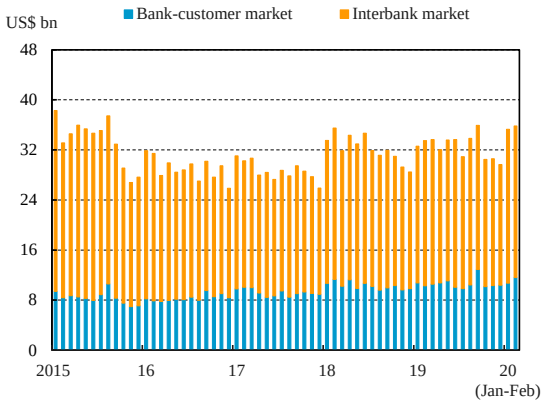
Note: December 28, 2018 = 100.
Source: CBC.

In 2019, the average daily trading volume in Taiwan's FX market expanded slightly by 1.14% and rose to US$32.5 billion from US$32. 1 billion a year earlier, primarily because of an increase in the bank-customer market (Chart 3.15).

NT dollar exchange rate volatility remained relatively stable, while the COVID-19 pandemic had less impact on the FX market

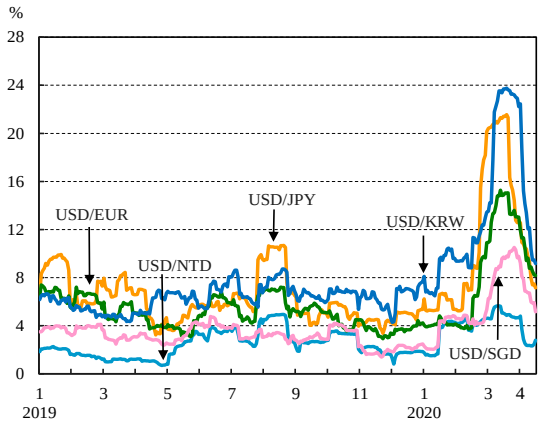
Volatility in the NT dollar exchange rate against the US dollar shifted between 0.70% and 4.94% and registered an annual average of 2.39% in 2019. However, global financial markets fluctuated dramatically during January to April 2020 because of the huge impacts of COVID-19, with surging volatility in the NT dollar exchange rate registering between 1.50% and 5.66%. Compared to major currencies such as the Japanese yen, the euro, and the Korean won, the NT dollar exchange rate has been relatively stable against the US dollar, owing to a lower impact of the COVID-19 pandemic on Taiwan (Chart 3.16).

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 February 2020.
Source: CBC.

Chart 3.16 Exchange rate volatility of various currencies versus the US dollar



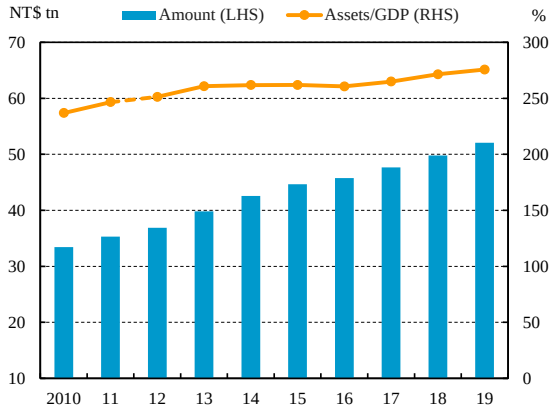
Note: Volatility refers to the annualized standard deviation of 20-day daily returns.
Source: CBC.

3.2 Financial institutions

3.2.1 Domestic banks

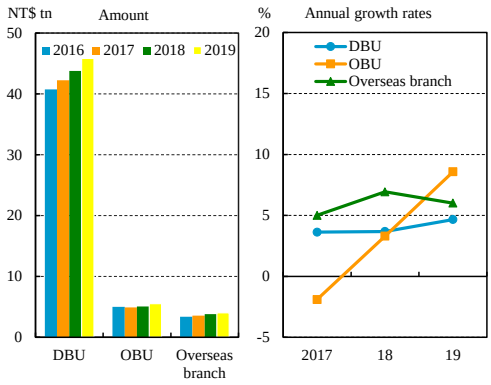
Owing to the growth in loans, the total assets of Taiwan's 37 domestic banks[49] continually expanded in 2019. Asset quality improved, and concentration in corporate loans decreased mildly while credit exposures to real estate loans increased slightly. Since prices in the real estate market remained oscillatory within a narrow range, credit risk related to real estate prices should be continuously monitored. Moreover, the estimated value at risk (VaR) of market risk exposures increased but liquidity risk remained moderate owing to ample funds in the banking system. While domestic banks posted higher profits in 2019 than the previous year, the average capital adequacy ratio increased and showed satisfactory capacity to bear losses.

Chart 3.17 Total assets of domestic banks



Note: Figures from 2012 forward are on the TIFRSs basis, while those of prior years are on the ROC GAAP basis.
Sources: CBC and DGBAS.

Chart 3.18 Total assets of domestic banks by sectors



Note: Figures for total assets are inclusive of interbranch transactions.
Source: CBC.

Total assets kept growing

The total assets of domestic banks kept growing and reached NT$52.06 trillion at the end of 2019, equivalent to 275.47% of annual GDP (Chart 3.17). The annual growth rate of the total assets slightly rose to 4.55%, mainly due to continuous growth in loans. Broken down by sector, the asset growth rates of domestic banking units (DBUs) and offshore banking units (OBUs) showed rising trends, and only the asset growth rate of overseas branches trended down[50] (Chart 3.18).

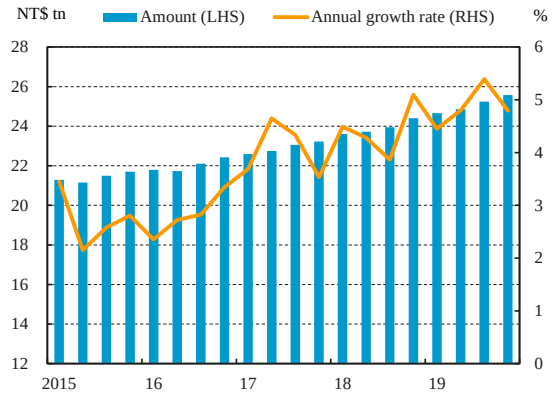
[49] Includes Agricultural Bank of Taiwan.
[50] Mainly because due from the Central Bank and commercial banks as well as interbank call loans of branches in the US and Hong Kong largely decreased.

Credit risk

Customer loans growth slowed

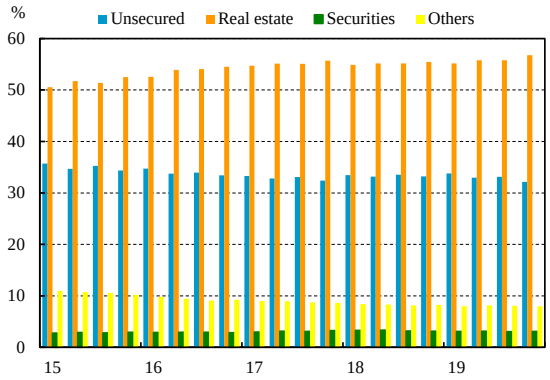
Customer loans granted by the DBUs of domestic banks stood at NT$25.57 trillion at the end of 2019, accounting for 49.12% of total assets, with the annual growth rate decreasing to 4.80% (Chart 3.19). Among them, the annual growth rate of household borrowing slightly rose to 5.77% owing to a steady increase in mortgage loan demand. Corporate loans growth slowed, with the annual growth rate declining to 3.72%. However, the annual growth rate of government loans rose to 4.50% mainly because of a lower base period in the previous year.

Chart 3.19 Outstanding loans in domestic banks



Note: Loans of OBUs and overseas branches are excluded.
Source: CBC.

Chart 3.20 Credit by type of collateral in domestic banks



Source: CBC.

Both credit concentration and the share of real estate-secured credit increased slightly

At the end of 2019, real estate loans granted by the DBUs of domestic banks[51] amounted to NT$9.56 trillion and accounted for a share of 37.38% of total loans, reflecting a marginally increasing concentration in credit exposure to real estate loans. Moreover, real estate-secured credit granted by domestic banks aggregated NT$17.79 trillion, accounting for 56.77% of total credit,[52] also higher than that of the previous year (Chart 3.20).

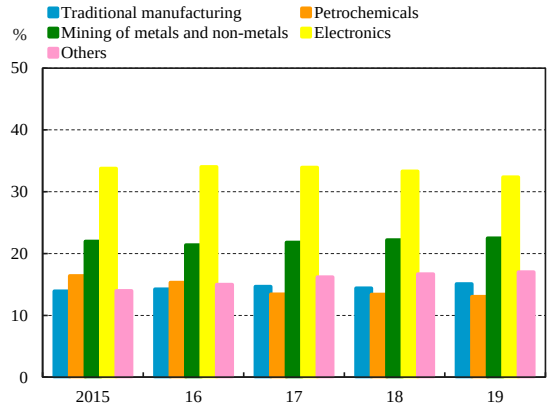
In 2019, the trading volume in the housing market grew and housing prices trended upwards. Nonetheless, the pressure stemming from unsold new residential properties remained a concern. In addition, owing to the COVID-19 outbreak in early 2020, housing market sentiment turned conservative. Banks should continue to pay close attention to real estate related credit risks.

[51] Real estate loans include house-purchasing loans, house-repairing loans and construction loans.
[52] The term "credit" herein includes loans, guarantee payments receivable, and acceptances receivable.

Credit concentration in corporate loans slightly diminished

For the DBUs of domestic banks, corporate loans stood at NT$11.09 trillion at the end of 2019, of which loans to the manufacturing sector registered NT$4.28 trillion and accounted for the largest share of 38.64%. Within the manufacturing sector,[53] the largest proportion of loans was for the electronics industry, which stood at NT$1.39 trillion and accounted for 32.38%, slightly decreasing over the previous year. This reflected that the credit concentration of corporate loans had mildly reduced (Chart 3.21).

Chart 3.21 Exposure to the manufacturing sector by domestic banks

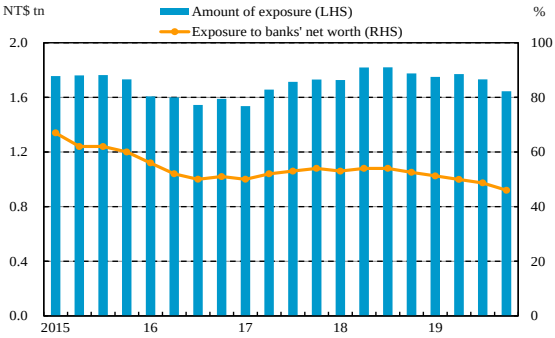


Notes: 1. Exposure to each sector = loans to each sector/loans to the whole manufacturing sector.
2. Exposures of OBUs and overseas branches were excluded.
Source: CBC.

Exposures to Mainland China decreased, but potential risks increased

At the end of 2019, the exposures of domestic banks to Mainland China stood at NT$1.65 trillion, decreasing by NT$129.9 billion or 7.32% from a year earlier. The ratio of the exposures to banks' net worth fell to a new low of 46% (Chart 3.22).

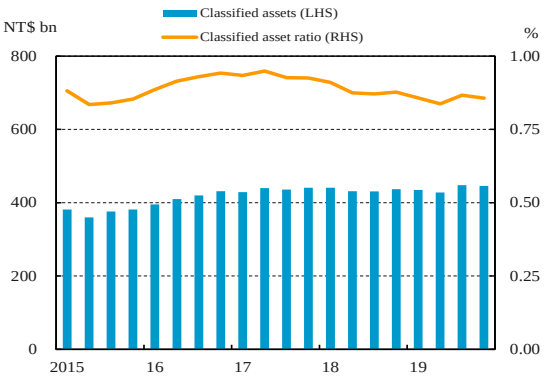
Chart 3.22 Exposures to Mainland China by domestic banks



Source: FSC.

In recent years, economic growth of Mainland China has slowed significantly and the debt of the non-financial sector has expanded rapidly. The COVID-19 outbreak in early 2020 made a major impact on the economy and finance in Mainland China, and potential risks increased. Given the high trade interconnectedness of the two sides across the Strait, changes in Mainland China's economic conditions would

Chart 3.23 Classified assets of domestic banks



Note: Classified asset ratio = classified assets/total assets.
Source: CBC.

[53] 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.

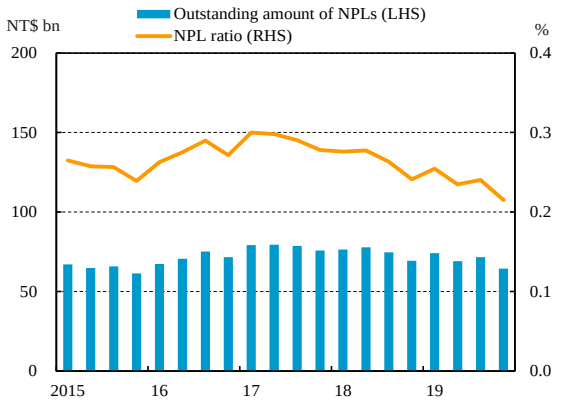
have a greater impact on Taiwan. Therefore, domestic banks should closely monitor the developments in Mainland China's economic and financial conditions and prudently manage the risks of such exposures.

Asset quality improved

Outstanding classified assets[54] of domestic banks stood at NT$445.9 billion at the end of 2019, increasing by 2.08% from a year earlier. Owing to a greater rise in total assets, the average classified asset ratio saw a slight decline to 0.86% (Chart 3.23), showing that the asset quality of domestic banks improved. Although the expected losses of classified assets[55] slightly increased to NT$58.5 billion, they only accounted for 12.60% of loss provisions, indicating that domestic banks had sufficient provisions to cover expected losses.

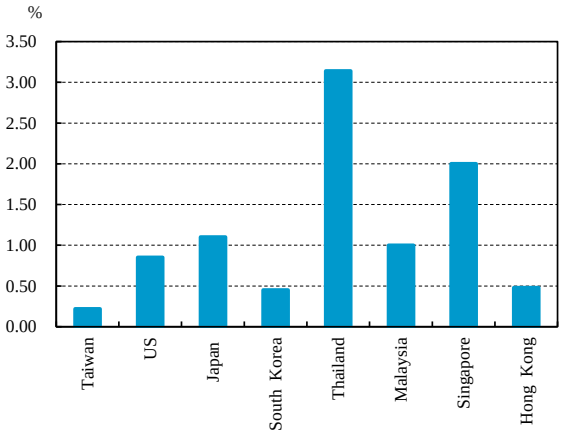
The outstanding NPLs of domestic banks registered NT$64.5 billion at the end of 2019, decreasing by 7.08% from the previous year. The average NPL ratio decreased to a historical low of 0.22% (Chart 3.24), and was much lower than those in the US and neighboring Asian countries (Chart 3.25).

Chart 3.24 NPLs of domestic banks



Note: Excludes interbank loans.
Source: CBC.

Chart 3.25 NPL ratios of banks in selected countries



Note: Figure for Japan is end-September 2019 data, while the others are end-December 2019 data.
Sources: CBC, FDIC, FSA, FSS, BOT, BNM, MAS and HKMA.

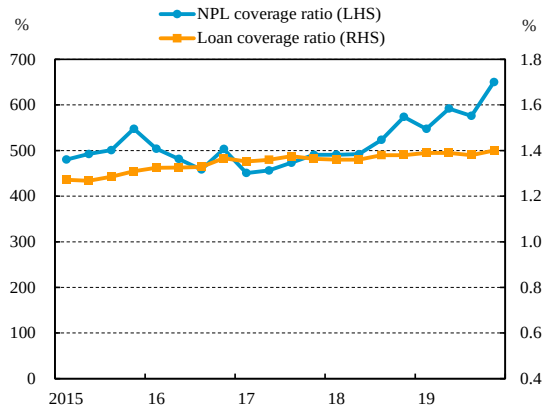
At the end of 2019, owing to the continued increase in provisions and the decrease in NPLs, the loan coverage ratio and the NPL coverage ratio rose to 1.4% and 650.3%, respectively (Chart 3.26). This indicates that the overall capability of domestic banks to cope with potential loan losses has improved.

[54] 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 as the latter four categories.
[55] Loss herein refers to the losses from loans, acceptances, guarantees, credit cards, and factoring without recourse.

Market risk

Estimated value-at-risk for market risk exposures increased

Chart 3.26 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.

At the end of 2019, the net position of interest rate sensitive debt securities accounted for the largest share of total market risk exposures of domestic banks, followed by the net positions of FX and of equity securities. Based on the Bank's VaR model,[56] the estimated total VaR for market risk exposures of domestic banks stood at NT$132 billion at the end of 2019, up by NT$15.8 billion or 13.6% compared to a year earlier. Among them, the interest rate and equities VaR increased by 13.53% and 27.96%, respectively. The main reasons were larger positions of debt and equity securities and uncertainty[57] surrounding the developments of the US-China trade dispute, which increased volatility in debt and equity markets. On the other hand, the FX VaR exposures decreased by 16.67%, owing to reductions in their net positions (Table 3.1).

Table 3.1 Market risks in domestic banks

Unit: NT$ bn

Types of risk	Items	End-Dec. 2018	End-Dec. 2019	Changes	
				Amount	pps; %
Foreign exchange	Net position	195.5	173.5	-22.0	-11.25
	VaR	4.2	3.5	-0.7	-16.67
	VaR/net position (%)	2.15	2.02		-0.13
Interest rate	Net position	1,796.0	1,957.2	161.2	8.98
	VaR	102.7	116.6	13.9	13.53
	VaR/net position (%)	5.72	5.96		0.24
Equities	Net position	63.1	86.8	23.7	37.56
	VaR	9.3	11.9	2.6	27.96
	VaR/net position (%)	14.74	13.71		-1.03
Total VaR		116.2	132	15.8	13.60

Source: CBC.

[56] For more details about the Bank's VaR model, please see CBC (2016), *Financial Stability Report*, Box 2, May. In 2019, the Bank calibrated the VaR model for evaluating market risk VaR, and retrospectively adjusted the data at the end of 2018.
[57] The situation of the US-China trade war in 2019 alternated between moderate and intensive. The first phase of the US-China trade deal was not reached until mid-December 2019.

From early 2020 onward, the spread of COVID-19 and inability of oil-producing nations to reach an agreement on reduction in oil output caused global stocks to plunge and oil prices to crash, sharply increasing the volatility in financial markets. As a result, market risk surged. Accordingly, future developments of the financial market and its possible impacts should be carefully watched.

The impacts of market risk on capital adequacy ratios were limited

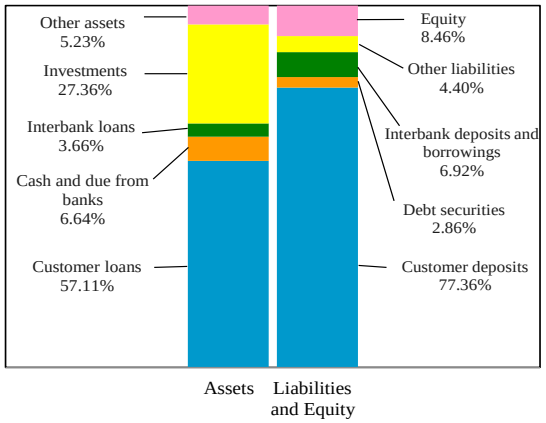
According to the estimation mentioned above, the total VaR would lead to a decrease of 0.22 pps in the average capital adequacy ratio of domestic banks, causing the ratio to drop from the current 14.07% to 13.85%. Nevertheless, it would still be higher than the statutory minimum of 10.5%.

Liquidity risk

Liquidity in the banking system remained ample

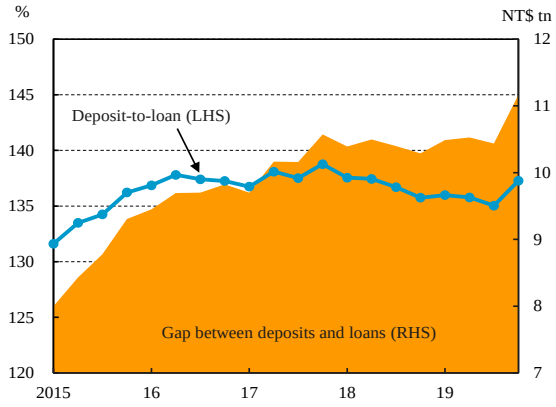
The assets and liabilities structure of domestic banks remained roughly unchanged in 2019. For the sources of funds, relatively stable customer deposits still made up the largest share of 77.36% of the total, while for the uses of funds, customer loans accounted for the biggest share of 57.11% (Chart 3.27). The average deposit-to-loan ratio of domestic banks rose to 137.27%, and the funding surplus (i.e., deposits exceeding loans) increased to NT$11.17 trillion. The overall liquidity of domestic banks remained abundant (Chart 3.28).

Chart 3.27 Asset/liability structure of domestic banks



Notes: 1. Figures are as of end-December 2019.
2. Equity includes loss provisions. Interbank deposits include deposits with the CBC.
Source: CBC.

Chart 3.28 Deposit-to-loan ratio of domestic banks



Note: Deposit-to-loan ratio = total deposits/total loans.
Source: CBC.

Overall liquidity risk remained relatively low

The average NT dollar liquid reserve ratio of domestic banks was well above the statutory minimum of 10% in every month of 2019 and stood at 31.61% in December (Chart 3.29). Looking at the components [58] of liquid reserves in December 2019, Tier 1 liquid reserves, mainly consisting of CDs issued by the Bank, accounted for 84.01% of the total. The quality of liquid assets held by domestic banks remained satisfactory.

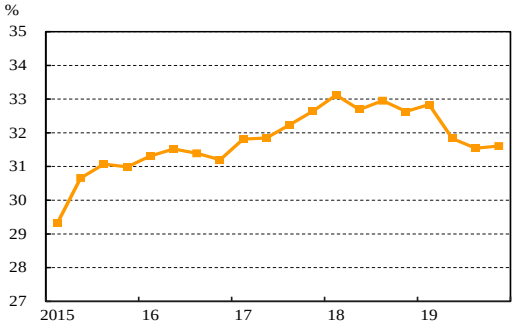
Moreover, the average liquidity coverage ratio (LCR) and net stable funding ratio (NSFR) of domestic banks were 135% and 133%, respectively, at the end of 2019, implying that the overall liquidity risk of domestic banks was relatively low.

Profitability

Profitability increased significantly

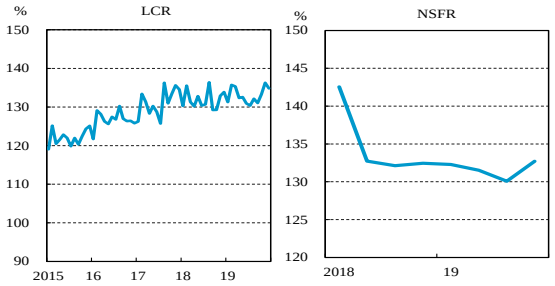
In 2019, the net income before tax of domestic banks rose to NT$362.1 billion, significantly increasing by 7.94% year on year and reaching a 10 year high (Chart 3.31). The rise was mainly caused by an increase in investment revenue. The average ROE and ROA of domestic banks went up to 9.49% and 0.70% (Chart 3.32), indicating an improvement in

Chart 3.29 Liquid reserve ratio of domestic banks



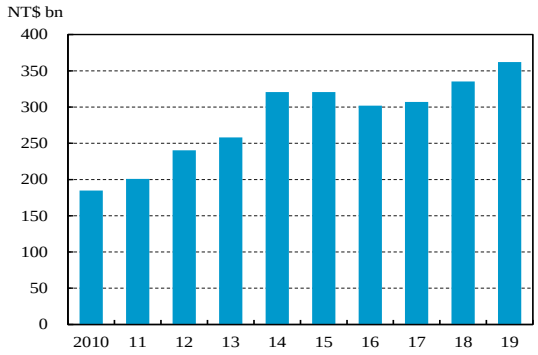
Note: Figures are the average daily data in the last month of each quarter.
Source: CBC.

Chart 3.30 LCR and NSFR of domestic banks



Notes: 1. LCR and NSFR were implemented from 2015 and 2018 onwards, respectively.
2. LCR is reported on a monthly basis; NSFR is reported on a quarterly basis.
Source: CBC.

Chart 3.31 Net income before tax of domestic banks



Note: Figures from 2012 forward are on the TIFRSs basis; figures of prior years are on the ROC GAAP basis (same as all charts in this section).
Source: CBC.

[58] According to the *Directions for Auditing Liquidity of Financial Institutions*, liquid reserve assets can be classified as: (1) excess reserves, net lending to financial institutions in the call loan market, re-deposits at designated banks with a maturity not exceeding one year, CDs issued by the Bank, government bonds and treasury bills; (2) negotiable certificates of deposit issued by banks, banker's acceptances, commercial paper, commercial acceptances, bank debentures, corporate bonds, NTD-denominated bonds issued in Taiwan by international financial organizations and foreign issuers and (3) other assets as approved by the Bank.

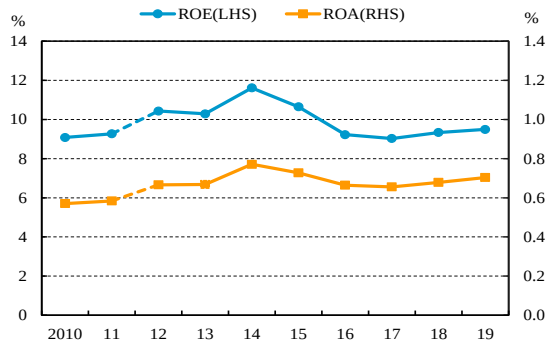
profitability. Compared to selected Asia-Pacific economies, the average ROE and ROA of domestic banks were only higher than those of South Korea and lagged behind those of most other countries (Chart 3.33).

All 37 domestic banks were profitable in 2019. Among them, 11 banks achieved a profitable ROE of 10% or more and four banks had ROAs above the international standard of 1% (Chart 3.34). ROE and ROA of most domestic banks showed better performance than those of the previous year.

Factors that might affect future profitability

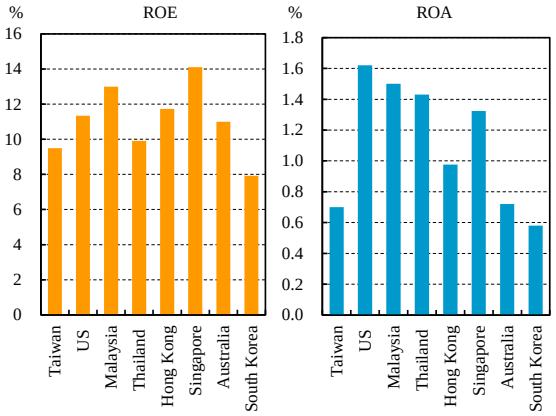
Although profitability of domestic banks increased in 2019, the interest rate spread between their deposits and loans fell to 1.32 pps from the previous year (Chart 3.35) owing to the increase in large low-rate loans offered to government-owned and private enterprises by some banks. The decline in interest rate spread could impair future profit growth momentum of domestic banks. In addition, other challenges facing future profitability include: (1) weaker debt-service capacity of COVID-19-affected industries might lead to higher default rates, which erodes banks' profitability; (2) interest rate cuts by the US, the UK, South Korea and the Bank could further reduce the interest rate spread between NTD- and foreign currency-denominated deposits and loans and affect banks' future profitability; and (3) BigTechs, which rely on their broad customer bases and advanced technological capabilities to provide innovative financial services, have not yet

Chart 3.32 ROE & ROA of domestic banks



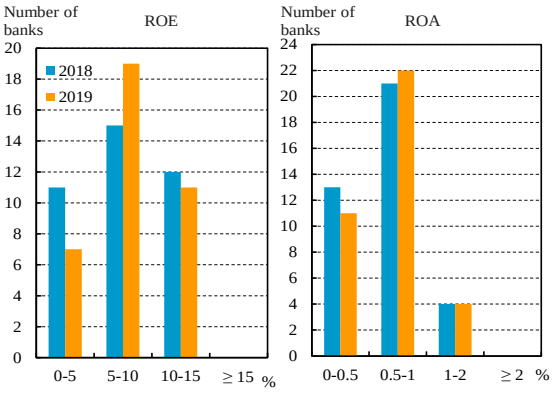
Notes: 1. ROE = net income before tax/average equity.
2. ROA = net income before tax/average total assets.
Source: CBC.

Chart 3.33 ROEs and ROAs of banks in selected economies



Note: Figures are 2019 data.
Sources: CBC, FDIC, BNM, BOT, APRA, FSS and IMF.

Chart 3.34 Domestic banks classified by ROE and ROA



Source: CBC.

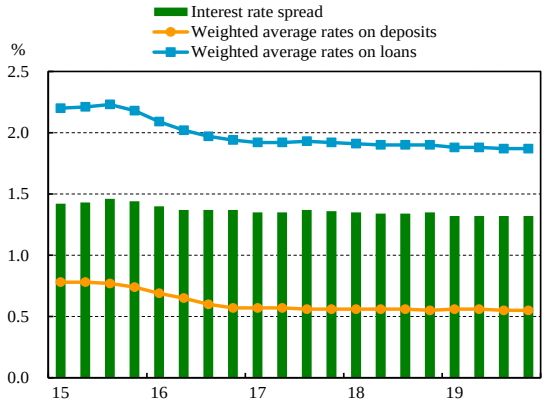
posed a serious threat to domestic banks or impacted financial stability; however, relevant authorities should still pay attention to their development and propose timely supervision response measures (Box 2).

Capital adequacy

Capital ratios trended upward

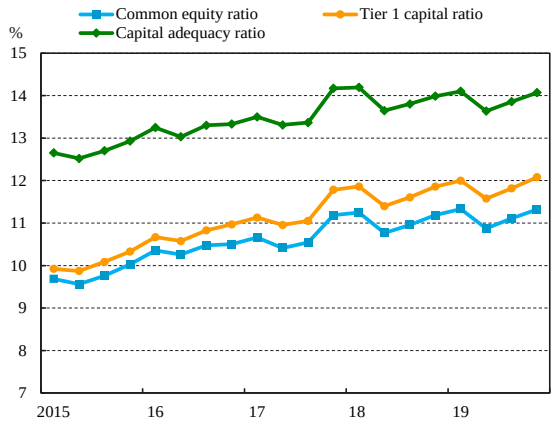
In 2019 Q2, owing to seasonal factors such as cash dividends declared and paid, the average capital ratios of domestic banks declined slightly. Afterwards, boosted by capital injections with cash and the revaluation of land, issuance of subordinated debts, and accumulated earnings, all capital ratios rebounded. As a result, at the end of 2019, the average common equity ratio, Tier 1 capital ratio, and capital adequacy ratio of domestic banks reached 11.32%, 12.08%, and 14.07% (Chart 3.36), respectively, all above their ratios a year before. However, compared to some Asia-Pacific economies, Taiwan's banking industry had relatively lower capital levels (Chart 3.37).

Chart 3.35 Interest rate spread of domestic banks



Notes: 1. Interest rate spread = weighted average interest rates on loan - weighted average interest rates on deposits.
2. The weighted average interest rates on deposits and loans exclude preferred deposits of retired government employees and central government loans.
Source: CBC.

Chart 3.36 Capital 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 = eligible capital/risk-weighted assets.
Source: CBC.

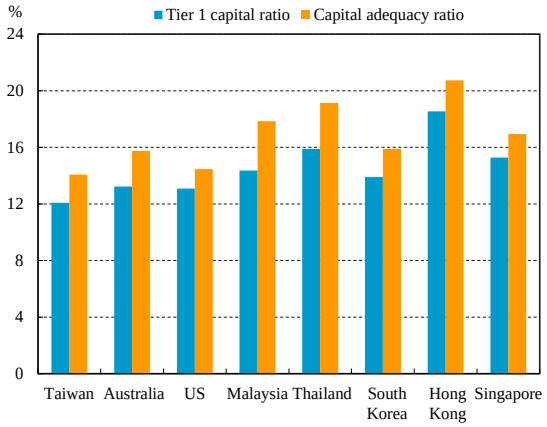
Further broken down by components of regulatory capital, common equity Tier 1 (CET 1) capital, featuring the best loss-bearing capacity, accounted for 80.48% of eligible capital. This showed that the capital quality of domestic banks was satisfactory.

Moreover, at the end of 2019, the average leverage ratio of domestic banks stood at 6.71%, higher than 6.56% a year before, indicating financial leverage remained sound.

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

The common equity ratios, Tier 1 capital ratios, and capital adequacy ratios at the end of 2019 for all domestic banks remained above the statutory minimum requirements (7.0%, 8.5%, and 10.5%, respectively). Leverage ratios of all domestic banks were also above the 3% statutory standard (Chart 3.38).

Chart 3.37 Capital ratios of banking industry in selected economies



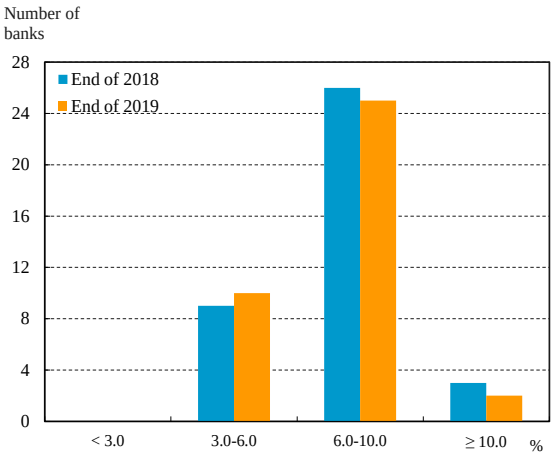
Note: Figures are as of the end of 2019.
Sources: CBC, APRA, FDIC, BNM, BOT, FSS and IMF.

Credit ratings

Average credit rating level further enhanced

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) [59] unchanged at Group 4 with moderate risk. Compared to other Asian economies, the risk level of Taiwan's banking system was higher than Hong Kong, Singapore, Japan and South Korea, the same as that of Malaysia, but much lower than those of Mainland China, Thailand, the Philippines and Indonesia. Moreover, the assessment of Taiwan's banking system by Fitch Ratings' Banking System Indicator/Macro-Prudential Indicator (BSI/MPI)[60] also remained unchanged at level bbb/2 (Table 3.2).

Chart 3.38 Distribution of domestic banks' leverage ratios



Notes: 1. Leverage ratio = Tier 1 capital/total exposures.
2. At the end of 2019, the number of domestic banks decreased from 38 a year before to 37.
Source: CBC.

[59] 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.
[60] 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, aa, a, bbb, bb, b, ccc, cc, c and f. The MPI indicates the vulnerability of the macro environment on a scale from 1, 2, 2* and 3.

All domestic banks received ratings by credit rating agencies[61] at the end of 2019. The weighted average credit rating index[62] went up slightly compared to the previous year owing to rating upgrades of five banks (Chart 3.39).

Rating outlooks for almost all domestic banks remained stable

Almost all domestic banks maintained credit ratings of twAA/twA (Taiwan Ratings) or AA(twn)/A(twn) (Fitch Ratings) and none had credit ratings lower than twBB/BB(twn) at the end of 2019 (Chart 3.40). Only one bank received a negative rating outlook, while rating outlooks for the other 36 banks remained stable.

3.2.2 Life insurance companies

In 2019, total assets of life insurance companies continued their rapid growth, while overall credit ratings held stable. Meanwhile, the average RBC ratio further improved and pretax income increased year on year. However, life insurance companies still faced higher reinvestment risk and equity risk.

Assets maintained fast growth

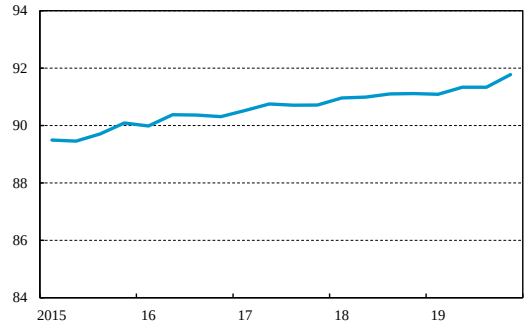
The total assets of life insurance companies reached NT$29.39 trillion at the end of 2019,

Table 3.2 Systemic risk indicators for the banking system

Banking System	Standard & Poor's BICRA		Fitch BSI/MPI	
	2019/2	2020/2	2019/4	2019/10
Hong Kong	2	2	a/3	a/2
Singapore	2	2	aa/2	aa/2
Japan	2	3	a/2	a/2
South Korea	3	3	a/1	a/1
Taiwan	**4**	**4**	**bbb/2**	**bbb/2**
Malaysia	4	4	bbb/1	bbb/1
Mainland China	6	6	bb/1	bb/1
Thailand	6	6	bbb/1	bbb/1
Philippines	6	5	bb/1	bb/1
Indonesia	7	6	bb/1	bb/1

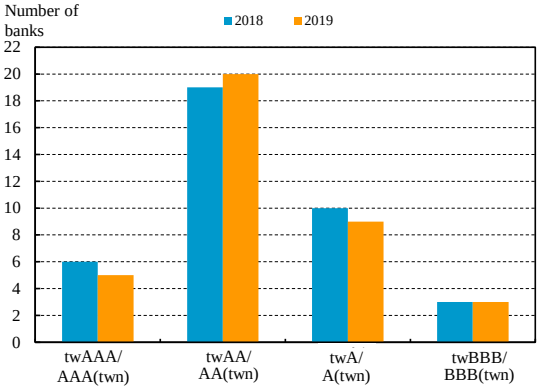
Sources: Standard & Poor's and Fitch Ratings.

Chart 3.39 Credit rating index of domestic banks



Sources: Taiwan Ratings Corporation, Fitch Ratings and CBC.

Chart 3.40 Number of domestic banks classified by credit ratings



Notes: 1. End-of-period figures.
2. The number of domestic banks decreased from 38 in 2018 to 37 in 2019.

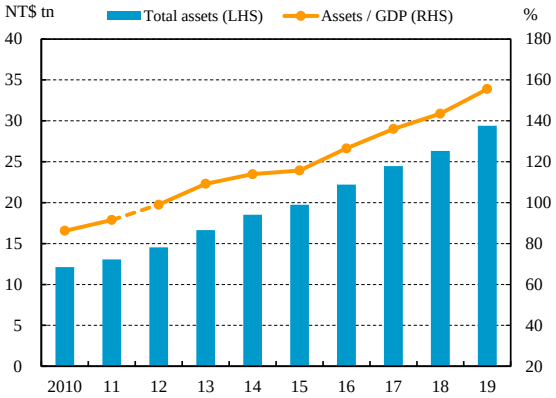
Sources: Taiwan Ratings Corporation and Fitch Ratings.

[61] As of the end of 2019, 27 of Taiwan's domestic banks received long-term issuer ratings from Taiwan Ratings, higher than the number of those with national long-term ratings from Fitch Ratings. Therefore, this section is based primarily on the Taiwan Ratings' ratings (tw~), and secondarily on Fitch Ratings' ratings (~twn).

[62] 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.

equivalent to 155.53% of annual GDP (Chart 3.41). The annual growth rate of total assets increased to 11.67%, maintaining a rapid pace of growth. The top three companies in terms of assets made up a combined market share of 55.30%. The market structure of the life insurance industry remained roughly unchanged in 2019.

Chart 3.41 Total assets of life insurance companies

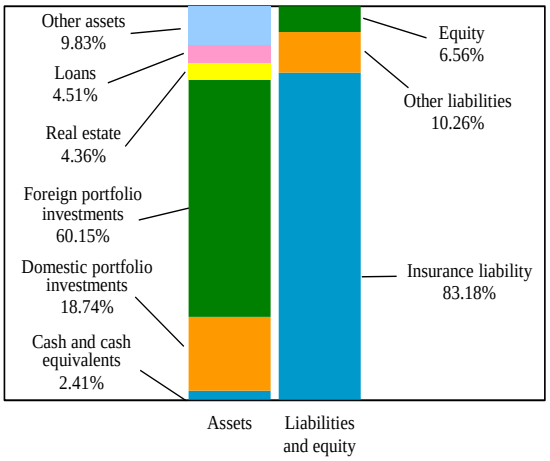


Note: Figures from 2012 forward are on the TIFRSs basis; figures of prior years are on the ROC GAAP basis.
Sources: FSC and DGBAS.

Foreign portfolio investments remained the primary usage of funds

In terms of the usage of funds of life insurance companies, foreign portfolios accounted for 60.15% at the end of 2019, the largest share of total assets, whereas the share of domestic securities investments rose to 18.74%. As for their sources of funds, insurance liabilities accounted for 83.18%, the primary share of total liabilities and equity, while the share of equity increased markedly to 6.56% owing to a strong expansion of unrealized investment profits (Chart 3.42).

Chart 3.42 Asset/liability structure of life insurance companies



Note: Figures are as of the end of 2019.
Source: FSC.

Pretax income increased significantly

Life insurance companies reported net income before tax of NT$154.6 billion in 2019, a substantial year-on-year increase of 84.74% (Chart 3.43). This was chiefly driven by growth in gains from financial assets or financial liabilities at fair value through profit and loss. Therefore, the average ROE and ROA strengthened to 10.24% and 0.55%, respectively (Chart 3.44), indicating improved profitability.

Average RBC ratio further increased

In 2019, capital levels of life insurance companies rose because of increases in profits and unrealized investment gains. As a result, the average RBC ratio rose to 292.54% at the end of the year (Chart 3.45). Among individual companies, there were 13 companies with RBC ratios

over 300%. No company had an RBC ratio below the statutory minimum of 200% (Chart 3.46). Furthermore, the average equity to asset ratio rose significantly to 7.10% at the end of 2019 (Chart 3.47), and all life insurance companies held the ratio above 3%.[63]

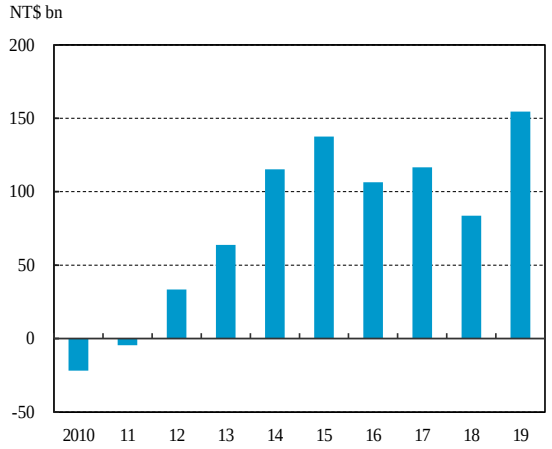
Overall credit ratings remained stable[64]

In 2019, credit ratings among the 11 life insurance companies remained stable. As of the end of the year, all rated life insurance companies maintained credit ratings above twA or its equivalent, with the ratings of the top three companies in terms of assets holding at twAA+. Moreover, the prospects of most companies were rated with a positive or stable outlook.

Foreign portfolio positions expanded with higher reinvestment risk and equity risk

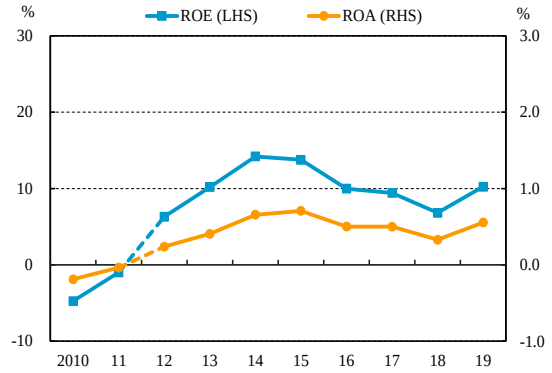
Foreign portfolio positions of life insurance companies grew continually and reached NT$17.68 trillion at the end of 2019, of which more than 90% was invested in USD-denominated financial products. With regard to FX risk, life insurance companies actively used derivative financial instruments and accelerated the accumulation of FX valuation reserves

Chart 3.43 Net income before tax of life insurance companies



Note: Figures from 2012 forward are on the TIFRSs basis; figures of prior years are on the ROC GAAP basis.
Source: FSC.

Chart 3.44 ROE & ROA of life insurance companies



Notes: 1. Figures from 2012 forward are on the TIFRSs basis; figures of prior years are on the ROC GAAP basis.
2. ROE = net income before tax/average equity.
3. ROA = net income before tax/average assets.
Source: FSC.

[63] The FSC amended the *Regulations Governing Capital Adequacy of Insurance Companies* on December 4, 2019, effective from April 1, 2020. In addition to serious capital inadequacy when the equity of an insurance company is less than zero, new classifications of capital adequacy ratios relating to the equity to asset ratio (the owner's equity divided by total assets excluding separate accounts for investment-linked insurance specified in the financial report audited by a certified public accountant) were added as follows:
(1) Inadequate capital: The equity to asset ratio of an insurance company is less than 3% in both of the most recent two periods and more than 2% in at least one period.
(2) Significantly inadequate capital: The equity to asset ratio of an insurance company for both of the most recent two periods is less than 2% and more than zero.

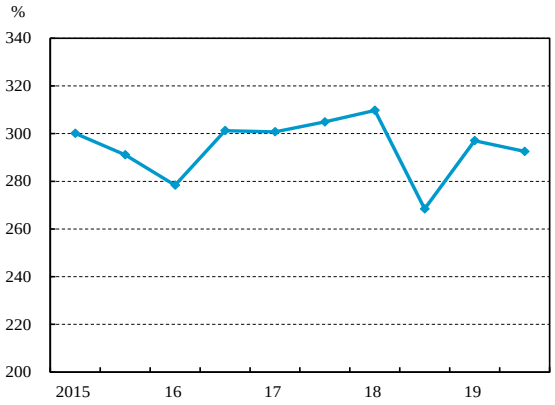
[64] The majority of rated life insurance companies received issuer ratings from the Taiwan Ratings Corp.; therefore, this section is based primarily on the Taiwan Ratings' rating (tw~), and secondarily on the ratings by other credit rating agencies.

according to a relevant regulation so as to mitigate the impact of FX rate fluctuations. However, since their open FX positions remained high, and the NT dollar turned to appreciate against the US dollar in April 2020, the FX risk for life insurance companies still warrants close attention.

Furthermore, NTD-denominated bond exchange-traded fund (ETF) investments of life insurance companies are excluded from the amounts subject to the overseas investment ceiling. Given that the net asset value of ETFs would be affected by the FX volatility of underlying overseas investments, NTD-denominated bond ETFs still carry potential FX risk. In the recent year, investment in ETFs grew rapidly and reached NT$1.3 trillion at the end of 2019. Considering that life insurance companies investing in NTD-denominated bond ETFs could face FX risk, the FSC imposed a rule adding an additional FX risk capital charge of 6.61% on NTD-denominated bond ETFs when calculating the RBC ratio. In addition, in December 2019, the FSC required that the credit ratings of underlying bond holdings of ETFs invested in by life insurance companies should be not lower than BBB-, a rule aiming to prevent insurance companies from trying to evade investment limits by investing in massive amounts of bond ETFs tracking high-yield bonds or junk bonds.

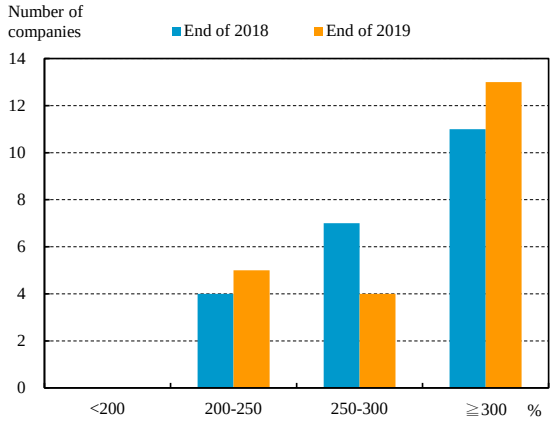
In the foreign portfolio of insurance companies, securities investments constituted the largest share, of which about 90% was invested in bills and bonds and 10% in

Chart 3.45 RBC ratio of life insurance companies



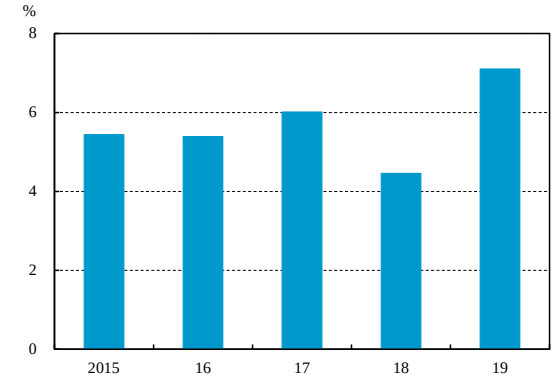
Notes: 1. RBC ratio = regulatory capital/risk-based capital.
2. Figures are exclusive of life insurance companies in receivership.
Source: FSC.

Chart 3.46 Life insurance companies classified by RBC ratios



Source: FSC.

Chart 3.47 Equity to asset ratios of life insurance companies



Notes: 1. Equity is unaudited figures.
2. Assets are exclusive of the assets of investment-linked insurance products in separate accounts.
Source: FSC.

equities. With respect to bond investments, as the Fed and many central banks successively cut interest rates in response to the COVID-19 pandemic from the beginning of 2020, US government bond yields trended downwards, which would help increase the value of government bond and high-rating corporate bond investments. However, insurance companies faced reinvestment risk especially when massive amounts of international bonds were called back by their issuers.[65] Moreover, owing to a global stock market crash and international oil price plunge in March 2020, global financial market volatility increased dramatically. Therefore, investment risks related to equities and corporate bonds with ratings of BBB or below remained high.

3.2.3 Bills finance companies

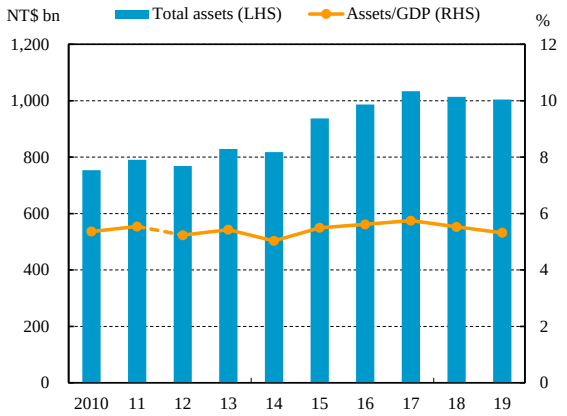
The total assets of bills finance companies contracted marginally in 2019. The guarantee business expanded and credit asset quality remained sound, while the impact of the COVID-19 pandemic on asset quality warrants attention. Profitability improved slightly, while the average capital adequacy ratio declined continually and liquidity risk remained high.

Total assets contracted successively

In 2019, mainly owing to the decrease in NCD investments, the total assets of bills finance companies decreased by 0.94% and stood at NT$1,004.6 billion at the end of the year, equivalent to 5.32% of annual GDP (Chart 3.48).

With respect to the asset and liability structure of bills finance companies, bill and bond investments constituted the largest share of 94.65% of total assets as of the end of 2019, an increase of 0.2 pps compared to a year earlier. On the liability side, bills and bonds sold under repo transactions as well as borrowings accounted for 85.66% of total

Chart 3.48 Total assets of bills finance companies

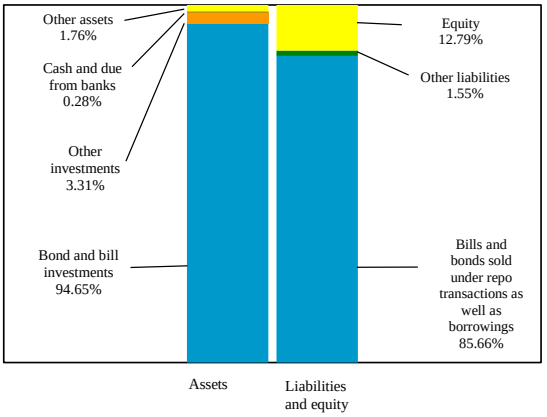


Note: Figures from 2012 forward are on the TIFRSs basis; figures of prior years are on the ROC GAAP basis.
Sources: CBC and DGBAS.

[65] The redemption amount of international bonds was US$11.9 billion and US$22.7 billion, respectively, in 2019 and the first four months of 2020. Although massive amounts of international bonds were called back by their issuers in the first four months of 2020, the amount of new issuance was still greater than that of redemption during this period. As a result, the outstanding amount of bond issuance expanded by US$3.3 billion. However, the interest rate of newly issued bonds was generally lower than those issued in the past.

assets, while equity only accounted for 12.79% (Chart 3.49). The asset and liability structure remained roughly unchanged.

Chart 3.49 Asset/liability structure of bills finance companies



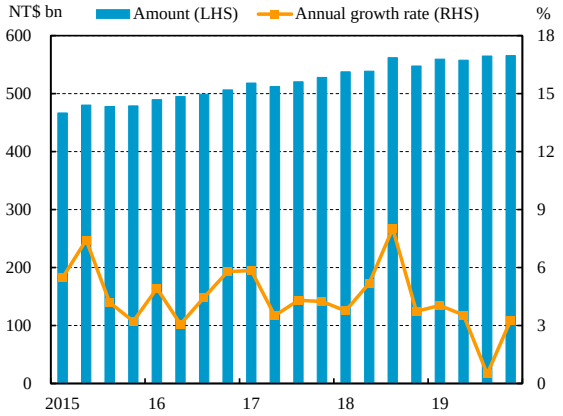
Note: Figures are as of the end of 2019.
Sources: CBC and FSC.

Credit risk

Guarantee liabilities expanded and the share of credit secured by real estate increased

CP guaranteed by bills finance companies registered NT$565.4 billion at the end of 2019, increasing by 3.27% year on year (Chart 3.50), mainly because corporates increased CP issuance for fund raising as interest rates in the money market generally remained at a low level. Although the average ratio of guarantee liabilities to equity increased to 5.02 times, the ratio of each company remained below the regulatory ceiling of 5 or 5.5 times.[66]

Chart 3.50 Outstanding CP guaranteed by bills finance companies



Source: CBC.

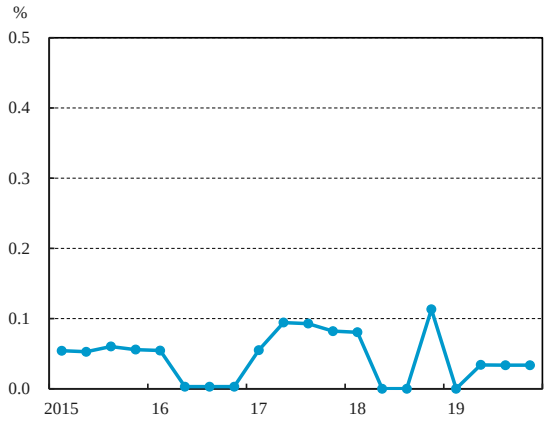
At the end of 2019, guarantees granted to the real estate and construction industries and credit secured by real estate increased to 30.34% and 41.47%, respectively, of total credit of bills finance companies. Both ratios remained at recent high levels. As pressures to reduce unsold residential properties remained and the COVID-19 pandemic induced more hesitation among real estate market participants, bills finance companies should closely monitor the impacts of housing market trends on the quality of mortgage-related credit and reinforce their capacity to cope with the changes in the real estate market cycle.

[66] According to the *Ceiling on the Total Amounts of the Short-term Bills Guarantee and Endorsement Conducted by Bills Finance Companies*, the ratio of outstanding commercial paper guaranteed to equity for a bills finance company should not exceed 1, 3, 4, 5 or 5.5 times, respectively, depending on the level of its capital adequacy ratio of below 10%, above 10% but below 11%, above 11% but below 12%, above 12% but below 13%, or above 13%.

Non-performing credit ratio remained low, but impacts of the pandemic on credit quality warrant close attention

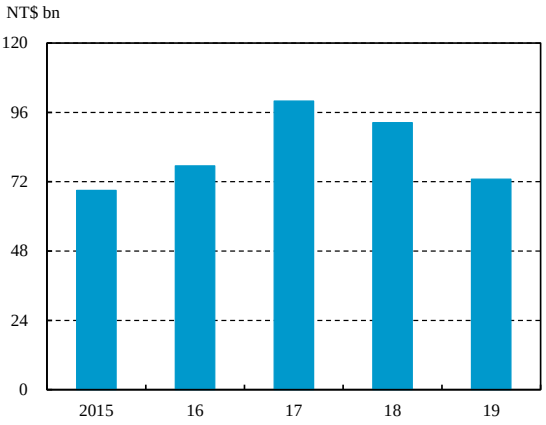
The credit quality of bills finance companies remained sound in 2019, as the non-performing credit ratio declined to 0.03% at the end of the year (Chart 3.51). Moreover, the credit loss reserves to non-performing credit ratio stood at 40.38 times, reflecting sufficient reserves to cover potential credit losses. However, a global flare-up of the COVID-19 pandemic not only disrupted supply chains and weakened demand for some domestic manufacturers but also severely damaged transportation, retail, tourism, and hospitality industries. This could have a negative impact on credit quality of bills finance companies and thus warrants close attention.

Chart 3.51 Non-performing credit ratio of bills finance companies



Note: Non-performing credit ratio = non-performing credit/(overdue guarantee advances + guarantees).
Source: CBC.

Chart 3.52 Non-guarantee CP investments of bills finance companies



Source: CBC.

Non-guarantee CP investment reduced continually, but its potential credit risk warrants concern

The outstanding amount of non-guarantee CP investment by bills finance companies stood at NT$72.9 billion at the end of 2019, decreasing by 21.21% year on year (Chart 3.52). Although each company's ratio of non-guarantee CP investment to equity remained below the regulatory ceiling of 2 times,[67] bills finance companies should continue to pay attention to the potential credit risk.

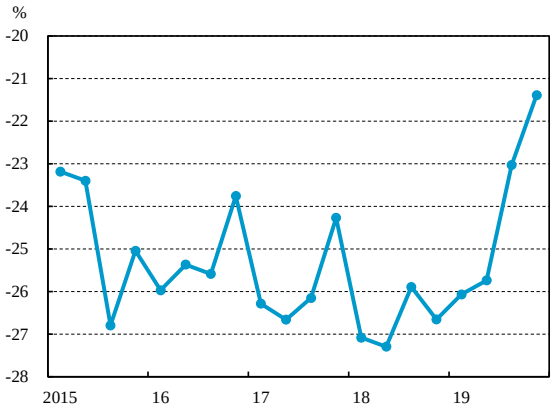
[67] According to the *Self-disciplinary Rule Governing Non-guarantee Commercial Paper Business Conducted by the Members of Bills Finance Association*, the ratio of outstanding non-guarantee CP investment to equity for a bills finance company should not exceed 2 times.

Liquidity risk remained high

Bills finance companies still faced a significant maturity mismatch between assets and liabilities, as more than 90% of their assets were invested in bills and bonds, 46.34% of which were long-term bonds. In addition, more than 80% of their liabilities were from short-term interbank call loans and repo transactions. Nevertheless, their 0-30 day maturity gap to total assets denominated in NTD shrunk to -21.39% from the -26.66% of the previous year (Chart 3.53), reflecting a decreasing but still high liquidity risk in bills finance companies.[68]

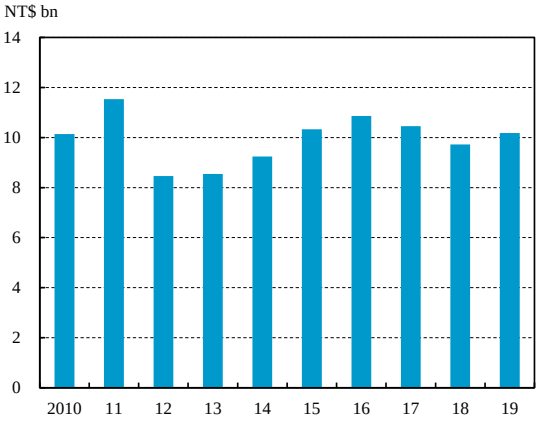
Major liabilities[69] stood at 7.64 times as much as equity stood at the end of 2019, remaining at the same level as the previous year. This, coupled with the fact that the ratio for each company stayed below the regulatory ceilings,[70] indicated a stabilized financial leverage.

Chart 3.53 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.

Chart 3.54 Net income before tax of bills finance companies



Note: Figures from 2012 forward are on the TIFRSs basis; figures of prior years are on the ROC GAAP basis.
Source: CBC.

[68] According to the *Self-disciplinary Rule Governing Liquidity Risk Management of Bills Finance Companies*, bills finance companies should establish a mechanism to limit the 0-30 day maturity gap of NTD cash flow and develop an emergency plan in order to strengthen liquidity risk management.

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

[70] According to the *Directions for Ceilings on the Total Amounts of the Major Liabilities and Reverse Repo Transactions Conducted by Bills Houses*, which aim to reduce the operating and liquidity risks of bills finance companies, the major liabilities of a bills finance company could not exceed six times, eight times or ten times its equity depending on the level of its capital adequacy ratio of below 10%, above 10% but below 12%, or above 12%. If a bills finance company is a subsidiary of a financial holding company or its bank shareholder meets safe and sound criteria, the ceiling will be raised by an additional two times its equity. As of the end of 2019, the capital adequacy ratio of each bills finance company was above 12%, so the ceilings were capped at ten times or twelve times for each company.

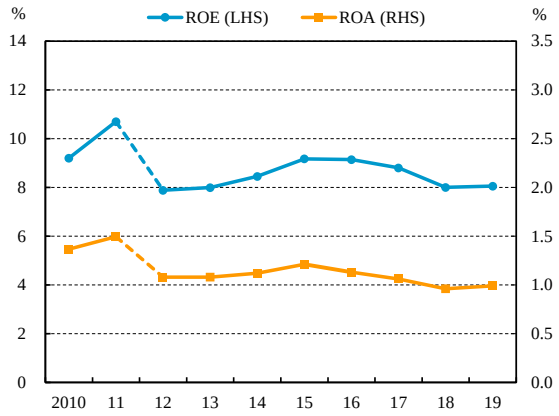
Profitability enhanced slightly

Bills finance companies posted a net income before tax of NT$10.2 billion in 2019, an increase of 4.71% year on year (Chart 3.54), mainly owing to an increase in gains from sales of bond investments. The average ROE and ROA roses lightly to 8.05% and 0.99% (Chart 3.55), respectively, reflecting slightly enhanced profitability.

Average capital adequacy ratio declined continually

The average tier 1 capital ratio and the capital adequacy ratio of bills finance companies were 12.93% and 13.37%, respectively, at the end of 2019, both lower than those of the previous year (Chart 3.56). However, the capital adequacy ratio for each company remained well above the statutory minimum of 8%.

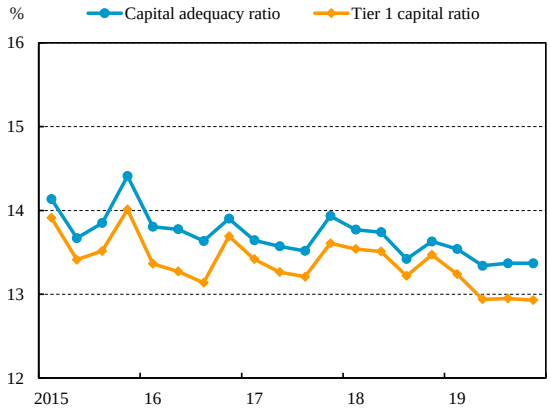
Chart 3.55 ROE & ROA of bills finance companies



Notes: 1. Figures from 2012 forward are on the TIFRSs basis; figures of prior years are on the ROC GAAP basis.
2. ROE = net income before tax/average equity.
3. ROA = net income before tax/average assets.

Source: CBC.

Chart 3.56 Average capital adequacy ratios of bills finance companies



Source: CBC.

3.3 Financial infrastructure

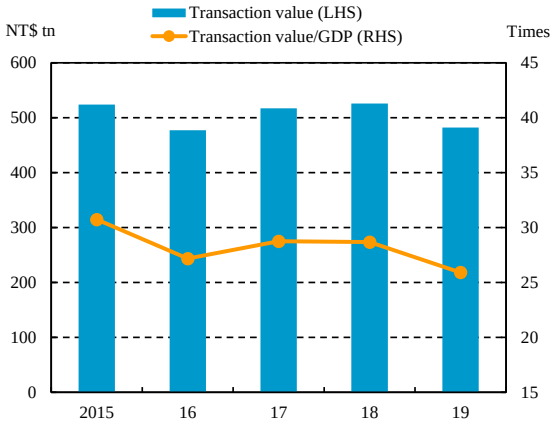
3.3.1 Payment and settlement systems

Overview of the CIFS's operation

The CIFS uses required reserves (part of central bank money) deposited in the Bank to deal with large-value interbank funds transfers. Moreover, it also provides interbank final settlement services to each clearing institution, such as those for domestic securities, bills, bonds and retail payments. In 2019, the daily average reserve balance for settlement was about NT$724.9 billion. The amount of funds transferred via the CIFS was about NT$482 trillion,[71] 25.9 times the GDP for the year (Chart 3.57).

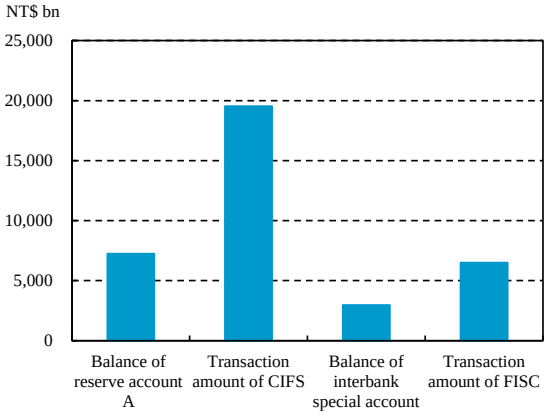
To deal with the clearing and settlement of retail interbank payment transactions[72] in the FISC's Inter-bank Financial Information System (FIS), the Bank set up an Interbank Funds Transfer Guarantee Special Account (Guarantee Account) under the CIFS as the basis to guarantee clearance of interbank payment transactions for each bank. In 2019, the daily average balance of the Guarantee Account was about NT$296.9 billion. The average daily transaction amount of the FIS using the funds of the Guarantee Account was about NT$650.8 billion (Chart 3.58).

Chart 3.57 The amount of funds transferred via the CIFS in the whole year



Sources: CBC and DGBAS.

Chart 3.58 Required reserves for inter-bank transaction settlement



Notes: 1. All data are based on daily average amount in 2019.
2. The balance of the CBC reserve account A includes the balance of the guarantee account.
3. The transaction amount of the CIFS includes financial institutions' funds transfers between the CBC reserve account A and the Guarantee Account.

Sources: CBC and FISC.

[71] The settlement amount of the CIFS declined in 2019, mainly owing to the reduction in the amount of transactions in interbank call loans, FX and CBC CDs.

[72] Including remittance, ATM cash withdrawals, and fund transfer, etc.

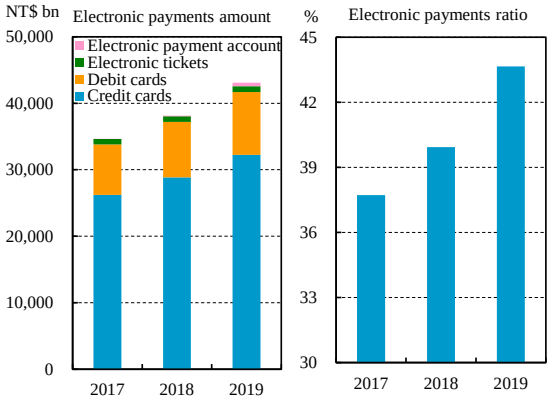
Overview of electronic retail payment transactions

In 2019, the electronic retail payment ratio continued to climb to 43.7%. Annual electronic payment amounted to approximately NT$4.3 trillion. Among the payment types, payment by credit card amounted to NT$3.2 trillion, accounting for the largest share. Electronic tickets and electronic payments account transactions amounted to NT$139.9 billion (Chart 3.59), representing a minor proportion of overall retail payments but a significant increase by 48% year on year.

In 2019, mobile payment was introduced to a wider variety of aspects of daily life. Merchants and people began to increasingly accept mobile payment, and the penetration rate exceeded 60%. Since 2017 Q4, the amount of mobile payment transactions has grown rapidly. It exceeded NT$110 billion in 2019 [73] and increased by approximately 120% year on year.

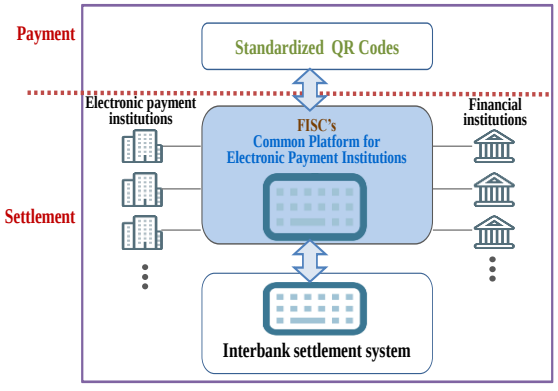
In 2017, the FISC joined hands with state-owned banks to promote standardized QR codes, an effort in line with the rising global trend of mobile payment. For long-term development, the Bank has urged the FISC to set up a "Common Platform for Electronic Payment Institutions" (Chart 3.60) based on the common QR code specifications so that banks and non-bank payment providers can connect across institutions, [74] further increasing the penetration of mobile payment. As of the end of 2019, the cumulative number of transactions conducted by scanning standardized QR codes was about 14.82 million, and the transaction amount totaled approximately NT$66.9 billion.

Chart 3.59 Overview of electronic retail payment transactions



Sources: CBC, FSC, FISC and DGBAS.

Chart 3.60 Common Platform for Electronic Payment Institutions



Source: FISC.

[73] The statistics cover 20 domestic banks. Mobile payments include the tap-to-pay payment and QR code-based payment of mobile credit cards, mobile debit cards and mobile banking.

[74] At present, the payment system provided by each electronic payment institutions and electronic ticket payment provider separately and respectively operate via its own closed system and cannot be used for inter-institutional transfer of funds. In order to be in line with the global trend, the government has planned to allow funds transfer among these institutions.

Impact of the rise of BigTechs on the payment market

The fact that in recent years, BigTechs have begun to enter the payment field could create a significant impact on the market and has thus attracted the attention of many countries (Box 2). For example, with the rise of blockchain technology, Facebook announced plans to use this technology to issue a stablecoin named Libra to provide global payment services. However, at present, there are still many challenges in the implementation of blockchain technology in practical applications,[75] whereas traditional centralized payment systems have long provided secure and efficient services. Only in the field of cross-border payment, where it involves multiple intermediaries and systems, may blockchain technology have room to develop and thrive.

3.3.2 The designation of domestic systemically important banks

To ensure sound development of the financial system and accord with international standards, the FSC established an assessment framework for D-SIBs in Taiwan based on "A framework for dealing with domestic systemically important banks" set out by the Basel Committee on Banking Supervision (BCBS) and the practices adopted by major economies. In December 2019, the FSC designated five D-SIBs,[76] including CTBC Bank, Cathay United Bank, Taipei Fubon Commercial Bank, Mega International Commercial Bank, and Taiwan Cooperative Bank, and required them to adhere to a set of enhanced supervisory measures. The requirements include: (1) holding an additional 2% regulatory capital buffer and 2% bank's internal capital buffer; (2) proposing "Contingency Plans for Business Crisis"; and (3) conducting and passing a 2-year stress test on an annual basis. Moreover, D-SIBs should actively proceed with the adjustment of their capital planning (Box 3). In response, the FSC also proposed four incentives with differentiated management for the D-SIBs,[77] so as to mitigate the impact of enhanced supervisory measures on their competitiveness.

[75] For example, it must meet some transaction requirements, such as security, speed or privacy, and also the anti-money laundering/countering the financing of terrorism (AML/CFT) regulatory requirements.

[76] The FSC excluded 100% government-owned banks from the assessment process.

[77] The four incentives include: (1) D-SIBs' applications for investments in financial-related businesses would be automatically approved if the amount of investment was under NT$50 million and in compliance with related regulations; (2) the D-SIBs would have an advantage when applying to establish new domestic branches and would be given priority when applying to set up new branches in Mainland China or foreign jurisdictions; (3) when developing business activities through pilot programs according to the *Operation Directions Governing Banks' Applications for Pilot Programs,* capital adequacy ratios may be an extra item for consideration and the approval may be fast tracked; and (4) D-SIBs would also be granted priority when applying to launch new businesses, and their application for extension of period would be automatically approved after a three-year trial period if no serious fault are committed by them.

3.3.3 Strengthening the supervision measures on life insurance companies

In order to ensure a balance among the principles of prudential insurance supervision, sound industrial development and protection of the rights and interests of policyholders, the FSC not only duly revised policy reserves interest rates for life insurance companies in accordance with market conditions, but also proposed the following measures on life insurance companies to better manage their usage of funds, adjust the structure and sales of products, reinforce the capital framework, while urging them to be successfully prepared for the IFRS 17.

Managing the usage of funds

In October 2019, the FSC stipulated that the NTD-denominated bond ETF holdings of insurance companies that invest in foreign markets should be included in their foreign asset exposures when calculating the capital charge for exchange rate risks, at a risk weight of 6.61%. In December, the FSC required that the ratings of underlying bond holdings of insurance companies' ETF investments should not be lower than 'BBB-'. In May 2020, in response to successive interest rate cuts by many central banks, the FSC issued new contract policy rates, to be applicable in the second half of 2020, for life insurance policies in various currencies so as to ensure the safe and sound operation of life insurance companies.

Adjusting the structure of products

In December 2019, the FSC revised the relevant regulations on life insurance products in order to return the purpose to protection against risks instead of parking savings, and to strengthen the product review process, credited interest rates, and post-sale management of insurance products, effective from July 1, 2020.

Correcting mis-selling sales practices induced by revenue chasing

In November 2019, the FSC, aiming to correct the insurance industry's improper sales practices induced by revenue chasing and to fulfill the principle of fair hospitality, revised the relevant regulations to ban improper solicitation behaviors of insurance companies including misleading policy holders to rescind or terminate contracts, or granting a loan or a policy loan to help pay premiums.

Reinforcing capital framework

In December 2019, with the aim of urging insurance companies to attach importance to capital structures, the FSC amended the relevant regulations, prescribing that insurance companies with an equity to asset ratio below 3% or 2% shall be ordered to put forward a plan for capital injection or for financial or business improvement within the specified period of time, effective from April 1, 2020.

Urging insurers gear up for the IFRS 17

The FSC amended the relevant regulation to urge life insurance companies to establish a stabilization mechanism for credited interest rates. In addition, the amendment sets out a list of items that insurers should examine and evaluate at their monthly credited interest rate meetings, and requires them to set aside a provision for special capital reserves when they have distributable earnings in segregated accounts. The amendment was put into effect on July 1, 2020.

3.3.4 Taiwan achieved the best result of the AML evaluation

Taiwan is a founding member of the APG and actively implemented corresponding measures in response to the third-round of APG mutual evaluation in 2018.[78] Those measures included establishing a dedicated "Anti-Money Laundering Office" under the Executive Yuan, amending nearly one hundred pieces of regulations governing AML/CFT, and strengthening financial supervision and illegal cash flow tracking.

In addition to completing four large-scale national risk assessment procedure meetings through close cooperation between the public and private sectors, concerned agencies and/or institutions examined and assessed the risk of AML/CFT and conducted a simulation evaluation. The APG Evaluation Team has been coming to Taiwan since August 2018 to hold preparatory meetings for mutual evaluation, as well as meetings for on-site evaluations and face-to-face communication.

In June 2019, the APG released a draft of its final report, stating that Taiwan reached the best "regular follow-up"[79] category. The final report passed the review by the global network and was published on October 2, 2019, assigning Taiwan the top-tier ranking for member jurisdictions in the Asia-Pacific region. The result showed that the efforts of the government

[78] Taiwan previously underwent the first two rounds of APG mutual evaluation in 2001 and 2007, respectively.
[79] See Note 16.

and the private sectors to collaboratively promote the work of AML/CFT were internationally recognized.

3.3.5 Establishing the Regulations Governing the Financial Investment, Management, and Utilization of Repatriated Offshore Funds

To attract offshore funds towards domestic financial markets and industries, boost economic development, and increase employment, the Executive Yuan approved the *Management, Utilization, and Taxation of Repatriated Offshore Funds Act* on July 24, 2019, which entered into force from August 15 onwards. Pursuant to the *Act*, the MOF, the MOEA and the FSC established related regulation[80] on taxation operation and management and utilization of financial and industrial investment, so as to ensure that the repatriated funds would be used in investing in industries and financial markets rather than for other purposes, such as speculation in the real estate market.

Among those regulations, the FSC established the *Regulations Governing the Financial Investment, Management, and Utilization of Repatriated Offshore Funds*, which entered into force on August 15, 2019. The regulations governing the scope and method of management and utilization of the repatriated offshore funds used for financial investments are shown in Table 3.3. It is expected that some of these repatriated funds would be utilized through the wealth and asset management industry, which would in turn benefit the development of financial markets in Taiwan.

Table 3.3 Key Requirements of the *Regulations Governing the Financial Investment, Management, and Utilization of Repatriated Offshore Funds*

Items	Contents
Investment cap	• 25% of the amount of the funds repatriated by deposit to the segregated FX deposit account after withholding tax.
Manner of investment	• Funds withdrawn from the segregated FX deposit account must be deposited into a segregated trust account or segregated securities discretionary account to invest. • The segregated trust account shall be an individually managed and utilized money trust, which furthermore shall be a self-benefit trust.
Scope of investment	• Domestic securities: Government bonds, and publicly offered and issued corporate bonds, financial bonds, international bonds, stock of TWSE-listed and OTC-listed

[80] Those regulations included the *Regulations Governing the Management, Utilization, and Taxation of Repatriated Offshore Funds*, the *Regulations on Industries Investment from Repatriated Offshore Funds*, and the *Regulations Governing the Financial Investment, Management, and Utilization of Repatriated Offshore Funds*, which were established by the MOF, the MOEA, and the FSC, respectively.

	companies, investment trust funds (including ETFs), futures ETFs, and exchange-traded notes (ETNs). • Hedging derivatives: TWSE-listed and OTC-listed put warrants; futures or options transactions for hedging purposes. • Insurance products: Individuals can use the funds within the limit of 3% of the segregated FX deposit account after withholding tax to buy domestic insurance products for care and protection and/or for the elderly.
Upper limit of domestic securities investment	• The total amount of investment utilizing the funds in the stock of any single listed company may not exceed 10% of the total number of issued shares of that company (5% for investment made by means of a non-discretionary money trust). • The total amount of investment utilizing the funds in the stocks and corporate bonds of any single company may not exceed 20% of the total amount of investment utilizing the funds in domestic securities (10% for investment made by means of a non-discretionary money trust).
Prohibited items	• Engaging in securities margin transactions is prohibited. • Lending or borrowing securities is prohibited. • Investing in any leveraged or inverse ETF or ETN is prohibited. • Pledging objects of the investment or providing them as security is prohibited, nor may policy loans be made on domestic insurance products.
Funds withdrawal	• Counting from the day that the funds are deposited in the segregated FX deposit account, one-third of the funds may be withdrawn after five full years, a further one-third may be withdrawn after six full years, and all may be withdrawn after seven full years.

Source: FSC.

3.3.6 FX regulation amendments

Relaxing FX regulations for banks

The Bank successively relaxed FX regulations for banks to promote development of the financial services industry in the context of financial globalization and liberalization. The regulation amendments in 2019 are as follows:

- The Bank revised the *Regulations Governing Foreign Exchange Business of Banking Enterprises* in February 2019, adding provisions relevant to the qualification criteria for internet-only banks to apply for approval to become authorized FX banks.

- In line with the amendments to the aforementioned regulations, the Bank revised related directions to expand business scopes and simplify application procedures for banks engaging in FX business with customers through electronic or communications equipment.

Relaxing FX regulations for securities firms

To conform with the policy that securities firms are allowed to issue ETNs that track underlying indices of foreign securities, the Bank stipulated in February 2019 the procedures and compliance requirements governing the application for new or additional issuance of ETNs by securities firms.

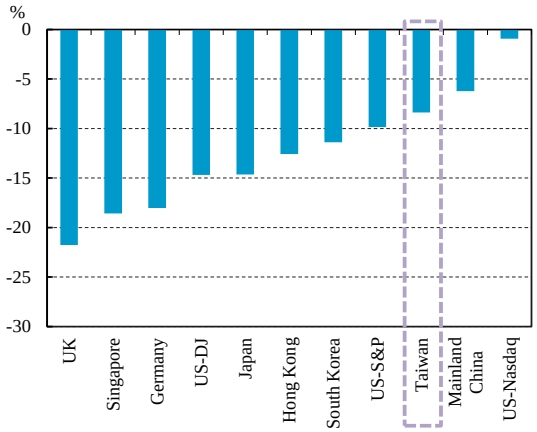
3.4 The impact of the COVID-19 pandemic on domestic financial systems

Owing to the impact of the outbreak of COVID-19 since early 2020, the global economy deteriorated and international financial markets experienced significant turmoil. Although the pandemic also affected domestic economic conditions, Taiwan was successful in fighting against COVID-19, and actively took relief and revitalization measures to mitigate the pandemic-related impacts. In addition, financial markets, financial institutions and financial infrastructures exhibited resilience. This demonstrated that the pandemic only had limited influence on Taiwan's financial system.

3.4.1 Stock indices and the NT dollar exchange rate have been relatively stable

In the beginning of 2020, the COVID-19 pandemic broke out and quickly spread to major economies, triggering dramatic volatility in global stock markets. For the first four months in 2020, stock indices in the UK stock market dropped 21.76%, and the US Dow Jones Industrial Average index fell 14.69%. In contrast, supported by the attractiveness of high-yields on Taiwanese stocks, the domestic stock indices fared relatively better. The TAIEX decreased merely by 8.38%, affected not as much by the COVID-19 crisis compared to major economies (Chart 3.61).

Chart 3.61 Changes in equity indices among major economies

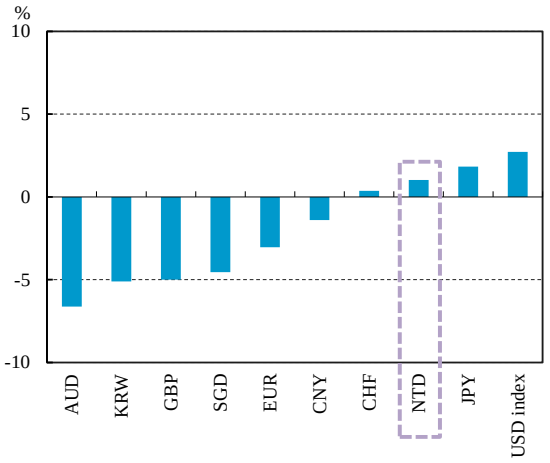


Note: Changes are figures at the end of April 2020 compared to those at the end of 2019.
Source: Bloomberg.

Turbulent financial markets reflected concerns over the global economic outlook. Hence, investors tended to invest in the US dollar to

reduce currency risk. From January to April 2020, the USD Index increased by 2.73%. Other major currencies (except JPY, NTD and CHF) also displayed depreciating trends against the US dollar. The NT dollar exchange rate against the US dollar increased by 1.02% (Chart 3.62), showing that the exchange rate was relatively stable.

Chart 3.62 Exchange rate and USD index changes in major economies



Note: Changes are figures at the end of April 2020 compared to those at the end of 2019.
Source: Bloomberg.

3.4.2 Varying degrees of impacts on financial institutions

With interest rate cuts in numerous economies in response to the COVID-19 pandemic, interest rate spreads between deposits and loans could shrank, which could undermine domestic banks' future profitability. Moreover, the asset quality of domestic banks' corporate loans to several industries could decline due to the impacts of the pandemic. However, because the government actively adopted relief and revitalization measures, the impacts of COVID-19 on domestic banks could be reduced. Under the influence of the COVID-19 crisis, the aggregate net income before tax of domestic banks was NT$81.3 billion in 2020 Q1, decreasing by 16.96% year on year[81] (Table 3.4). Furthermore, the NPL ratio increased to 0.24% compared to the end of 2019 Q4 and the NPL coverage ratio declined. A few banks received negative rating outlooks. Nevertheless, overall financial conditions and operations of domestic banks remained stable, as asset quality was satisfactory with sufficient loss provisions; in addition, capital ratios were adequate (Table 3.5). With sound risk bearing capacity, domestic banks were able to withstand financial shocks brought by the pandemic.

The massive investment portfolios of life insurance companies were inevitably influenced by the turmoil in international financial markets. However, the reduction of interest rates in many countries led market rates to decrease, which was favorable to the valuation of bond positions. In particular, the quickly narrowing interest rate spreads of the USD and the NTD helped to reduce hedging costs. In 2020 Q1, life insurance companies reported net income before tax of NT$63.3 billion, a huge year-on-year increase of 93.58% (Table 3.4), mainly driven by actively realized capital gains of stock and bond investments. Nevertheless, in March 2020, the total value of equities of these companies decreased by NT$466.7 billion or 24.18% compared to

[81] In 2020 Q1, the aggregate net income decreased mainly because of a huge reduction in investment income, especially in March, when the impact on profitability was significant.

that at the end of 2019, owing to an increase in unrealized losses on financial assets affected by the global stock market crash and the wider interest rate spreads of some corporate bonds. Moreover, the rating outlooks of some life insurance companies were revised to negative. Accordingly, the COVID-19 pandemic had quite an impact on life insurance companies. However, taking into consideration that life insurance companies have continuously injected profits as capital in recent years, the capability to overcome unfavorable impacts has enhanced. Moreover, as global stock markets strongly rebounded and interest rate spreads of corporate bonds narrowed in April 2020, the impact of the pandemic on life insurance companies would be easing.

Table 3.4 Net income before tax of major financial institutions

Unit: NT$ bn

Financial Institutions	2020/Q1	2019/Q1	Changes
Domestic banks	81.3	97.9	-16.96%
Life insurance companies	63.3	32.7	+93.58%
Bills finance companies	2.9	2.4	+20.83%

Sources: CBC and FSC.

Table 3.5 Financial conditions of domestic banks

Items	2020/Q1	2019/Q4	Changes; (pps)
NPL ratio	0.24%	0.22%	+0.02
NPL coverage ratio	568%	650%	-82
Capital adequacy ratio	14.27%	14.07%	+0.2

Source: CBC.

The major investments of bills finance companies were bill and bond holdings. After the outbreak of the COVID-19 pandemic, long-term interest rates turned low, which was favorable to the valuation of bond investments. However, there were hidden reinvestment risks. Furthermore, short-term interest rates also turned low, which was also beneficial to the long-term holdings of bills and bonds. Nevertheless, it was worth noting that future credit quality might be still affected by the pandemic. Meanwhile, bills finance companies have been profitable in recent years and have adequate capital with satisfactory asset quality. In addition, a net income before tax of NT$2.9 billion was posted in 2020 Q1, with an increase of 20.83% year on year (Table 3.4). In March 2020, the total equities of bills finance companies decreased

merely by 0.54% compared to the end of the previous year, showing that COVID-19 did not have large impacts on the industry.

3.4.3 Domestic major payment and settlement systems operated smoothly, without being affected by the COVID-19 pandemic

Important domestic financial infrastructures such as major payment and settlement systems were equipped with complete remote backup systems (including system and data backup, etc.). The CIFS and the FISC took pandemic prevention actions to cope with COVID-19 related impacts. The pandemic prevention operational system included having key operational staff working in an off-site office, as well as enhancing remote backup systems to achieve the goal of uninterrupted operations of payment systems.

In response to the crisis, in March 2020, the Bank promulgated guidance for the CIFS and open market operating systems to cope with the COVID-19 pandemic. The guidance included preparing a remote backup system in advance and activating remote operation measures, etc. These measures ensured the consistency of financial institutions participating the CBC interbank and open market operations. As a whole, domestic major payment and settlement systems operated smoothly and were not severely affected by the COVID-19 crisis.

Box 2
The Influence of BigTechs on the payment market and financial stability

In recent years, some large technology companies (BigTechs) that did not primarily provide financial services have started from payment services to provide innovative financial services such as lending, insurance, savings, and investment products. Their business scale and competitiveness have posed challenges for conventional banks, while potentially affecting financial stability in the future. The novel trend has drawn attention from international financial regulators.

1. What drives BigTechs to provide financial services

According to BIS research,[1] BigTechs have intrinsic elements such as data analytics, network externalities[2] and interwoven activities (collectively referred to as "DNA") that mutually reinforce their benefits. Such elements, combined with the provision of non-financial businesses and financial services, allow BigTechs to expand their market share in financial markets. Furthermore, BigTechs collect customer data from different sources through their original non-financial activities, and those data can be used to support the development of new businesses, generate economies of scale and scope, and reduce the cost of new business development.

2. Operating characteristics of BigTechs and conventional banks as well as the competitive-cooperative relationship between them

Conventional banks typically provide wide-ranging financial services and diversified service channels, and tend to have stable and long-term customer relationships. In comparison, BigTechs' operating characteristics include using multiple complementary business activities to quickly enhance customer engagement and having a good command of customer information, logistics, and cash flow at the same time. They can understand customer behavior and preferences from multiple aspects and have relatively flexible use of data.

The global competitive-cooperative relationship between BigTechs and conventional banks can mainly be divided into complementary cooperation or direct competition (Table B2.1), based on factors such as the penetration rates of financial services and of mobile devices, and the rigidity of financial supervision. For instance, in developed countries, where the penetration rates of financial services are high and financial supervision is stricter, BigTechs often strategically cooperate with conventional banks. On the other hand, in many emerging markets and developing countries, BigTechs tend to adopt direct

competition strategies because of lower penetration rates of financial services and relatively loose financial supervision.

Table B2.1 BigTechs and conventional banks' operating characteristics, competitive-cooperative relationship and degree of financial regulations

Items		Conventional Banks	BigTechs
Management	Financial services	Comprehensive	Increasingly diversified
	Channels	Branches; internet	Internet
	Financial technology (FinTech) capabilities	Improving gradually	Strong
Customer relationship	Sources	Via promotion or walk-in customers	Extending from non-financial activities
	Relationship building	Based on long-term relations	Using multiple complementary activities to quickly improve customer engagement
	Data source	Focused on financial side (e.g., cash flow)	Multi-faceted, including customer information, logistics, and cash flow
	Use of data	Strict regulatory limits (e.g., *Personal Data Protection Act*)	More flexible
Relationship with conventional banks		—	Cooperation or direct competition
Degree of financial regulation		Highly regulated	Increasing regulated (e.g., on market entry for banking business)

Source: CBC.

3. Major changes that BigTechs may cause are in the payment market

In terms of market capitalization, BigTechs is far superior to FinTech companies (e.g., PayPal) with the latter being smaller in scale and usually focusing on one specific field (e.g., payment, lending, etc.), and even large international financial institutions may find it difficult to compete with BigTechs. If BigTechs successfully apply their "DNA" competitiveness to the payment market and get hold of privacy-related cash flow data, they will be able to comprehensively analyze individual consumer habits to enhance their competitive advantages. Therefore, BigTechs may bring about structural changes in the payment market and even monopolize the market.

4. Risks and impacts arising from BigTechs regarding financial stability

With BigTechs entering the field of financial services, they could improve the efficiency of financial services, enhance the competitiveness and fairness of financial products pricing, prompt conventional banks to strengthen their financial innovation capabilities, and promote financial inclusion. However, if BigTechs continue to expand their financial

services footprint, they may bring about the following impacts on financial stability:

4.1 Conventional banks with weakening profitability may be forced to conduct risky activities

The increasing competition between BigTechs and conventional banks could jeopardize the profitability of conventional banks. In order to maintain profit levels, banks might engage in more risky activities and take excessive risks.

4.2 High connectedness between conventional banks and BigTechs could increase the instability of the financial system

Some banks are becoming gradually more reliant on BigTechs to offer third-party services, which will increase operational and information security risks, the complexity of the financial system, and the possibility of risk contagion, and in turn compromise stability of the financial system as a whole.

4.3 The expansion of BigTechs could bring about too-big-to-fail risks

When the scale of BigTechs directly providing financial services develops to a certain extent, their operational or financial failure may have a wide-ranging impact on the overall financial system, even jeopardizing the economy, and pose too-big-to-fail risks.

4.4 A dramatic expansion in payment services by BigTechs could weaken the soundness of conventional banks' balance sheets

Once BigTechs successfully extend the payment services to their existing user bases, the deposits of commercial banks held by those users may be converted into electronic money or other forms of instruments on a large scale. As a result, it could weaken the soundness of banks' balance sheets and undermine the liquidity and financial stability of the banking system.

4.5 BigTechs may bring about risks such as data privacy and fair competition concerns

It is not unusual for BigTechs to violate the privacy of users in data storage and usage. If they further capture the key cash flow information, it could pose major risks to personal privacy. In addition, BigTechs may use their competitive advantages such as business scales and technologies to engage in unfair competition or adopt pricing models that are unfavorable to consumers.

5. Currently, the development of BigTechs has not caused significant impacts on financial stability in Taiwan

While BigTechs have entered the domestic financial services sector, mainly in providing mobile payment services, they have not yet caused any major threat to the banking industry or undermined financial stability in Taiwan. Nevertheless, relevant competent authorities should pay attention to their future development and propose appropriate supervision policies in a timely manner in line with the principle of "same business, same risks, same rules," and should strengthen the communication and cooperation with foreign supervisors, so as to reduce possible adverse effects.

Notes: 1. BIS (2019), "*Big tech in finance: opportunities and risks," BIS Annual Economic Report 2019*, June.

2. "Network externality," also known as network effects, refers to the phenomenon when the value of a product depends on the overall number of users in the market. The more users a product has, the higher the value or benefit for new users, and thus the more attractive it becomes.

Box 3
The designation of domestic systemically important banks and their future capital planning

To enhance financial stability and accord with international standards, the FSC designated five domestic banks as the domestic systemically important banks (D-SIBs) in December 2019, and then adopted strengthened sup ervisory measures to improve their loss-absorbing capacity. However, most of them have not met the supervisory requirements and they may face pressure to increase capital in the future, which warrants close attention.

1. The development of D-SIBs identification in Taiwan

To resolve the "too-big-to-fail" problem, the Basel Committee on Banking Supervision (BCBS) issued "A framework for dealing with domestic systemically important banks"[1] in October 2012 and recommended that national authorities should develop their own assessment indicators and weighting system in the D-SIBs methodology. Banks should be required to improve loss-absorbing capacity in accordance with the degree of their systemic importance.

Following the aforementioned framework set out by the BCBS and the actual practices adopted by major economies, the FSC established an assessment framework for D-SIBs in Taiwan. The methodology in the framework identified four categories of factors: size, interconnectedness, substitutability, and complexity (Table B3.1). Meanwhile, the FSC amended the *Regulations Governing*

Table B3.1 Assessment framework for D-SIBs in Taiwan

Category (weighting)	Indicators	Indicator weighting
Size (25%)	Total assets	25%
Interconnected-ness (25%)	Interbank related assets	8.33%
	Interbank related liabilities	8.33%
	Securities outstanding	8.33%
Substitutability (25%)	Deposits and remittances	6.25%
	Outstanding balance of loans	6.25%
	Clearing and settlement volumes	6.25%
	Custodian services	6.25%
Complexity (25%)	Trading and available-for-sale financial assets	6.25%
	Nominal amount of OTC derivatives	6.25%
	Cross-jurisdictional activity	6.25%
	Intra-group interaction	6.25%

Source: FSC.

Table B3.2 Enhanced supervisory measures for D-SIBs in Taiwan

Items	Requirements
Additional Capital requirements	• 2% additional regulatory capital buffer: supervisory measures on inadequate capital in the *Banking Act* are applied to D-SIBs. • 2% bank's internal capital buffer: not a statutory standard; D-SIBs are only required to include this rule into their internal management.
Contingency plans	• D-SIBs are required to report to the FSC and the CDIC their "Contingency Plans for Business Crisis" (including emergency actions in the event of capital shortage).
Stress Test	• D-SIBs are mandated to conduct and report 2-year stress test results to competent authorities according to the principles of supervisory review in Pillar II of the Basel III.

Source: FSC.

the Capital Adequacy and Capital Category of Banks in December 2019 and designated five D-SIBs, including CTBC Bank, Cathay United Bank, Taipei Fubon Commercial Bank, Mega International Commercial Bank, and Taiwan Cooperative Bank. To improve D-SIBs' loss-absorbing capacity and mitigate the negative impacts incurred by the failure of D-SIBs on the financial system, the FSC required them to follow a set of enhanced supervisory measures, including: (1) holding an additional 2% regulatory capital buffer and 2% bank's internal capital buffer; (2) proposing "Contingency Plans for Business Crisis"; and (3) conducting and passing a 2-year stress test on an annual basis (Table B3.2).

The requirement of 2% additional regulatory capital buffer has been included in the *Regulations* mentioned in the preceding paragraph. If the D-SIBs fail to hold the minimum capital, they will be subject to supervisory measures governing inadequate capital in the *Banking Act*. In addition, the requirement of 2% bank's internal capital buffer is not a statutory standard. Therefore, it is not included in the calculation of D-SIBs' consolidated capital adequacy ratios and not used to judge if a bank passes the 2-year stress test.

2. *D-SIBs in Taiwan should actively proceed with the adjustment of their capital planning*

Since the additional regulatory and bank's internal capital buffer must be supported by common equity Tier 1 (CET 1) capital, the minimum requirements of CET 1 ratio, Tier 1 capital ratio and capital adequacy ratio for D-SIBs will rise to 11.0%, 12.5% and 14.5%,[2] respectively. To facilitate D-SIBs' capital planning, the FSC allowed them to calibrate the annual increase evenly in capital ratios within four years after the designated date. However, the outbreak of the COVID-19 pandemic earlier this year seriously impacted the domestic economy and financial markets. To promote the financial intermediary function of domestic banks, the FSC agreed that the implementation of the requirement of 2% bank's internal capital buffer for D-SIBs could be postponed to a year later[3] to assist them in conducting various relief and reviltalization programs (Table B3.3). According to the data at the end of 2019, most of the capital ratios of the five D-SIBs did not meet the minimum standard after the

Table B3.3 Minimum standard of D-SIBs' capital adequacy ratios within the adjustment period

Adjust-ment period	CET1 ratio (%)	Tier 1 capital ratio (%)	Total capital ratio (%)
1st year	7.5	9.0	11.0
2nd year	8.5	10.0	12.0
3rd year	9.5	11.0	13.0
4th year	10.5	12.0	14.0
5th year	11.0	12.5	14.5

Source: FSC.

adjustment period, and those banks should actively adjust their capital planning in the next five years so as to meet the enhanced supervisory requirements.

3. Conclusion

Owing to the small difference in the size of domestic banks, the enhanced supervisory measures for D-SIBs will increase their operating costs. In the medium and long term, they may be able to adopt some prudential strategies for business growth as a response, such as adjusting the structure of risk-weighted assets or modifying their dividend policy under a balanced consideration between capital accumulation and disposition of earnings. Nonetheless, if their profits cannot further improve, the business performance may be affected, posing significant challenges to these D-SIBs.

Alternatively, the competent authority may consider reviewing the components of indicators as well as the weighting system in the D-SIBs methdology on a regular basis. If in need, the methdology should be adjusted or revised properly according to the outcome of the trial calculation.

Notes: 1. BCBS (2012), "A framework for dealing with domestic systemically important banks," October.
2. The minimum standards of CET 1 ratio, Tier 1 capital ratio and capital adequacy ratio for non-D-SIBs are 7%, 8.5%, and 10.5%, respectively.
3. The 2% additional regulatory capital buffer will be calibrated equally from 2020 to 2023, while the 2% bank's internal capital buffer will be calibrated equally from 2021 to 2024.

IV. Measures to promote financial stability and respond to the COVID-19 pandemic

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

4.1.1 Measures taken by the Bank to bolster financial stability

In view of stable domestic economic growth and mild inflation outlook, the Bank held policy rates unchanged in 2019. Moreover, the Bank continued to implement restrictions on high-price housing loans in consideration of their higher price volatility. The Bank also continued to adopt flexible FX rate policies to maintain dynamic stability of the NT dollar exchange rate and duly review relevant FX regulations.

Adopting appropriate monetary policies in response to domestic and global economic and financial conditions

Taking into account the steady global economic growth and an uncertain outlook for the international economy and trade, coupled with a slightly negative output gap, a stable inflation outlook, and domestic nominal and real interest rates ranking in the middle level compared to those in major economies, the Bank kept policy rates unchanged in 2019. The discount rate, the rate on accommodations with collateral, and the rate on accommodations without collateral remained at 1.375%, 1.75%, and 3.625%, respectively.

In 2019, the excess reserves in all financial institutions remained at an ample level. The total loans and investments in the banking sector grew by 4.71%, while the monetary aggregate M2 increased by 3.46% year on year. Both rates were higher than the GDP growth rate of 2.71%, indicating that market liquidity was sufficient to support economic activity.

The Bank will continue to closely monitor price conditions, the output gap, as well as changes in global and domestic economic and financial conditions, and undertake appropriate monetary policies to maintain price stability and financial stability, thereby fostering economic growth.

Continuing to regulate high-price housing loans

Since June 2010, the Bank has actively adopted a series of targeted prudential measures for real estate loans, which have achieved results since their implementation. At present, except for high-price housing loans, most measures have been removed and mortgage-related credit risk management returned to rely on self-discipline of banks. In the future, the Bank will continue to monitor financial institutions' credit risk management of real estate loans and the developments in the real estate market, and undertake appropriate policy actions in a timely manner as needed to ensure financial stability.

Adopting flexible FX rate policies to safeguard the dynamic stability of the NT dollar exchange rate

As Taiwan is a small open economy that is highly interconnected in trade with other economies, the Bank adopts a managed float exchange rate regime to contain sharp fluctuations in the exchange rate. Under this regime, the exchange rate of the NT dollar is in principle decided by market forces. Nevertheless, when seasonal factors (such as massive inflows or outflows of short-term capital) 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, aptly maintain FX market order.

In the event of excessive exchange rate volatility caused by movements of large international short-term capital flows, the Bank would conduct "leaning against the wind" operations to stave off adverse implications for economic and financial stability and to enhance FX market efficiency.

Additionally, the Bank continued to undertake appropriate management measures in 2019 to safeguard FX market order and promote its sound development. These measures mainly included: (1) taking hold of the updated transaction information in the FX market through the Real-Time Reporting System for Large-Amount FX Transactions; (2) reinforcing examination efforts made to ensure that forward transactions were based only on actual transactions; (3) urging authorized banks to enhance their exchange rate risk management, thereby reducing FX exposures of individual banks and systemic risk in the FX market; and (4) strengthening targeted examinations on 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 2019 onwards, the FSC continued promoting the development of the financial industry, enhancing financial inclusion and encouraging financial technology (FinTech) innovation. Additionally, the FSC undertook several measures to preserve financial stability as follows: (1) enacting regulations governing the identification of D-SIBs and enhancing supervisory measures; (2) strengthening supervision on the product structure, sales and capital adequacy of the insurance industry; (3) promulgating regulations regarding the financial investment of repatriated offshore funds; (4) reinforcing capital requirements, anti-money laundering (AML) and corporate governance of domestic banks; and (5) enhancing the efficiency of financial inspection and supervisory reporting.

Amending the regulations governing capital requirements on investments by domestic banks in financial related enterprises

With a view to keeping the capital adequacy calculation of domestic banks in line with international standards, the FSC amended the regulations governing capital requirements on a bank's investments in financial related enterprises and eligible debt instruments issued by global systemically important banks (G-SIBs) for total loss-absorbing capacity (TLAC) instruments in January 2020. The investments mentioned above will be divided into important investments and non-important investments, which are determined by the threshold of 10% shareholding and applied to the methods of "cross-threshold exclusion" or "applicable capital exclusion." The investments may be excluded from the calculation of a bank's regulatory capital or included in the calculation of risk weighted assets according to the threshold applied.

Strengthening AML measures of innovative FinTech experimentation

Given that different innovative FinTech experimentations should comply with different AML regulations, the FSC promulgated the *Regulations Governing Anti-Money Laundering and Countering Terrorism Financing of Financial Technology Innovative Experimentation* in May 2019, stipulating that applicants should establish related operational procedures, including due diligence measures on participants, ongoing due diligence measures, policies and procedures for cross-border remittance, internal control and audit systems for AML, and reports of suspicious transactions.

Continually reinforcing corporate governance and internal audit systems for financial institutions

(1) To achieve transparent disclosure of major ownership information and financial reports, the FSC amended shareholding reporting related regulations in December 2019, requiring majority shareholders to report beneficial owners/persons with ultimate control when reporting their shareholding information. Moreover, the FSC amended the regulations governing preparation of financial reports in March 2020, requiring issuers to disclose the names, numbers of shares held, and shareholding percentages of shareholders who hold 5 percent or more of the issuer's equity in quarterly financial reports.

(2) The FSC amended regulations regarding public offering and issuance prospectuses, in January 2020, and annual reports of public companies, in March, respectively. The amendments require a public company to give explanations regarding the reasonableness and necessity when the chairperson of the board of directors and the general manager (or the person of an equivalent position) are the same person, spouses, or relatives within the first degree of kinship, and to disclose the remuneration paid to each individual director and supervisor under specific conditions.[82]

(3) The FSC continually promoted risk-based internal audit systems and supported the Bankers Association to introduce internal audit self-discipline guidelines for foreign branches and subsidiaries and to implement audit performance evaluation for the insurance industry.

Enhancing the efficiency of financial inspection and supervisory reporting

(1) In view of digitalization of financial services and establishment of internet-only banks, the FSC set up an audit task force to prepare related work to focus on during examinations, introduced an automatic application programming interface (API) reporting system, and facilitated a digital examination process.

(2) In October 2019, the FSC promulgated the *Directions on the Defects of Filing Regulatory Data by the Domestic Banks* to enhance the quality of supervisory reporting by giving demerit points if a bank delays or makes mistakes when filing regulatory data.

(3) The FSC started a program of digital supervisory reporting system in October 2019. Under the program, it would set up a digital supervisory reporting platform and data warehouse

[82] Includes companies that have posted after-tax deficits within the recent 3 fiscal years, poor corporate governance evaluations and lower average annual salaries of the full-time non-supervisory employees.

system with a step-by-step plan divided into three stages including internet-only banks, bills finance companies and domestic banks.

4.2 Taiwan's responses to the COVID-19 pandemic

In response to the impact of the COVID-19 pandemic on the domestic economy and society, Taiwan announced in February 2020 the *Special Act for Prevention, Relief and Revitalization Measures for Severe Pneumonia with Novel Pathogens* and launched an NT$1.05 trillion "Relief package 2.0," providing various types of assistance from the three major aspects of pandemic prevention, relief, and revitalization (Table 4.1).

Table 4.1 Summary of NT$1.05 trillion "Relief package 2.0" of the Executive Yuan

Items	Amount	Details
Special Budget	NT$210 billion	• The upper limit of the special budget was increased from NT$$60 billion to NT$210 billion. Moreover, the upper limit could be raised by NT$210 billion (yet to be submitted to the Legislative Yuan) to NT$420 billion, depending on the pandemic situation in the future. • Allocation of the NT$210 billion special budget: the MOEA, NT$97.5 billion; the MOHW, NT$36.5 billion; the MOL, NT$31 billion; the MOTC, NT$30.9 billion; and other ministries, NT$14.1 billion.
Funds and Disbursement Through Reprioritization	NT$140 billion	• Ministerial funds: the MOL, the MOTC, the Ministry of Education and the Council of Agriculture, with a total of NT$52.6 billion. • Special funds: the National Development Fund and the Small & Medium Enterprise Credit Guarantee Fund (SMEG), totaling NT$60 billion. • Advance procurement: The public construction budget totaling NT$12 billion. • Reprioritization: NT$15.4 billion.
Bailout Loans	NT$700 billion	• Loan amounts: the Bank provided NT$200 billion (up to NT$400 billion depending on the pandemic situation) through the special accommodation facility; the postal savings fund and government-owned banks provided relief funds of NT$500 billion (in addition, each domestic bank has its own bailout loan program). • Loan assistance: The MOEA and the MOTC would assist enterprises in obtaining funding through the SMEG's guarantee, as well as providing corporate and personal interest subsidies.

Sources: Executive Yuan and related ministries.

In addition, in order to reduce the impact of the pandemic, the Bank cut the policy rate by 25 bps in March 2020 and undertook measures to support liquidity in the financial system and sustain stability of the FX market. Meanwhile, the FSC adopted a number of measures to stabilize financial markets. Other ministries also introduced various response measures.

4.2.1 Monetary policy

To help enterprises affected by the COVID-19 pandemic to return to normal operations and to prevent massive capital flows from affecting financial stability, the Bank has implemented major measures since March 2020 as follows:

1. Cutting policy rates: the discount rate, the rate on accommodations with collateral, and the rate on accommodations without collateral were reduced to 1.125%, 1.50%, and 3.375%, respectively.

2. Providing a special accommodation facility to support bank credit to SMEs: the Bank provided banks with a total amount of NT$200 billion (set at an annual interest rate of 0.1%), in order to support credit extensions to SMEs. The accommodation facility mechanism can be categorized into three schemes A, B and C, according to eligible borrowers, amount, interest rate and collateral (Table 4.2).

Table 4.2 The Bank launched the special accommodation facility to support bank credit to SMEs

Items	Scheme A	Scheme B	Scheme C
Eligible borrowers	SMEs (including small business entities)	SMEs (including small business entities)	Only small business entities[1]
Amount	Maximum: NT$2 million per borrower	Maximum: NT$6 million per borrower	Maximum: NT$500,000 per borrower
Interest rate	Not exceeding 1%	Not exceeding 1.5%	Not exceeding 1%
Collateral	The Small and Medium Enterprise Credit Guarantee Fund provides more than 90% credit guarantee.	Collateral[2] required by banks	The Small and Medium Enterprise Credit Guarantee Fund provides 100% credit guarantee.

Notes: 1. Small business entities refer to those for-profit businesses that have tax registration with a sales amount not reaching NT$200,000 in any given month since January 2020.
2. Collateral means those listed in Article 12 of the *Banking Act*.
3. As of May 21, 2020, the approved loan amounts for Scheme A, B, and C were NT$6.63 billion, NT$7.22 billion, and NT$15.41 billion, respectively, with a total of NT$29.26 billion.

Source: CBC.

4.2.2 Measures for financial market stability

Main measures taken by the Bank

To provide the financial system with sufficient liquidity and maintain FX market stability, the Bank took response measures as follows:

(1) In order to keep market liquidity at an accommodative level, the Bank decreased the

issuance of CDs in a timely manner so as to reduce sterilized funds.

(2) Banks with funding demand are able to use their holdings of CDs issued by the Bank to request early withdrawal or to obtain funds from the Bank with CDs as collateral whenever necessary.

(3) In case of emergency, the Bank's expanded repo facility, introduced in 2008 at the onset of the GFC, could also be applied.

(4) The Bank paid close attention to cross-border capital flows and acted in line with its mandate to maintain an orderly FX market and safeguard financial market stability.

Main measures taken by the FSC

To orderly maintain the stability of securities exchange markets and protect the interests of investors, the FSC took the following response actions from March 19, 2020 onwards:

(1) Lowering the cap on total securities borrowing and lending (SBL) short selling volume during trading sessions.

(2) Expanding the scope of collateral to cover margin deficiency.

(3) Requiring that if the closing price of the listed securities and Taiwan depositary receipts falls by more than 3.5%, then on the following trading day the investors are not permitted to engage in regular or SBL short selling at a price lower than the closing price of the previous trading day.

(4) Encouraging listed companies to buy back treasury shares in a timely manner to protect the interests of shareholders and enhance investors' confidence.

4.2.3 Providing relief loans, subsidy schemes and tax assistance

The "Relief package 2.0" was mainly employed by the ministries and commissions under the Executive Yuan in supportive measures, such as relief loans and various subsidy schemes for affected corporates and individuals, and the MOF also put easing tax burden measures into practice to provide related tax assistance as follows:

- FSC: through rating and rewarding, lowering loan provisioning ratios, decreasing deposit insurance premium rates and other measures, the FSC encouraged financial institutions to

take strong steps to implement relief measures [83] put forward the ministries and commissions of the central government. In addition, the FSC urged the banking industry to provide loan assistance to enterprises and individuals affected by the COVID-19 pandemic.

- MOF: the MOF urged government-owned banks to continue to extend policy loans to enterprises and provide assistance of relief loans to SMEs, micro-enterprises and individuals; moreover, interest rates of mortgages and consumer loans were reduced further. The MOF also cut taxes and deferred reporting and payment periods of corporate and individual income taxes.

- MOL: the MOL took measures to help unemployed workers to find jobs and/or to participate in public services, to subsidize self-employed business owners, to initiate youth employment stabilization plans, to implement a program that offer part-time jobs in public sectors, to provide labor relief loans, etc.

- Various government agencies, including the MOEA, MOHW, MOTC: the government approved a wide-range of relief packages, providing loan assistance to enterprises, individuals or groups affected by the pandemic. There were also subsidies for business operations, loan interest payments, taxes, payroll and expenses, etc.

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

In 2019, Taiwan's financial markets and infrastructure maintained normal operation and sound development in the context of a slowing economy and mild inflation both domestically and abroad, while financial institutions experienced large increases in profitability, good asset quality and higher capital levels. Overall, Taiwan's financial system remained stable. In such a stable economic and financial environment, the Bank adopted appropriate monetary, credit and FX policies, while the FSC continued to revamp financial regulations and enhance financial supervision measures so as to guide the sound operations of financial institutions and promote financial stability.

Since the beginning of 2020, the outbreak of the COVID-19 pandemic disrupted global supply chain operations, greatly weakened the momentum of international trade and consumer demand, and triggered volatility in global financial markets. These circumstances, coupled with the collapse in oil prices, US-China trade dispute uncertainty, geopolitical conflicts, and other

[83] As of May 26, 2020, domestic banks had taken over one million borrowers of relief loans, with a total amount of NT$925.5 billion. Among them, around 680 thousand borrowers with NT$735.8 billion were approved.

factors, resulted in a sharp increase in domestic and international economic downside risks. In order to mitigate the impact of the COVID-19 pandemic on Taiwan's economy and financial system, Taiwan's government agencies (including the Bank) have consecutively launched various relief measures, such as revitalization programs, financing assistance, and market stabilization, which would help to keep labor market strong and support the momentum of economic growth, thereby promoting financial stability.

Considering that the COVID-19 pandemic has not yet eased and that international economic and financial developments are still surrounded by many uncertainties, the Bank will continue to pay close attention to the impacts of relevant subsequent developments on domestic economic and financial conditions so as to take pertinent response measures in a timely manner to promote financial stability.

Appendix: Financial soundness indicators[84]

Table 1: Domestic Banks

Unit: %

Items \ Year (end of year)	2014	2015	2016	2017	2018	2019
Earnings and profitability						
Return on assets (ROA)	0.77	0.73	0.66	0.66	0.68	0.70
Return on equity (ROE)	11.62	10.65	9.23	9.03	9.34	9.49
Net interest income to gross income	59.34	60.85	60.04	60.03	59.33	56.59
Non-interest expenses to gross income	50.15	52.62	52.01	52.74	51.55	51.30
Gains and losses on financial instruments to gross income	14.11	9.60	11.37	14.85	11.23	18.78
Employee benefits expenses to non-interest expenses	57.50	55.90	56.29	56.75	57.15	56.76
Spread between lending and deposit rates (basis points)	1.42	1.44	1.38	1.36	1.35	1.32
Asset quality						
Non-performing loans to total loans	0.25	0.24	0.27	0.28	0.24	0.22
Provision coverage ratio	502.87	547.66	503.45	490.59	573.67	650.30
Capital adequacy						
Regulatory capital to risk-weighted assets	12.35	12.93	13.33	14.17	13.99	14.07
Tier 1 capital to risk-weighted assets	9.60	10.33	10.97	11.78	11.86	12.08
Common equity Tier 1 capital to risk-weighted assets	9.38	10.03	10.50	11.19	11.19	11.32
Capital to total assets	6.85	7.12	7.37	7.35	7.50	7.72
Non-performing loans net of provisions to capital	-3.86	-3.03	-2.49	-2.18	-1.86	-1.78
Leverage ratio	-	5.90	6.29	6.42	6.56	6.71
Liquidity						
Customer deposits to total loans	130.89	136.21	137.25	138.76	135.75	137.27
Liquid assets to total assets	13.17	12.18	10.55	9.75	9.46	9.05
Liquid assets to short-term liabilities	18.32	16.85	14.98	13.37	13.36	12.53
Liquidity coverage ratio	-	125.13	125.81	r 134.54	133.89	134.82
Net stable funding ratio	-	-	-	-	132.44	132.71

[84] For more details, please refer to CBC (2017), "Explanatory notes: Compilation of financial soundness indicators," *Financial Stability Report*, May.

Table 1: Domestic Banks (cont.)

Unit: %

Items \ Year (end of year)	2014	2015	2016	2017	2018	2019
Credit risk concentration						
Household loans to total loans	48.67	49.79	50.10	50.93	51.16	51.64
Corporate loans to total loans	44.32	43.74	43.79	43.63	43.80	43.36
Large exposures to capital	42.21	36.97	34.74	31.88	28.95	27.46
Gross asset positions in financial derivatives to capital	15.61	16.62	12.33	6.29	6.92	6.95
Gross liability positions in financial derivatives to capital	15.53	17.35	12.67	7.76	9.36	8.16
Sensitivity to market risk						
Net open position in foreign exchange to capital	2.69	2.91	4.21	3.95	3.78	3.20
Foreign-currency-denominated loans to total loans	21.22	21.55	20.80	20.35	20.14	20.67
Net open position in equities to capital	24.33	22.52	21.73	21.42	22.51	24.56
Foreign-currency-denominated liabilities to total liabilities	29.01	30.58	29.49	26.31	29.21	26.57

Notes: 1. Figures for "Return on assets"and "Return on equity" are based on the daily average assets and daily average equity.
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. Figures for "Capital adequacy" are on the Basel III basis.
4. Figures for "Leverage ratio" and "Liquidity coverage ratio" are published from 2015, while figures for "Net stable funding ratio" are published from 2018.
5. Figures for "Large exposures" are revised to the total amount of credit to the first 20 private enterprises at domestic banks after integration.
6. Figures with "r" are revised data.

Table 2: Non-financial Corporate Sector

Units: %, times

Items \ Year (end of year)	2014	2015	2016	2017	2018	2019
Total liabilities to equity						
TWSE-listed companies	101.77	94.29	98.33	100.07	99.48	104.61
OTC-listed companies	76.76	76.26	82.52	82.73	82.36	88.55
Return on equity						
TWSE-listed companies	14.78	13.73	14.38	15.81	14.92	12.62
OTC-listed companies	12.21	10.36	10.39	10.44	13.02	12.23
Net income before interest and tax / interest expenses (times)						
TWSE-listed companies	13.38	13.45	13.18	13.60	11.18	9.35
OTC-listed companies	14.50	12.75	12.59	12.88	16.23	15.99

Note: Data of TWSE-listed and OTC-listed companies are from TEJ.

Table 3: Household Sector

Unit: %

Items \ Year (end of year)	2014	2015	2016	2017	2018	2019
Household borrowing to GDP	r 81.91	r 81.54	r 81.57	r 83.43	r 85.26	86.74
Borrowing service and principal payments to gross disposable income	r 43.31	r 45.70	r 46.32	r 46.67	r 45.07	44.98

Notes: 1. Figures for "gross disposable income" are the sum of household disposable income, rent expense and interest expense.
2. Figure of "gross disposable income" for 2019 is a CBC estimate.
3. Figures with "r" are revised data.

Table 4: Real Estate Market

Unit: index, %

Items \ Year (end of year)	2014	2015	2016	2017	2018	2019
Land price index	115.07	119.28	118.91	117.24	100.22	100.74
Residential real estate loans to total loans	28.04	28.96	29.35	29.82	29.73	29.44
Commercial real estate loans to total loans	14.70	15.87	16.60	17.54	17.78	17.73

Note: The land price index is published semiannually, and the reference dates are the end of March and September, respectively, while these figures are based on end-September data every year (March 2013 = 100).

Table 5: Market Liquidity

Unit: %

Items \ Year (end of year)	2014	2015	2016	2017	2018	2019
The turnover ratio of trading value in stock market	84.63	77.54	64.60	78.40	92.55	80.36
The monthly average turnover ratio in bond market	8.64	7.67	6.62	5.10	4.25	3.68

Notes: 1. The turnover ratio in terms of trading value in stock market is the cumulative figure of the period.
2. The monthly average turnover ratio in bond market is the average figure of the period.

Abbreviations

ABS	Australian Bureau of Statistics
AI	Artificial intelligence
AML	Anti-money laundering
APG	Asia/Pacific Group on Money Laundering
APRA	Australian Prudential Regulation Authority
ASEAN-10	Association of Southeast Asian Nations
BCBS	Basel Committee on Banking Supervision
BigTechs	Large technology companies
BICRA	Banking Industry Country Risk Assessment
BIS	Bank for International Settlements
BNM	Bank Negara Malaysia
BOJ	Bank of Japan
BOK	Bank of Korea
BOT	Bank of Thailand
BPS	Basis points
BSI	Banking system indicator
CBC	Central Bank of the Republic of China (Taiwan)
CDs	Certificates of deposits
CET 1	Common Equity Tier 1
CFT	Countering the financing of terrorism
CIFS	CBC Interbank Funds Transfer System
COVID-19	Coronavirus disease 2019
CP	Commercial paper
CPI	Consumer price index
DBUs	Domestic banking units
DGBAS	Directorate-General of Budget, Accounting and Statistics of the Executive Yuan
DJIA	Dow Jones Industrial Average

D-SIBs	Domestic systemically important banks
ECB	European Central Bank
ETF	Exchange-traded fund
ETNs	Exchange-traded notes
EU	European Union
FATF	Financial Action Task Force
FDIC	Federal Deposit Insurance Corporation
Fed	Federal Reserve System
FinTech	Financial technology
FIS	Financial information system
FISC	Financial Information Service Co., Ltd.
FSA	Financial Services Agency, Japan
FSC	Financial Supervisory Commission
FSS	Financial Supervisory Service, South Korea
FX	Foreign exchange
GAAP	Generally accepted accounting principles
GDP	Gross domestic product
GFC	Global financial crisis
G-SIBs	Global systemically important banks
HKMA	Hong Kong Monetary Authority
IFRS	International Financial Reporting Standard
IIF	Institute of International Finance
IMF	International Monetary Fund
JCIC	Joint Credit Information Center
JPY	Japanese yen
KOSPI	Korea Composite Stock Price Index
LCR	Liquidity coverage ratio
LTV	Loan-to-value
MAS	Monetary Authority of Singapore
MLF	Medium-term lending facility
MOEA	Ministry of Economic Affairs
MOF	Ministry of Finance
MOHW	Ministry of Health and Welfare

MOI	Ministry of the Interior
MOL	Ministry of Labor
MOTC	Ministry of Transportation and Communications
MPI	Macro-Prudential Indicator
MSCI	Morgan Stanley Capital International
NCD	Negotiable certificates of deposit
NMI	Non-Manufacturing Index
NPL	Non-performing loan
NSFR	Net stable funding ratio
NTD	New Taiwan dollar
OBUs	Offshore banking units
OPEC	Organization of the Petroleum Exporting Countries
OTC	Over-the-counter
PBC	People's Bank of China
PPS	Percentage points
QE	Quantitative easing
RBC	Risk-based capital
Repo	Repurchase agreement
RMB	Renminbi
ROA	Return on assets
ROC	Republic of China
ROE	Return on equity
SBL	Securities borrowing and lending
SET	Stock Exchange of Thailand
SMEs	Small and medium enterprises
SMEG	Small & Medium Enterprise Credit Guarantee Fund
SSE	Shanghai Stock Exchange
TAIEX	Taiwan Stock Exchange Weighted Index
TEJ	Taiwan Economic Journal Co., Ltd.
TIFRSs	Taiwan-IFRSs
TLAC	Total loss-absorbing capacity
TPEx	Taipei Exchange
TPEX	Taipei Exchange Capitalization Weighted Stock Index

TWSE	Taiwan Stock Exchange
USD	US dollar
VaR	Value at risk
VIX	Chicago Board Options Exchange Volatility Index
WPI	Wholesale price index
WTI	West Texas Intermediate

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