III. Financial system assessment

3.1 Financial markets

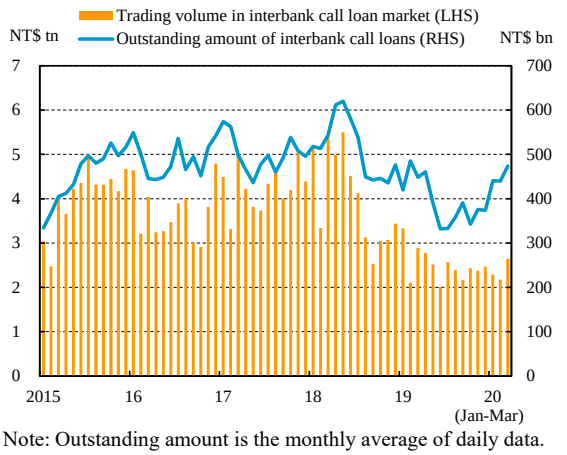
With respect to money and bond markets from 2019 onwards, the interbank call loan market contracted, while the primary bill market expanded and the bill trading volume in the secondary market decreased moderately. The outstanding amount of bond issuance also increased, while the turnover rate of outright 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

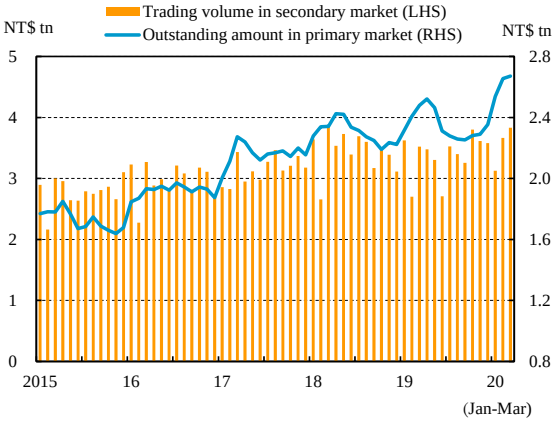
The outstanding amount of bill issuance in the primary market reached NT$2.35 trillion at the end of 2019, increasing by 5.85% year on year, owing to the expansion in treasury bill and CP issuance. In 2020 Q1, the outstanding amount of bill issuance continued to grow because of the increase in the issuance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

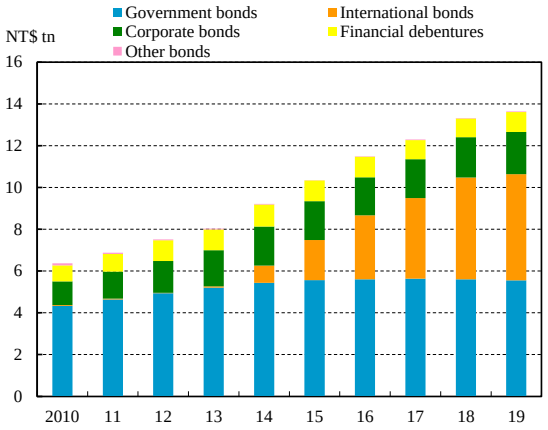
At the end of 2019, the outstanding amount of bond issuance stood at NT$13.64 trillion and increased slightly by 2.35% year on year. Analyzed by categories, the annual growth rate of international bond issuance [48] dropped significantly to 4.41% from 26.23% a year earlier, owing to reasons that the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

Chart 3.2 Primary and secondary bill markets



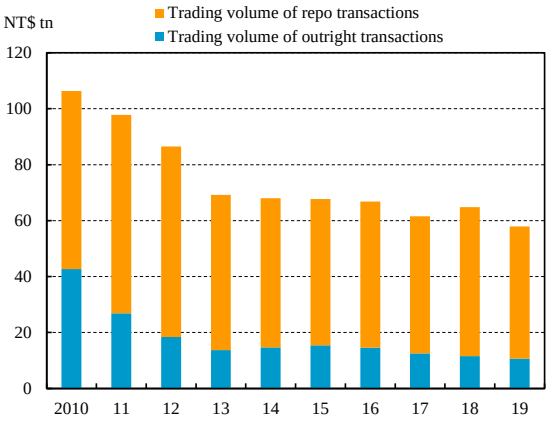
Source: CBC.

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

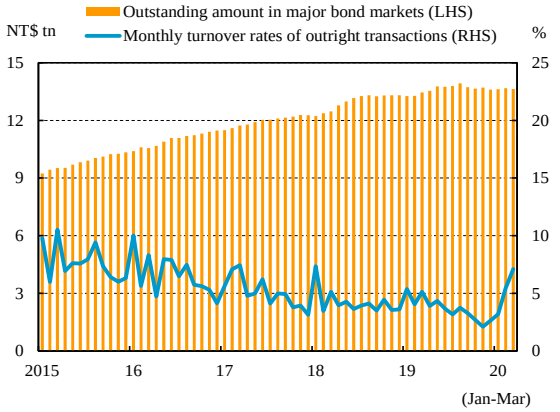


Source: CBC.

[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

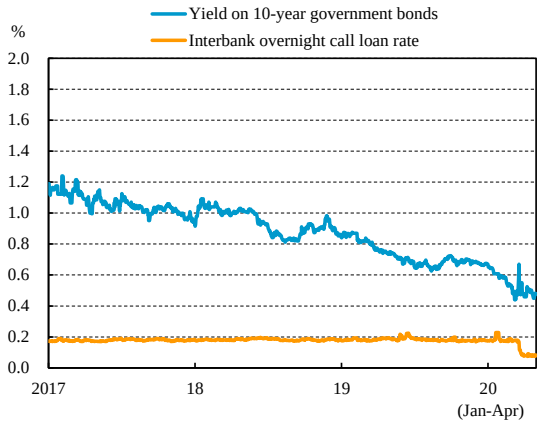


Notes: 1. Major bonds include government bonds, international bonds, corporate bonds, and financial debentures.
2. Monthly turnover rate = trading value in the month/ average outstanding amount of bonds issued. Average outstanding amount of bonds issued = (outstanding amount at the end of the month +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

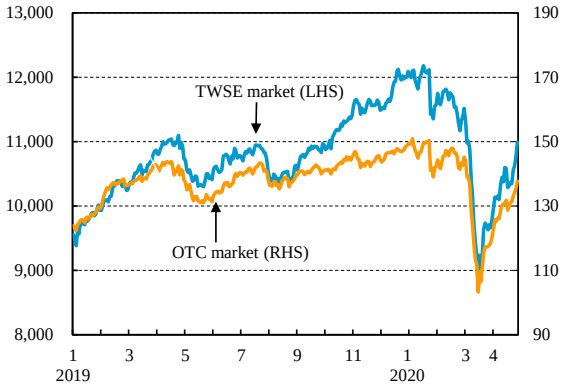
3.1.2 Equity markets

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).

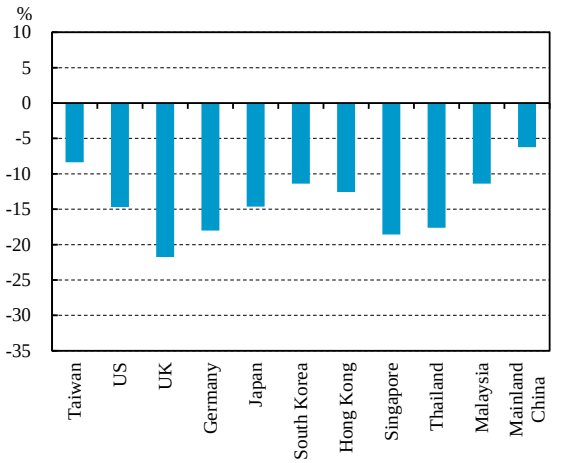
In the beginning of 2020, the TAIEX continued fluctuating at a high level. Nevertheless, in late January, the COVID-19 pandemic led to a huge decline in the TWSE market. Coupled with a collapse in crude oil prices and the US stock crash in March, the TWSE market plunged. Afterwards, the TAIEX rebounded 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).

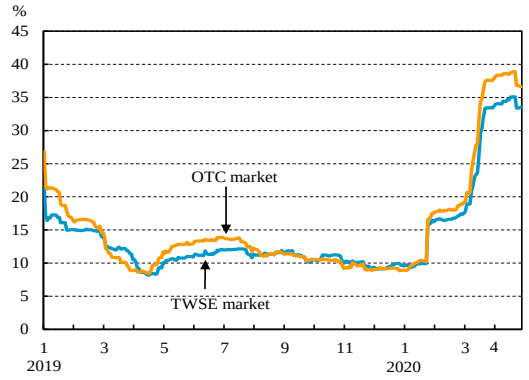
The COVID-19 pandemic caused volatility in the stock markets to increase sharply

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

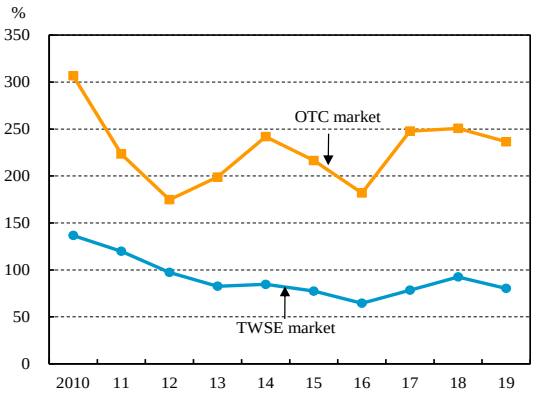
The annual turnover rates in terms of trading value in both the TWSE and the OTC markets fell to 80.36% and 236.49%, respectively (Chart 3.10), still higher than many major stock markets around the world. This showed that Taiwan's stock market liquidity remained high (Chart 3.11). The annual turnover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



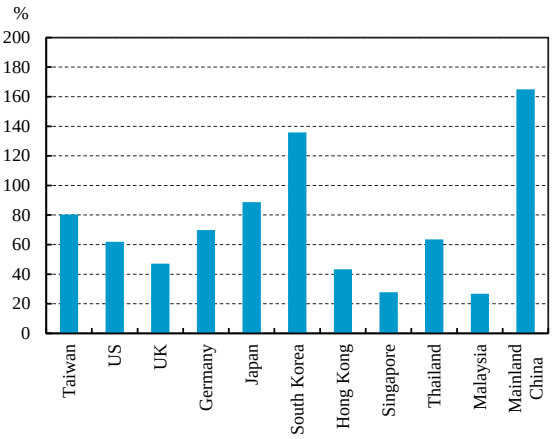
Note: Volatility refers to the annualized standard deviation of 60-day daily index returns.
Sources: TWSE, TPEx and CBC.

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

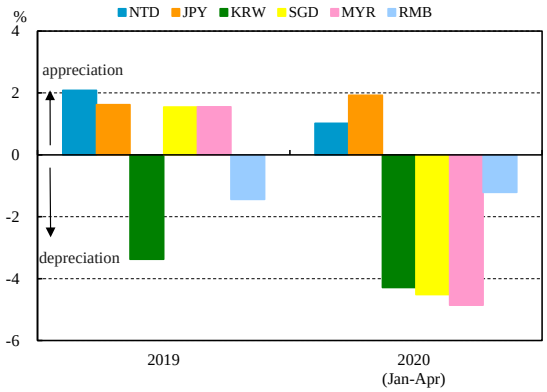
In the first four months in 2019, the NT dollar exchange rate against the US dollar fluctuated within a narrow range. From May onwards, owing to the intensified US-China trade dispute, the NT dollar depreciated. However, the NT dollar turned to appreciate against the US dollar from September and stood 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

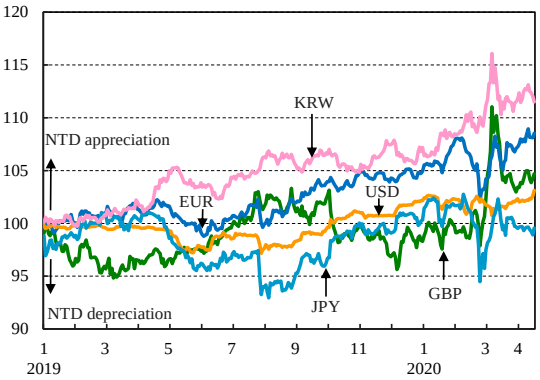
Source: CBC.

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



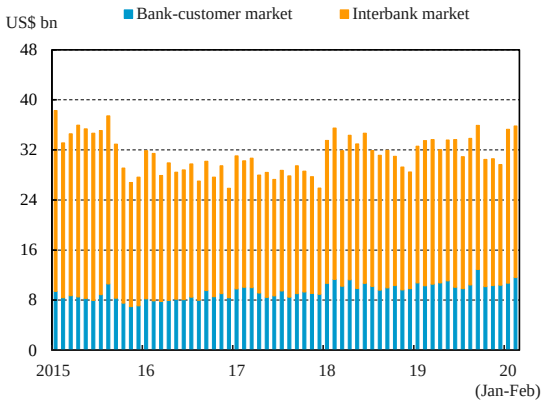
Note: December 28, 2018 = 100.
Source: CBC.

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

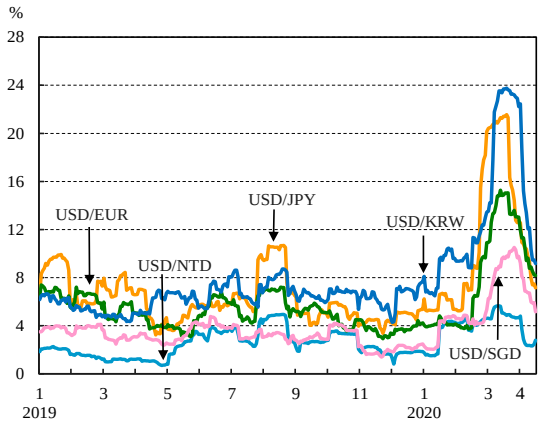
Volatility in the NT dollar exchange rate against the US dollar shifted between 0.70% and 4.94% and registered an annual average of 2.39% in 2019. However, global financial markets fluctuated dramatically during January to April 2020 because of the huge impacts of COVID-19, with surging volatility in 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



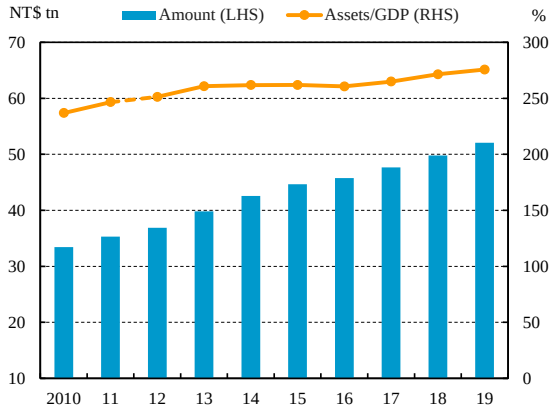
Note: Volatility refers to the annualized standard deviation of 20-day daily returns.
Source: CBC.

3.2 Financial institutions

3.2.1 Domestic banks

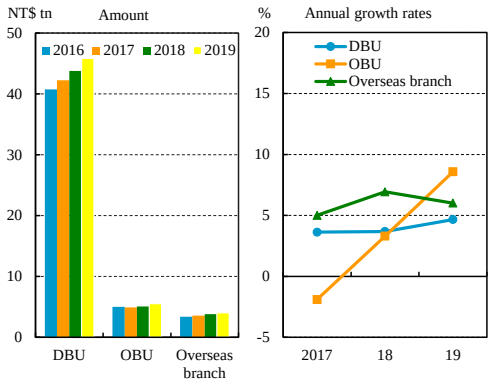
Owing to the growth in loans, the total assets of Taiwan's 37 domestic banks[49] continually expanded in 2019. Asset quality improved, and concentration in corporate loans decreased mildly while credit exposures to real estate loans increased slightly. Since prices in the real estate market remained 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).

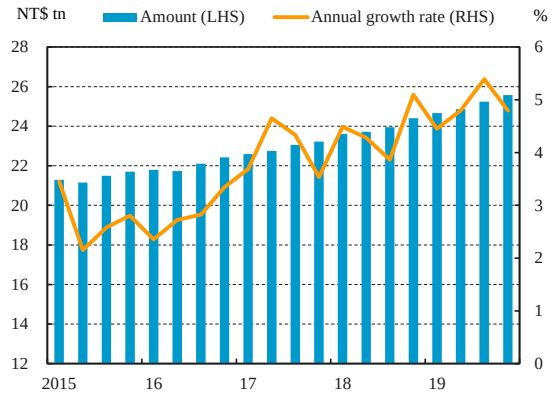
[49] Includes Agricultural Bank of Taiwan.
[50] Mainly because due from the Central Bank and commercial banks as well as interbank call loans of branches in the US and Hong Kong largely decreased.

Credit risk

Customer loans growth slowed

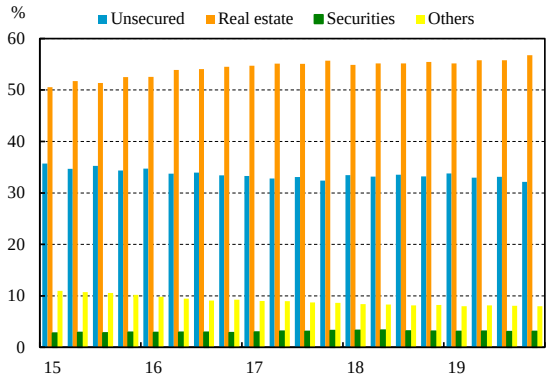
Customer loans granted by the DBUs of domestic banks stood at NT$25.57 trillion at the end of 2019, accounting for 49.12% of total assets, with the annual growth rate decreasing to 4.80% (Chart 3.19). Among them, the annual growth rate of household borrowing slightly rose to 5.77% owing to a steady increase 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).

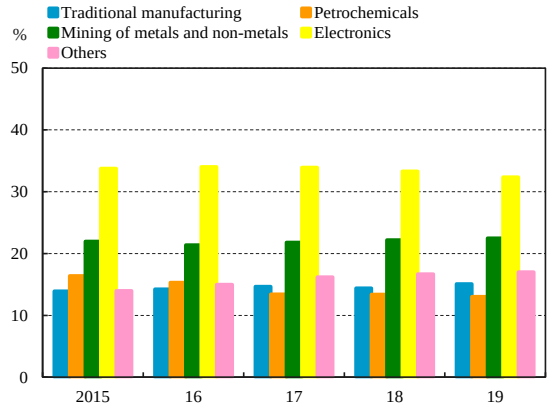
In 2019, the trading volume in the housing market grew and housing prices trended upwards. Nonetheless, the pressure stemming from unsold new residential properties remained a concern. In addition, owing to the COVID-19 outbreak in early 2020, housing market sentiment turned conservative. Banks should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

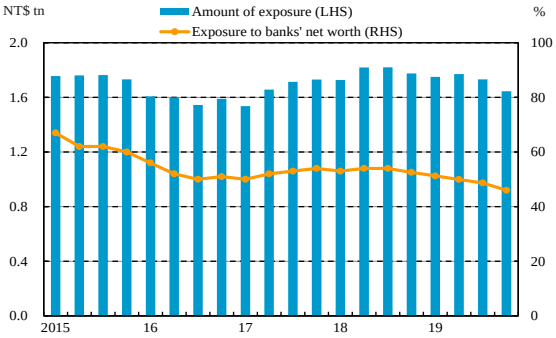


Notes: 1. Exposure to each sector = loans to each sector/loans to the whole manufacturing sector.
2. Exposures of OBUs and overseas branches were excluded.
Source: CBC.

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).

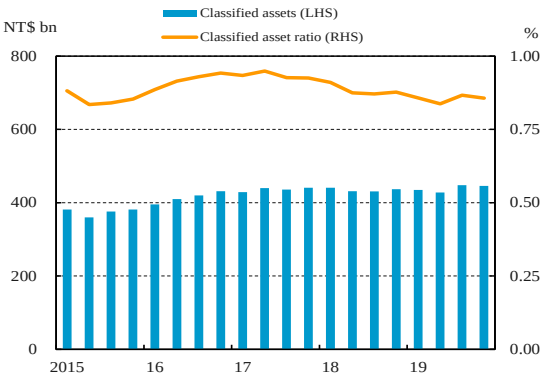
Chart 3.22 Exposures to Mainland China by domestic banks



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.

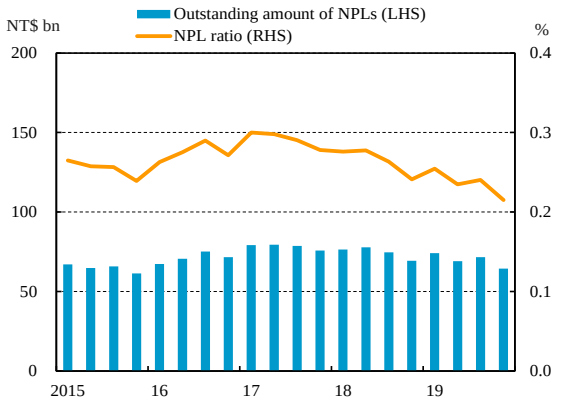
have a greater impact on Taiwan. Therefore, domestic banks should closely monitor the developments in Mainland China's economic and financial conditions and prudently manage the risks of such exposures.

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.

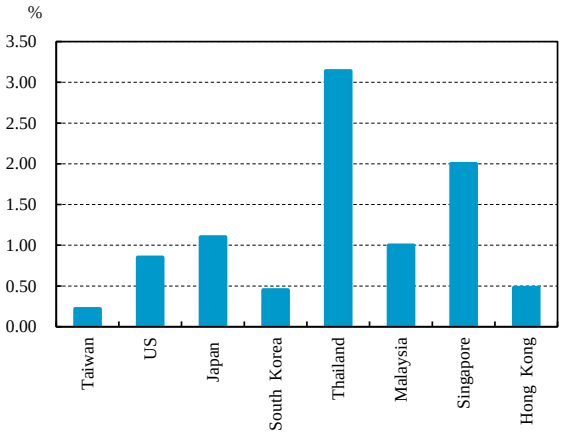
The outstanding NPLs of domestic banks registered NT$64.5 billion at the end of 2019, decreasing by 7.08% from the previous year. The average NPL ratio decreased to a historical low of 0.22% (Chart 3.24), and was much lower than those in the US and neighboring Asian countries (Chart 3.25).

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.

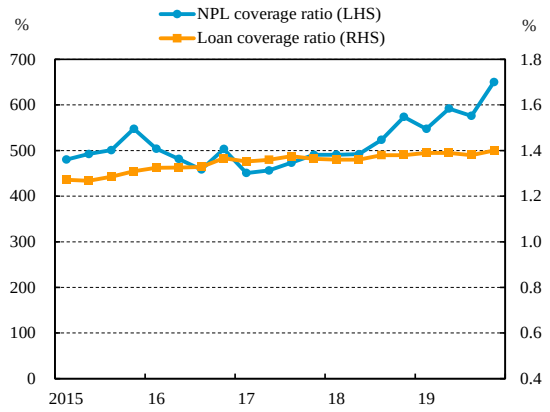
At the end of 2019, owing to the continued increase in provisions and the decrease in NPLs, the loan coverage ratio and the NPL coverage ratio rose to 1.4% and 650.3%, respectively (Chart 3.26). This indicates that the overall capability of domestic banks to cope with potential loan losses has improved.

[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

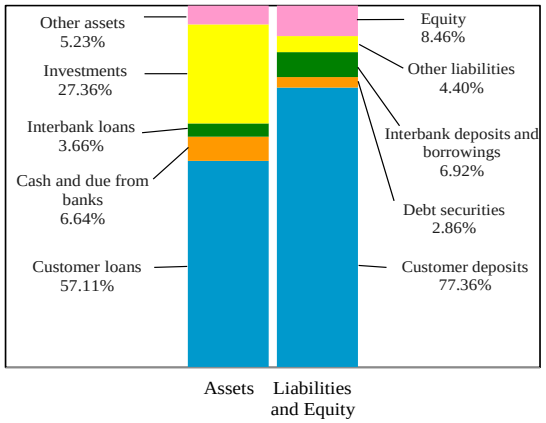
According to the estimation mentioned above, the total VaR would lead to a decrease of 0.22 pps in the average capital adequacy ratio of domestic banks, causing the ratio to drop from the current 14.07% to 13.85%. Nevertheless, it would still be higher than the statutory minimum of 10.5%.

Liquidity risk

Liquidity in the banking system remained ample

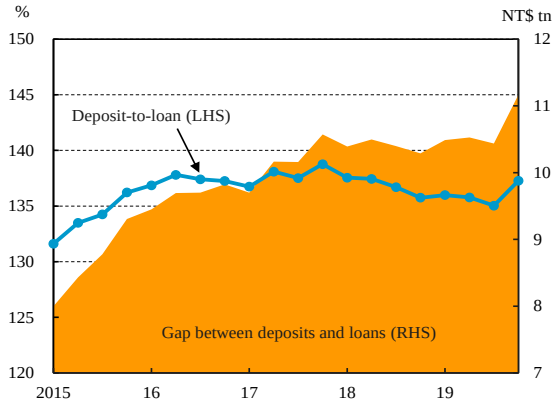
The assets and liabilities structure of domestic banks remained roughly unchanged in 2019. For the sources of funds, relatively stable customer deposits still made up the largest share of 77.36% of the total, while for the uses of funds, customer loans accounted for the biggest share of 57.11% (Chart 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.

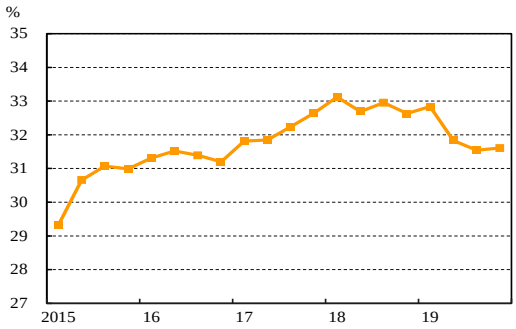
Moreover, the average liquidity coverage ratio (LCR) and net stable funding ratio (NSFR) of domestic banks were 135% and 133%, respectively, at the end of 2019, implying that the overall liquidity risk of domestic banks was relatively low.

Profitability

Profitability increased significantly

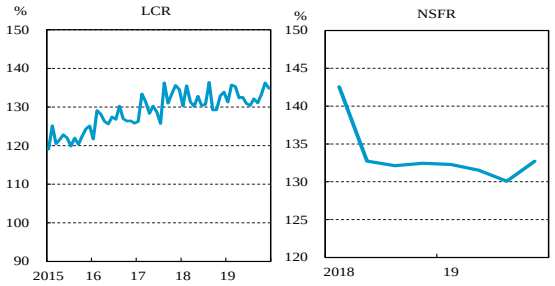
In 2019, the net income before tax of domestic banks rose to NT$362.1 billion, significantly increasing by 7.94% year on year and reaching a 10 year high (Chart 3.31). The rise was mainly caused by an increase in investment revenue. The average ROE and ROA of domestic banks went up to 9.49% and 0.70%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

Chart 3.29 Liquid reserve ratio of domestic banks



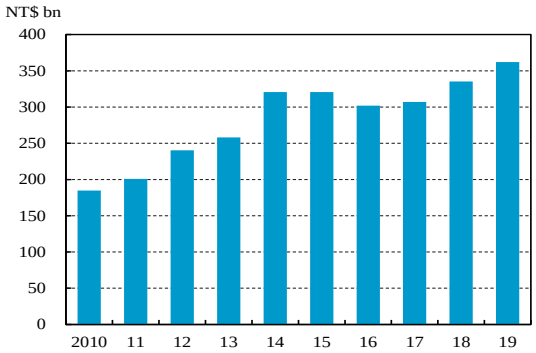
Note: Figures are the average daily data in the last month of each quarter.
Source: CBC.

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.

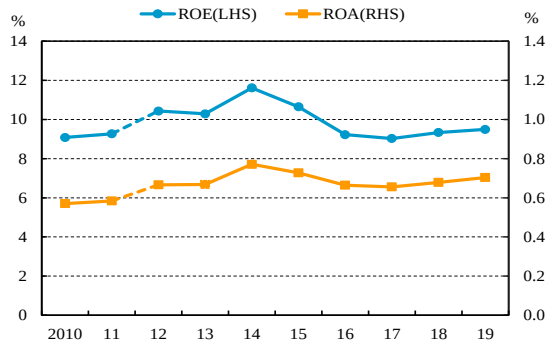
profitability. Compared to selected Asia-Pacific economies, the average ROE and ROA of domestic banks were only higher than those of South Korea and lagged behind those of most other countries (Chart 3.33).

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

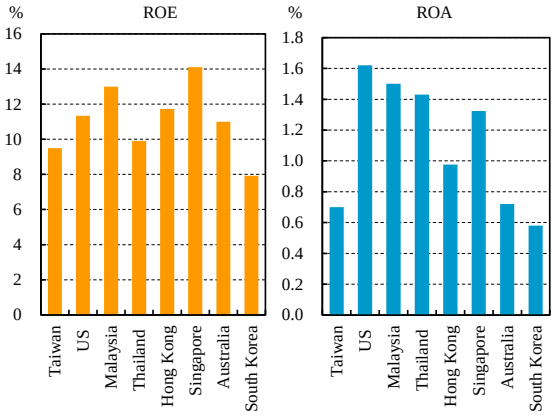
Although profitability of domestic banks increased in 2019, the interest rate spread between their deposits and loans fell to 1.32 pps from the previous year (Chart 3.35) owing to the increase in large low-rate loans offered to government-owned and private enterprises by some banks. The decline in interest 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



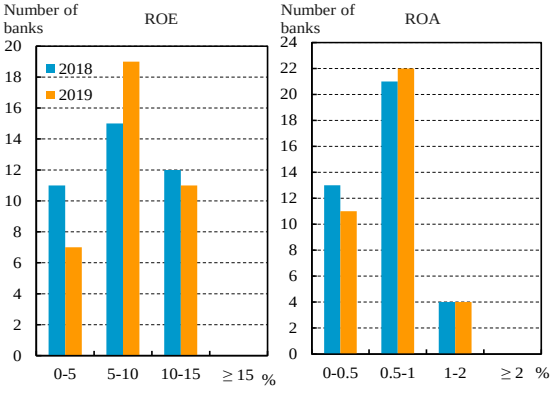
Notes: 1. ROE = net income before tax/average equity.
2. ROA = net income before tax/average total assets.
Source: CBC.

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.

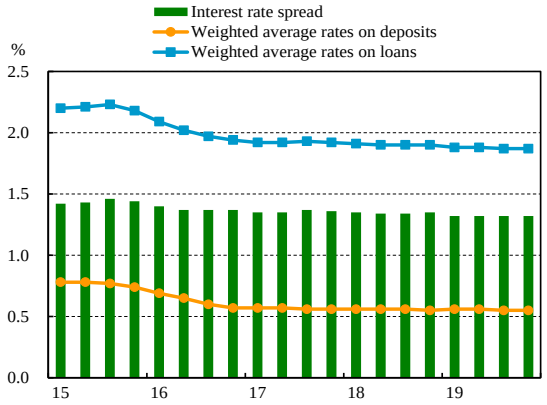
posed a serious threat to domestic banks or impacted financial stability; however, relevant authorities should still pay attention to their development and propose timely supervision response measures (Box 2).

Capital adequacy

Capital ratios trended upward

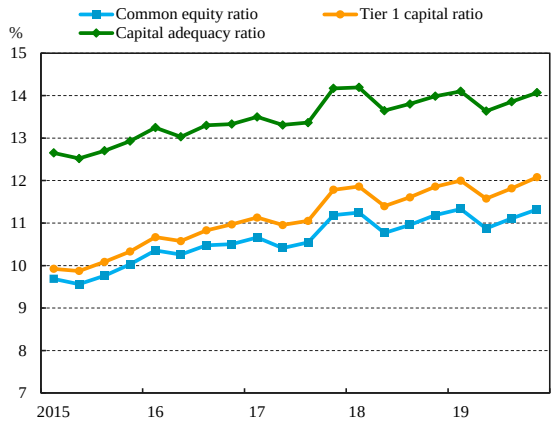
In 2019 Q2, owing to seasonal factors such as cash dividends declared and paid, the average capital ratios of domestic banks declined slightly. Afterwards, boosted by capital injections with cash and the revaluation of land, issuance of subordinated debts, and accumulated earnings, all capital ratios 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.

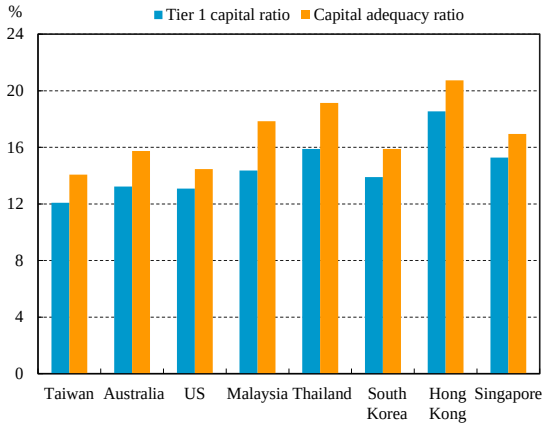
Further broken down by components of regulatory capital, common equity Tier 1 (CET 1) capital, featuring the best loss-bearing capacity, accounted for 80.48% of eligible capital. This showed that the capital quality of domestic banks was satisfactory.

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



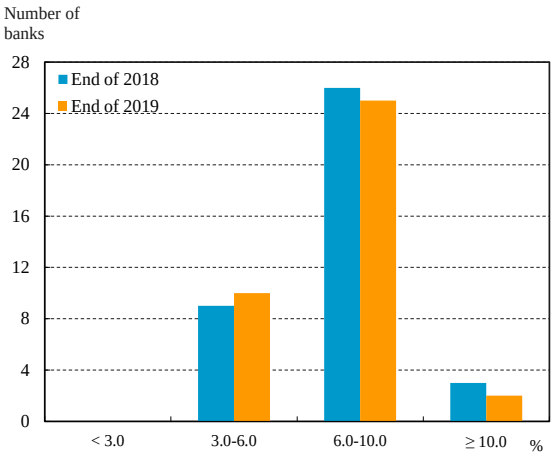
Note: Figures are as of the end of 2019.
Sources: CBC, APRA, FDIC, BNM, BOT, FSS and IMF.

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

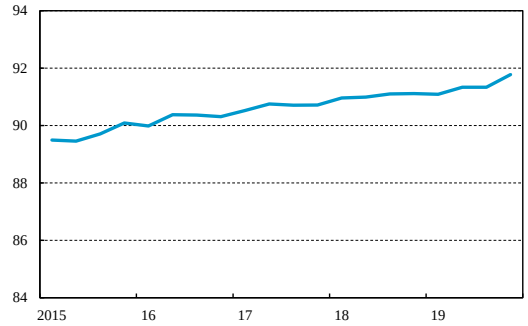
The total assets of life insurance companies reached NT$29.39 trillion at the end of 2019,

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

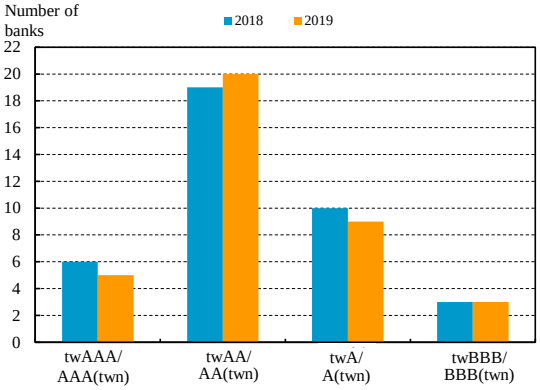
Sources: Standard & Poor's and Fitch Ratings.

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.

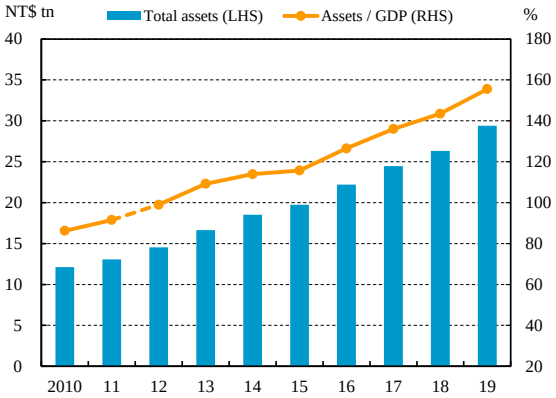
Sources: Taiwan Ratings Corporation and Fitch Ratings.

[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

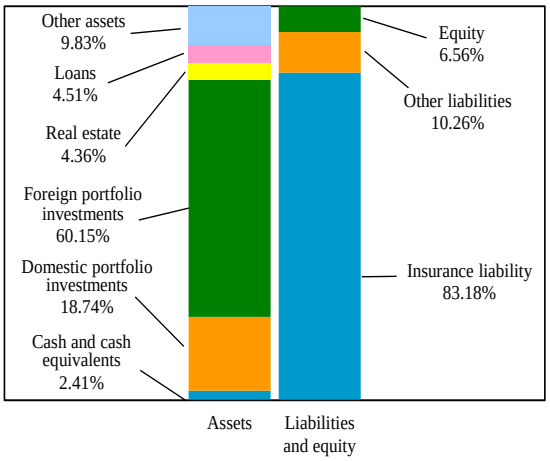


Note: Figures from 2012 forward are on the TIFRSs basis; figures of prior years are on the ROC GAAP basis.
Sources: FSC and DGBAS.

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]

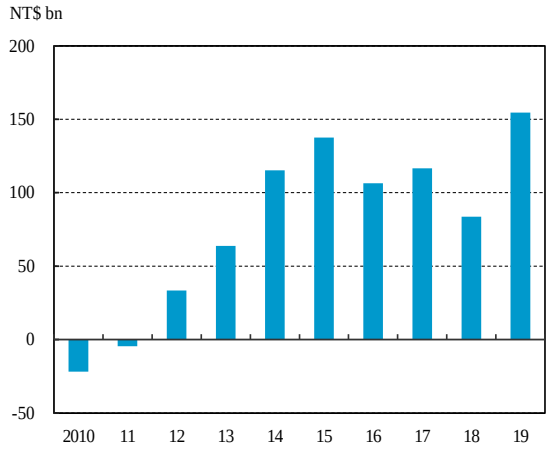
Overall credit ratings remained stable[64]

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

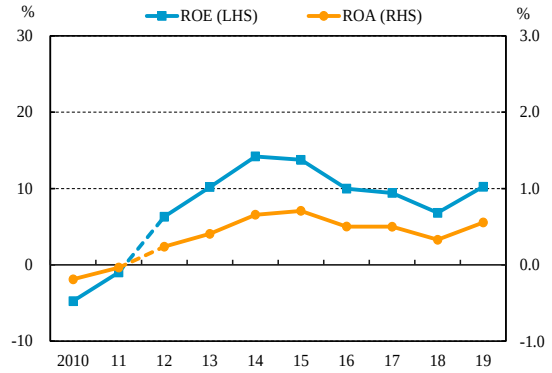
Foreign portfolio positions of life insurance companies grew continually and reached NT$17.68 trillion at the end of 2019, of which more than 90% was invested in USD-denominated financial products. With regard to FX risk, life insurance companies actively used derivative financial instruments and accelerated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

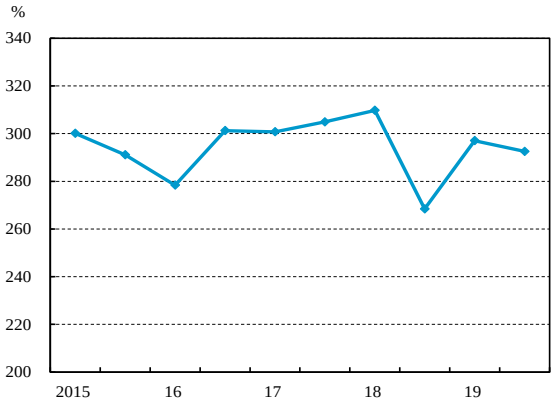
[64] The majority of rated life insurance companies received issuer ratings from the Taiwan Ratings Corp.; therefore, this section is based primarily on the Taiwan Ratings' rating (tw~), and secondarily on the ratings by other credit rating agencies.

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.

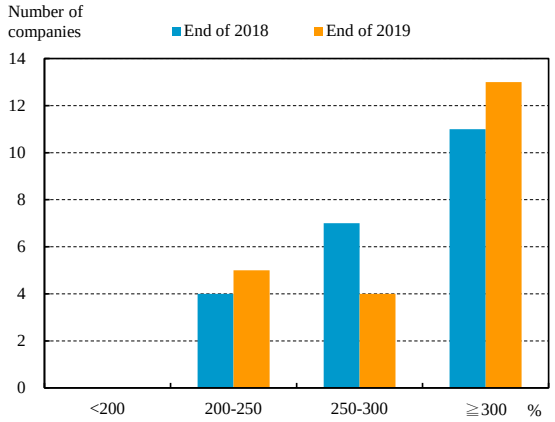
In the foreign portfolio of insurance companies, securities investments constituted the largest share, of which about 90% was invested in bills and bonds and 10% in

Chart 3.45 RBC ratio of life insurance companies



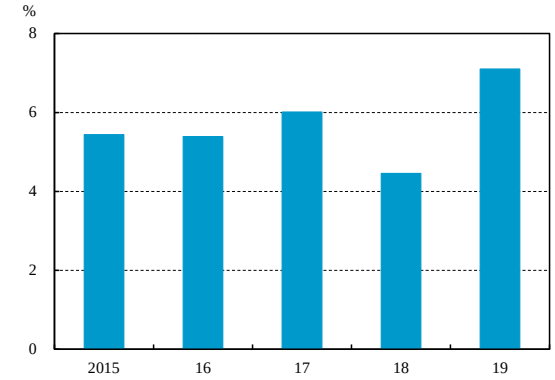
Notes: 1. RBC ratio = regulatory capital/risk-based capital.
2. Figures are exclusive of life insurance companies in receivership.
Source: FSC.

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

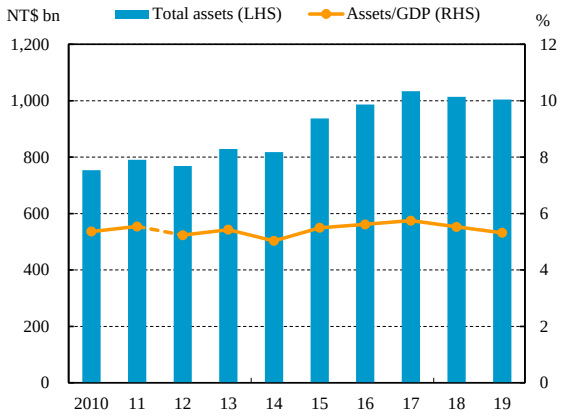
The total assets of bills finance companies contracted marginally in 2019. The guarantee business expanded and credit asset quality remained sound, while the impact of the COVID-19 pandemic on asset quality warrants attention. Profitability improved slightly, while the average capital adequacy ratio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

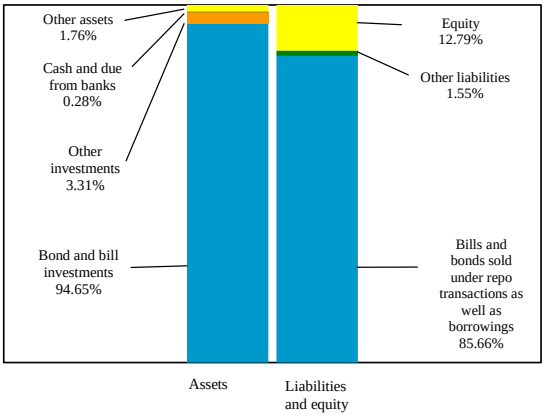


Note: Figures from 2012 forward are on the TIFRSs basis; figures of prior years are on the ROC GAAP basis.
Sources: CBC and DGBAS.

[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



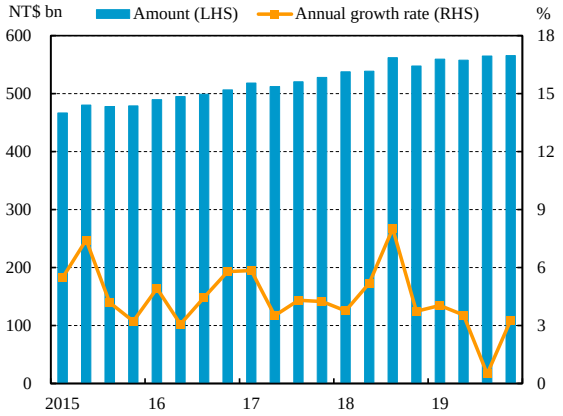
Note: Figures are as of the end of 2019.
Sources: CBC and FSC.

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.

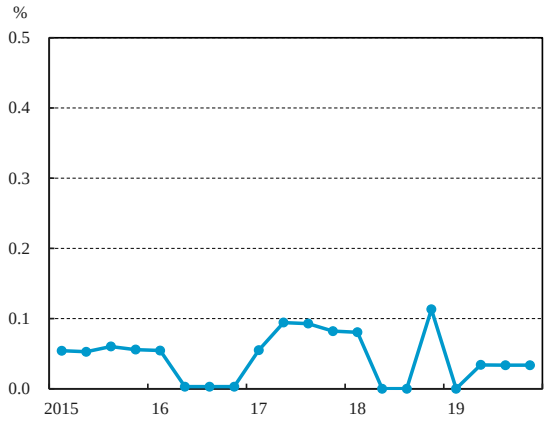
At the end of 2019, guarantees granted to the real estate and construction industries and credit secured by real estate increased to 30.34% and 41.47%, respectively, of total credit of bills finance companies. Both ratios remained at recent high levels. As pressures to reduce unsold residential properties 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

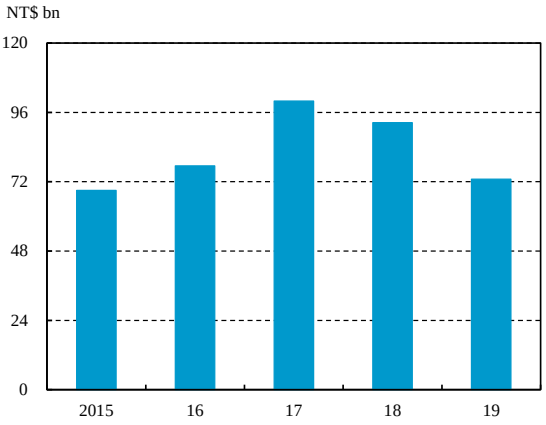
The credit quality of bills finance companies remained sound in 2019, as the non-performing credit ratio declined to 0.03% at the end of the year (Chart 3.51). Moreover, the credit loss reserves to non-performing credit ratio stood at 40.38 times, reflecting sufficient reserves to cover potential credit 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.

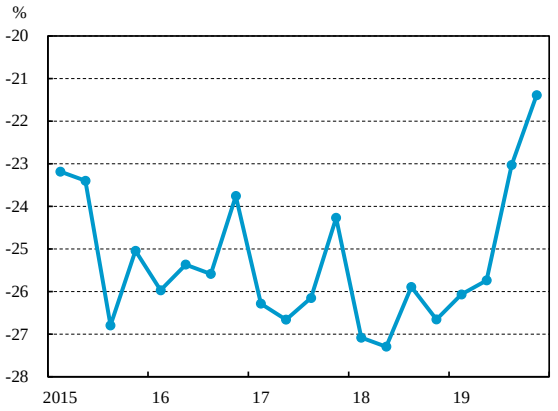
[67] According to the *Self-disciplinary Rule Governing Non-guarantee Commercial Paper Business Conducted by the Members of Bills Finance Association*, the ratio of outstanding non-guarantee CP investment to equity for a bills finance company should not exceed 2 times.

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]

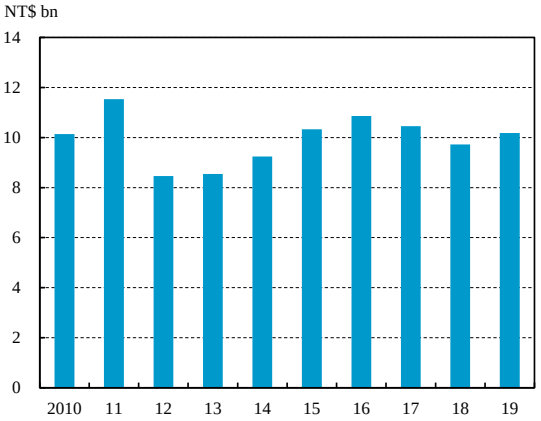
Major liabilities[69] stood at 7.64 times as much as equity stood at the end of 2019, remaining at the same level as the previous year. This, coupled with the fact that the ratio for each company stayed below the regulatory ceilings,[70] indicated a stabilized financial leverage.

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.

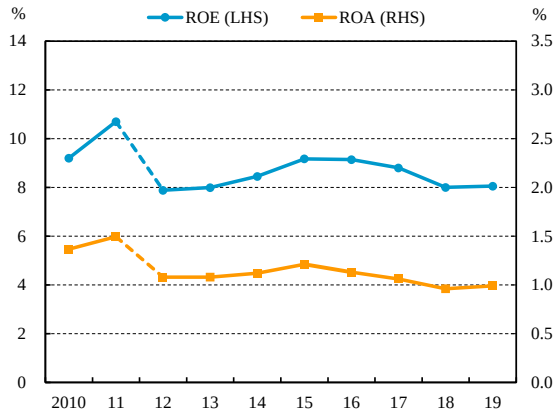
Profitability enhanced slightly

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%.

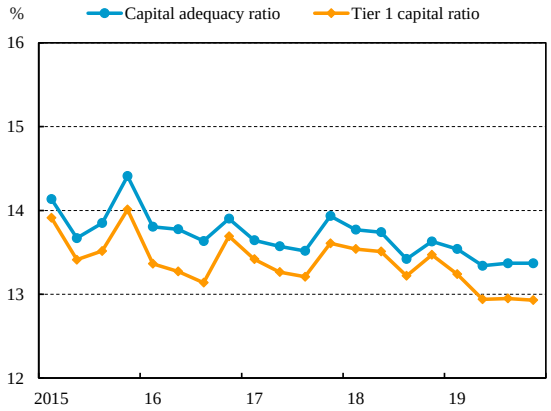
Chart 3.55 ROE & ROA of bills finance companies



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

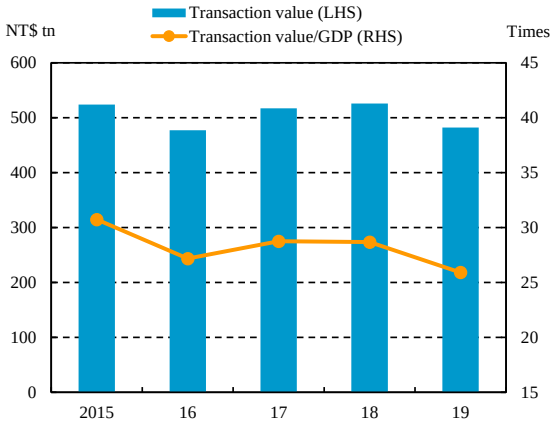
3.3.1 Payment and settlement systems

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).

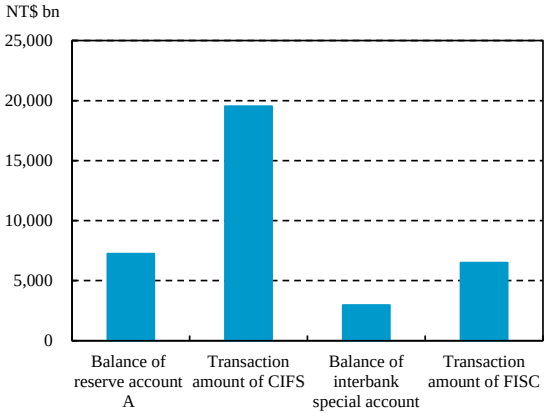
To deal with the clearing and settlement of retail interbank payment transactions[72] in the FISC's Inter-bank Financial Information System (FIS), the Bank set up an Interbank Funds Transfer Guarantee Special Account (Guarantee Account) under the CIFS as the basis to guarantee clearance of interbank 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.

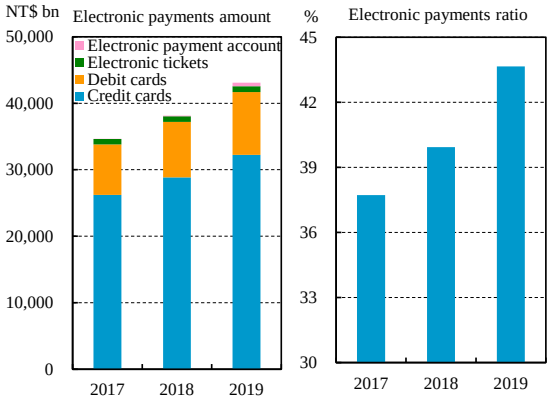
Overview of electronic retail payment transactions

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.

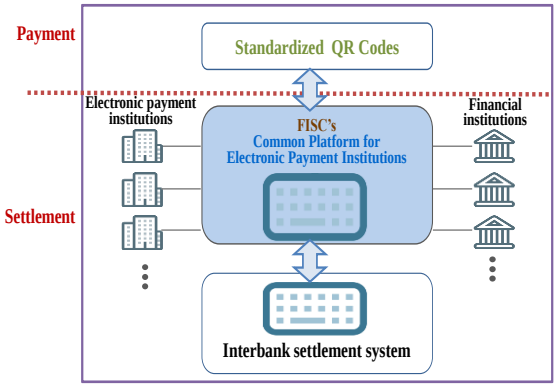
In 2017, the FISC joined hands with state-owned banks to promote standardized QR codes, an effort in line with the rising global trend of mobile payment. For long-term development, the Bank has urged the FISC to set up a "Common Platform for Electronic Payment Institutions" (Chart 3.60) based on the 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.

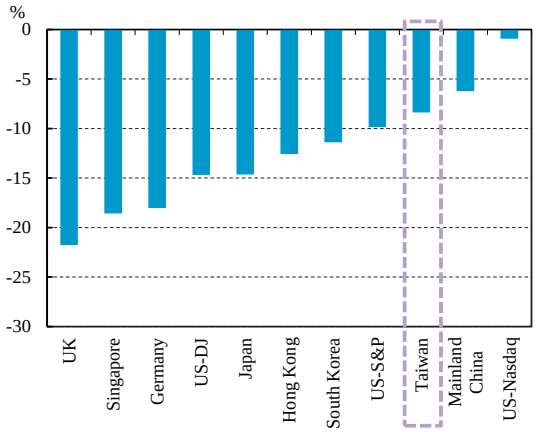
3.4 The impact of the COVID-19 pandemic on domestic financial systems

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

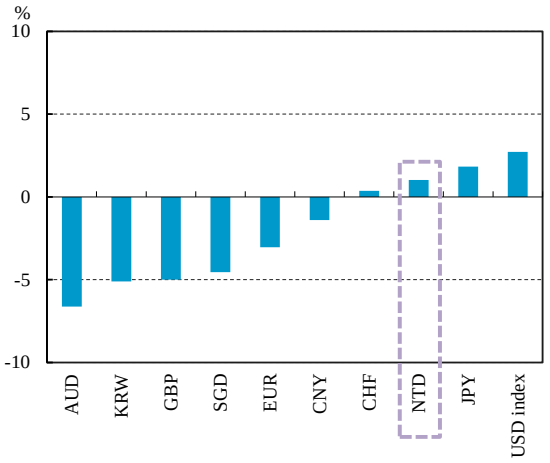


Note: Changes are figures at the end of April 2020 compared to those at the end of 2019.
Source: Bloomberg.

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.