

III. Financial system assessment

3.1 Financial markets

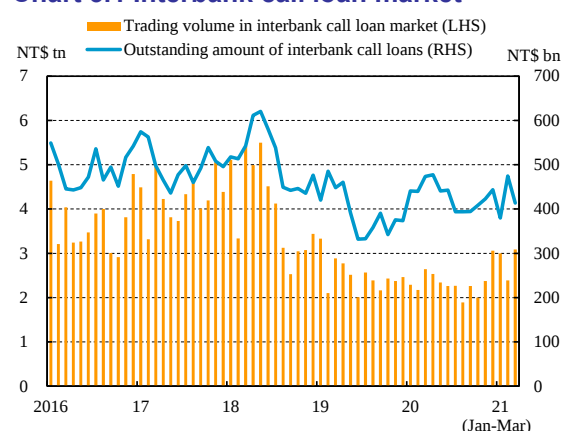
In 2020, the outstanding amount of interbank call loans expanded, while their trading volume shrank. The outstanding amount of bill issuance in the primary market reached a historical high mainly because of a greater increase in CP issuance. Propelled by the expansion in the primary market, the bill trading volume in the secondary market also increased. The outstanding amount of bond issuance increased significantly with corporate bond issuance registering the largest increment. Nevertheless, the turnover rate of outright transactions in the secondary bond market fell back after rising. Short-term market rates decreased marginally after the Bank cut the policy rates, while long-term interest rates dropped before rebounding. As for stock markets, stock prices slumped and fluctuated dramatically in the beginning of 2020 owing to the COVID-19 pandemic. Subsequently, with the strong recovery of the domestic economy and other favorable factors, the stock indices rebounded sharply and recorded new highs repeatedly. However, volatility in the stock market has intensified again since mid-May 2021, owing to expectations of US interest rate hikes and the COVID-19 pandemic resurgence worldwide. In the FX market, the NT dollar oscillated and appreciated against the US dollar in 2020, while the volatility was relatively low.

3.1.1 Money and bond markets

Outstanding amount of interbank call loans elevated, while their trading volume shrank

In 2020, overall domestic funds were abundant, but the fund levels across financial institutions were divergent. The average daily outstanding amount of interbank call loans increased by 9.78% and registered NT\$430.9 billion, driven by the fact that some banks increased interbank borrowing to fulfill higher

Chart 3.1 Interbank call loan market



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

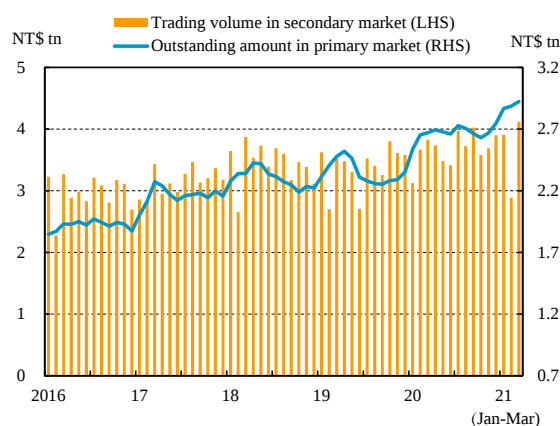
demand by corporates for loans. Although the average outstanding amount of interbank call loans expanded, the trading volume decreased continually by 6.38% year on year in 2020, given that the proportion of interbank overnight call loans in the market decreased and financial institutions reduced the frequency with which they rolled over their interbank borrowing. In 2021 Q1, the outstanding amount of interbank call loans and their trading volume continued to stay at a low level (Chart 3.1).

Outstanding amount of bill issuance hit a new high, propelling the bill trading volume in the secondary market to increase accordingly

The outstanding amount of bill issuance in the primary market reached NT\$2.75 trillion at the end of 2020, increasing markedly by 16.75% year on year. The main reason was that interest rates trended downward to new record lows and low issuance costs attracted corporates to significantly increase CP issuance for fund raising. In 2021 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).

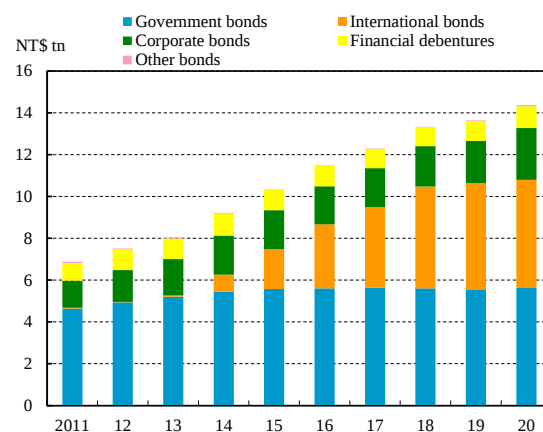
Impelled by the expansion in the primary market, the bill trading volume in the secondary market also increased in 2020. The trading volume increased by 8.97% year on year and amounted to NT\$44.14 trillion with CP constituting the largest share of 95.21%. In 2021 Q1, the bill trading volume continued its upward trend (Chart 3.2).

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.

Bond issuance expanded remarkably, while the turnover rates of outright transactions dropped after hitting a recent high

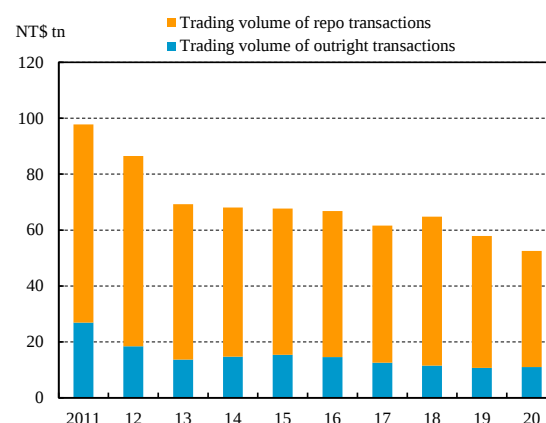
The outstanding amount of bond issuance increased by 5.32% and reached a new high of NT\$14.36 trillion at the end of 2020, because record low interest rates attracted corporates to increase bond issuance. Major bonds all saw increasing issuance. Among them, the outstanding amount of corporate bond issuance significantly increased by 23% year on year, followed by financial debentures, which registered an annual growth rate of 9.60%. Meanwhile, the outstanding amount of international bond and government bond issuance increased year on year by 1.58% and 1.32%, respectively (Chart 3.3).

However, the trading volume in the secondary bond market recorded NT\$52.50 trillion in 2020, decreasing by 9.30% year on year (Chart 3.4). Analyzed by trading types, repo transaction volume shrank by 12.12% year on year, while outright transactions volume increased marginally by 3.16%. Although the average monthly outright turnover rate of major bonds elevated to a recent high of 7.11% in March 2020, it declined later and continued to stay at a low level in 2021 Q1 (Chart 3.5).

Short-term market rates descended marginally, while long-term market rates rose after declining

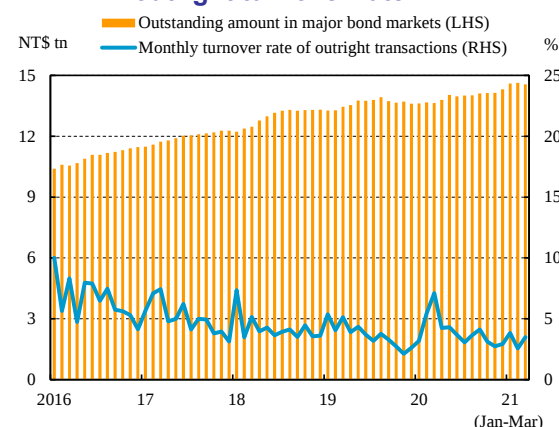
In terms of short-term market rates, in 2020, the interbank overnight call loan rate descended gradually and hit a recent low of 0.072% on May 4 after the Bank lowered the policy rates and

Chart 3.4 Outright and repo transactions in the bond market



Source: CBC.

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.

the interest rate of the Bank's certificates of deposit (CDs) in March. Afterwards, the interbank overnight call loan rate stabilized at a low level, reflecting ample liquidity in financial markets (Chart 3.6).

As for long-term market rates, in the beginning of 2020, the COVID-19 pandemic triggered panic selling in the bond market, propelling 10-year government bond yields to rise sharply in March. However, the yields fell back following the Bank's rate cut, and fluctuated downwards as risk-aversion sentiment in the market increased and financial institutions saw increasing pressures to dispose their idle funds. However, the yields have rebounded since December, following the sharp rise of US government bond yields (Chart 3.6). Considering that the recent rise in US inflation expectations could push up US government bond yields and, in turn, propel 10-year government bond yields to increase further, interest rate risks related to bond investments might elevate and warrant close attention.

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

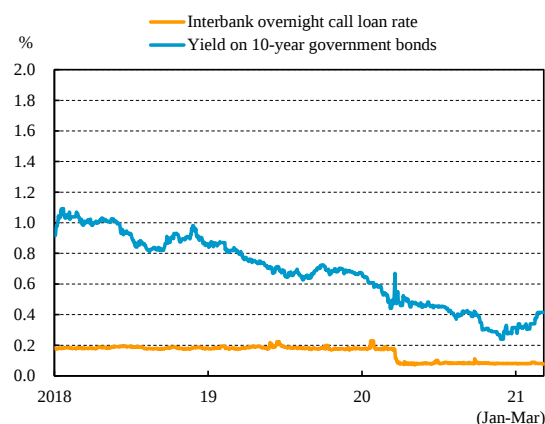
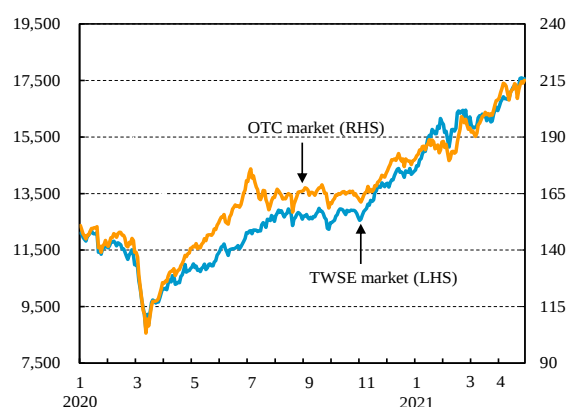


Chart 3.7 Taiwan's stock market indices



3.1.2 Equity markets

Stock indices successively reached their historical highs

Owing to the impact of the pandemic on global financial markets in the beginning of 2020, international stock markets plunged. The TAIEX of the TWSE market also saw a significant drop from above the 12,000 mark and closed at the year's lowest level of 8,681 on March 19. However, driven by the quantitative monetary easing policies and fiscal relief measures subsequently implemented by major countries along with the strong recovery exhibited by the domestic economy, the TAIEX rebounded significantly (Chart 3.7), posting an increase of 22.80% year on year. Under the support on the economic and capital fronts, the TAIEX surged

higher than the major indices in the US, Japan, and other international stock markets, except for South Korea (Chart 3.8).

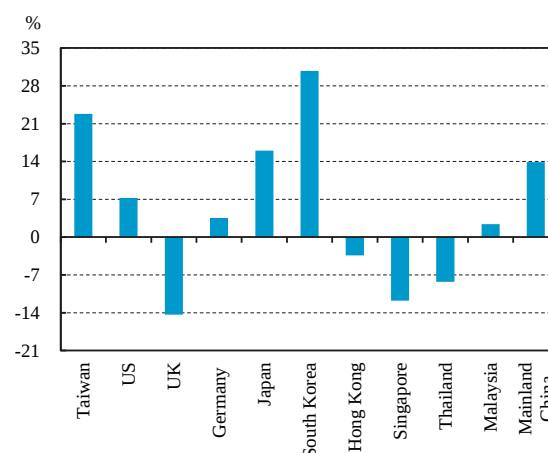
In the beginning of 2021, induced by the economic relief plans in the US and the better-than-expected economic performance in Taiwan, the TAIEX went up steadily, surging by 19.24% in the first four months of 2021 (Chart 3.7). Nevertheless, with market expectations for interest rate hikes by the Fed and the resurgence of the pandemic globally and domestically, the TAIEX saw a deep decline and then rebounded toward stability. The Taipei Exchange Capitalization Weighted Stock Index (TPEX) of the OTC market closely tracked the movements of the TAIEX (Chart 3.7).

Volatility in the stock markets increased sharply and annual turnover rates rose dramatically

The intensified panic sentiment in financial markets drove volatility in the TWSE and the OTC markets surging sharply in March 2020. As major stock markets stabilized, volatility of the two markets dropped and registered 12.55% and 11.79%, respectively, at the end of December. However, affected by the significant fluctuations in global stock markets at the beginning of 2021, volatility of the TWSE and the OTC markets increased, registering 17.91% and 17.97%, respectively, at the end of April (Chart 3.9).

Owing to the surging indices of the two domestic stock markets and expanding trading volume, the trading value in both the TWSE and the OTC markets increased to NT\$45.7 trillion and

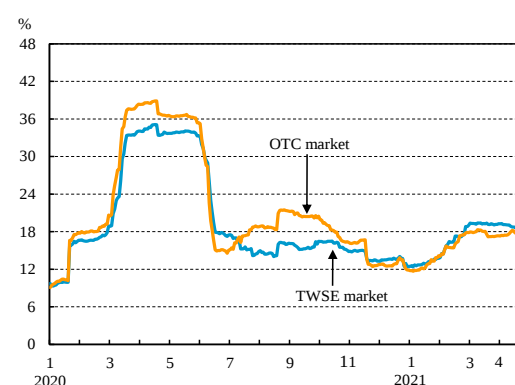
Chart 3.8 Major stock market performance



Notes: 1. Changes are figures at the end of 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: TWSE.

Chart 3.9 Stock price volatility in Taiwan's markets



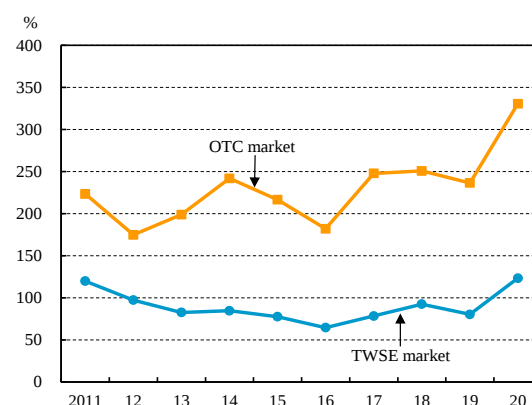
Note: Volatility refers to the annualized standard deviation of 60-day daily index returns.

Sources: TWSE, TPEx, and CBC.

NT\$12.1 trillion in 2020, respectively, reaching individual historical highs. The annual turnover rates in terms of trading value also rose to 123.34% and 330.63% (Chart 3.10), respectively, higher than those in most of the major international stock markets (Chart 3.11). Domestic stock markets were boosted by sound economic fundamentals; however, owing to their high correlations with international stock markets, coupled with the stock prices staying high and amplifying volatility, the potential impacts of the pandemic and the movements of foreign investments in and out of domestic stock markets warrant close attention.

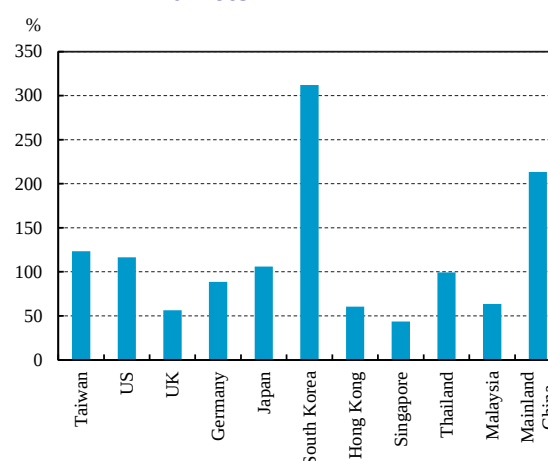
Furthermore, the scale of domestic mutual funds raised and issued by securities investment trust companies increased continually in recent years. Among them, exchange-traded funds (ETFs) grew most swiftly, reaching NT\$ 1.74 trillion at the end of 2020. However, with the diversification in the issuance of domestic ETFs, complexity and investment risks of such products mounted, and the systemic risk that might be incurred by ETF investments in particular warrants close attention (Box 2).

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 2020.
Source: TWSE.

3.1.3 FX market

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

The NT dollar exchange rate against the US dollar depreciated in 2020 Q1, owing to the impacts of the COVID-19 pandemic, interest rate cuts in major countries, and the outward remittances of foreign capital. Later on, as an appropriate domestic pandemic response led to

stellar performance of exports and the economy, the NT dollar appreciated steadily and stood at 28.508 at the end of 2020, rising by 5.61% for the year. The exchange rate further strengthened, closing at 27.950 as of the end of April 2021, which was ignited by the inward remittances of foreign capital and the US dollar sell-off by exporters as the US dollar weakened (Chart 3.12); therefore, the NT dollar increased in value by 2.00% compared to the end of 2020. In comparison with major Asian currencies, the extent of NT dollar appreciation against the US dollar was more than the Japanese yen, the Singapore dollar, and the Malaysian ringgit in 2020; however, it was less than the Korean won and the RMB. From January to April in 2021, the value of the NT dollar was relatively stable compared with other currencies (Chart 3.13).

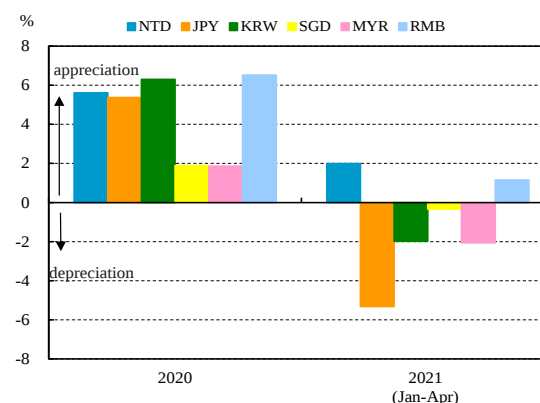
In addition, the scale of trading in Taiwan's FX market slightly expanded in 2020, with average daily trading volume amounting to US\$33.1 billion from US\$32.5 billion a year earlier, or rising by 1.85%, primarily because of an increase in interbank dealings (Chart 3.14). A breakdown by counterparty in 2020 exhibited that the daily trading volume in the interbank market mainly accounted for 67.07% of the total; as for type of transactions, FX swap deals accounted for the largest share of 49.70% of the total.

Chart 3.12 NTD/USD exchange rate



Source: CBC.

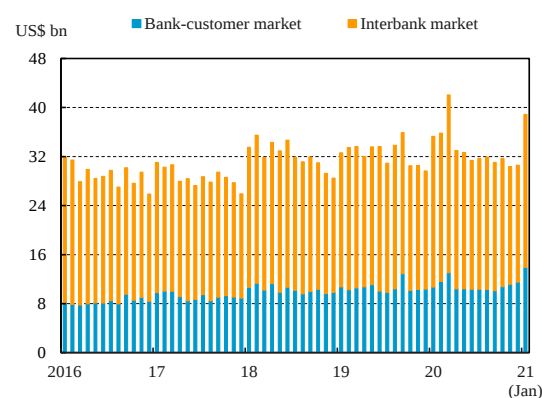
Chart 3.13 Exchange rate changes of major Asian currencies against the US dollar



Note: Changes in the year 2020 are figures at the end of 2020 compared to those at the end of 2019; changes in the period of Jan-Apr 2021 are figures at the end of April 2021 compared to those at the end of 2020.

Source: CBC.

Chart 3.14 FX market trading volume



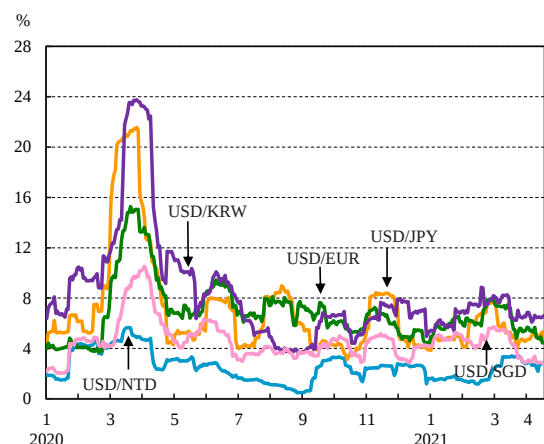
Notes: 1. Trading volume is the monthly average of daily data.
2. The latest data for trading volume are as of January 2021.

Source: CBC.

NT dollar exchange rate volatility remained relatively stable

Even though global FX markets fluctuated dramatically in 2020 owing to the impacts of the pandemic, volatility in the NT dollar exchange rate against the US dollar shifted between 0.49% and 5.66% and registered an annual average of 2.66%, which was relatively lower than those in other major currencies. During January to April 2021, volatility in the NT dollar exchange rate registered between 1.17% and 3.42%. Compared to major currencies such as the Japanese yen, the euro, the Singapore dollar, and the Korean won, the NT dollar exchange rate stayed relatively steady against the US dollar (Chart 3.15).

Chart 3.15 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.

Box 2

The impacts of substantial growth of Taiwan's exchange-traded funds on financial markets

Exchange-traded funds (ETFs) that possess the characteristics of low transaction costs, risk diversification, high transparency of investment portfolios, and passive management have widely won the favor of international and domestic investors in the past ten or more years. Global ETF assets have grown considerably, while the fund sizes, number of investors, and transaction volumes of domestic ETFs have also multiplied. However, potential risks lurking in the ETF market to investors and the financial system still warrant close attention.

1. ETF market development in Taiwan

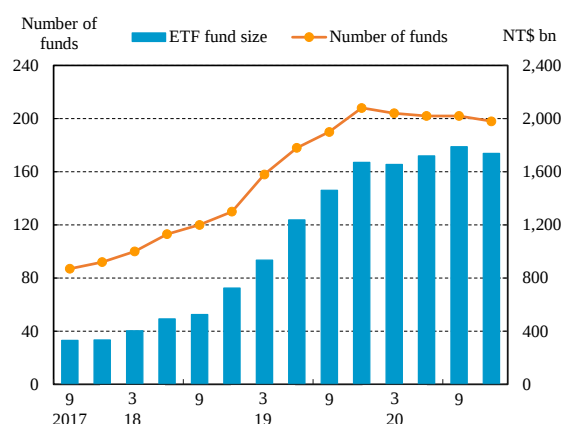
1.1 ETF fund size and trading volume greatly expanded

The first ETF listed on the Taiwan Stock Exchange Corporation (TWSE) was the Yuanta/P-shares Taiwan Top 50 ETF issued in June 2003. With a relaxation of pertinent regulations by the FSC, the domestic ETF market progressively unfolded. Industrial funds, umbrella funds, and funds with linkages to overseas targets were issued successively. In

addition, various types of ETF products, for example leveraged, reversed, and futures ETFs, have been allowed to be issued by investment trust companies since 2014. Coupled with the advantages of low transaction costs and investment diversification, the products have been increasingly appreciated by investors. Therefore, the fund size of ETFs rose hugely, registering NT\$1.74 trillion at the end of 2020, which was 12 times compared with that of NT\$131.9 billion at the end of 2011. The number of funds increased sharply from 87 at the end of September 2017 to 198 at the end of 2020 (Chart B2.1). ETF beneficiaries also largely rose to 1.52 million, an increase of 3.8 times compared to that at the end of 2017. ETF products have become quite well accepted investments in Taiwan.

The trading value of domestically listed ETFs was NT\$2.84 trillion in 2020, a huge

Chart B2.1 ETF fund size and number of funds in Taiwan



Source: SITCA.

increase of 7.9 times compared to that in 2011. The transaction amount of ETFs to that of the whole stock markets reached 5.8% in 2020, sharply rising from the 1.3% in 2011. The turnover rate of ETFs reached 163.36% in 2020, much higher than that of 123.34% in TWSE stock trading. This showed that transactions in the ETF market have been booming.

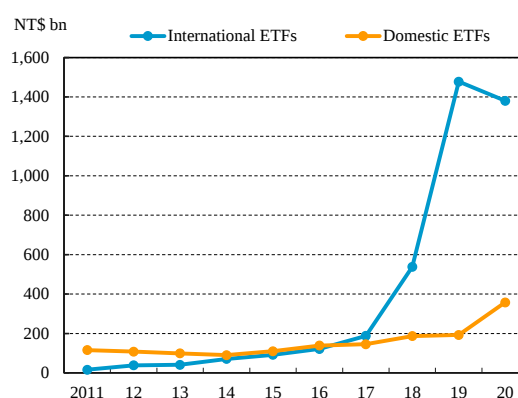
1.2 ETF investments linked to overseas targets have been all the rage

In order to pursue better returns, cross-border investments in ETFs linked to overseas targets have become mainstream. The fund size of those ETFs reached NT\$1.38 trillion at the end of 2020, largely increasing 85 times compared to that at the end of 2011, much higher than that of NT\$357.4 billion for the ETFs investing in domestic targets (Chart B2.2).

1.3 Bond ETF assets rose quickly because of the huge investments of life insurance companies

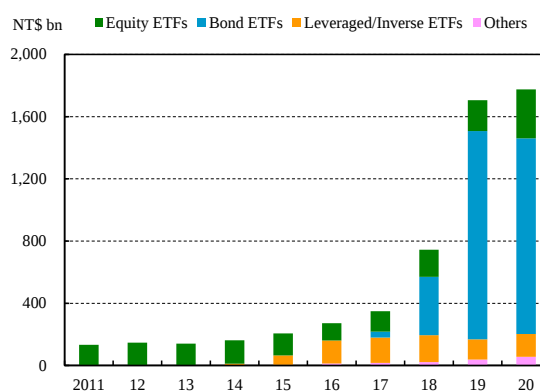
In recent years, the fund size of bond ETFs increased massively, reaching NT\$1.34 trillion at the end of 2019, growing by 36 times compared to that at the end of 2017, largely surpassing the size of equity ETFs (Chart B2.3). The major reason was that the amounts life insurance companies invested in TWSE- and OTC-listed securities were excluded from the amounts subject to the overseas investment ceiling.¹ Hence, life insurance companies made huge investments in NTD-dominated offshore bond ETFs. However, as the FSC successively took measures to control the risks of life insurance companies investing in offshore ETF funds starting from October 2019,² their investments in bond ETFs shrank gradually in 2020. Nevertheless, equity ETFs have still grown rapidly while the indices of stock markets continually reached historical highs.

Chart B2.2 International ETFs and domestic ETFs in Taiwan



Source: SITCA.

Chart B2.3 Types of ETFs in Taiwan



Source: FSC.

2. ETFs may pose potential risks to investors and the financial system

2.1 Potential risks to investors

The Bank for International Settlements (BIS) (2020)³ points out that the market value of ETFs has been more informative than the NAV (net asset value). When the market volatility rises sharply, the discount or premium to the NAV of ETFs may change rapidly. Investors will take higher price volatility risks if they buy shares in the secondary market at a bigger discount or premium to the NAV. In addition, though ETFs have traced specific stock price indices, changes of indices may not be entirely replicated owing to numerous reasons and caused mis-tracing risks. Also, with the increasing complexity of ETFs, it has drawn wide attention that investors may not fully understand the potential risks of ETF products, especially complex and special ETFs.

Moreover, investing in equity ETFs is similar to investing a basket of equities. When equity ETFs overly increase their share in the whole equity market, it will cause trading behavior such as transaction volumes and prices among the stocks within the basket to be more convergent. As a consequence, the risk diversification effect of holding multiple stocks may be compromised, with the price correlation increasing via co-movements up and down. Furthermore, when ETFs are approved by regulatory authorities to delist from an exchange, investors who buy shares at a premium will bear liquidation risks.

2.2 Potential risks to financial systems

2.2.1 Equity ETFs increased their impacts on stock markets, augmenting the correlation of asset prices

The turnover rates of equity ETFs are higher than those of general common stocks, and the proportion of transaction amount of ETFs to the trading volumes of stock markets is high. Especially during market turmoil, ETFs will have greater trading value and thus increase their influence on financial markets. ESRB (2019)⁴ also points out that ETFs lead to greater asset price co-movement, which might result in losses for many investors and further trigger bankruptcy and fire sale of assets. This would undermine the stability of financial markets and heighten systemic risks.

2.2.2 The large investment in ETFs in the short term may induce contagion risks

ESRB (2019) also indicates that investors might take large and same direction short-term ETF positions on account of the high liquidity and trading boom. Once investors unwind the huge positions, it may lead to an upheaval in the ETF market and transmit to the indices themselves owing to arbitrage trading, resulting in remarkable elevation of the volatility

of the indices and the correlation of individual securities in the indices. Furthermore, certain types of ETFs have merely a few counterparties. When the counterparties are unable to fulfill their obligations under surging financial stress, ETFs may be subject to counterparty risks which also raise systemic risk concerns.

3. Conclusions

ETFs were classified as passive investment products originally. However, the product complexity and potential risks rose when the types of ETFs issued in Taiwan diversified. While some local investors buy ETFs as short-term investments, there is a need to enhance the financial literacy of investors and pay attention to ETF product types and information transparency so as to reduce consumer financial disputes. Moreover, the size of the global ETF market has expanded substantially in recent years. It is crucial for regulatory authorities to monitor systemic risks potentially raised by ETFs and take responsive measures early to preserve financial stability.

- Notes: 1. Investments of life insurance companies in bond ETFs were merely NT\$0.37 trillion at the end of 2018. The amount reached NT\$1.3 trillion at the end of 2019, increasing by 2.5 times.
2. The FSC required life insurance companies investing in NTD-dominated offshore bond ETFs to control FX risks in October 2019, adding an additional FX risk capital charge on those ETFs with a risk weight of 6.61% when calculating their risk-based capital (RBC) ratios. Credit ratings of underlying bonds held by bond ETFs invested by life insurance companies should not be below BBB- based on the regulations implemented in December 2019.
3. BIS (2020), “The Recent Distress in Corporate Bond Markets: Cues from ETFs,” *BIS Bulletin*, April.
4. ESRB (2019), “Can ETFs Contribute to Systemic Risk?” *Reports of the Advisory Scientific Committee*, June.

3.2 Financial institutions

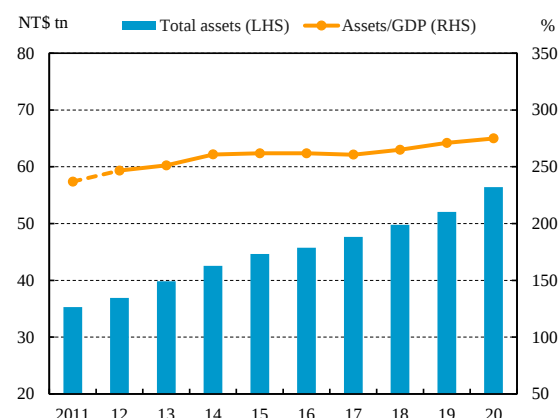
3.2.1 Domestic banks

Owing to the growth in loans, the total assets of domestic banks³⁹ continually expanded in 2020. Asset quality remained sound and exposures to Mainland China continuously decreased, while concentration in corporate loans and loans related to real estate increased slightly. The estimated value at risk (VaR) of market risk exposures increased, but the impacts of market risk on capital adequacy ratios were limited. Liquidity in the banking system was ample, with overall liquidity risk remaining relatively low. Although profitability of domestic banks decreased in 2020, the average capital adequacy ratio increased, indicating satisfactory capacity to bear losses.

Total assets grew apace

The total assets of domestic banks kept growing and reached NT\$56.4 trillion at the end of 2020, equivalent to 285.24% of annual GDP (Chart 3.16). The annual growth rate of the total assets rose at a faster pace of 8.35%, mainly driven by a greater increase in loans by domestic banking units (DBUs). Broken down by sector, the annual asset growth rate of DBUs steadily rose to 9.78% on the back of loan growth. However, those of offshore banking units (OBUs) and overseas branches trended down instead or even slipped into negative territory as their loan policies turned conservative in view of increasing credit defaults (Chart 3.17).

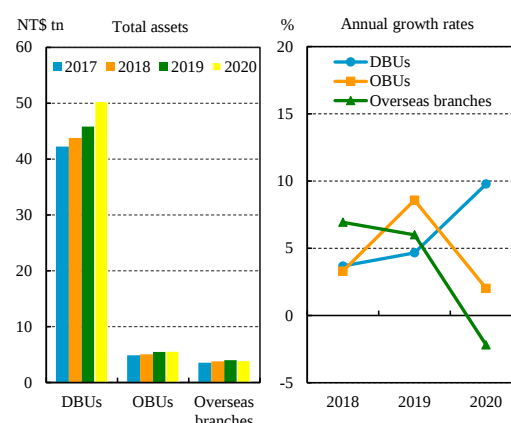
Chart 3.16 Total assets of domestic banks



Note: Figures from 2012 forward are on the TIFRSs basis; figure of 2011 is on the ROC GAAP basis.

Sources: CBC and DGBAS.

Chart 3.17 Total assets of domestic banks by sector



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

Source: CBC.

³⁹ Includes Agricultural Bank of Taiwan but not Rakuten International Commercial Bank because the latter launched internal operations on December 30, 2020 and officially opened for business on January 19, 2021.

Credit risk

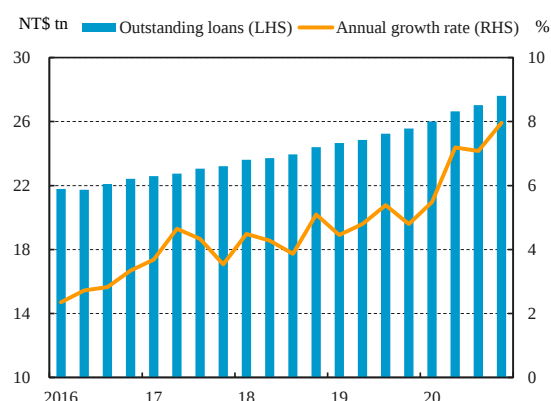
Customer loans growth accelerated

Customer loans⁴⁰ granted by the DBUs of domestic banks stood at NT\$27.61 trillion at the end of 2020, accounting for 48.95% of total assets, with the annual growth rate increasing to 7.96% (Chart 3.18). Among them, the annual growth rate of household borrowing rose to 8.99% owing to an increase in mortgage loan demand. The annual growth rate of corporate loans rose to 6.38%, largely driven by rising demand for purchasing offices and production plants as well as the extension of relief loans to SMEs. The annual growth rate of government loans also rose to 11.25% mainly because of the implementation of relief and revitalization measures by the government.

The share of real estate-secured credit continuously increased

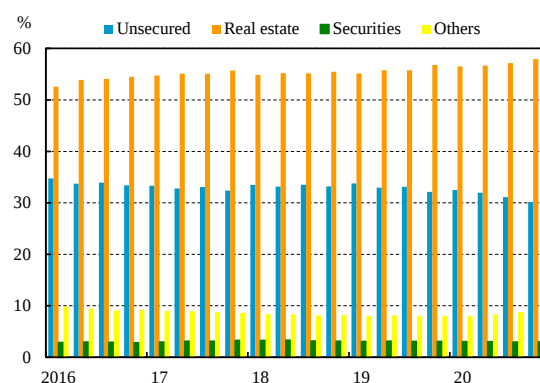
At the end of 2020, real estate-secured credit granted by domestic banks aggregated NT\$19.29 trillion, accounting for 57.94% of total credit,⁴¹ with an increase of 1.16 pps over the previous year (Chart 3.19). In view of continued housing market buoyancy, the Bank and the relevant government ministries and agencies introduced a series of measures from December 2020 onwards to foster a sound real estate market. However, real estate related credit risks warrant continuous monitoring as the above-mentioned measures will need some time before showing results.

Chart 3.18 Outstanding loans in domestic banks



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

Chart 3.19 Credit by type of collateral in domestic banks



Source: CBC.

⁴⁰ The term “customer loans” herein refers to discounts, overdrafts, other loans, and import bills purchased. It excludes export bills purchased, non-accrual loans and interbank loans.

⁴¹ The term “credit” herein includes loans, guarantee payments receivable, and acceptances receivable.

Credit concentration in corporate loans slightly increased

For the DBUs of domestic banks, corporate loans stood at NT\$11.79 trillion at the end of 2020, of which loans to the manufacturing sector accounted for the largest share at 37.40%. Within the manufacturing sector,⁴² the largest proportion of loans was in the electronics industry with a share of 32.81% that slightly increased over the previous year. This reflected that credit concentration of corporate loans mildly rose (Chart 3.20).

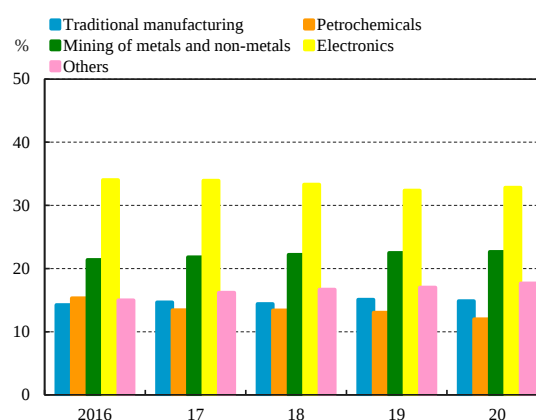
The impact of the COVID-19 pandemic on banks' credit quality should be closely monitored

From the second half of 2020 onwards, with the COVID-19 pandemic easing worldwide and vaccination accelerating in major countries, domestic economic activity gradually recovered. Taiwan's Purchasing Managers' Index (PMI) and Non-Manufacturing Index (NMI) entered into the expansion zone (Chart 3.21), reflecting an abatement in the pandemic's impact on domestic industries. Nonetheless, as the current pandemic still raises concerns over the outlook of foreign and domestic economic growth, the impact therefrom on banks' credit quality should be closely monitored.

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

At the end of 2020, the exposures of domestic banks to Mainland China stood at NT\$1.51 trillion, decreasing by NT\$136.6 billion or 8.30% from a year earlier mainly owing to a

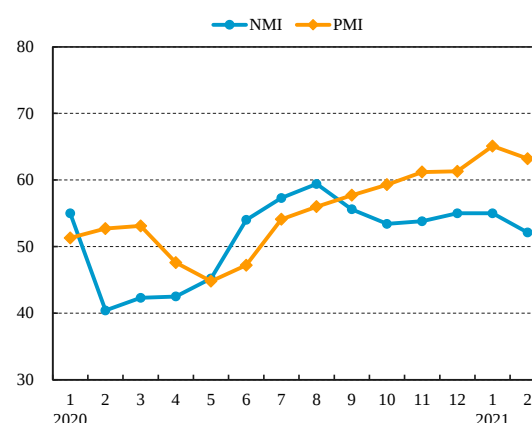
Chart 3.20 Exposure to the manufacturing sector by domestic banks



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.

Chart 3.21 Taiwan's PMI and NMI



Source: CIER.

⁴² 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.

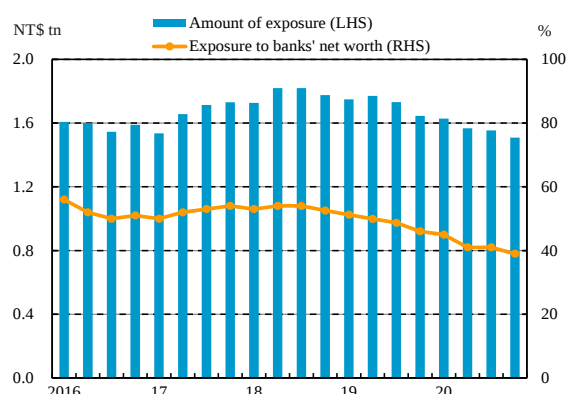
decline in the credit granted. The ratio of the exposures to banks' net worth continued to fall to a new low of 39% (Chart 3.22), far below the highest ratio of 69% in 2014.

Considering that spillovers of risk deriving from Mainland China would have a greater impact on Taiwan, coupled with weakening credit quality of local borrowers recently, 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 was satisfactory, but still faced uncertainties

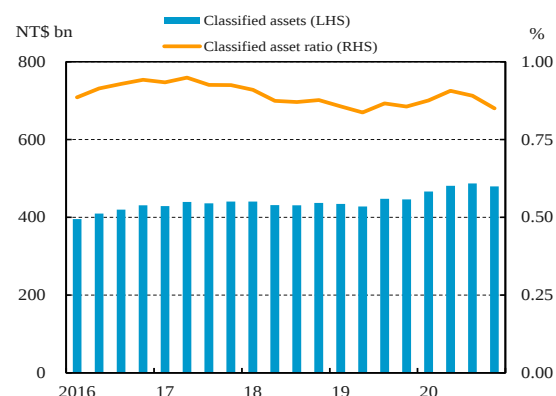
Owing to weakened debt-servicing capacity of overseas borrowers, outstanding classified assets⁴³ of domestic banks increased by 7.59% from a year earlier and stood at NT\$479.7 billion at the end of 2020. However, owing to a greater rise in total assets, the average classified asset ratio stood at 0.85%, slightly decreasing by 0.01 pps compared to the end of 2019 (Chart 3.23), showing that the asset quality of domestic banks was satisfactory. Meanwhile, the expected losses of classified assets⁴⁴ decreased by NT\$6.6 billion from a year earlier to NT\$51.9 billion, accounting for 10.77% of loss provisions, indicating that domestic banks had sufficient provisions to cover expected losses.

Chart 3.22 Exposures to Mainland China of domestic banks



Source: FSC.

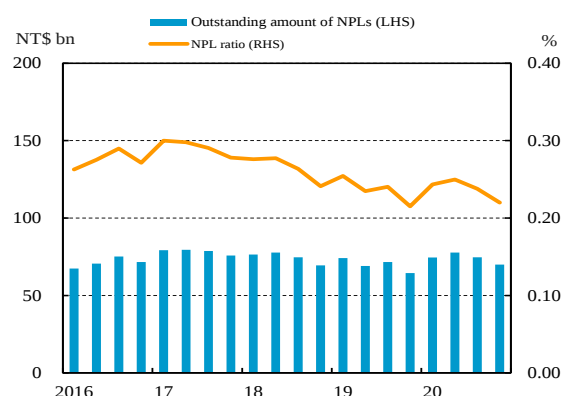
Chart 3.23 Classified assets of domestic banks



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

Source: CBC.

Chart 3.24 NPLs of domestic banks



Note: Excludes interbank loans.

Source: CBC.

⁴³ 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.

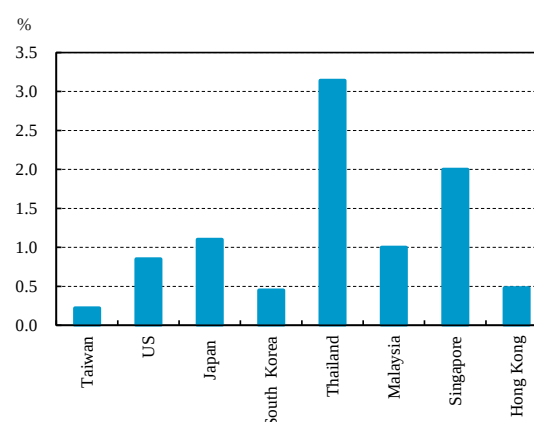
⁴⁴ Loss herein refers to the losses from loans, acceptances, guarantees, credit cards, and factoring without recourse.

The outstanding NPLs of domestic banks registered NT\$69.9 billion at the end of 2020, increasing by 8.44% from the previous year. Owing to an increase in both NPLs and loans, the average NPL ratio remained at a historical low of 0.22% (Chart 3.24), much lower than those in the US and neighboring Asian countries (Chart 3.25). In addition, at the end of 2020, because of a greater rise in loans and NPLs, the loan coverage ratio and the NPL coverage ratio declined to 1.37% and 623.74% respectively from 1.40% and 650.30% a year earlier (Chart 3.26). Nevertheless, the capability of domestic banks to cope with potential loan losses remained satisfactory.

Almost all banks had NPL ratios of less than 0.5% at the end of 2020. In terms of borrowers, the NPL ratio for individual loans declined by 0.05 pps to 0.16% compared to the previous year. However, the NPL ratio for corporate loans, which were affected by the pandemic more significantly, rose by 0.02 pps to 0.27% over the same period. Among corporate loans, those to the wholesale & retail trade industry saw a drop in the NPL ratios, while the NPL ratios of loans to other industries mostly increased (Chart 3.27). Nevertheless, the overall NPL ratio stayed at a low level.

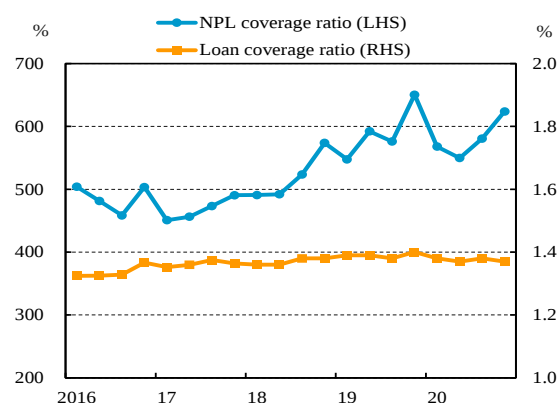
Considering that uncertainties surrounding the global pandemic outlook remained high, and the relief loans⁴⁵ extended by domestic banks in line with government policies will be withdrawn going forward, closely monitoring the above-mentioned impact on banks' credit quality is warranted.

Chart 3.25 NPL ratios of banks in selected countries



Note: Figures for Japan and South Korea are end-September 2020 data, while the others are end-December 2020 data.
Sources: CBC, FDIC, FSA, FSS, BOT, BNM, MAS and HKMA.

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.

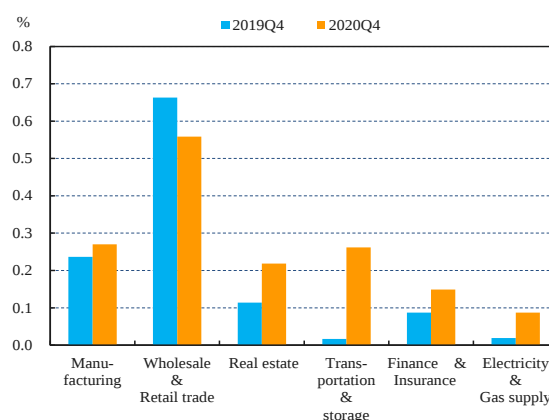
⁴⁵ According to the statistics of the FSC, as of April 7, 2021, domestic banks provided relief loans with a total amount of NT\$3.2 trillion.

Market risk

Estimated value-at-risk for market risk exposures increased

Based on the Bank's VaR model,⁴⁶ the estimated total VaR for market risk exposures of domestic banks stood at NT\$159.8 billion at the end of 2020, increasing by NT\$27.8 billion or 21.06% compared to a year earlier. Among the market risk exposures, the interest rate VaR increased by 24.96% year on year in 2020. The main reasons were that bond market volatility surged because of the COVID-19 pandemic and the net position of debt securities increased. Meanwhile, the equities VaR decreased by 10.08%, reflecting reductions in the net position of equity securities. The FX VaR diminished by 2.86%, owing to decreasing volatility in the NT dollar exchange rate against the US dollar (Table 3.1).

Chart 3.27 NPL ratios of domestic banks in selected industries



Note: Excludes interbank loans.
Source: JCIC.

Table 3.1 Market risks in domestic banks

Unit: NT\$ bn

Type of risk	Item	End-Dec. 2019	End-Dec. 2020	Changes	
				Amount	pps; %
Foreign exchange	Net position	173.5	201.8	28.3	16.31
	VaR	3.5	3.4	-0.1	-2.86
	VaR/net position (%)	2.02	1.68		-0.34
Interest rate	Net position	1,957.2	1,986.5	29.3	1.50
	VaR	116.6	145.7	29.1	24.96
	VaR/net position (%)	5.96	7.33		1.37
Equities	Net position	86.8	78.0	-8.8	-10.14
	VaR	11.9	10.7	-1.2	-10.08
	VaR/net position (%)	13.71	13.72		0.01
Total VaR		132.0	159.8	27.8	21.06

Source: CBC.

⁴⁶ For more details about the Bank's VaR model, please see CBC (2016), Box 2, *Financial Stability Report*.

From early 2021 onwards, boosted by optimism over a firming US economy and rising inflation expectations, US bond yields rose sharply, exacerbating volatilities in both bond and stock market prices. This could in turn increase the VaR for relevant exposures of domestic banks and thus warrants close attention.

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 0.44 pps⁴⁷ in the average capital adequacy ratio of domestic banks, causing the ratio to drop from the current 14.85% to 14.41%. Nevertheless, it would still be higher than the statutory minimum of 10.5%.

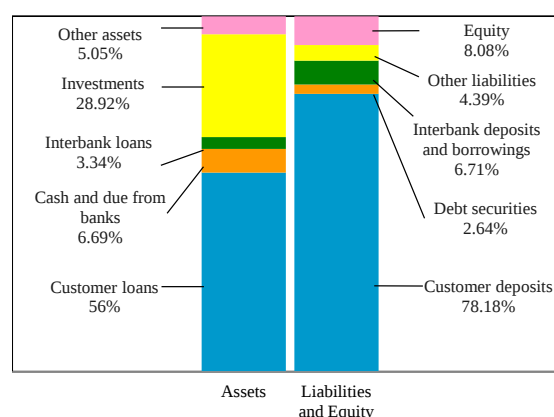
Liquidity risk

Liquidity in the banking system remained ample

The asset and liability structure of domestic banks remained roughly unchanged in 2020.

For the sources of funds, customer deposits, which tend to be relatively stable, still made up the largest share with 78.18% of the total, while for the uses of funds, customer loans accounted for the biggest share with 56% (Chart 3.28). At the end of 2020, the average deposit-to-loan ratio of domestic banks rose to 142.04%, and the funding surplus (i.e., deposits exceeding loans) increased to NT\$13.36 trillion. The overall liquidity of domestic banks remained abundant (Chart 3.29).

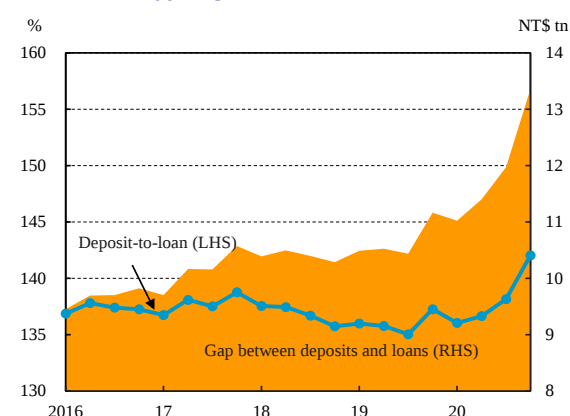
Chart 3.28 Asset/liability structure of domestic banks



Notes: 1. Figures are as of end-December 2020.
2. Equity includes loss provisions. Interbank deposits include deposits with the CBC.

Source: CBC.

Chart 3.29 Deposit-to-loan ratio of domestic banks



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

Source: CBC.

⁴⁷ Domestic banks had already set aside capital for market risk in accordance with relevant regulations. To avoid double counting, the impacts of market risk on the capital adequacy ratio herein were capital shortfalls after considering the aforementioned capital.

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 2020 and stood at 32.20% in December (Chart 3.30). Looking at the components⁴⁸ of liquid reserves in December 2020, Tier 1 liquid reserves, mainly consisting of CDs issued by the Bank, accounted for 82.74% of the total. The quality of liquid assets held by domestic banks remained satisfactory.

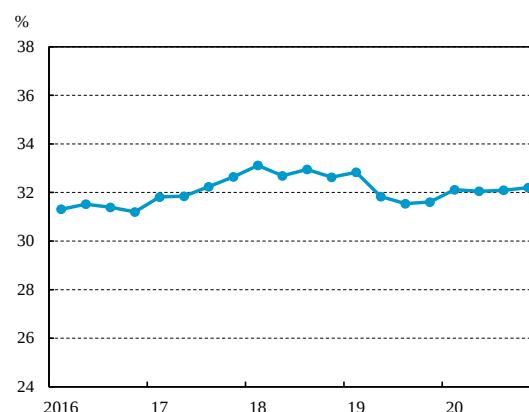
Moreover, the average liquidity coverage ratio (LCR) and net stable funding ratio (NSFR) of domestic banks rose to 142% and 137%, respectively, at the end of 2020 (Chart 3.31). Meanwhile, all banks met the minimum LCR and NSFR requirements in 2020, indicating that the overall liquidity risk of domestic banks was relatively low.

Risks of LIBOR cessation

To avoid undue market disruption caused by an unexpected cessation of LIBOR, the UK regulatory authority announced that it would no longer require banks to submit LIBOR settings from January 2022 onwards. The forthcoming cessation of the LIBOR settings and the transition of interest rate benchmarks posed challenges for financial markets.

Being a participant in the global financial market, the Taiwanese banking industry has widely used LIBOR in their daily operations. In response to LIBOR cessation, the Bank and the FSC successively implemented various measures from February 2020 onwards with the aim of

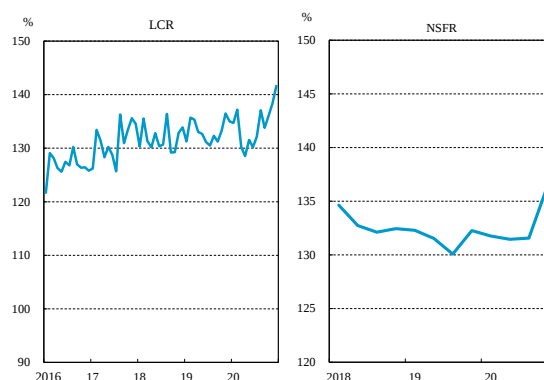
Chart 3.30 Liquid reserve ratio of domestic banks



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

Source: CBC.

Chart 3.31 LCR and NSFR of domestic banks



Notes: 1. LCR and NSFR were implemented in 2015 and 2018, respectively.

2. LCR is reported on a monthly basis; NSFR is reported on a seasonal basis.

Source: CBC.

⁴⁸ 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.

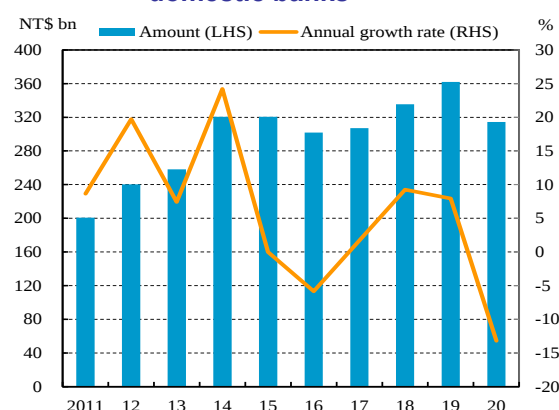
urging banks to carefully assess the associated risks and address them appropriately. Although most banks established dedicated committees or task forces to actively address this issue, they are advised to carefully make and execute LIBOR transition plans and carry out the transition process as soon as possible so as to reduce potential risks arising from LIBOR cessation (Box 3).

Profitability

Profitability declined

In 2020, the net income before tax of domestic banks fell to NT\$314.3 billion, significantly decreasing by NT\$47.8 billion or 13.19% year on year, the sharpest fall in 10 years (Chart 3.32). The contraction was mainly caused by a decrease in profits from investment such as equities and financial derivatives, as well as an increase in loan loss provisions for their overseas branches. The average ROE and ROA of domestic banks went down to 7.84% and 0.58% from the 9.49% and the 0.70% of the previous year (Chart 3.33), respectively, indicating a deterioration in profitability. Compared to other economies, the average ROE of domestic banks was higher than those of the US, Thailand, South Korea, and Japan. However, the average ROA of domestic banks still lagged behind those of many other countries, outperforming just a few ones such as South Korea and Japan (Chart 3.34).

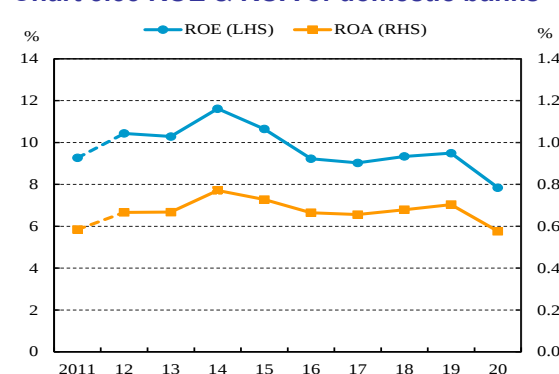
Chart 3.32 Net income before tax of domestic banks



Note: Figures from 2012 forward are on the TIFRSs basis; figure of 2011 is on the ROC GAAP basis.

Source: CBC.

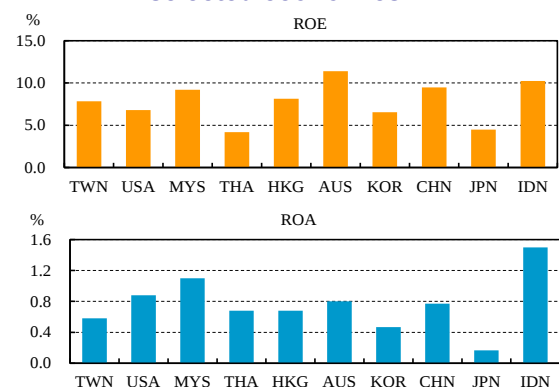
Chart 3.33 ROE & ROA of domestic banks



Notes: 1. ROE = net income before tax/average equity.
2. ROA = net income before tax/average assets.
3. Figures from 2012 forward are on the TIFRSs basis; figure of 2011 is on the ROC GAAP basis.

Source: CBC.

Chart 3.34 ROEs and ROAs of banks in selected economies



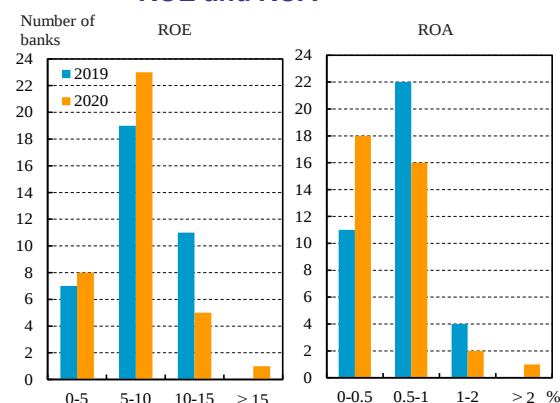
Note: Figures for Japan are 2020 Q3 data, others are 2020 Q4 data.
Sources: CBC, FDIC, BNM, BOT, APRA, FSS and IMF.

All domestic banks were profitable in 2020. Among them, only six banks achieved a profitable ROE of 10% or more, decreasing from 11 banks in 2019. Meanwhile, the number of banks with ROAs above the international standard of 1% also saw a decrease from four to three (Chart 3.35). In 2020, the number of banks with higher ROEs and ROAs than the previous year were down to 11 and seven, respectively.

Factors that might affect future profitability

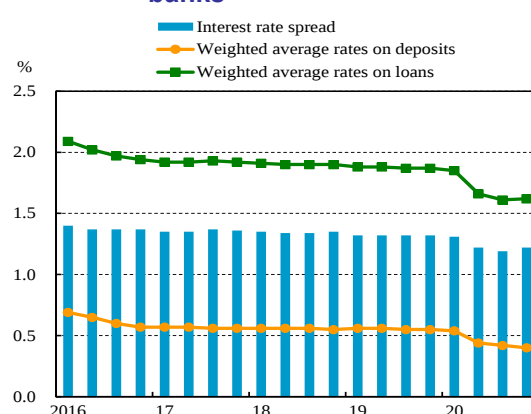
The impact of the COVID-19 pandemic resulted in the decline in domestic banks' profits in 2020. The uncertainties around future profitability warrant close attention, including: (1) the rising financial vulnerabilities of distressed firms and individuals after the withdrawal of the Taiwan's government's financial relief measures, which could weaken banks' asset quality and thus undermine their profits; and (2) the average interest rate spread between deposits and loans of domestic banks sliding to a low of 1.19 pps in 2020 Q3 (chart 3.36). This, together with accommodative monetary policy stances expected to be continued by major economies, will affect those domestic banks with net interest income as a major revenue resource and dampen growth momentum for their future profits.

Chart 3.35 Domestic banks classified by ROE and ROA



Source: CBC.

Chart 3.36 Interest rate spread of domestic banks



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

Source: CBC.

Capital adequacy

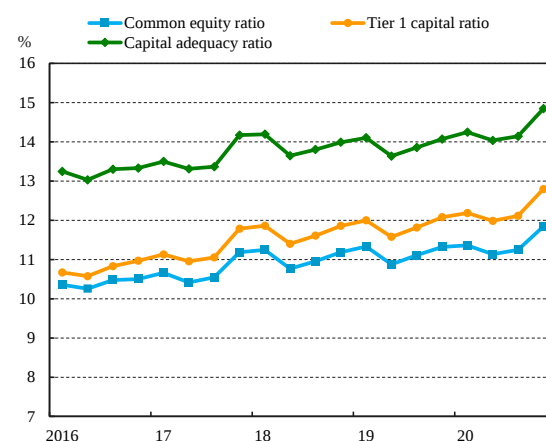
Capital ratios trended up significantly

In 2020, underpinned by accumulated earnings, and capital injections with cash or the issuance of subordinated debt by several banks, the regulatory capital of domestic banks increased. Moreover, some banks assigned lower risk weights to their real-estate exposures with the early adoption of the LTV approach⁴⁹ under Basel III in 2020 Q4, leading to a reduction in their risk-weighted assets. As a result, the average common equity ratio, Tier 1 capital ratio, and capital adequacy ratio of domestic banks reached 11.84%, 12.79%, and 14.84% (Chart 3.37), respectively, at the end of 2020, all above those ratios a year before. However, compared to some Asia-Pacific economies, Taiwan's banking industry had relatively lower capital levels (Chart 3.38).

Further broken down by component of regulatory capital, common equity Tier 1 (CET 1) capital, featuring the best loss-bearing capacity, accounted for 79.77% of eligible capital. This showed that the capital quality of domestic banks was satisfactory.

Moreover, at the end of 2020, the average leverage ratio of domestic banks stood at 6.82%, higher than 6.71% a year before and also above the 3% statutory standard, indicating that financial leverage remained sound.

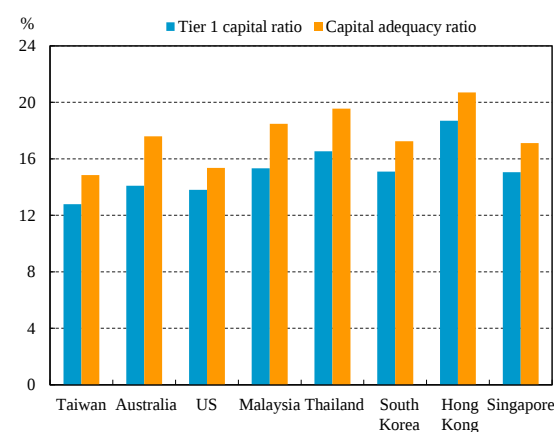
Chart 3.37 Capital ratios of domestic banks



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.

Chart 3.38 Capital ratios of banking industry in selected economies



Note: Figures for Singapore are end-September 2020 data, while the others are end-December 2020 data.

Sources: CBC, APRA, FDIC, BNM, BOT, FSS, HKMA and MAS.

⁴⁹ Regarding banks' adoption of the new version of the LTV approach in assessing their real estate exposures, please refer to Chapter 3 for more details.

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

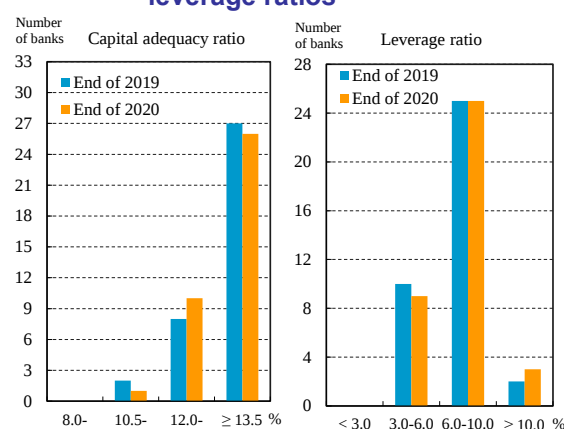
At the end of 2020, the capital ratios of six domestic systemically important banks (D-SIBs), including CTBC Bank, Cathay United Bank, Taipei Fubon Commercial Bank, Mega International Commercial Bank, Taiwan Cooperative Bank, and First Bank, and non-D-SIBs were all above the relevant FSC statutory minimum standards or additional capital buffer requirements⁵⁰ (Chart 3.39). Leverage ratios of all domestic banks were also above the 3% statutory standard (Chart 3.39).

Credit ratings

Average credit rating level remained steady

Of the overall risk assessments of Taiwan's banking system made by credit rating agencies, Standard & Poor's kept Taiwan's Banking Industry Country Risk Assessment (BICRA)⁵¹ unchanged at Group 4 with moderate risk. Compared to other Asian economies, the risk level of Taiwan's banking system was 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 in its Banking System Indicator/Macro-Prudential Indicator (BSI/MPI)⁵² also remained unchanged at level bbb/2 (Table 3.2).

Chart 3.39 Distribution of domestic banks' capital adequacy ratios and leverage ratios



Note: Leverage ratio = Tier 1 capital/total exposures.
Source: CBC.

Table 3.2 Systemic risk indicators for the banking system

Banking System	Standard & Poor's		Fitch	
	BICRA		BSI/MPI	
	2020/2	2021/2	2019/10	2020/8
Singapore	2	2	aa/2	aa/1
Hong Kong	2	2	a/2	a/2
Japan	3	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
Philippines	5	5	bb/1	bb/1
Mainland China	6	6	bb/1	bb/1
Thailand	6	6	bbb/1	bbb/1
Indonesia	6	6	bb/1	bb/1

Sources: Standard & Poor's and Fitch Ratings.

⁵⁰ For all D-SIBs, excluding the First Bank which was just designated as a D-SIB at the end of 2020, the common equity ratio, Tier 1 capital ratio and capital adequacy ratio should reach 7.5%, 9% and 11%, respectively. The statutory standards for the aforementioned three ratios of non-D-SIBs are 7%, 8.5% and 10.5%, respectively.

⁵¹ 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.

⁵² 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.

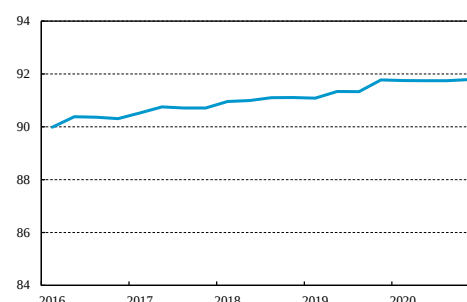
Among 38 domestic banks, except for one bank which had its credit rating upgraded, the others remained unchanged at the end of 2020. The weighted average credit rating index⁵³ remained the same as the previous year, indicating a limited impact of the COVID-19 pandemic on banks. Overall, the average credit rating level remained stable (Chart 3.40).

Rating outlooks for most domestic banks remained stable

Most 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 2020 (Chart 3.41). Ten banks received a negative rating outlook caused by the impact of the pandemic or weakening capital levels, while rating outlooks for the other banks remained stable or positive.

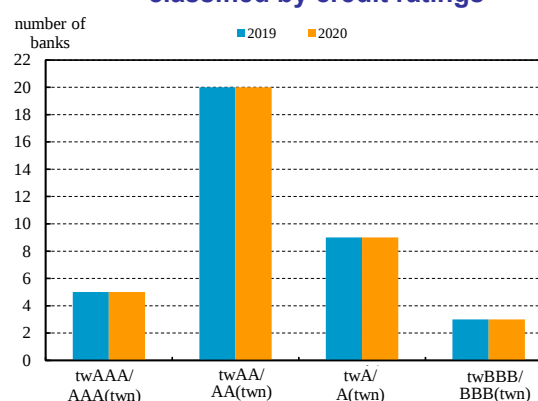
Taiwan's strong economic growth momentum despite the pandemic disrupting the global economy, coupled with an improvement in the operational environment of the banking industry, would help buttress domestic banks' capital levels and profitability. Reflecting this, Taiwan Ratings announced in March 2021 that Taiwan's banking industry outlook was stable, and Moody's also adjusted the outlook of Taiwan's banking industry from negative to stable.⁵⁴

Chart 3.40 Credit rating index of domestic banks



Sources: Taiwan Ratings Corporation, Fitch Ratings and CBC.

Chart 3.41 Number of domestic banks classified by credit ratings



Sources: Taiwan Ratings and Fitch Ratings.

⁵³ 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.

⁵⁴ Press releases by Taiwan Ratings and Moody's on March 29, 2021.

3.2.2 Life insurance companies

In 2020, total assets of life insurance companies kept growing, though at a slower pace. Moreover, pretax income reached a record high, while the average RBC ratio further improved and overall credit ratings held stable. However, owing to the expansion of foreign investment positions, life insurance companies still faced higher FX risk, interest rate risk and equity risk.

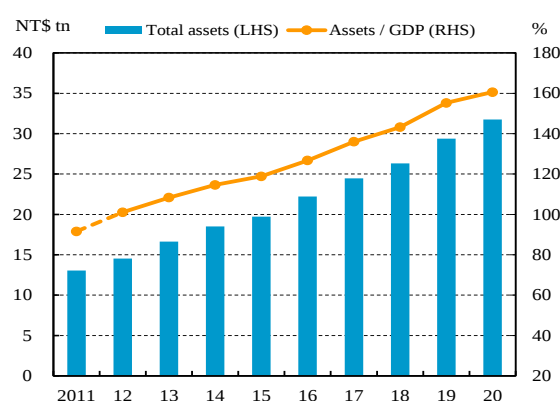
Assets grew at a slower pace

The total assets of life insurance companies reached NT\$31.75 trillion at the end of 2020, equivalent to 160.59% of annual GDP (Chart 3.42). The annual growth rate of total assets decreased to 8.03%, reflecting a slower pace of growth. The top three companies in terms of assets made up a combined market share of 55.29%. The market structure of the life insurance industry remained roughly unchanged in 2020.

Foreign investments remained the primary usage of funds

In terms of the usage of funds of life insurance companies at the end of 2020, foreign investments and domestic portfolio investments continued to account for the primary shares of total assets. Among them, the share of foreign investments decreased to 58.77% owing to a contraction in international bond investments, whereas that of domestic portfolio investments rose to 20.11% as life insurers increased investments in Taiwan's stock markets. As for the sources of funds, insurance liabilities accounted for 81.80%, the largest share of total liabilities and equity, while the share of equity increased to 7.93%, mainly supported by the accumulation of earnings and a strong expansion of unrealized securities investment profits (Chart 3.43).

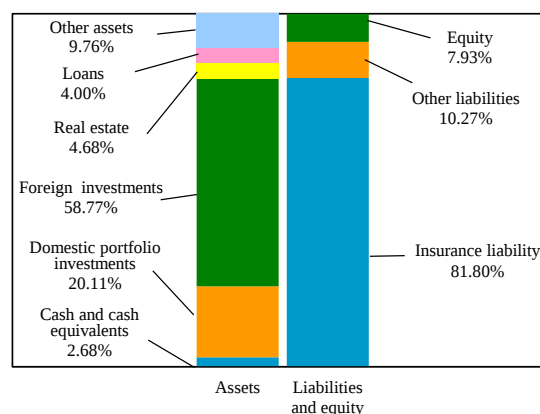
Chart 3.42 Total assets of life insurance companies



Note: Figures from 2012 forward are on the TIFRSs basis; figure of 2011 is on the ROC GAAP basis.

Sources: FSC and DGBAS.

Chart 3.43 Asset/liability structure of life insurance companies



Note: Figures are as of the end of 2020.

Source: FSC.

Pretax income continued to reach a record high

Life insurance companies reported a record-high net income before tax of NT\$206.1 billion in 2020 from NT\$154.7 billion a year before, a substantial year-on-year increase of 33.26% (Chart 3.44). This mainly resulted from an increase in investment revenue as life insurance companies actively realized their capital gains of stock and bond investments. Accordingly, their average ROA increased markedly to 0.67% from 0.56% a year earlier, whereas the ROE declined to 9.27% from 10.24% (Chart 3.45) because of a greater rise in equity.

Average RBC ratio rebounded, while equity to asset ratio continued to rise

Thanks to higher valuations of their stock holdings in 2020, capital levels of life insurance companies rose in the year, and the average RBC ratio rebounded to 299.13% at the end of the year from 292.54% the previous year (Chart 3.46). Furthermore, the average equity to asset ratio rose significantly to 8.57% from 7.1% the previous year (Chart 3.47).

Overall credit ratings remained stable, and downside risks to rating outlooks diminished

Among the 11 life insurance companies rated by credit rating agencies,⁵⁵ none received rating adjustments in 2020, except for one life insurance company receiving an upgrade from twA+ to twAA. As of the end of the year, all rated life insurance companies maintained credit ratings

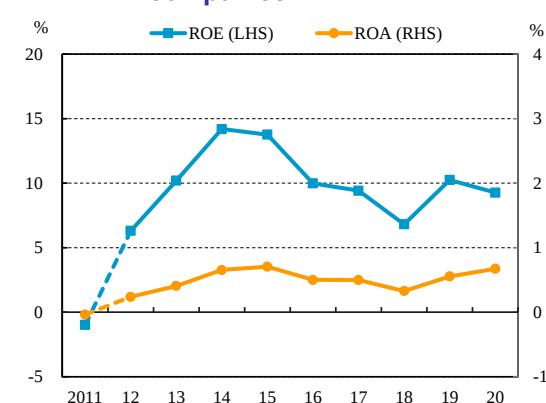
Chart 3.44 Net income before tax of life insurance companies



Note: Figures from 2012 forward are on the TIFRSs basis; figure of 2011 is on the ROC GAAP basis.

Source: FSC.

Chart 3.45 ROE & ROA of life insurance companies



Notes: 1. Figures from 2012 forward are on the TIFRSs basis; figure of 2011 is on the ROC GAAP basis.

2. ROE = net income before tax/average equity.

3. ROA = net income before tax/average assets.

Source: FSC.

⁵⁵ 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' ratings, and secondarily on the ratings by other credit rating agencies.

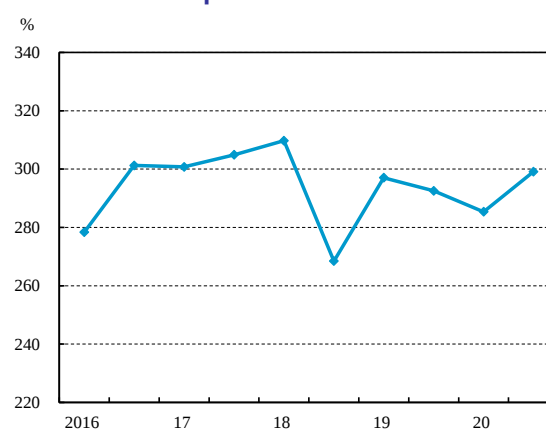
above twA or its equivalent, with the ratings of the top three companies in terms of assets holding at twAA. However, many companies were rated with a negative outlook in consideration of increasing volatility in financial markets and a weakening global economic outlook amid the pandemic, which might pose a negative impact on their capital levels. Nevertheless, downside risks to their rating outlooks diminished, supported by the assessment that a record high of pretax income in 2020 could help sustain their capital levels.

First-year premiums declined dramatically

From the beginning of 2020 onwards, a cut in credited interest rates by insurance companies and a new measure implemented by the FSC to enhance sound management of investment-linked insurance policies linked to target maturity bond funds, affected consumers' willingness to purchase new insurance policies. As a result, the first-year premiums (FYPs) from traditional as well as investment-linked insurance policies markedly dropped by 28.08% year on year. In 2021 Q1, the FYPs from traditional insurance policies continued to shrink. However, the FYPs from investment-linked insurance policies rebounded significantly, fueled by buoyant buying sentiment in such policies as stock markets in the US and Taiwan hit new highs. As a result, the FYPs from traditional and investment-linked insurance policies picked up and increased by 10.19% year on year.

In view of increasing demand for foreign currency-denominated insurance policies and with the aim of enhancing asset-liability allocation efficiency for life insurance companies that offer such products, the FSC announced in March 2021 its intention to amend the *Regulations Governing Foreign Investments by Insurance Companies*. The amendments proposed a change

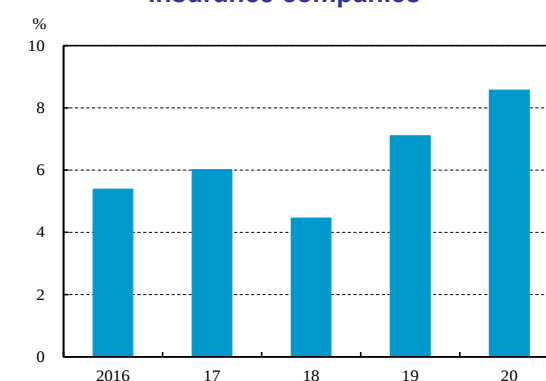
Chart 3.46 RBC ratio of life insurance companies



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

Source: FSC.

Chart 3.47 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.

to the current percentage for the reserves for non-investment-linked life insurance business to be exempted from the allowed foreign investment amount, raising it from 35% to 40%. Furthermore, the FSC proposed to strengthen the disclosure of the FX risk in foreign currency-denominated traditional insurance policies to policyholders.

Foreign investment positions expanded, with higher equity risk and interest rate risk

Foreign investment positions of life insurance companies grew continually and reached NT\$18.66 trillion at the end of 2020, of which more than 90% was invested in USD-denominated financial products. In order to alleviate the impacts of exchange rate fluctuations, life insurance companies actively used derivative financial instruments for FX hedges and accelerated the accumulation of FX valuation reserves to adhere to relevant regulations. However, the FX risk inherent in open FX positions for life insurance companies still warrants close attention.

In the foreign investments of insurance companies, securities investments constituted the largest share, of which about 90% were invested in bills and bonds and 10% in equities. With respect to bond investments, US government bond yields trended downwards significantly from 2020 Q1 onwards, triggering a massive wave of calling back international bonds by their issuers to be replaced with new issues. The redemption amount of international bonds in total reached US\$45.8 billion throughout 2020, mostly held by life insurance companies that would face reinvestment risks. However, as the FSC expected the redemption amount of international bonds to shrink substantially in 2021, the reinvestment risks were to diminish. Moreover, recently, the stock indices, which seem to have decoupled from the real economy, rebounded strongly in some financial markets and, in turn, inflated the bubbles in some asset categories. In addition, US government bond yields rose significantly, which was unfavorable to the valuation of bond positions. Therefore, life insurance companies still face elevated equity risk and interest rate risk.

3.2.3 Bills finance companies

The total assets of bills finance companies expanded substantially in 2020. Their guarantee business increased and credit asset quality remained sound. Profitability improved markedly and the average capital adequacy ratio edged up. However, liquidity risk remained high.

Total assets expanded substantially

The total assets of bills finance companies expanded substantially by NT\$100.8 billion or 10.03% in 2020 and stood at NT\$1,105.3 billion at the end of the year, mainly owing to increases in bill and bond investments. The ratio of total assets to annual GDP rose to 5.59% from 5.31% the previous year (Chart 3.48).

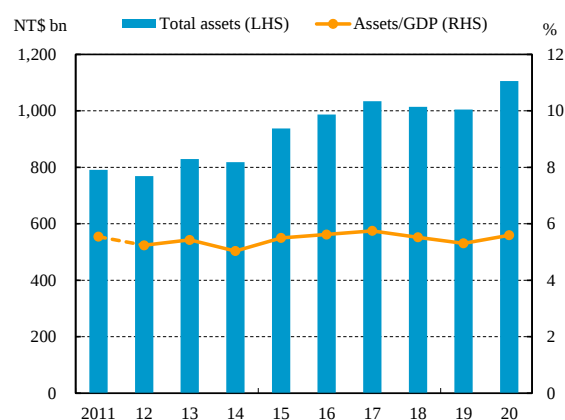
With respect to the asset and liability structure of bills finance companies, bill and bond investments constituted the largest share of 96.69% of total assets as of the end of 2020, an increase of 2.04 pps compared to a year earlier. On the liability side, bills and bonds sold under repo transactions as well as borrowings accounted for 85.43% of total assets, while equity accounted for 12.60% (Chart 3.49). The asset and liability structure remained roughly unchanged.

Credit risk

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

CP guaranteed by bills finance companies registered NT\$589.1 billion at the end of 2020, increasing by 4.19% year on year (Chart 3.50). The increase was mainly because corporates

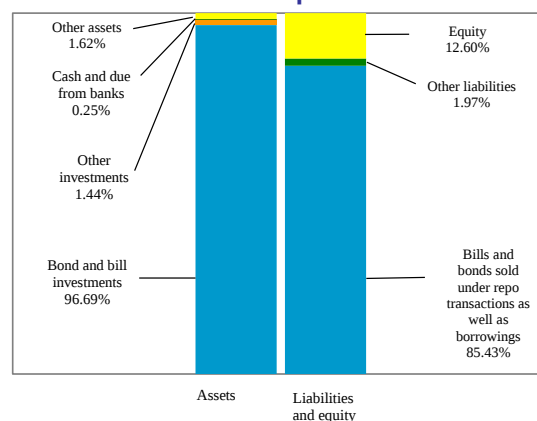
Chart 3.48 Total assets of bills finance companies



Note: Figures from 2012 forward are on the TIFRSs basis; figure of 2011 is on the ROC GAAP basis.

Sources: CBC and DGBAS.

Chart 3.49 Asset/liability structure of bills finance companies



Note: Figures are as of the end of 2020.

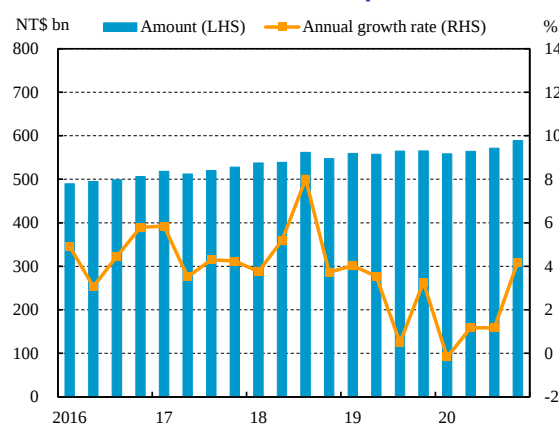
Sources: CBC and FSC.

increased CP issuance to raise funds on the back of a new low level of interest rates in the money market. However, the average ratio of guarantee liabilities to equity decreased to 4.89 times owing to a greater increase in equity, and the ratio of each company remained below the regulatory ceiling of 5 or 5.5 times.

At the end of 2020, guarantees granted to the real estate and construction industries and credit secured by real estate increased to 30.81% and 42.11%, respectively, of the total credit of bills finance companies. Both ratios remained at recent high levels. As pressures on reducing unsold residential properties remain a concern and the government's recent measures to improve the health of the housing market will take time to show results, the credit risk of mortgage-related credit remains high. Bills finance companies should closely monitor the impacts of housing market trends on mortgage-related credit.

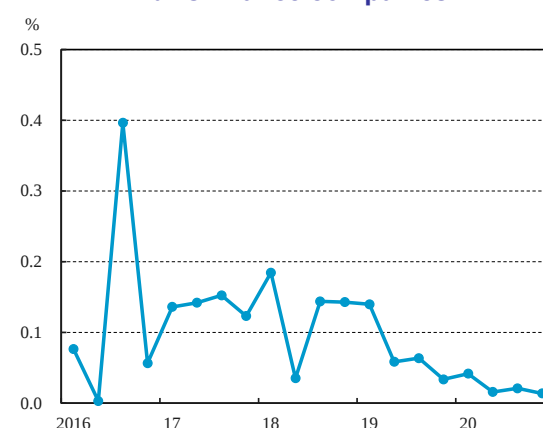
To strengthen the risk control on mortgage-related credit of bills finance companies, in December 2020, the Bank suggested the FSC consider preventing bills finance companies from allocating excessive credit resources in the real estate market. In response, the FSC included the guarantee business for the real estate industry as a focus of financial inspection on bills finance companies in 2021, initiated related targeted examinations, and proposed measures for preventing excessive credit resource allocation to the real estate market, so as to help enhance the risk control of mortgage-related credit of bills finance companies.

Chart 3.50 Outstanding CP guaranteed by bills finance companies



Source: CBC.

Chart 3.51 Guaranteed advances ratio of bills finance companies



Notes: 1. Guaranteed advances ratio = overdue guarantee advances/(overdue guarantee advances + guarantees)
2. The guaranteed advances ratio rose at the end of September 2016 because bills finance companies faced a dispute over the right to dispose of collateral.

Source: CBC.

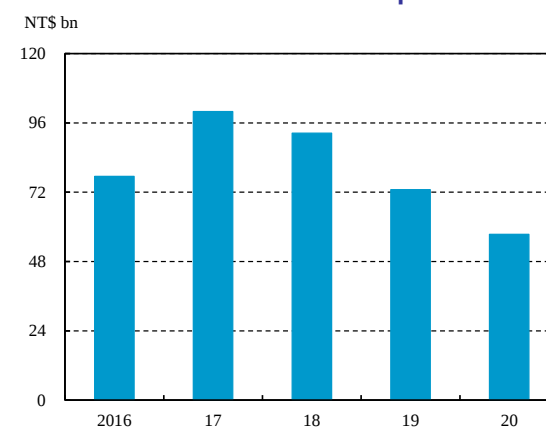
Credit quality remained sound as guaranteed advances ratio declined further

The credit quality of bills finance companies remained sound in 2020, as the guaranteed advances ratio declined further, reaching 0.01% at the end of the year (Chart 3.51). Moreover, the credit loss reserves to guaranteed advances ratio⁵⁶ expanded to 99.31 times, indicating sufficient reserves to cover potential credit losses. However, the risk of the COVID-19 pandemic resurging may add to concerns about a highly uncertain outlook for both domestic and global economic growth, which could weaken the credit quality of bills finance companies going forward, and thus warrant continuing attention.

Investment in non-guaranteed CP issued by the leasing industry accounted for a higher share, and its potential credit risks warrant attention

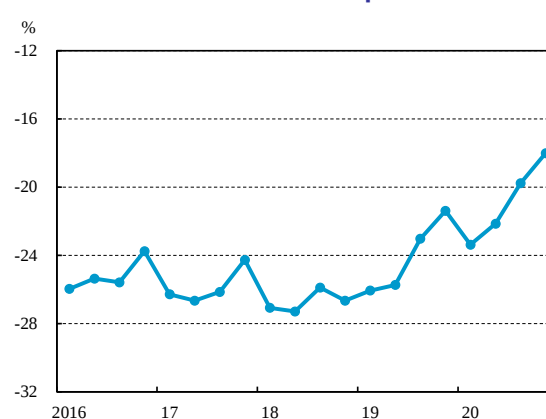
The outstanding amount of non-guaranteed CP investment by bills finance companies stood at NT\$57.4 billion at the end of 2020, decreasing by 21.22% year on year (Chart 3.52). Each company's ratio of non-guaranteed CP investment to equity remained below the self-disciplinary ceiling of 2 times. However, the outstanding amount of investment in non-guaranteed CP issued by the leasing industry doubled compared to the previous year and accounted for more than 10% of total non-guaranteed CP investment. Considering that the leasing industry tends to rely on short-term sources for funding long-term investments, bills finance companies should pay attention to the potential credit risk associated with such investment.

Chart 3.52 Non-guaranteed CP investments of bills finance companies



Source: CBC.

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.

⁵⁶ Credit loss reserves to guaranteed advances ratio = (provisions + loss reserves to guarantees)/guaranteed advances

Liquidity risk remained high

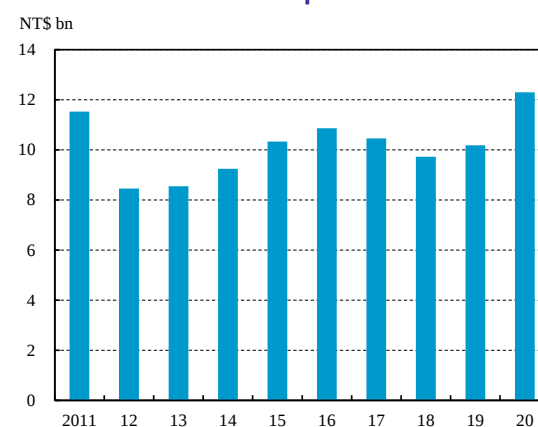
In 2020, bills finance companies still faced a significant maturity mismatch between assets and liabilities, as more than 90% of their assets were invested in bills and bonds at the end of the year, 45.22% of which were long-term bonds. Meanwhile, more than 80% of their liabilities were from short-term interbank call loans and repo transactions. Nevertheless, their 0-30 day maturity gap to total assets denominated in NTD shrunk continually and registered -18.01% at the end of the year (Chart 3.53), reflecting a decreasing but still high liquidity risk in bills finance companies.

The outstanding amount of major liabilities⁵⁷ increased by 10.23% in 2020 and the average ratio of major liabilities to equity also increased to 7.88 times at the end of the year, reflecting a higher degree of financial leverage. However, the leverage ratios of all bills finance companies stayed below the regulatory ceilings of 10 or 12 times.

Profitability enhanced substantially

Bills finance companies posted a 10-year high net income before tax of NT\$12.3 billion in 2020, markedly increasing by 20.79% year on year (Chart 3.54), mainly owing to a decrease in interest expenses of bill and bond repo transactions. The average ROE and ROA rose to 9.33% and 1.18% (Chart 3.55), respectively, reflecting a sharp increase in profitability.

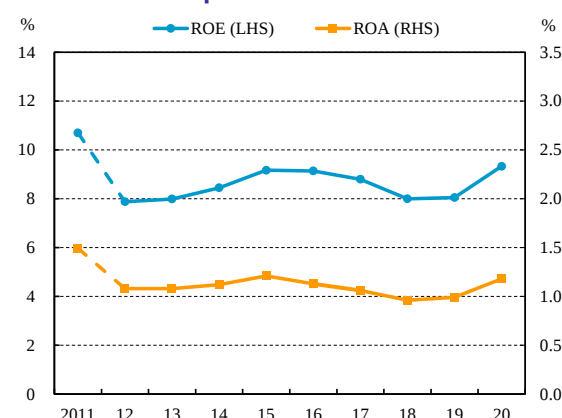
Chart 3.54 Net income before tax of bills finance companies



Note: Figures from 2012 forward are on the TIFRSs basis; figure of 2011 is on the ROC GAAP basis.

Source: CBC.

Chart 3.55 ROE & ROA of bills finance companies



Notes: 1. Figures from 2012 forward are on the TIFRSs basis; figure of 2011 is on the ROC GAAP basis.

2. ROE = net income before tax/average equity.

3. ROA = net income before tax/average assets.

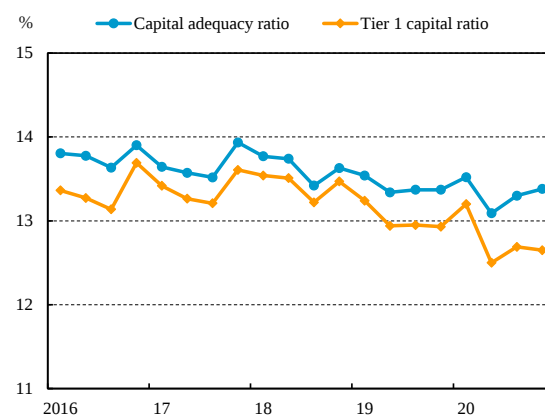
Source: CBC.

⁵⁷ Major liabilities include call loans, repo transactions, as well as issuance of corporate bonds and CP.

Average capital adequacy ratio rose marginally

At the end of 2020, the average Tier 1 capital ratio of bills finance companies declined marginally to 12.65%, while their average capital adequacy ratio rose slightly to 13.38% (Chart 3.56). Moreover, the capital adequacy ratio for each company remained well above the statutory minimum of 8%.

Chart 3.56 Average capital adequacy ratios of bills finance companies



Source: CBC.

Box 3**LIBOR cessation: Impacts on Taiwanese banking industry and response measures**

The London Interbank Offered Rate (LIBOR) is the main reference rate for pricing various financial instruments in global financial markets. After the 2008 financial crisis, there were multiple scandals related to LIBOR manipulation around the world. Moreover, the rapid shrinking of the interbank call loan market has affected the willingness of banks to submit LIBOR settings. To avoid undue market disruption caused by an unexpected cessation of LIBOR, the UK Financial Conduct Authority (FCA) stated that panel bank submissions for all LIBOR settings will no longer be required from January 2022 onwards. As a result, the approaching cessation of publication of the LIBOR settings and the transition of interest rate benchmarks posed challenges for financial markets. Against this backdrop, the way that the Taiwanese banking industry addresses the risks of LIBOR cessation warrants attention.

1. Background and developments of LIBOR cessation**1.1 Background of LIBOR cessation**

LIBOR, calculated from estimates of unsecured interbank call loan rates submitted by a panel of banks, is widely used in the pricing and evaluation of various financial products. After the 2008 financial crisis, it was discovered that several banks had reported false interest rates to manipulate LIBOR to their own advantage. The scandal prompted a wave of financial benchmark rate reforms around the world. Although the LIBOR management mechanism was improved after the reforms, the interbank call loan markets in major economies continued to shrink over the same period. It not only affected the willingness of panel banks to submit LIBOR settings, but also led most LIBOR submissions to be reliant on assumptions or expert judgments. As a result, LIBOR submissions remained vulnerable to manipulation. Meanwhile, given shrinking interbank call loan markets, the scale of which fall disproportionately far below the amount of LIBOR-linked financial products globally, doubts about the representativeness of LIBOR in financial markets have been raised.

In order to avoid undue market disruption caused by an unexpected cessation of LIBOR and to promote the reform of alternative reference rates (ARRs), the UK FCA announced in July 2017 that it would no longer require banks to submit settings of LIBOR after the end of 2021 and jurisdictions are encouraged to establish robust ARRs to replace LIBOR. Then, with a view to reducing the burden of contract conversion on financial institutions, in March 2021, the FCA announced that it had decided to extend the cessation date of some

USD LIBOR settings to the end of June 2023. However, regulatory authorities such as the US Fed still encouraged financial institutions to cease entering into new contracts that use USD LIBOR as a reference rate for various tenors of financial instruments by the end of 2021.

1.2 Alternative reference rates for LIBOR

LIBOR is currently calculated for five currencies (USD, GBP, EUR, CHF, and JPY) and seven tenors (ranging from overnight to 12 months) with respect to each currency, resulting in the publication of 35 individual rates.¹ For those five currencies, ARR were identified and recommended in respective jurisdictions. Unlike LIBOR, which represents an unsecured interest rate with a complete forward-looking term structure, ARRs are backward-looking overnight interest rates, relying entirely on transaction data. Among them, the Secured Overnight Financing Rate (SOFR) and the Swiss Average Rate Overnight (SARON) are secured rates calculated on the basis of repo transaction data, whereas the other three ARRs are unsecured rates.

2. Impacts of LIBOR cessation on Taiwanese banking industry

2.1 LIBOR exposure of Taiwanese banking industry

LIBOR has been a long-established benchmark interest rate with the most influence on the world. Being a participant in the global financial market, the Taiwanese banking industry has widely used LIBOR in their daily business. Considering that LIBOR and ARRs are essentially different, it is necessary for the banking industry to align relevant systems and operating procedures with the characteristics of ARRs. However, this may impact product design and trading system in the front office, asset and liability valuation, capital allocation, and risk analysis models in the middle office, and collateral management, settlement, and hedge accounting in the back office. According to a survey conducted by the Bankers Association of the Republic of China (BAROC), in terms of the LIBOR exposures of the Taiwanese banking industry, the notional position of financial derivatives accounted for the largest share of approximately 60% of the total at the end of June 2020, while the rest mostly went to cash products in assets. Compared with Japan and Hong Kong, the Taiwanese banks' overall exposures to LIBOR-linked products and contracts were limited. However, an estimated more than 60% of current LIBOR exposures will successively mature after January 1, 2022. It is higher than the levels of major economies, ranging from 40% to 50%.² Considering that more than 90% of such exposures lack appropriate fallback language in contracts, banks may find it difficult to apply fallback mechanisms or adopt ARRs after LIBOR cessation.

2.2 Major LIBOR cessation risks to the banking industry

LIBOR cessation risks are widely present in various bank operations. In general, there are six key risks faced by the banking industry, including profit and capital risk, market risk, liquidity risk, operational risk, legal risk, and reputational risk. According to a Sionics research,³ financial derivatives trades posed lower LIBOR cessation risks as most market participants adhere to the International Swaps and Derivatives Association protocol, whereas cash products, such as loans and bonds, may have higher legal and operational risks owing to the lack of standardized contracts that incorporate fallback language.

3. LIBOR cessation response measures in Taiwan

3.1 Measures taken by the Bank and the FSC

In order to ensure that all banks are fully prepared for LIBOR cessation, in February 2020, the Bank and the FSC urged domestic financial institutions to carefully assess the risks of LIBOR discontinuation and address them appropriately. They are advised to: (1) make transition plans so as to shift to ARR; (2) review legacy contracts referencing LIBOR, and actively communicate with affected customers and counterparties to negotiate relevant contract modifications; and (3) identify risks posed by LIBOR cessation and transition. In March 2020, the Bank, together with the FSC, urged the BAROC to establish a task force on LIBOR transition, which aims to investigate the impacts on and preparations by the Taiwanese banking industry and to recommend response measures for banks to make LIBOR transition plans. Currently, this task force is right on schedule in carrying out a series of working projects.

3.2 Current efforts of banks and recommendations

According to the information submitted by banks on October 30, 2020, most Taiwanese banks have set up dedicated committees or task forces for benchmark interest rate transition. They not only monitor the affected exposures regularly, but also assess potential impacts and carry out response strategies continually. In light of the wide-ranging impacts of LIBOR cessation, Taiwanese banks should conduct comprehensive impact assessments and develop complete LIBOR cessation and transition plans. In particular, they are advised to review the completeness of their own preparations and actively carry out LIBOR transition processes based on the recommendations of the aforementioned task force on eight major work items, namely governance structure and transition plans, impact assessments, new benchmark interest rate markets and product transition, contract renegotiation, customer communication, system and process adjustments, risk and

revaluation models, and financial reporting and taxation.

4. Conclusion

The Taiwanese banking industry uses LIBOR widely in their front, middle, and back office operations. Therefore, LIBOR cessation will have significant impacts on their financial product contracts, customer retention, business processes and information systems, risk management models, accounting, and taxation. Currently, some banks with LIBOR-linked financial product contracts which lack appropriate fallback language would need to actively strengthen their preparations for LIBOR cessation. With the LIBOR cessation date getting closer, banks should have adequate manpower and resources in place to formulate and execute LIBOR transition plans prudently. They are encouraged to carry out LIBOR transition processes as soon as possible so as to reduce potential risks arising from LIBOR cessation.

- Notes: 1. The ARR for USD, EUR, GBP, CHF, and JPY LIBOR are the Secured Overnight Financing Rate (SOFR), the Euro Short-Term Rate (€STR), the Sterling Overnight Index Average (SONIA), the Swiss Average Rate Overnight (SARON), and the Tokyo Overnight Average Rate (TONA), respectively.
2. Financial Stability Board (2020), “Supervisory Issues Associated with Benchmark Transition,” July.
3. Sionics (2019), “Benchmark Reform – Taipei Workshop,” October.

3.3 Financial infrastructure

3.3.1 Payment and settlement systems

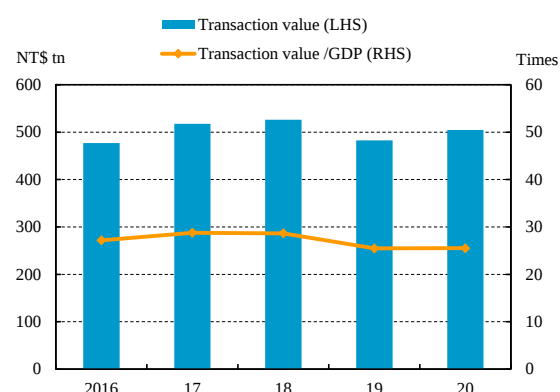
Overview of the CIFS's operation

The CIFS uses required reserves⁵⁸ deposited with the Bank to deal with large-value interbank funds transfers, e.g., foreign exchange transactions.⁵⁹ It also electronically conducts the final settlement of NTD interbank transfers, connecting to each clearing system,⁶⁰ such as those for domestic securities, bills, bonds and retail payments. In 2020, the amount of funds settled via the CIFS was about NT\$505 trillion, approximately 25.5 times the GDP for the year (Chart 3.57). The daily average reserves deposited for settlement⁶¹ was about NT\$814.1 billion, through which the transaction amount completed was approximately NT\$2.01 trillion.

In response to the pandemic, the Bank took measures to maintain the smooth operation of the payment systems as follows:

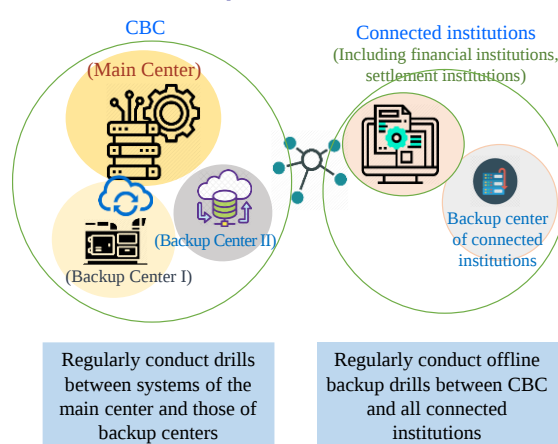
1. Preparing the onsite and offsite data backup facilities for the CIFS and performing drills on a regular basis to ensure uninterrupted system operation (Chart 3.58).
2. Working off-site and working from home. In line with the government's pandemic prevention policies, some of the Bank's employees carried out work off-site from March 6, 2020 and then resumed normal

Chart 3.57 Funds transferred via the CIFS



Sources: CBC and DGBAS.

Chart 3.58 Schematic diagram of CIFS backup mechanism in CBC



Source: CBC.

⁵⁸ The required reserves deposited by banks are a type of central bank money and are deemed an asset without credit risk.

⁵⁹ Large-value interbank funds transfers include foreign exchange transactions, interbank loans, interbank transfers, and book-entry central government bond payments, etc.

⁶⁰ The CIFS links every domestic clearing system, handling negotiable instruments exchanges, interbank payment services, credit cards, and clearance services of the settled amounts of bills, listed/over-the-counter (OTC) stocks, and government bonds.

⁶¹ Refer to the balance deposited by banks in the CBC Reserves Accounts A.

work back to the office on June 1 as the pandemic eased. However, in mid-May 2021, owing to an upsurge of domestic cases, the mechanism of working off-site and working from home (WFH) was reinstated.

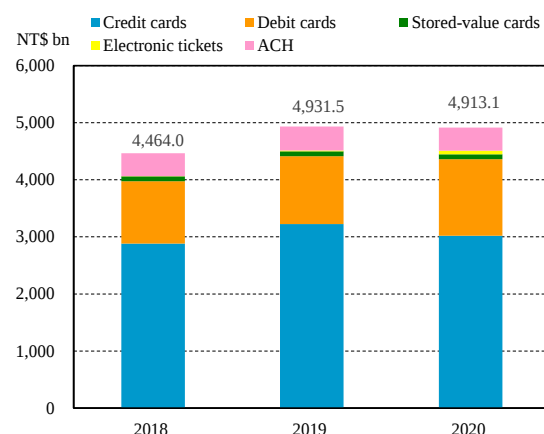
3. Formulating the *Precautions for the Implementation of the CIFS and Open Market Operation System in Response to a Major Epidemic*. Financial institutions were required to adopt relevant measures⁶² in unison, ensuring normal functioning of liquidity management.

The FISC's Inter-bank Financial Information System (hereinafter abbreviated as FIS) uses the funds of the Interbank Funds Transfer Guarantee Special Account (referred to as the Guarantee Account)⁶³ under the CIFS to clear and settle one by one interbank payment transactions of remittances, automated teller machines (ATM) withdrawals, transfers, etc. The annual transaction amount in 2020 was approximately NT\$174.8 trillion. As the demand for interbank electronic payment transactions increased, the daily average balance of the Guarantee Account in 2020 amounted to about NT\$302.2 billion, while the average daily transaction amount of the FIS using the funds of the Guarantee Account was about NT\$699.1 billion.

Consumption via domestic electronic payment instruments

In 2020, the overall consumption expenditure via various electronic payment tools⁶⁴ was NT\$4.91 trillion (Chart 3.59), decreasing slightly by 0.37% year on year. Among them, the consumption amount via credit cards, ACH interbank collection, and electronic ticketing declined by about NT\$200 billion, NT\$12.5 billion, and NT\$4.4 billion, respectively. The declines were mainly caused by the impact of the pandemic under which people could not travel abroad and face-to-face transactions in physical stores reduced.

Chart 3.59 Overview of electronic retail payment transactions



Notes: 1. The consumption statistics of debit cards include consumer purchases with domestic chip bank cards, VISA and other international debit cards, UnionPay cards, and ATM transfers for shopping payments.
2. ACH inter-bank collection means that the payment institutions handle deduction and account entry through the ACH system of the TCH after obtaining the entrustment of the public.

Sources: CBC, FSC and FISC.

⁶² Relevant measures include: (1) to prepare an offsite backup system and operating manpower; (2) to transfer funds via offline media or by manual billing if the connection is interrupted; (3) to avoid relevant personnel from being quarantined, thus affecting fund dispatching, another financial institution can be entrusted to appropriate funds on its behalf; (4) to notify the Bank as soon as possible when the headquarters initiates the mechanism of working off-site or entrusts another financial institution to appropriate funds.

⁶³ To deal with the clearance and settlement of retail interbank payment transactions, the Bank agrees all banks shall jointly open an Interbank Funds Transfer Guarantee Special Account at the Bank. The Guarantee Account is a collective account within the sub-account of each bank. Each bank can transfer funds from its reserves account to this special account as a guarantee for clearing of interbank payments on a one by one basis.

⁶⁴ See Note 9.

Overview of the development of domestic mobile payment in 2020

In order to promote the use of mobile payment, the National Development Council has set a target of 90% penetration rate of mobile payment in 2025. According to a survey,⁶⁵ the penetration rate⁶⁶ in September 2020 was 67.5% as the public mindful of pandemic prevention tended to reduce cash transactions and stores used related promotion schemes to lure customers, boosting the willingness to use mobile payments. In order to improve the domestic mobile payment environment, the Bank urged the FISC to establish a common QR Code payment standard,⁶⁷ and promoted it jointly with banks. Since its launch in September 2017, the accumulated number of transactions processed using this common standard has exceeded 40 million with a total value of approximately NT\$153.7 billion at the end of December 2020. The number and the value of transactions in 2020 increased respectively by 130% and 74%⁶⁸ year on year.

To facilitate inter-institutional connection between banks and non-bank payment institutions and thus promote the efficiency of the overall payment market, the FSC completed the amendment to the *Act Governing Electronic Payment Institutions*,⁶⁹ to be enacted on July 1, 2021, along with its sub-regulations. The Bank had already instructed the FISC to establish an inter-institutional electronic payment platform and to complete the development of functions such as fund transfers and shopping payments. Once the relevant sub-regulations are amended, the FISC will apply to the competent authority for this business and begin to accept participation by electronic payment institutions in the platform.

The role of central banks and new currency paradigms in the era of digital payment

As digital innovations are changing the landscape of payment service, central banks in many countries have actively embraced payment innovations, continued to improve payment systems, and started research on CBDCs. In terms of research progress on a CBDC, the Bank was in step with the world and had completed the first phase program in June 2020 with a technical

⁶⁵ MIC survey data from the Institute for Information Industry.

⁶⁶ See Note 10.

⁶⁷ Competition in the domestic mobile payment market is fierce. In order to seize the market opportunities, telecommunication industries have developed their own brands, resulting in incompatibility of specifications, which hinders the long-term development. With the support and assistance of the Ministry of Finance, the FISC and government-owned banks launched the common QR Code payment standard in September 2017.

⁶⁸ The analysis of transactions processed via the common QR Code payment standard in 2020 shows: 1. in terms of the number of transactions, transfers were the most (accounting for about 44%), while shopping grew the fastest (doubling); 2. in terms of transaction amounts, transfers were still the most (about 69%) and shopping also grew the fastest (multiplying 1.8 times).

⁶⁹ The key points of the amendment include: (1) to abolish the *Act Governing Issuance of Electronic Stored Value Cards*, and to include issuing institutions of the electronic stored value cards in the scope of the amended *Act*; (2) to expand the scope of services, which include cross-institutional money transfer services and small amount remittances services.

report on the feasibility of a wholesale CBDC, and moved on to the second phase program on a general purpose CBDC in September of the same year (Box 4).

3.3.2 The FSC revised the regulations governing risk weights of real estate exposures on domestic banks

The Basel Committee on Banking Supervision (BCBS) issued the Basel III final reform document in December 2017.⁷⁰ The revised capital requirements of real estate exposures applied different risk weights according to loan-to-value ratios of the exposures (hereinafter referred to as the LTV approach), with an addition of the capital requirement for “land acquisition, development and construction” (ADC) exposures.

In view of the new BCBS capital requirements being more sensitive to risks, the FSC amended the capital requirements for real estate exposures for domestic banks in December 2020, effective at the end of June 2021. However, well prepared banks were permitted to early adopt the new approaches by the end of 2020.⁷¹ The revised risk weights of real estate exposures are shown in Table 3.3. The main amendments are as follows:

- Domestic banks may choose to either adopt the new LTV approach for residential and commercial real estate exposures or apply the current simplified method.
- Residential and commercial real estate exposures may be either general or income-producing exposures, depending on whether repayments of the loans rely on cash flows generated by the real estate. The risk weights assigned to these exposures will be determined based on their LTV ratios.
- Risk weights assigned to exposures with LTV ratios below 80% will be lower; whereas risk weights will be increased for exposures with LTV ratios higher than 80%.
- The new ADC exposures will be risk-weighted at 150% in general, which will be higher than the existing risk weight of 100% assigned to corporate exposures without external credit ratings.

Eleven banks were permitted to adopt the new LTV approach by the end of 2020 based on the pilot test results that the adoption will be favorable to the calculations of capital ratios.⁷² The

⁷⁰ Basel Committee on Banking Supervision (2017), “Basel III: Finalizing post-crisis reforms,” December.

⁷¹ The adoption of a new LTV approach for overseas exposures (including exposures of overseas branches and subsidiaries) will be postponed until January 2023.

⁷² Banks that adopted the LTV approach earlier include: Taiwan Cooperative Bank, Taipei Fubon Commercial Bank, Cathay United Bank, Shin Kong Commercial Bank, Yuanta Commercial Bank, Bank SinoPac, E.Sun Commercial Bank, Taishin International Bank, Jih Sun International Bank, CTBC Bank, and Sunny Bank, amounting to 11 banks.

FSC will require the banks to apply the simplified method again, to make an improvement or to raise additional capital charges when banks fail to meet the minimum operation requirements.

Table 3.3 The newly revised risk weights of real estate exposures

Type of exposures	Risk weights based on LTV ratios							
	Applicable exposures							Inapplicable exposures
Residential real estate exposures	LTV ratios		≤50%	50%-60%	60%-80%	80%-90%	90%-100%	
	General	LTV approach	20%	25%	30%	50%	70%	Risk weight of the counterparty
	Income-producing	LTV approach	30%	35%	45%	75%	105%	150%
Commercial real estate exposures	LTV ratios		≤60%		60%-80%	>80%		Inapplicable exposures
	General	LTV approach	60% or the risk weight of the counterparty (whichever is lower)		Risk weight of the counterparty			Risk weight of the counterparty
	Income-producing	LTV approach	70%		90%	110%		150%
ADC exposures	At 150%, in principle; at 100%, for those meeting the criteria in Basel III							

Notes: 1. “Applicable exposures” are real estate exposures which meet the following six requirements: (1) the properties securing the exposures are finished properties; (2) any claims on the properties taken must be legally enforceable in all relevant jurisdictions; (3) the exposures are claims over the properties; (4) borrowers are able to repay; (5) properties must be valued according to specific criteria; (6) documentation requirements are met.

2. Risk weights of exposures to individuals are 75% and those to SMEs are 85%; for exposures of other corporate counterparties, the risk weights applied would be those assigned to corporate exposures.

Source: FSC.

3.3.3 Financial institutions actively advanced sustainable development in unison

In recent years, as international investment institutions and global industrial chains have increasingly attended to sustainability-related issues, corporate governance and responsible investment have gradually become important drivers in major global capital markets. In order to promote the sustainable development of corporates, establish a competent environmental, social, and governance (ESG) ecosystem, and strengthen the international competitiveness of Taiwan’s capital markets, the FSC officially launched the Corporate Governance 3.0 - Sustainable Development Roadmap (hereinafter referred to as CG 3.0) in August 2020. The CG 3.0 centers on the following five action plans: (1) strengthening the duties and functions of

the boards; (2) enhancing information transparency; (3) strengthening communication with stakeholders; (4) encouraging stewardship; (5) deepening a corporate culture of governance and sustainable development.

In addition, considering that green finance is an integral part of the government's overall environmental, economic, and industrial policies, the FSC formulated the Green Finance Action Plan 1.0 in November 2017, encouraging financial institutions to provide the green energy industry with investment and financing, with the aim of enhancing effective operation of the domestic green finance market and advocating overall developments in sustainable finance. Furthermore, in order to achieve Taiwan's carbon reduction and sustainable development goals, the FSC proposed the Green Finance Action Plan 2.0 (hereinafter referred to as Action Plan 2.0) in August 2020. The Action Plan 2.0 expanded the scope of sustainable finance and included a total of 38 measures that cover the following eight aspects: credit, investment, capital market fundraising, professional development, information disclosure, promotion of further development of green financial products or services, prudential supervision, international connections, and incentive mechanisms.

However, financial institutions still face some challenges in the course of promoting sustainable finance, such as harmonizing the definitions of sustainable finance, improving the quality of ESG disclosure, removing in-house hindrances to the advancement of sustainable finance, and synchronizing stakeholder engagement. The FSC is establishing Taiwan's classification standards for sustainable firms and planning a database platform for sustainable development of industries, which could serve as a reference for financial institutions in choosing investment and financing targets or cooperation partners and in disclosing relevant information. Looking forward, it is hoped that the vision of sustainable finance ecosystem can be achieved through close cooperation between the public and private sectors in the future (Box 5).

3.3.4 Encouraging banks to engage in Open Banking data sharing services

To speed up the process of Taiwan's financial data sharing, the FSC encourages banks to initiate open banking services based on their business needs in a voluntary, self-disciplined and progressive manner. In cooperation with Third-party Service Providers (TSPs), the open banking services would help banks to provide more innovations in financial services and enable digital finance transformation so as to promote the development of financial inclusion.

The FSC planned to promote open banking in three phases that would be reviewed on a rolling basis. The focus of planning and the current status for each phase are as follows:

1. Phase I - “public information inquiry”: the first phase aims at facilitating the inquiry of non-transactional financial information. Consumers can compare goods and services of each bank through a third-party platform developed by TSPs by accessing such information as interest rates, exchange rates, ATM locations, branch status, and financial products. In September 2019, the FSC approved the applications of 25 banks to launch Phase I service in cooperation with seven TSPs.
2. Phase II - “customer information inquiry”: the second phase focuses on the information of financial transactions, such as bank savings account balance and transaction details. Since this type of information involved customer data ownership, personal information protection, customer interests, dispute resolution mechanisms, and standards for the management of TSPs, the FSC assigned the Bankers Association and the FISC to formulate guidance on institutional and technical standards for banks and TSPs to follow. In December 2020, the FSC approved the applications of seven banks to conduct Phase II service in cooperation with two TSPs. More banks have filed applications and are waiting for approval.
3. Phase III - “transaction information”: the third phase mainly involves the process of banking transactions and payments. Bank customers, after giving consent for TSPs to consolidate their personal accounts across banks, may make a debit, payment, adjustment, or disbursement of account funds through an account-linked app. The FSC will review the outcomes of Phase II operations before moving on with Phase III.

3.3.5 The relaxation of wealth management regulations and the enhancement of related supervisory measures are expected to increase the competitiveness of the domestic wealth management industry

To meet the needs of high-net-worth customers for investment and wealth management, and in light of a wave of offshore funds repatriation, the FSC launched the New Wealth Management Scheme in 2020 and relaxed the relevant regulations. The deregulation allows financial institutions to provide more diverse financial products and consulting services to high-net-worth customers, i.e., HNW customers defined as those hold NT\$100 million or above in net

worth of investable assets and insurance products, possess professional knowledge and trading experience in financial products, and have adequate risk tolerance. This, coupled with the enhancement of related supervisory measures, is expected to take Taiwan's wealth management industry to a more sophisticated level.

When financial institutions apply for permission to engage in wealth management business for HNW customers, the FSC requires them to meet the standards set in accordance with the principle of differentiated supervision. Moreover, the applicants should strengthen their risk management by establishing management mechanisms related to product suitability and risk disclosure, product review and monitoring, liability for issuers of offshore financial products, internal control, cyber security, and fraud-prevention measures for digital financial services, and risk management and code of conduct. Moreover, applicants' board of directors should be responsible for building a corporate culture of integrity and establishing a comprehensive code of conduct for consumer protection, in order to fulfill the principle of treating clients fairly. The FSC also introduced the "senior manager accountability scheme" in a bid to understand the vision and commitment of senior management of financial institutions for business operations in terms of "corporate culture and code of conduct" and "treating clients fairly." Since December 2020, the FSC had approved the applications of several financial institutions to conduct such businesses.

3.3.6 FX regulation amendments

To keep up with the trends of financial digitalization and FX business development, and to promote the development of domestic bank debentures market and the diversification of financial products, the Bank amended the *Regulations Governing Foreign Exchange Business of Banking Enterprises* in January 2021 to relax some restrictions on banks' FX business. The major amendments included the following:

- Stipulating the definition of foreign currency bank debentures, relaxing the restrictions on authorized banks' issuing within the territory of the ROC foreign currency bank debentures linked to derivatives or structured notes, and amending the rules that authorized banks shall comply with.
- Simplifying qualifications for banks applying to the Bank for approval to become authorized FX banks by deleting the provision that banks shall participate in joint processing of foreign exchange business with other authorized banks for a minimum

accumulated amount.⁷³

- Streamlining the application procedure for banks applying to the Bank for approval to become authorized FX banks, including deleting the provision that the application made to the Bank for reviewing the qualifications shall be forwarded via the competent authority.
- Stipulating that authorized banks shall obtain approval from the Bank to engage in FX derivatives business before offering any FX derivatives, and amending the definition of an FX swap product.

⁷³ In line with the digital development of financial technology and FX business trends, the amendment deleted the provision that banks shall participate in joint processing of foreign exchange business with other authorized banks for an accumulated amount up to US\$400 million or up to 7,000 transactions before applying for approval.

Box 4

Central banks' roles and currency forms in the digital payment era

As the world continues shifting to the digital era, the payment system has become more diverse and the environment more competitive. For the purpose of facilitating a safer and more efficient payment ecosystem, as well as fostering an environment more conducive to innovation, central banks play a pivotal role by ensuring trust in money.¹ Besides this, central banks can take advantage of the opportunities that digital technology opens up to engage in innovations as well. In particular, if experiments confirm its feasibility, the central bank digital currency (CBDC) is expected to serve as a new basis for digital payments in the future.

1. Central banks help construct a sound functioning payment system by playing three key roles

Central banks play a key role in the development of digital payments by promoting a safe and efficient payment ecosystem (Chart B4.1).

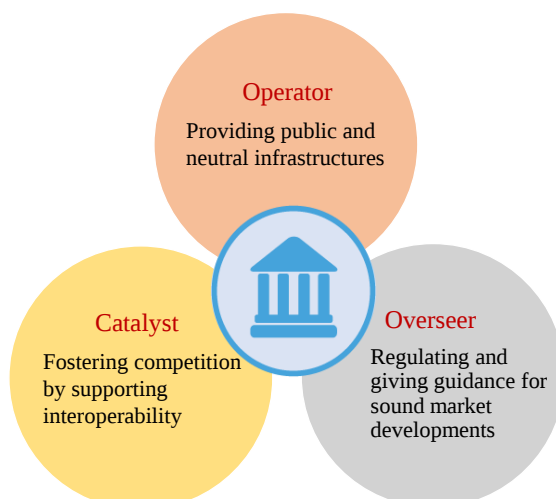
1.1 As an operator to provide public and neutral infrastructures

Most central banks run crucial payment infrastructures in their countries and directly provide public and neutral payment services aimed at maximizing public interest instead of pursuing commercial profits. For instance, physical cash issued by central banks can be used for various small-value retail transactions, while the Real Time Gross Settlement Systems (RTGSs) operated by central banks, which deal with interbank settlements and connect retail clearing systems, serve as a basis for private payment providers to deploy a nationwide network.

1.2 As a catalyst to promote interoperability so as to foster competition

Payment systems are supposed to be scalable in order to accommodate as many users as possible, with the intention of bringing a network effect into full play. Nevertheless, private payment providers tend to offer an independent and closed-loop network, resulting in the phenomenon of fragmented payment markets. Central banks and other authorities can

Chart B4.1 Central banks' roles in the digital payment era



Source: BIS (2020).

break down the barriers between payment networks and reduce the obstacles to entry by supporting the development of common standards for payment systems, thereby delivering a more competitive market.

1.3 As an overseer to regulate and guide sound market development

The regulatory approaches launched by central banks and competent authorities are keeping up with the times, especially those guarding against risks lurking around digital innovations to consumer protection and privacy. Furthermore, measures that are increasingly emphasized globally, such as know-your-customer (KYC) and anti-money laundering and combating the financing of terrorism (AML/CFT), also lay down important foundations for sound development in payment markets.

2. Central banks provide the solid foundation for payment systems by underpinning the public's trust in money

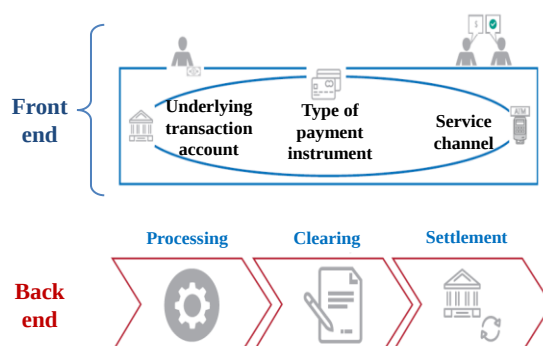
Payment systems are usually built upon a two-tier structure operated by central banks together with financial institutions. On one side, the former ensures trust in money, while the latter serves the public and is able to carry out innovations. On the other side, central banks supply the safest systems (e.g., the RTGS) and payment instruments (e.g., physical cash) for settling both wholesale and retail transactions, while financial institutions provide diverse retail electronic payment instruments, meeting the needs of various payment scenarios for the public.

Owing to the latest wave of innovation in digital payments, payment services put into contact with the public have continued to evolve in recent years. A sound payment system is still based on the trust in money ensured by the central bank. Under this condition, financial institutions are able to concentrate on the innovative development of payment services and increase users' willingness to accept such new services as well.

3. Digital innovation is radically reshaping the provision of payment services and attempting to change the forms of currency

3.1 Digital innovation is altering customer experience of payment services

Chart B4.2 Payment infrastructure elements and arrangements



Source: BIS (2020).

Digital innovation has been undergoing a comprehensive change in front-end and back-end services supported by payment systems (Chart B4.2). For the front-end services, a “transaction account” is not limited to those opened at banks but includes electronic payment accounts as well. CBDCs may be used as “payment instruments” in the future. The “service channel” includes not only physical facilities such as automated teller machines (ATMs), point-of-sale (POS) terminals, but also more popular and means that have become the leading trend, namely internet and mobile applications (apps). For the back-end services, arrangements of payment flows, including processing, clearing, and settlement, continue to improve with technological evolution. Moreover, the emergence of distributed ledger technology (DLT) has sparked off discussion on the feasibility of applying decentralized frameworks in clearing and settlement systems.

3.2 Private providers are challenging to change the form of money, while central banks continue upgrading their systems and embracing this innovation

With continuing innovation in payment services, private payment providers also begin to challenge the core foundation of payment systems, attempting to change the existing forms of money. In this view, central banks have been improving and upgrading their payment systems, actively embracing innovations. Those central banks engaging in the study of CBDCs currently account for about 86% of global peers.² In October 2020, the Bank for International Settlements (BIS) and seven central banks, including those of the US, the UK, Japan, and the euro area, published the *CBDC: Foundational Principles and Core Features*, which emphasizes that a central bank should not compromise monetary or financial stability by issuing a CBDC and that it should incorporate core features such as convertibility, safety and financial inclusion as a guiding principle of CBDC issuance by national authorities.³

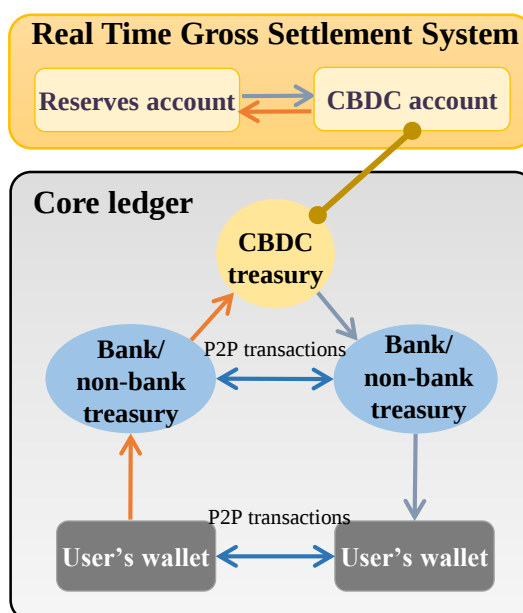
3.3 The Bank has completed research on a wholesale CBDC and proceeded to an experiment on a general purpose CBDC

With its CBDC research keeping pace with international studies, the Bank already completed the first phase program with a technical report on the feasibility of a wholesale CBDC⁴ in June 2020. The results showed that DLT has the potential to increase the resilience of systems. However, when applying DLT to the financial front of a CBDC, its efficacy would be affected by the need for additional mechanisms in pursuit of privacy protection and supervision (e.g., AML/CFT).

Starting from September 2020, the Bank moved on to the second phase program on a general purpose CBDC, planning to adopt a two-tier structure under a public-private

partnership between the Bank and financial intermediaries. Its functional process is structured as the following: the Bank issues the CBDC to intermediaries, such as banks, which enables customers to hold the CBDC with these intermediaries. Financial intermediaries and end users are allowed to directly conduct peer-to-peer (P2P) transactions using the CBDC (Chart B4.3).⁵ With regard to CBDC design, the Bank would use a “centralized system with partial functions operated through DLT.” In other words, the plan is to establish a centralized transaction platform, aiming at achieving efficacy in dealing with large-sum and high-frequency transactions through a general-purpose CBDC while fulfilling the need for privacy and supervision. In addition, the DLT is used to store transaction data with the aim of building operational resilience and avoiding business interruption. The whole program is expected to be completed within two years, and the Bank will continuously reassess the timetable with a rolling review, depending on the progress of the trial and global CBDC development trends. Three main test scenarios preliminarily planned are as follows: (1) large-sum transactions under the delivery versus payment (DvP) mechanism; (2) domestic consumption and transfers; and (3) cross-border outward remittances in small amounts.⁶ These scenarios would cover the major application fields of a general purpose CBDC.

Chart B4.3 The concept of the CBC's general purpose CBDC



Note: In the core ledger, the wallets of CBDC treasury, bank/non-bank treasury and user's wallet, which belong to the Bank, intermediaries and customers, respectively, store information about CBDC account balances.

Source: CBC.

Notes: 1. BIS (2020), “Central Banks and Payments in the Digital Era,” *BIS Annual Economic Report*, June.

2. Boar, Codruta and Andreas Wehrli (2021), “Ready, Steady, Go? – Results of the Third BIS Survey on Central Bank Digital Currency,” *BIS Papers*, No. 114, January.

3. BOC, ECB, BOJ, Riksbank, SNB, BOE, Fed and BIS (2020), “Central Bank Digital Currencies: Foundational Principles and Core Features,” October.

4. In comparison to traditional central bank money, which include cash for retail payment use and reserves for wholesale payment use, the CBDC can be split into two categories: general purpose and wholesale. A general purpose CBDC is widely accessible in all payment scenarios, while a wholesale one mainly serves for interbank payments.

5. Money transfers can be directly conducted using a CBDC wallet on a P2P basis, while the RTGS

would only allow CBDC transactions among financial institutions.

6. With regard to experimentation on cross-border outward remittances in small amounts, the Bank would focus on reducing the inconvenience and costs arising from domestic cash payment based on its preliminary plan. Cross-border and overseas transactions would be operated under the current mechanism. For instance, foreign workers may be able to send the CBDC money to companies in charge of small-amount foreign remittances without the need to send their own remittances through convenience stores or via authorized institutions engaging in collecting and making payment as an agent.

Box 5

The development and challenges of sustainable finance in Taiwan

Financial institutions, which take in funds from the public and manage and utilize those funds by undertaking activities such as lending and investment, are a key force in steering public attention toward sustainable development. Against this backdrop, in recent years, more and more economies have incorporated sustainable finance as a core strategy of their financial development policies. In order to ensure that the financial system plays its role and function of driving the society in the pursuit of sustainable development in Taiwan, the FSC adopted several measures. The Bank also continued to pay attention to international trends of sustainable finance. However, domestic financial institutions still face some challenges to their efforts of promoting sustainable finance. It is thus hoped that a vision of sustainable finance ecosystem will be achieved through close coordination and cooperation among relevant government agencies, the private sector, and international organizations.

1. The definition of sustainable finance

The research on sustainable finance is still in the early stages, so there is no universal definition or taxonomy for sustainable finance. According to the IMF,¹ sustainable finance is defined as the incorporation of environmental, social, and governance (ESG) principles into business decisions, economic development, and investment strategies. Furthermore, promoting economic and financial stability is also the objective pursued by various competent authorities to support sustainable finance.

Sustainable finance not only focuses on the environmental and climate issues related to green and climate finance but also values social finance so as to enhance social well-being. In some cases, it even extends to cover “impact finance,” which incorporates both financial aspects mentioned above.

2. The development of sustainable finance in Taiwan

2.1 The FSC implemented green finance and revised the relevant regulation

In order to enhance effective operation of the domestic green finance market and promote comprehensive development in sustainable finance, the FSC formulated the Green Finance Action Plan 1.0 in November 2017, encouraging financial institutions to provide the green energy industry with investment and financing. Furthermore, the FSC proposed the Green Finance Action Plan 2.0 (hereinafter referred to as Action Plan 2.0) in August 2020, with the range further expanded to cover sustainable finance. The short-term focus of Action

Plan 2.0 is to develop a clear definition and taxonomy for sustainable development industries, and enhance the quality and transparency of ESG disclosure in corporate financial reporting. The mid- to long-term action will be establishing an ESG data integration platform and a database for sustainable development to resolve the pending issues related to sustainable development.

Action Plan 2.0 included a total of 38 measures that cover the following eight aspects: credit, investment, capital market fundraising, professional development, information disclosure, promotion of further development of green financial products or services, prudential supervision, international connections, and incentive mechanisms. The FSC will study the international development trends, and establish the relevant regulations and guidelines based on the legal environment and the directions of industrial development in Taiwan.

2.2 Financial institutions have actively complied with international principles for sustainable finance and incorporated ESG factors into their risk management strategies

In recent years, financial institutions in Taiwan have actively complied with international trends, cooperated with the government to promote sustainable finance, and established dedicated units or teams to promote the relevant policies. Moreover, some financial institutions also have voluntarily supported or adopted internationally sustainable finance standards, such as the Equator Principles (EPs), the recommendations by the Task Force on Climate-Related Financial Disclosure (TCFD), and the Principles for Responsible Banking (PRB). In addition, some financial institutions have incorporated ESG factors into their risk management strategy so as to raise awareness of sustainable finance-related issues and strengthen governance effectiveness within the organization. As of the end of March 2021, eight domestic financial institutions³ have adopted the EPs, while 16 domestic financial institutions have embraced the TCFD framework.

In addition, some financial institutions have worked together with academic institutions to assess the potential impacts of climate-related risks on their own financial positions, and sought to enhance their resilience to weather the climate risk and to address those impacts in a timely manner.

2.3 The Bank has increasingly taken sustainable finance into consideration for policymaking

As many central banks have incorporated green bonds in their investment portfolios recently, the Bank has also gradually included ESG financial products as part of its FX

reserves investment strategy, such as ESG bonds issued by international organizations like the World Bank, the Asian Development Bank, and the European Investment Bank. Furthermore, if needed, the Bank is ready to act as the lender of last resort should financial institutions suffer significant losses from climate-related risks and face liquidity problems.

In light of the fact that the approaches to assessing climate-related risks are still in their infancy, coupled with unavailability of the relevant data, the Bank will continue to pay attention to international development trends and domestic implementation of green finance and climate risk disclosure conducted by financial institutions, and utilize the information for assessing related risks in the future.

3. Challenges facing financial institutions in promoting sustainable finance

3.1 Inconsistencies in the definitions of sustainable finance

As sustainable finance involves a wide range of issues and exhibits high complexity, relevant information seems to be under continuous development. However, some economies have developed the taxonomy for sustainable economic activities in recent years. Currently, Taiwan does not yet have uniform and clear definitions or criteria to determine whether an economic activity or asset qualifies as green or sustainable. As a result, there is a lack of reliable and consistent information and criteria as the basis for financial institutions to make judgement upon, and this is also unfavorable for the competent authority to make peer comparisons.

3.2 Quality improvement in corporate ESG disclosure

The global sustainable finance initiatives and related principles proposed by international organizations as well as the FSC's Action Plan 2.0 tend to require or encourage financial institutions to disclose ESG-related information of their investment and financing targets and of the customers getting credit from them. However, listed companies in Taiwan have not fully disclosed the aforementioned information, which makes it difficult for financial institutions to acquire related information in full. This could create hurdles when they attempt to comply with international principles.

3.3 Hindrances to the advancement of sustainable finance within organizations

For financial institutions, the path to sustainable finance within the organization tend to involve hefty costs such as internal communication, organization restructuring, and employee training. Among them, the processes of internal communication and organization restructuring are time consuming. Moreover, cultivating expertise in sustainable finance and building professional capabilities are neither easy tasks. All of

these increase the difficulty of promoting related practices within financial institutions.

3.4 Difficulties in stakeholder engagement

When promoting sustainable development in the corporate sector, on the one hand, financial institutions need to engage with their stakeholders. For example, they are expected to share experiences with enterprises on ESG issues, jointly respond to sustainable initiatives with their customers, and encourage enterprises to embark on gradual transformation towards low-carbon industries. However, on the other hand, in order to comply with ESG principles or standards, enterprises would have to change their business models, resulting in a substantial increase in operating costs. Since domestic enterprises are mainly small and medium-sized enterprises, the additional costs deriving from ESG implementation might have a great impact on their revenue. This therefore dampens the willingness of enterprises to change, increasing the difficulty for financial institutions to engage with them towards sustainable development.

4. Conclusion

In order to help domestic enterprises and the financial industry clearly understand the scope of sustainable economic activities, communicate in a common language, and avoid green washing, the FSC and the Environmental Protection Administration, Executive Yuan jointly commissioned a research project on the sustainable finance taxonomy, which is expected to be completed by the end of 2021. In addition, the FSC proposed to integrate climate and environmental information from relevant government agencies to build a database platform for sustainable development of industries. Such a platform will serve as a basis for enterprises and the financial industry to conduct risk assessments and scenario analysis.

In the future, it is expected that relevant parties will jointly discuss and learn about international development trends through close coordination and cooperation among agencies, the private sector, and international organizations so as to fine-tune their legal systems as well as the directions of industrial development in Taiwan and establish effective frameworks and foundations for promoting markets for green and sustainable finance. Furthermore, it is also expected that the role of financial institutions in the financial markets may be leveraged to raise the awareness of enterprises and investors regarding ESG issues, thereby bringing about a healthy cycle of investment and sustainable development and helping the country attain emissions reductions and sustainable development goals.

Notes: 1. IMF (2019), *Global Financial Stability Report*, October.

2. Impact finance is the financing of businesses or economic activities which could generate verifiable, direct, and positive impacts on society and/or the environment based on agreed metrics and benchmarking while also seeking market aligned or better financial returns. See ICMA (2020), “Sustainable Finance: High Level Definition,” May.

3. As of the end of March 2021, 16 domestic financial institutions have adopted TCFD recommendations, including 14 life insurance companies and financial holding companies, as well as one management consulting company and one vehicle financing company.

4. Stakeholders here include employees, shareholders, investors, customers, suppliers, academics and experts, government, competent authorities, and other financial institutions.