III. Financial system assessment

3.1 Financial markets

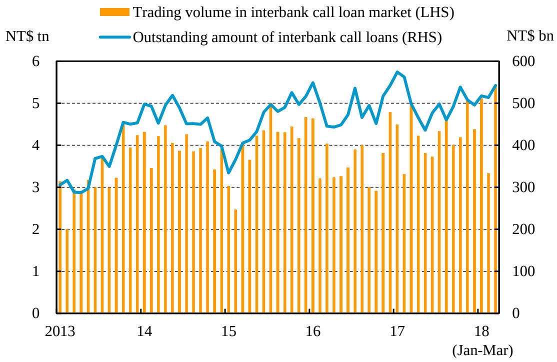
With respect to money and bond markets in 2017, the interbank call loan market expanded and the outstanding amount of bill and bond issuance in the primary market increased, but the turnover rates of outright transactions in the secondary bond market declined. In the same period, short-term market rates remained at a low level, while long-term rates moved within a small range. As for stock markets, stock prices trended up over the same period, yet market volatility fluctuated dramatically at the beginning of 2018. In the FX market, although the NT dollar exchange rate against the US dollar followed an upward path, its volatility remained relatively stable.

3.1.1 Money and bond markets

Outstanding amount and trading volume of interbank call loans increased

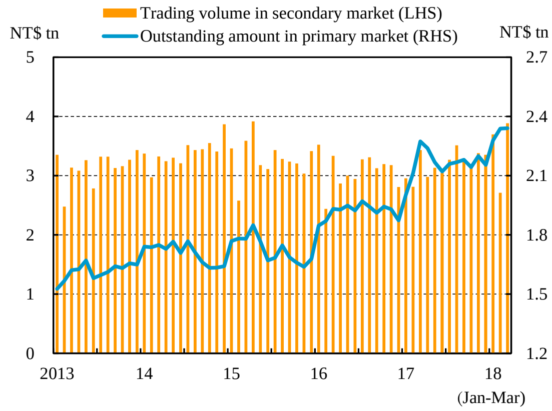
The average daily outstanding amount of interbank call loans in 2017 registered NT$500.5 billion, increasing by 2.38% year on year. The main reason was that bills finance companies increased interbank borrowing owing to low interest rates, and the turnover rates of call loans surged. As a result, the trading volume of interbank call loans in 2017 increased by 15.39% year on year. In 2018 Q1, the outstanding amount and the trading volume of interbank call loans stayed at a high level (Chart 3.1).

Chart 3.1 Interbank call loan market



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

Chart 3.2 Primary and secondary bill markets



Sources: CBC and FSC.

Both primary and secondary bill markets remained on growth paths

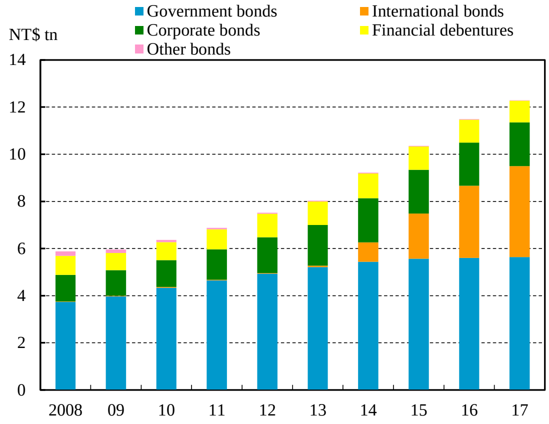
At the end of 2017, the outstanding amount of bill issuance in the primary market stood at NT$2.15 trillion, substantially increasing by 15% year on year owing to the expansion of CP issuance and banks' negotiable certificates of deposit (NCDs). In 2018 Q1, the outstanding amount of bill issuance continued its upward trend because of increases in CP and treasury bill issuance (Chart 3.2).

Following the expansion in the primary market, the bill trading volume in the secondary market also increased by 3.55% year on year and amounted to NT$38.33 trillion in 2017. It continued at a high level in 2018 Q1 (Chart 3.2).

Bond issuance expanded, but the turnover rates of outright transactions remained at a low level

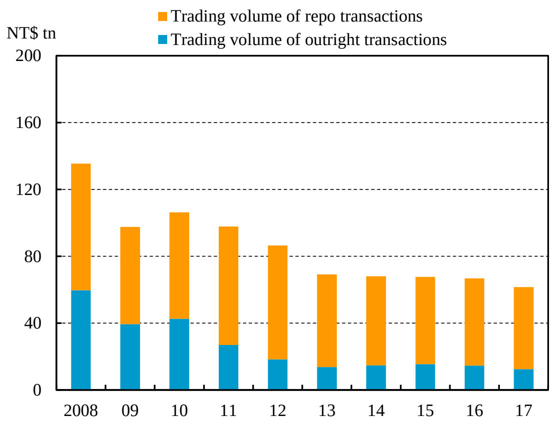
At the end of 2017, the outstanding amount of bond issuance stood at NT$12.29 trillion and increased by 6.98% on a year-on-year basis, mainly driven by significant growth of international bond issuance.[38] However, after the FSC stipulated the regulations on international bond investments[39] of life insurance companies in June 2017, the momentum of bond issuance cooled down. In addition, the outstanding amount of corporate bond issuance increased slightly by 1.91% year on year induced by low funding rates, while that of government bond issuance remained about the same because of the implementation of regular issuance and debt management by the government (Chart 3.3).

Chart 3.3 Total amount of bonds outstanding in the primary market



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

Chart 3.4 Outright and repo transactions in the bond market

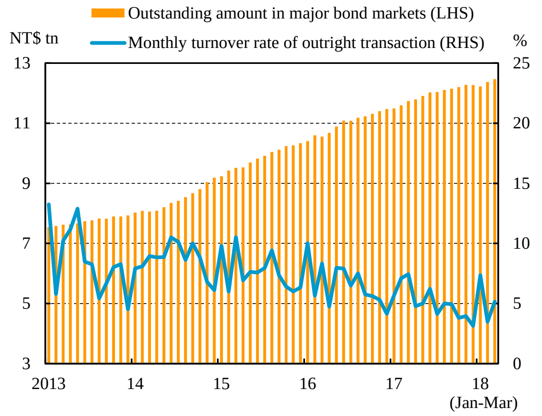


Source: CBC.

[38] International bonds refer to bonds denominated in foreign currencies and issued in Taiwan by domestic and overseas issuers.
[39] See section 4.2 of this report in detail.

In the secondary bond market, trading volume decreased by 7.83% year on year to NT$61.58 trillion, in contrast to the trend in the primary market, mainly because of the buy-and-hold strategies for international bond investments adopted by life insurance companies (Chart 3.4). The monthly turnover rates of major bonds[40] in the secondary market also declined in 2017, but slightly rebounded in 2018 Q1 (Chart 3.5).

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



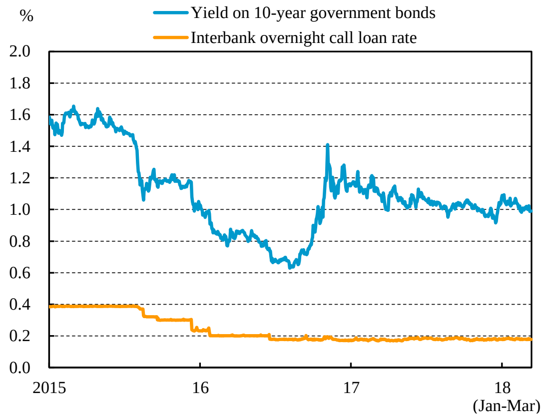
Notes: 1. Major bonds include government bonds, international bonds, corporate bonds, and financial debentures.
2. Monthly turnover rate = trading value in the month/ average bonds issued outstanding amount.
Average bonds issued outstanding amount = (outstanding amount at the end of the month + outstanding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

Source: FSC.

Short-term market rates remained at a low level, while long-term market rates moved within a small range

In 2017, owing to sustained ample funds in financial markets, short-term market rates remained at a low level. However, long-term market rates (i.e. 10-year government bond yields) moved downward after 2017 Q2 and fell to a low level of 0.915% on January 2, 2018, resulting from market expectations of stable interest rates and low inflation. Afterwards, long-term market rates fluctuated within a small range following a rebound in US government bond yields (Chart 3.6)

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



Source: Bloomberg.

Gradual interest rate hikes by the Fed and more US government bond issuance after tax cuts might push up the yields on US government bonds and, in turn, lead to the yields on Taiwan's government bonds to rise. Therefore, interest rate risks related to bond investments warrant close attention.

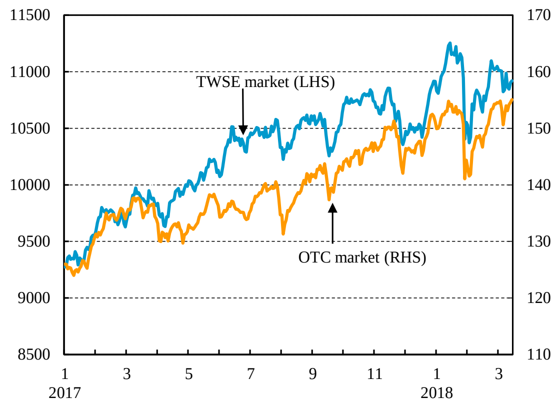
[40] See Note 7.

3.1.2 Equity markets

Stock indices gradually trended up, but turned volatile in early 2018

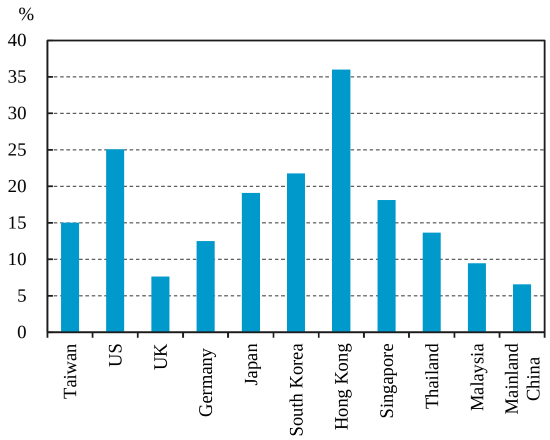
Affected by US stock markets hitting new highs and massive net buying by foreign investors, both the TWSE and the OTC markets trended up in the first half of 2017, especially the TAIEX of the TWSE market which stood above 10,000 from May onwards. In the second half of the year, stock markets initially tumbled, induced by a slump in international stocks owing to geopolitical risks from North Korea, but soon regained momentum after a surge in major stock markets in Europe and the US. At the end of the year, the TAIEX and the Taipei Exchange Capitalization Weighted Stock Index (TPEx) of the OTC market respectively registered 10,643 and 149, posting increases of 15.01% and 18.65% year on year (Chart 3.7). Going into 2018, although dropping in February following a big fall in US stock markets, stock prices moved up further, while the TAIEX and the TPEx reached 10,919 and 155, respectively, at the end of March, higher than the records posted at the end of 2017 (Chart 3.7).

Chart 3.7 Taiwan's stock market indices



Sources: TWSE and TPEx.

Chart 3.8 Major stock market performance



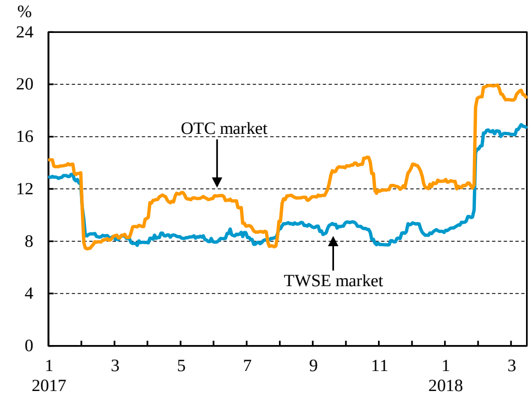
Notes: 1. Figures are for 2017.
2. Market performance is based on TWSE Weighted Index for Taiwan, DJIA Index for the US, FTSE-100 Index for the UK, DAX Index for Germany, NK-225 Index for Japan, KOSPI Index for South Korea, Hang Seng Index for Hong Kong, Straits Times Index for Singapore, SET Index for Thailand, Kuala Lumpur Composite Index for Malaysia, and SSE Composite Index for Mainland China.

Source: TWSE.

Compared to major stock markets around the world, performance of the TAIEX ranked in the middle, outperforming Europe, Thailand, Malaysia, and Mainland China in 2017 (Chart 3.8).

In 2017, volatility in the TWSE and the OTC markets dropped sharply from their respective highs of 13.11% and 14.23% in the beginning of the year, but then fluctuated mildly and stood at 8.80% and 12.41% at the end of December. In 2018 Q1, however, affected by the drop in US stock markets in February, volatility of the two markets surged and registered 16.71% and 19.02%, respectively, at the end of March (Chart 3.9).

Chart 3.9 Stock price volatility in Taiwan's markets

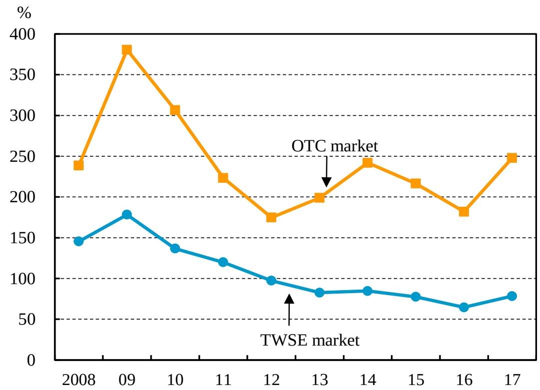


Note: Volatility refers to the annualized standard deviation of 60-day daily index returns.
Sources: TWSE, TPEx, and CBC.

Annual turnover rate increased

With the day trading transaction tax being cut by half, trading in both the TWSE and OTC markets were boosted in 2017, and the annual turnover rates in terms of trading value in both markets rose to 78.40% and 247.81%, respectively (Chart 3.10). In 2018 Q1, the annual turnover rate in the TWSE market continued to rise and reached 85.88%, whereas that in the OTC market slightly declined to 242.07%. Compared to major stock markets around the world, the annual turnover rate of TWSE was higher than that in Hong Kong, Singapore, and Malaysia (Chart 3.11).

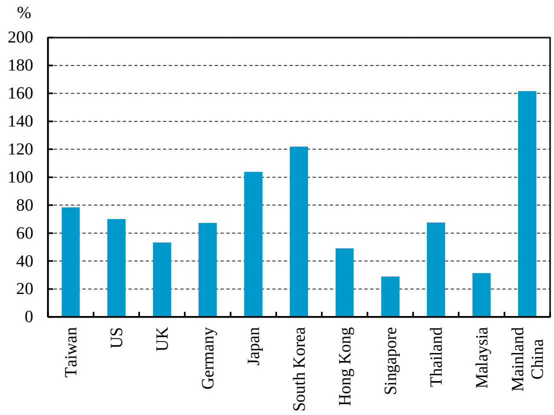
Chart 3.10 Annual turnover rates in Taiwan's stock markets



Sources: TWSE and TPEx.

In recent years, Taiwan's exchange-traded fund (ETF) market has expanded rapidly and its trading volume has risen significantly on account of relaxation of regulations, active issuing by securities firms, and lower trading costs than other countries. The quick expansion of ETF assets and high turnover rates have posed a great influence on Taiwan's stock markets. Therefore, ETF market developments and potential impacts on local financial markets warrant close attention (Box 2).

Chart 3.11 Turnover rates in major stock markets



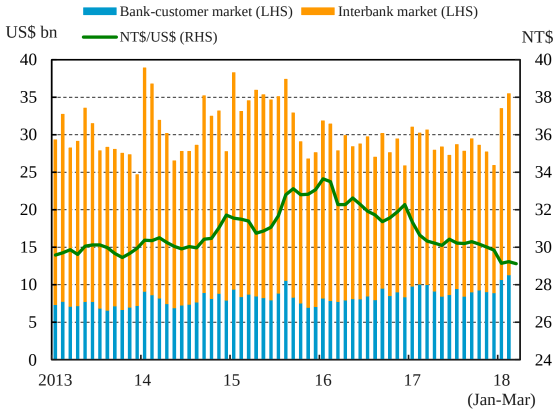
Notes: 1. Figures refer to accumulated turnover rates in 2017.
2. As for the stock market in each country, please see Chart 3.8 note 2.
Source: TWSE.

3.1.3 FX market

The NT dollar exchange rate appreciated, while the trading volume of the FX market slightly decreased

Owing to global economic growth, Taiwan's rebounding exports, and sustained foreign capital inflows to Asian economies, the NT dollar exchange rate experienced volatility and appreciated against the US dollar to stand at 29.848 at the end of 2017, an annual appreciation of 8.14%. In 2018 Q1, as the expansion of US fiscal deficits remained a concern, accompanied by a recovery of Taiwan's domestic economy and persistent foreign capital inflows attracted by the high dividend yields offered by some companies listed on its stock markets, the NT dollar exchange rate continued appreciating against the US dollar and rose to 29.120 at the end of March[41] (Chart 3.12).

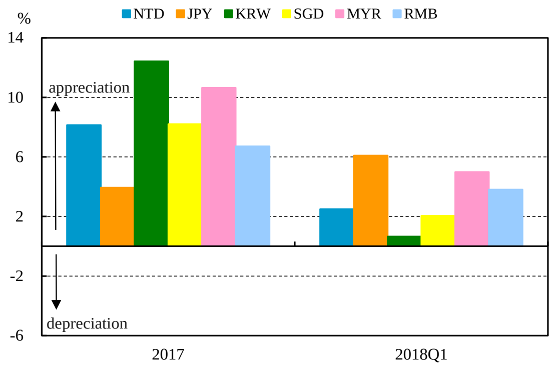
Chart 3.12 NTD/USD exchange rate and FX market trading volume



Notes: 1. Trading volume is the monthly average of daily data, while exchange rate is end-of-period data.
2. The latest data for trading volume are as of February 2018.

Source: CBC.

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



Source: CBC.

The NT dollar against the US dollar appreciated by 8.14% in 2017, lower than the Korean won, the Malaysian ringgit, and the Singapore dollar. Furthermore, it continued to appreciate by 2.50% in 2018 Q1 (Chart 3.13). However, it depreciated by 4.93%, 3.81%, and 1.48% against the euro, the Korean won, and the British pound, respectively, but appreciated by 4.05% against the Japanese yen over the same period (Chart 3.14).

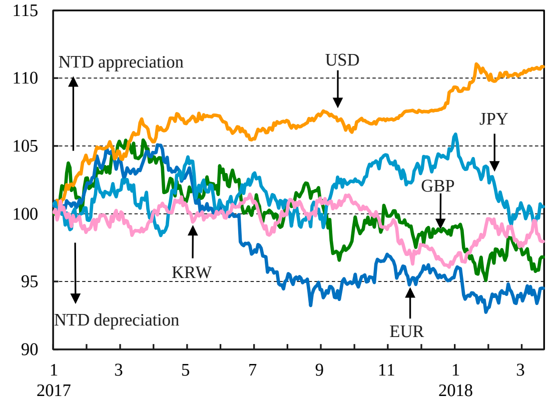
41 See Note 8.

In 2017, the average daily trading volume in Taiwan's FX market contracted by 1.25% to US$28.7 billion, compared to US$29 billion a year earlier, primarily because of a decrease in the interbank market (Chart 3.12).

NT dollar exchange rate volatility remained relatively stable

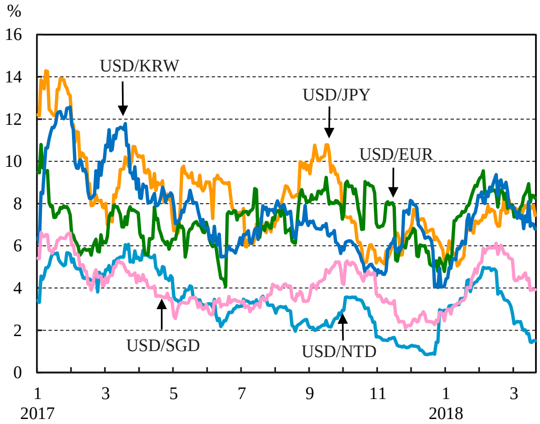
Volatility in the NT dollar exchange rate against the US dollar shifted between 0.85% and 6.07% and registered an annual average of 3.41% in 2017, while moving between 1.43% and 4.97% during 2018 Q1. Compared to major currencies such as the Japanese yen, the euro, the Korean won, and the Singapore dollar, the NT dollar exchange rate has been relatively stable against the US dollar (Chart 3.15).

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



Note: December 31, 2016 = 100.
Source: CBC.

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 development of exchange traded funds business in Taiwan

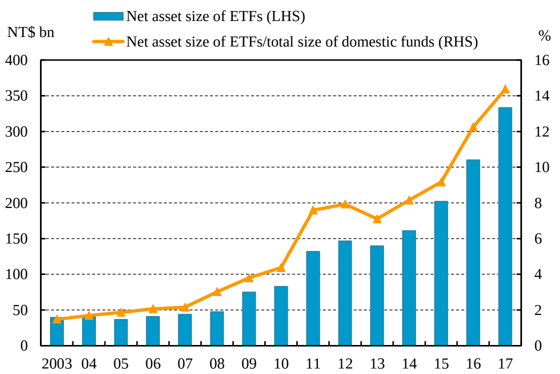
Thanks to transaction convenience and lower transaction costs, the global assets of exchange-traded funds (ETFs) have grown rapidly. Among them, passive investment funds such as equity ETFs have gradually nibbled away at the market share of actively managed funds. In the US, for example, with growth in equity ETF assets, which tend to have higher turnover rates, their influence on US stocks has been increasing steadily. Equity ETFs adopt a "package deal" model, which also causes transaction volumes and prices among the stocks within the package to become more and more convergent (i.e., correlation coefficients increase in magnitude). As a result, the risk diversification effect of holding multiple stocks has reduced, signifying that the systematic risks of the stock market have subsequently risen. A number of key persons in the financial sector and academia have appealed to the public to pay attention to the systemic risks which could be derived from passive investments such as ETFs. Several foreign regulators have also reviewed the impact of ETFs on financial markets and set out to formulate relevant regulations. So far, the types of ETFs in Taiwan have been quite diverse, and the volume of their transactions has been booming. Regulators should continue to pay close attention to the future development of ETFs and their potential impact on financial markets.

1. ETF development in Taiwan

1.1 Asset size greatly expanded and types diversified

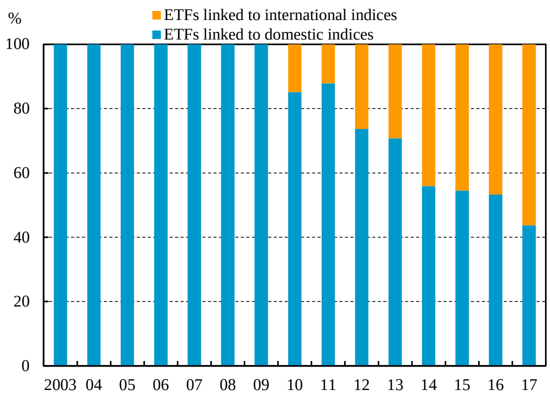
Taiwan's first ETF (P-shares Taiwan Top 50 ETF) was issued in 2003, but the domestic ETF market has grown rapidly since 2009. Against a backdrop of declining transactions in actively managed funds, the ETF assets as a share of total

Chart B2.1 ETF assets and their market share in Taiwan



Source: SITCA.

Chart B2.2 The proportion of Taiwan–issued ETFs linked to different indices

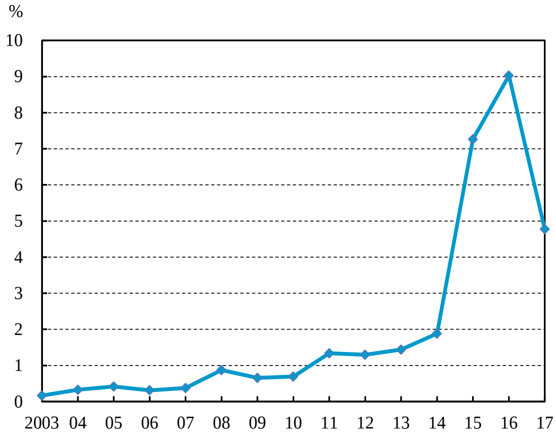


Source: SITCA.

assets of domestic funds rose sharply, reaching 14.4% at the end of 2017 (Chart B2.1).

With investors gradually accepting domestic ETFs and a relaxation of related regulations, domestically issued ETF products have not been limited to those linked to domestic stock price indices. Instead, they have been expanding their linkages to overseas targets from 2010 onwards. At the end of 2017, of Taiwan's ETFs, those linking to global targets and to domestic ones made up 56.3% and 43.7%, respectively (Chart B2.2).

Chart B2.3 The proportion of transaction amount of ETFs listed on the TWSE to total market trading value



Source: TWSE.

In addition, regulations began to allow investment trust companies to issue leveraged, reversed and futures ETFs in 2014, making it easier for the public to raise financial leverage, short underlying assets, and invest in more complex products. As a result, domestic ETF products are no longer simply general financial products.

1.2 Transactions were booming

According to the statistics of the Taiwan Stock Exchange, the turnover rate of ETFs listed on the market reached 427.5% in 2017, which was equivalent to them rotating 4.3 times a year, much higher than the common stock turnover rate of 83.8%. This phenomenon is similar to that in international markets.

The transaction amount of ETFs to total market trading value in Taiwan reached the highest point of 9.03% in 2016. While the share fell to 4.77% in 2017, it was still much larger than the 0.17% recorded in 2003 (Chart B2.3).

2. The possible impact of ETFs on financial markets has drawn wide attention

2.1 The industry, official institutions and the academia appeal to the public to address the systemic risks that could result from ETFs

Academia, financial circles, and official institutions such as the Norwegian Sovereign Wealth Fund and the Japanese Government Pension Investment Fund have warned that the increasing interconnectedness among constituent stocks resulting from the rise of

ETFs may escalate systematic risks in stock markets and the passive investment model used by ETFs may undermine the efficiency of financial markets, leading to a reduction in the ability of ETF markets to efficiently allocate resources in the economy.

2.2 Several regulatory authorities and international organizations evaluated ETF-related risks in depth

On August 24, 2015, numerous ETF transactions on the US stock market were temporarily suspended due to trading program problems, which resulted in the total value of the US stock market's impairment losses reaching a peak of US$1.2 trillion on the same day. Meanwhile, stocks and ETFs listed on the exchange were halted 1,278 times, among which ETFs accounted for 1,008. As ETF trading was suspected to exacerbate the plummet in US stocks on the same day, the US Securities and Exchange Commission (SEC) initiated a series of investigations. This also prompted more national regulatory authorities and international organizations to pay attention to the development of ETFs, including the Central Bank of Ireland and the International Organization of Securities Commissions (IOSCO).

In addition, on February 5, 2018, the US stock market crash pushed the CBOE volatility index (VIX) to rise rapidly, leading to a sharp devaluation in total assets of short VIX exchange-traded products (ETPs), to US$525 million from US$3.7 billion. The Bank for International Settlements (BIS) points out that even though the overall scale of leveraged and inverse volatility ETPs is relatively small currently, they could induce and aggravate market volatility. Investors should pay more attention to this risk. The US SEC has launched investigations into such products, including looking into how investment performance is calculated and whether retail consumers are qualified investors.

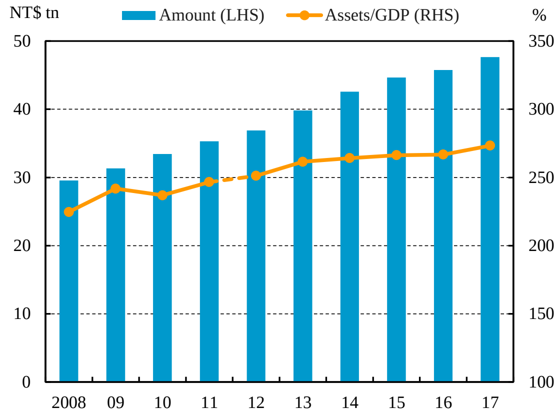
Notes: 1. SEC (2015), *Research Note: Equity Market Volatility on August 24*, U.S. SEC Report, December.
2. Campbell, Dakin et al. (2018), *Volatility Inc.: Inside Wall Street's $8 Billion Mess*, Bloomberg, February.
3. Borio, Claudio et al. (2018), *BIS Quarterly Review: International banking and financial market developments*, BIS, March.

3.2 Financial institutions

3.2.1 Domestic banks

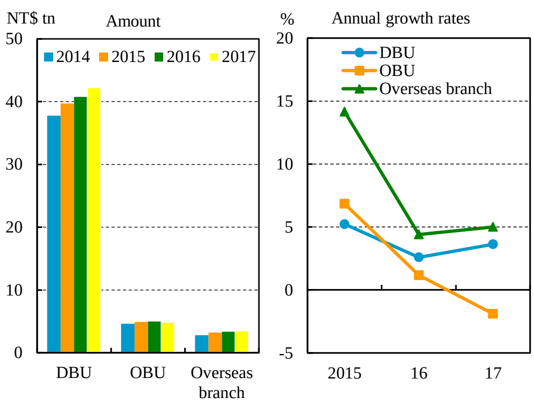
The total assets of domestic banks[42] expanded at a faster pace in 2017. Asset quality remained satisfactory, and the concentration of corporate loans decreased slightly, whereas that of credit exposures to real estate loans mildly increased. Considering that the outlook for the real estate market remains conservative, banks should prudently monitor and control related credit risks. Moreover, the estimated value at risk (VaR) of market risk exposures of domestic banks descended and liquidity risk was moderate thanks to ample funds in the banking system. With domestic banks posting higher profits in 2017 than the previous year, the average capital adequacy ratio further improved, revealing satisfactory capacity to bear losses.

Chart 3.16 Total assets of domestic banks



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

Chart 3.17 Total assets of domestic banks by sectors



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

Total assets kept growing at a faster pace

The total assets of domestic banks kept growing at a faster pace of 4.14%[43] year on year in 2017 and reached NT$47.65 trillion at the end of the year, equivalent to 273.34% of annual GDP (Chart 3.16). Broken down by sector, asset growth rates of domestic banking units (DBUs) and overseas branches re-embarked on rising trajectories, but that of offshore banking units (OBUs) still declined (Chart 3.17).

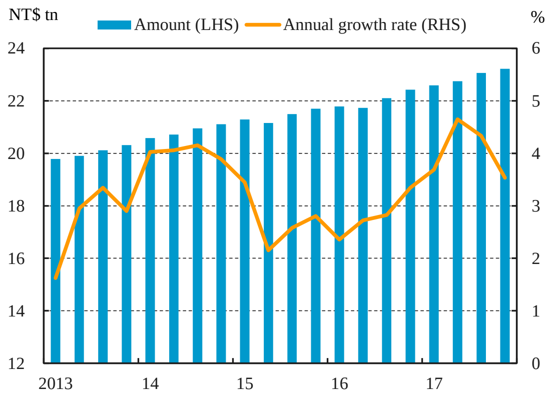
[42] There were 39 domestic banks (including Agricultural Bank of Taiwan) in 2017.
[43] The rise was mainly due to a significant increase of hold-to-maturity financial investments and continued growth of loans.

Credit risk

Customer loans kept on rising

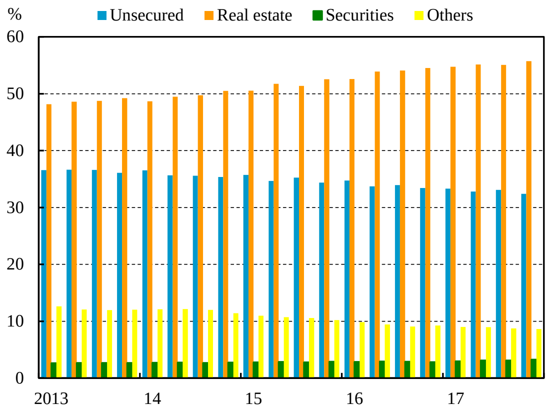
Customer loans granted by the DBUs of domestic banks stood at NT$23.22 trillion at the end of 2017, accounting for 48.73% of total assets, with the annual growth rate increasing to 3.53% (Chart 3.18). Among them, the annual growth rate of household borrowing rebounded to 5.24% owing to a rise in mortgage loan growth. However, the growth rate of corporate loans fell slightly to 3.16%, while government loans saw a negative growth of -8.64% mainly because of less financing demand from the government as a result of increased tax revenues.

Chart 3.18 Outstanding loans in domestic banks



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

Chart 3.19 Credit by type of collateral in domestic banks



Source: CBC.

Credit concentration in real estate went up slightly, and the share of real estate-secured credit continued to increase

At the end of 2017, real estate loans granted by the DBUs of domestic banks amounted to NT$8.48 trillion, accounting for 36.54% of total loans, reflecting rising concentration of credit exposure in real estate loans. Moreover, the real estate-secured credit granted by domestic banks rose to NT$15.76 trillion, accounting for 55.71% of total credit,[44] higher than that of the previous year (Chart 3.19).

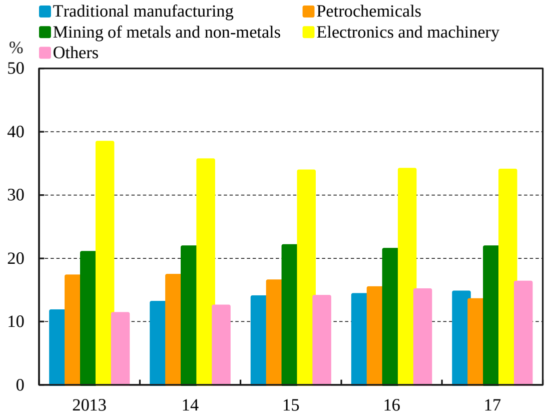
As the real estate trading volume recovered but prices stagnated after falling, prospects for the real estate market remained dim. Banks should prudently readjust loan strategies and strengthen risk management to contain related credit risks.

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

Credit concentration of corporate loans slightly diminished

For the DBUs of domestic banks, corporate loans stood at NT$10.13 trillion at the end of 2017, of which loans to the manufacturing sector registered NT$4.05 trillion and accounted for the largest share of 40.0%. Within the manufacturing sector,[45] loans to the electronics industry contributed to the largest but decreasing share of the total, reflecting that the credit contentration of corporate loans has mildly diminished (Chart 3.20).

Chart 3.20 Exposure to the manufacturing sector by domestic banks



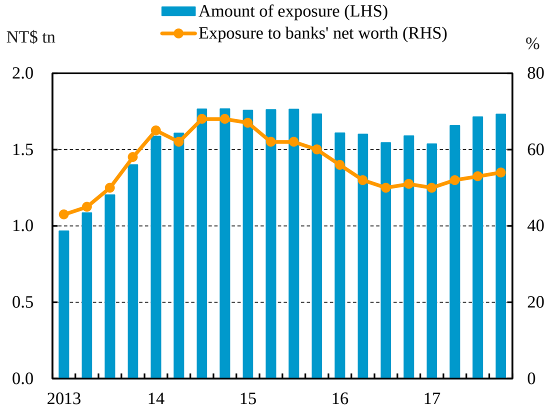
Notes: 1. Exposure to each sector = loans to each sector/loans to the whole manufacturing sector.
2. Exposures of OBUs and overseas branches were excluded.

Source: CBC.

Exposures to Mainland China turned to increase

At the end of 2017, the exposures of all domestic banks to Mainland China stood at NT$1.73 trillion, or 54% of banks' net worth, higher than 51% a year earlier (Chart 3.21). Although such exposures turned to increase, no bank exceeded the statutory limit of 100%.

Chart 3.21 Exposure to Mainland China by domestic banks



Source: FSC.

In order to reinforce risk control and risk-bearing capacity of domestic banks regarding exposures to Mainland China, the FSC implemented several measures[46] from 2014 onwards. However, considering the fact that long-term sovereign credit ratings of Mainland China were successively cut by credit rating agencies in 2017, as well as increasing NPLs in its commercial banks, domestic banks should closely monitor Mainland China's economic and financial conditions, and prudently manage the risk of such exposures.

[45] 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.

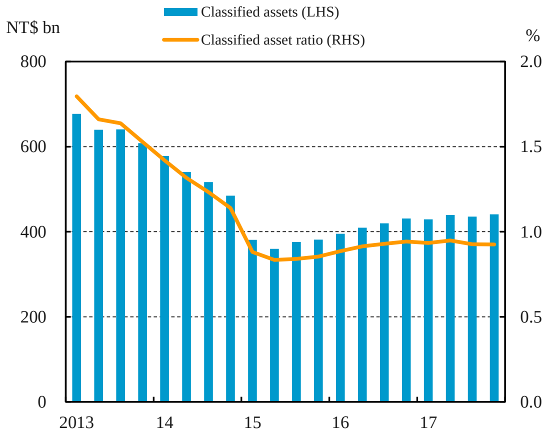
[46] See CBC (2015), *Financial Stability Report*, Chapter IV, May and CBC (2017), *Financial Stability Report*, Chapter III, May.

Asset quality remained satisfactory

Outstanding classified assets[47] of domestic banks stood at NT$441 billion at the end of 2017, increasing by 2.26% from the previous year. The average classified asset ratio was only 0.93% (Chart 3.22), revealing that the asset quality of domestic banks remained satisfactory. Meanwhile, the expected losses of classified assets[48] decreased by 2.39% from a year earlier to NT$53.4 billion, while the ratio of expected losses to loss provisions was only 12.57%. This indicated that domestic banks had sufficient provisions to cover expected losses.

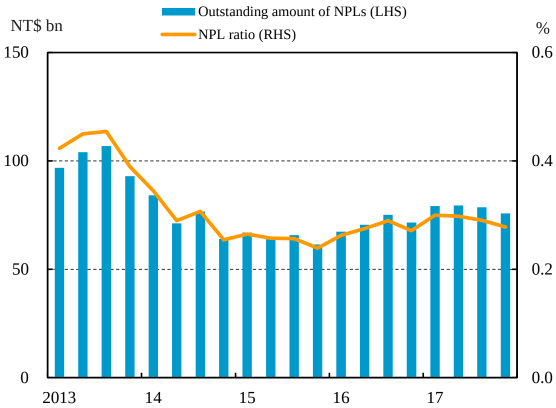
Furthermore, the outstanding NPLs of domestic banks registered NT$75.8 billion at the end of 2017. Although the average NPL ratio slightly rose to 0.28% (Chart 3.23), it was much lower than those in the US and neighboring Asian countries (Chart 3.24). Among 39 domestic banks, almost all had NPL ratios less than 0.5%. In terms of borrowers, the NPL ratio for individual loans was 0.26%, whereas for corporate loans it registered 0.35%.

Chart 3.22 Classified assets of domestic banks



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

Chart 3.23 NPL ratio of domestic banks



Note: Excludes interbank loans.
Source: CBC.

At the end of 2017, owing to the marginally larger increases in both loans and NPLs, the loan coverage ratio and the NPL coverage ratio slightly fell to 1.36% and 490.59% from 1.37% and 503.45% a year earlier, respectively (Chart 3.25). Nevertheless, the capability of domestic banks to cope with potential loan losses remained satisfactory.

[47] 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.

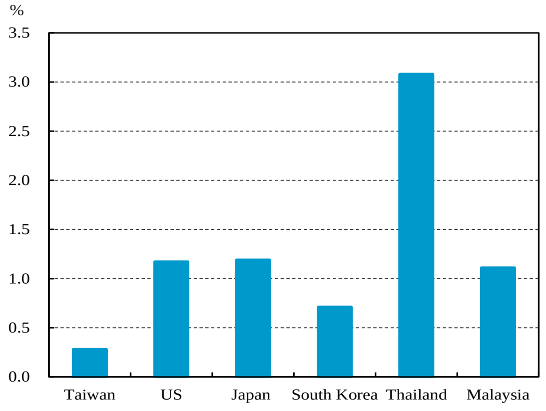
[48] Loss herein refers to the losses from loans, acceptances, guarantees, credit cards, and factoring without recourse.

Market risk

Estimated value-at-risk for market risk exposures decreased

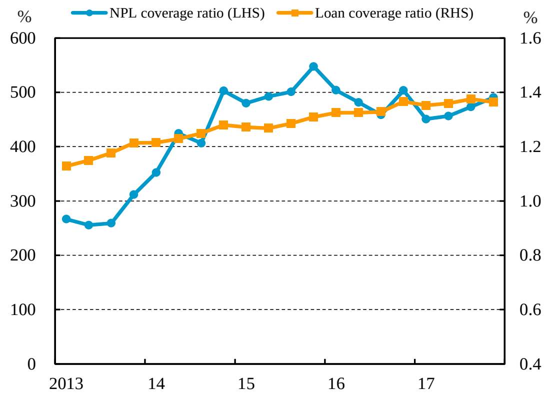
At the end of 2017, the net position of debt securities accounted for the largest share of total market risk exposures of domestic banks, followed by the net positions of FX and of equity securities. Based on the CBC's VaR model,[49] the estimated total VaR for market risk exposures of domestic banks stood at NT$105.3 billion at the end of 2017, down by 22.97% compared to a year earlier (Table 3.1). Among them, the interest rate and FX VaRs decreased by 25.33% and 13.46%, respectively. The main reasons were that the yields on Taiwan and US government bonds oscillated in a narrow range and the NT dollar exchange rate against the US dollar appreciated moderately in 2017, resulting in lower volatility in bond and FX markets compared to the previous year. On the other hand, the equities VaR remained almost the same (Table 3.1).

Chart 3.24 NPL ratios of banks in selected countries



Note: Figure for Japan is end-September 2017 data, while the others are end-December 2017 data.
Sources: CBC, FDIC, FSA, FSS, BOT and BNM.

Chart 3.25 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.

In 2018 Q1, the US government bond yields trended up owing to the Fed's faster-than-expected interest rate hikes and increasing demand for government bond issuance as a result of tax cuts. This in turn drove up government bond yields of several major countries. Additionally, global stock markets experienced a significant downturn as US stocks sank and the volatility in international financial markets picked up dramatically. All of these could pose higher market risk to domestic banks.

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

Table 3.1 Market risks in domestic banks

Unit: NT$ bn

Types of risk	Items	End-Dec. 2016	End-Dec. 2017	Changes	
				Amount	PP;%
Foreign exchange	Net position	223.4	223.5	0.1	0.04
	VaR	5.2	4.5	-0.7	-13.46
	VaR/net position (%)	2.33	2.01		-0.32
Interest rate	Net position	1,547.4	1,799	251.6	16.26
	VaR	121.6	90.8	-30.8	-25.33
	VaR/net position (%)	7.86	5.05		-2.81
Equities	Net position	64.5	59.8	-4.7	-7.29
	VaR	9.9	10	0.1	1.01
	VaR/net position (%)	15.35	16.72		-1.37
Total VaR		136.7	105.3	-31.4	-22.97

Note: PP = percentage point.
Source: CBC.

The impacts of market risk on capital adequacy ratios were slight

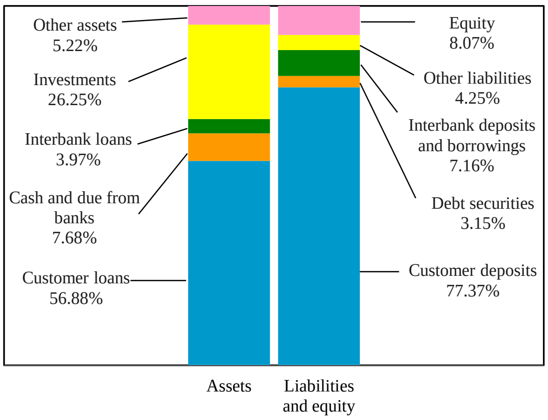
According to the estimation mentioned above, the total VaR would lead to a decrease of 0.15 percentage points in the average capital adequacy ratio of domestic banks and cause the ratio to drop from the current 14.17% to 14.02%. Nevertheless, it would still be higher than the statutory minimum of 9.25% in 2017.

Liquidity risk

Liquidity in the banking system remained ample

The assets and liabilities structure of domestic banks remained roughly unchanged in 2017. For the sources of funds, relatively stable customer deposits still made up the largest share of 77.37% of the total, while for the uses of funds, customer loans accounted for the biggest share of 56.88% (Chart 3.26). The average deposit-to-loan ratio of domestic

Chart 3.26 Asset/liability structure of domestic banks



Notes: 1. Figures are as of end-December 2017.
2. Equity includes loss provisions. Interbank deposits include deposits with the CBC.

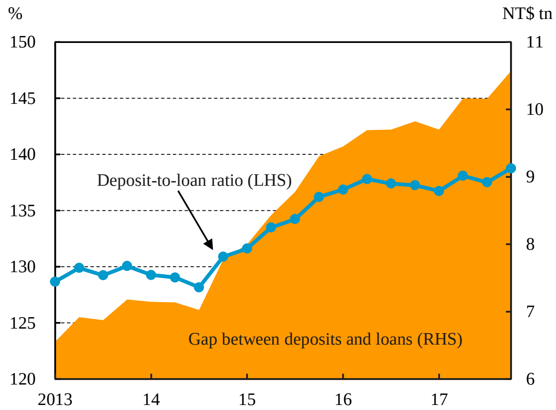
Source: CBC.

banks rose to 138.76%, and the funding surplus (i.e., deposits exceeding loans) also expanded to NT$10.57 trillion. This indicated that the overall liquidity of domestic banks remained abundant (Chart 3.27).

Overall liquidity risk remained relatively low

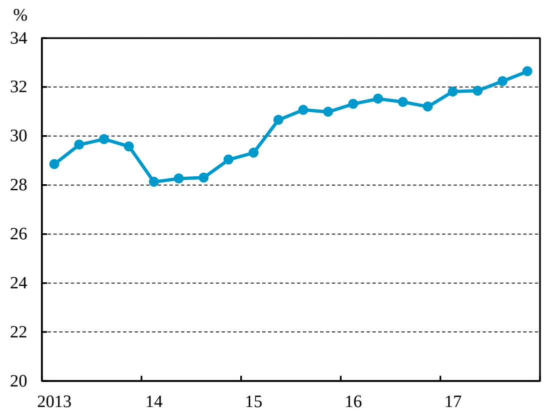
The average NT dollar liquid reserve ratio of domestic banks was well above the statutory minimum of 10% in every month of 2017 and stood at 32.64% in December, an increase of 1.44 percentage points year on year (Chart 3.28). Looking at the components of liquid reserves in December 2017, Tier 1 liquid reserves, mainly consisting of certificates of deposit issued by the CBC, accounted for 84.96% of the total. The quality of liquid assets held by domestic banks remained satisfactory. Moreover, the average liquidity coverage ratio (LCR) of domestic banks was 135% at the end of 2017 (Chart 3.29), and all banks met the minimum LCR requirement in 2017.[50] Therefore, the overall liquidity risk of domestic banks was relatively low.

Chart 3.27 Deposit-to-loan ratio of domestic banks



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

Chart 3.28 Liquid reserve ratio of domestic banks



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

Profitability

Profitability increased moderately

In 2017, the net income before tax of domestic banks was NT$307 billion, increasing by 1.71% year on year (Chart 3.30). The rise was mainly owing to growth in net gains on financial instruments and net interest revenues. Though performing well in profits, the average ROE of domestic banks fell slightly year on year to 9.03% from 9.23% owing to a higher increase in equity than in profits; nevertheless, the average ROA of 0.66% remained at

[50] The minimum LCR requirement for domestic banks was 80% in 2017, except for O-Bank with a minimum requirement of 60% during its initial period of restructuring.

the same level as the previous year (Chart 3.31). Compared to selected Asia-Pacific economies, the average ROE of domestic banks ranked in the middle; however, the average ROA still lagged behind (Chart 3.32).

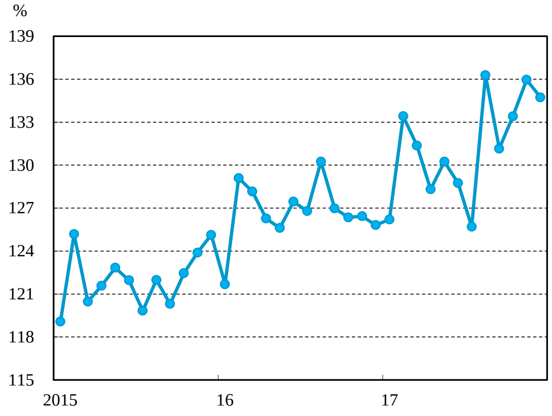
Almost all domestic banks were profitable in 2017, except for one whose profits turned to a loss because of substantial loan loss provisions. As in the previous year, 13 banks achieved a profitable ROE of 10% or more and four banks had ROAs above the international standard of 1% (Chart 3.33). Compared to 2016, there were 19 banks with higher ROEs and ROAs.

Factors that might affect future profitability

The interest rate spread between deposits and loans of domestic banks dropped in the first half of 2017, but rebounded somewhat to 1.36 percentage points in Q4 (Chart 3.34). If the upward trend persists, it will help to improve the future profitability of domestic banks. Nevertheless, in response to the *Mutual Evaluation* by the Asia/Pacific Group on Money Laundering (APG) in 2018, the FSC required domestic banks to reinforce their AML control mechanisms and regulatory compliance programs. As a result, the compliance costs of domestic banks will increase.

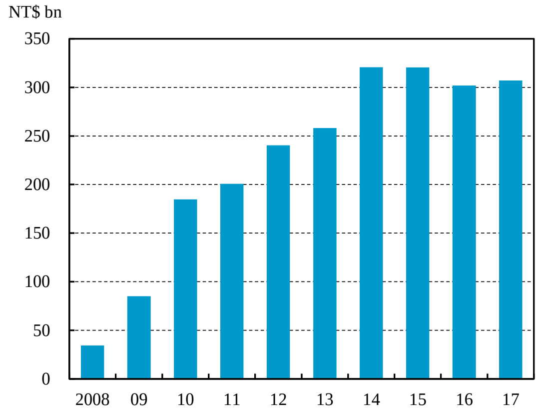
Furthermore, owing to overbanking in the domestic market, coupled with regulation relaxations and government policies encouraging banks to develop overseas

Chart 3.29 Liquidity coverage ratio of domestic banks



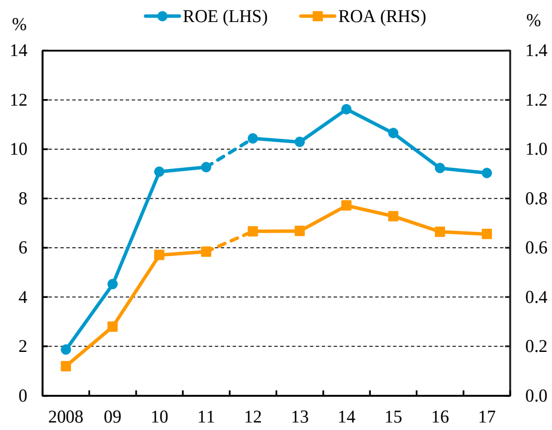
Source: CBC.

Chart 3.30 Net income before tax of domestic banks



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

Chart 3.31 ROE & ROA of domestic banks



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

markets, domestic banks have actively established overseas business units in recent years. Consequently, overseas business profit contribution for domestic banks has been on the rise. However, overseas business units still face some challenges such as management issues and higher macro risks in some countries. Hence, domestic banks are advised to reinforce monitoring and risk management on the operation of overseas business units (Box 3).

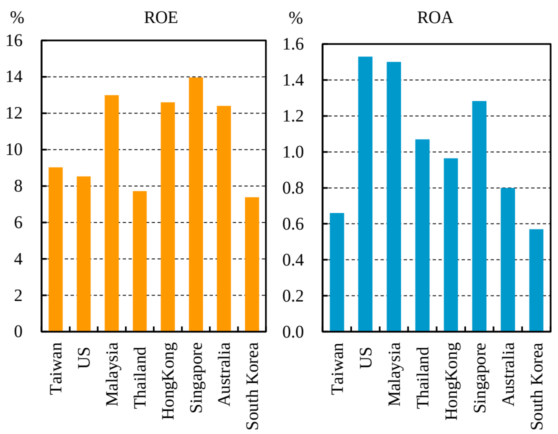
Capital adequacy

Capital ratios trended upward

The average capital ratios of domestic banks declined slightly in 2017 Q2 owing to seasonal factors such as cash dividends declared and paid. Afterwards, as a result of capital injection, accumulated earnings, issuing eligible capital instruments and lowering risk weights of certain assets by the FSC, the average common equity ratio, Tier 1 capital ratio, and capital adequacy ratio of domestic banks rose to 11.19%, 11.78%, and 14.17%, respectively, at the end of 2017 (Chart 3.35). However, compared to some Asia-Pacific economies, Taiwan's banking industry had relatively lower capital levels (Chart 3.36).

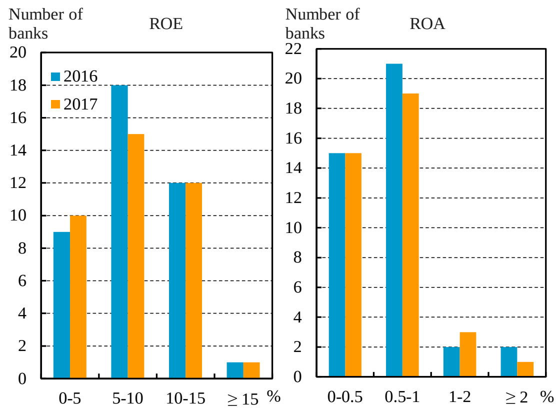
Further breaking down the components of regulatory capital, common equity Tier 1 capital, which features the best loss-bearing capacity, accounted for 78.94% of eligible capital. This showed that the capital quality of domestic banks was satisfactory.

Chart 3.32 ROEs and ROAs of banks in selected economies



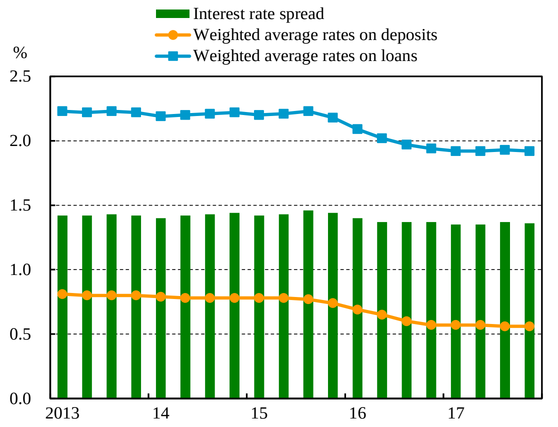
Note: Figures are 2017 data.
Sources: CBC, FDIC, BNM, BOT, APRA, FSS and IMF.

Chart 3.33 Domestic banks classified by ROE and ROA



Source: CBC.

Chart 3.34 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.

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

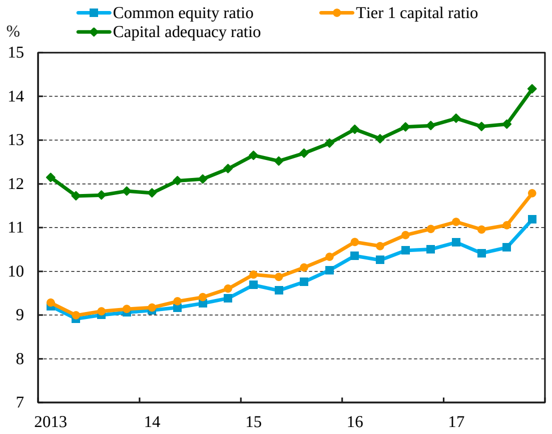
At the end of 2017, the common equity ratios, Tier 1 capital ratios, and capital adequacy ratios for all domestic banks remained above the statutory minimum requirements[51] for 2017 (Chart 3.37). The average leverage ratio[52] of domestic banks at the end of 2017 stood at 6.42%, higher than a year before and well above the international standard of 3%. It indicated domestic banks maintained sound financial leverage (Chart 3.38).

Credit ratings

Average credit rating level further enhanced

Of the overall risk assessments of Taiwan's banking system made by credit rating agencies, Standard & Poor's kept Taiwan's Banking Industry Country Risk Assessment (BICRA)[53] 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,

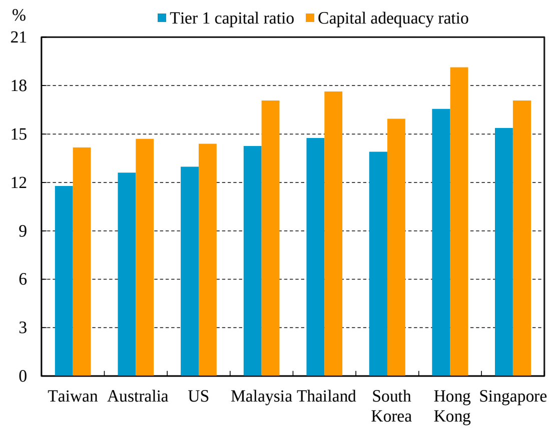
Chart 3.35 Capital ratios of domestic banks



Notes: 1. Figures from 2013 forward are based on Basel III.
2. Common equity ratio = common equity Tier 1 capital/risk-weighted assets.
3. Tier 1 capital ratio = Tier 1 capital/risk-weighted assets.
4. Capital adequacy ratio = eligible capital/risk-weighted assets.

Source: CBC.

Chart 3.36 Capital ratios of banking industry in selected economies



Note: Figures are as of the end of 2017.

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

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51 The minimum capital requirements in the Basel III transition periods of domestic banks are as follows:

Ratios	2017	2018	2019 onwards
Common equity ratio (%)	5.75	6.375	7.0
Tier 1 capital ratio (%)	7.25	7.875	8.5
Capital adequacy ratio (%)	9.25	9.875	10.5

52 With a view to keeping in line with international standards published by the Basel Committee on Banking Supervision (BCBS), the FSC required all banks to calculate Basel III leverage ratios from 2013 onwards and disclose the ratios starting from 2015. Moreover, the leverage ratio will be incorporated into Pillar 1 (minimum capital requirement) from January 1, 2018.

53 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.

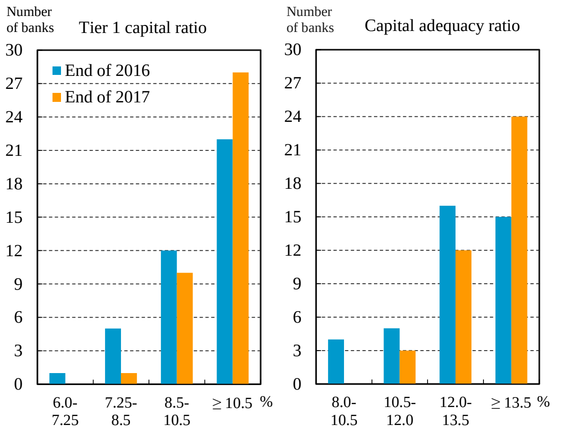
Indonesia and the Philippines. Moreover, the assessment of Taiwan's banking system by Fitch Ratings' Banking System Indicator/Macro-Prudential Indicator (BSI/MPI)[54] also remained unchanged at level bbb/1 (Table 3.2).

All domestic banks received ratings by credit rating agencies. The average credit rating of domestic banks further improved in 2017, as the credit rating index[55] went up slightly compared to 2016 (Chart 3.39).

Rating outlooks for almost all domestic banks remained stable or positive

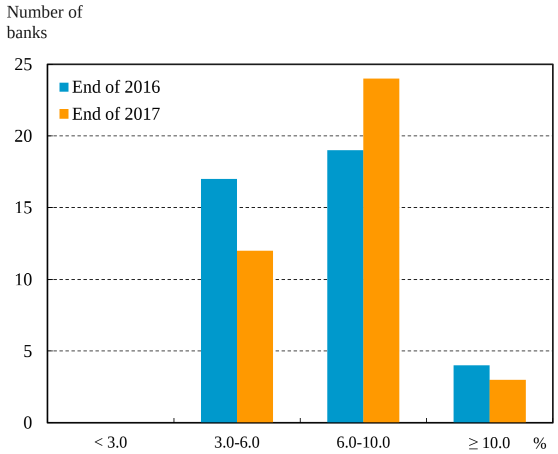
Almost all domestic banks maintained credit ratings of twAA/twA (Taiwan Ratings) or AA(twn)/A(twn) (Fitch Ratings) and none had credit ratings lower than twBB/BB(twn) at the end of 2017 (Chart 3.40), similar to the previous year. Only two banks received negative rating outlooks, while those for the other 37 banks remained stable or positive.

Chart 3.37 Domestic banks classified by capital ratios



Source: CBC.

Chart 3.38 Domestic banks classified by leverage ratio



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

3.2.2 Life insurance companies

In 2017, total assets of life insurance companies continued their rapid growth, and their average RBC ratio further improved. Overall credit ratings held stable and pretax income grew year on year; however, life insurance companies still faced higher market risks.

[54] 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 aa, a, bbb, bb/b to ccc/cc/c. The MPI indicates the vulnerability of the macro environment on a scale from 1 to 3.

[55] 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 sovereign long-term ratings from Fitch Ratings. The higher the index is, the better the bank's overall solvency.

Assets maintained fast growth

The total assets of life insurance companies maintained fast growth with a higher year-on-year growth rate of 9.96% in 2017. At the end of the year, total assets held by life insurance companies reached NT$24.47 trillion, equivalent to 140.35% of annual GDP (Chart 3.41). The top three companies in terms of assets made up a combined market share of 56.16%, a slight decrease of 0.1 percentage points year on year. The market structure of the life insurance industry remained roughly unchanged in 2017.

Foreign portfolio investments remained the primary usage of funds

In terms of the usage of funds of life insurance companies, foreign portfolios accounted for 59.05% at the end of 2017, the largest share of total assets, whereas the share of domestic securities investments continued to drop to 18.66%. As for their sources of funds, insurance liabilities accounted for 84.80%, the primary share of total liabilities and equity, while the share of equity increased slightly to 5.58%. Overall, financial leverage of life insurance companies decreased marginally (Chart 3.42).

Pretax income grew year on year

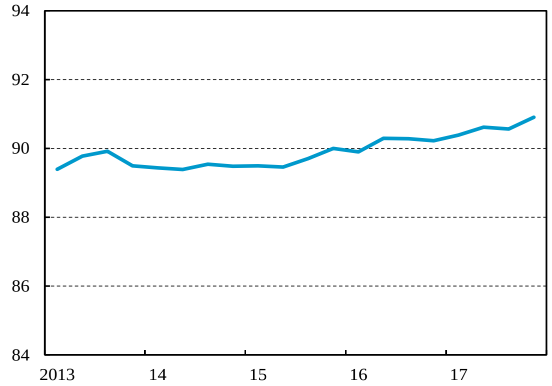
Life insurance companies reported net income before tax of NT$116.7 billion in 2017, a substantial year-on-year increase of NT$10.2 billion or 9.59% (Chart 3.43). This

Table 3.2 Systemic risk indicators for the banking system

Banking System	Standard & Poor's		Fitch	
	BICRA		BSI/MPI	
	2017/2	2018/2	2017/1	2018/3
Hong Kong	2	2	a/3	a/3
Singapore	2	2	aa/2	aa/2
Japan	2	2	a/1	a/1
South Korea	3	3	a/1	a/1
Taiwan	**4**	**4**	**bbb/1**	**bbb/1**
Malaysia	4	4	bbb/1	bbb/1
Mainland China	5	6	bb/1	bb/1
Thailand	6	6	bbb/1	bbb/1
Indonesia	7	7	bb/1	bb/1
Philippines	7	7	bb/1	bb/1

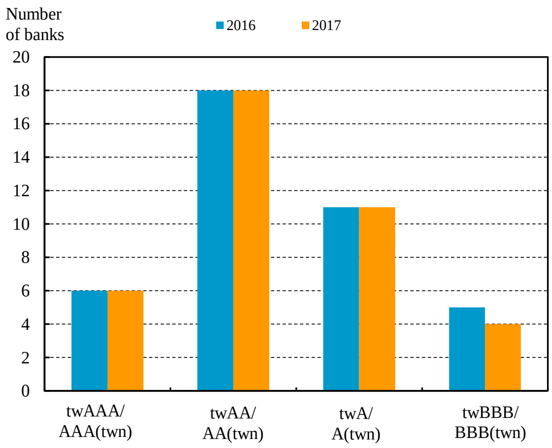
Sources: Standard & Poor's and Fitch Ratings.

Chart 3.39 Credit rating index of domestic banks



Sources: Taiwan Ratings Corporation, Fitch Ratings, and CBC.

Chart 3.40 Number of domestic banks based on credit ratings



Notes: 1. End-of-period figures.
2. The number of domestic banks reduced from 40 in 2016 to 39 in 2017.

Sources: Taiwan Ratings Corporation and Fitch Ratings.

was chiefly driven by growth in interest revenue and gains on securities investments, as well as a decrease in policy underwriting expenses. However, owing to a greater increase in total equities, the average ROE dropped to 9.42%, while the average ROA held at 0.5% (Chart 3.44), indicating slightly weakened profitability.

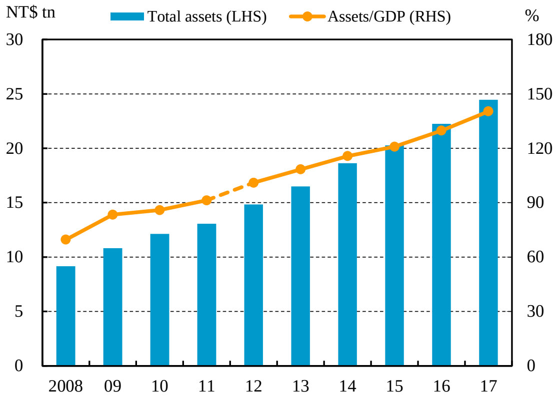
Average RBC ratio further improved

In 2017, life insurance companies strengthened their capital through accumulation of operating profits and issuance of subordinated debt. As a result, the average RBC ratio rose to 304.9% at the end of the year (Chart 3.45). By individual company, there were 16 companies with RBC ratios over 300%. Only one company had an RBC ratio below the statutory minimum of 200% and needed to improve its financial structure, though its assets accounted for only 1.47% of the total (Chart 3.46).

Overall credit ratings remained stable

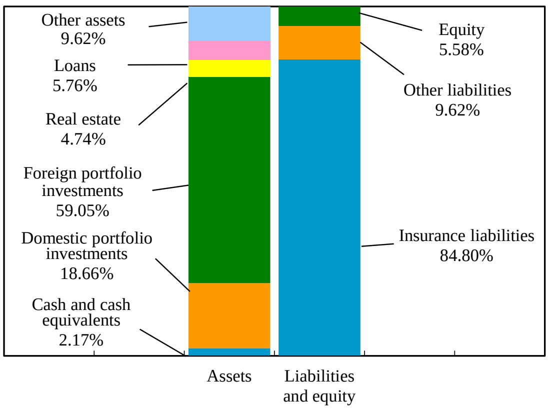
Among the 12 life insurance companies rated by Taiwan Ratings or Fitch Ratings, most received unchanged credit ratings in 2017. As of the end of the year, all rated life insurance companies maintained credit ratings above twA or its equivalent, and most received positive or stable credit outlooks.

Chart 3.41 Total assets of life insurance companies



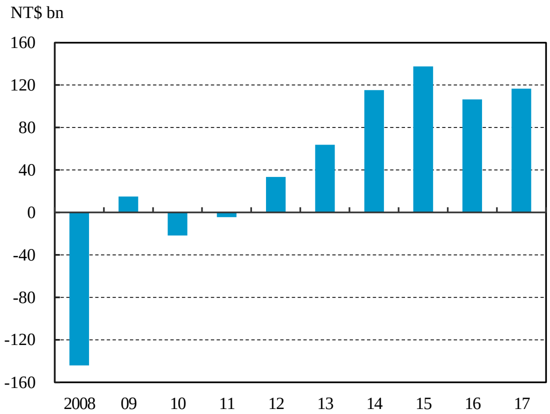
Note: Figures from 2012 forward are on the TIFRSs basis. Figures of prior years are on the ROC GAAP basis..
Sources: FSC and DGBAS.

Chart 3.42 Asset/liability structure of life insurance companies



Note: Figures are as of the end of 2017.
Source: FSC.

Chart 3.43 Net income before tax of life insurance companies



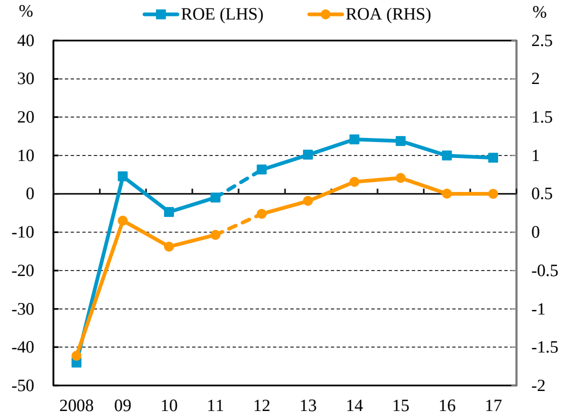
Note: Figures from 2012 forward are on the TIFRSs basis. Figures of prior years are on the ROC GAAP basis.
Source: FSC.

Investment positions expanded, with higher market risks

Foreign portfolio positions of life insurance companies grew continually and reached NT$14.45 trillion in 2017, posing higher FX risks. In January 2018, the FSC amended the applicable regulations and required life insurance companies to accelerate the accumulation of FX valuation reserves,[56] which could help mitigate the impacts of FX rate fluctuations on their profits.

In addition, volatility in international stock and bond markets heightened in 2018, and, should the US-China trade dispute heat up, downward pressure on global stock prices may further increase. Moreover, considering that the yield on Taiwan government bonds may follow the upward trend of US government bond yields, interest rate risk on bond investments remains high. Therefore, life insurance companies should prudently control the equity risk and interest rate risk of their securities investment positions.

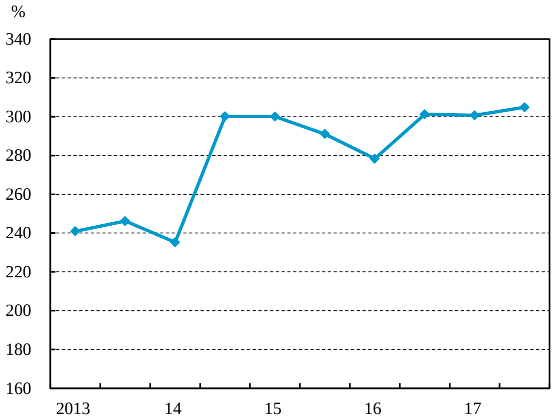
Chart 3.44 ROE & ROA of life insurance companies



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

Source: FSC.

Chart 3.45 RBC ratio of life insurance companies



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

Source: FSC.

[56] See Section 4.2 "Measures undertaken by the FSC to maintain financial stability."

3.2.3 Bills finance companies

The total assets of bills finance companies continued expanding in 2017, while the guarantee business grew moderately and credit asset quality remained sound. The average capital adequacy ratio slightly rose; however, profitability weakened slightly and liquidity risk stayed high.

Total assets continued to expand

The total assets of bills finance companies increased by 4.82% in 2017 and stood at NT$1,034 billion at the end of the year, equivalent to 5.93% of annual GDP (Chart 3.47). The asset expansion was mostly due to the increase in short-term bill investments.

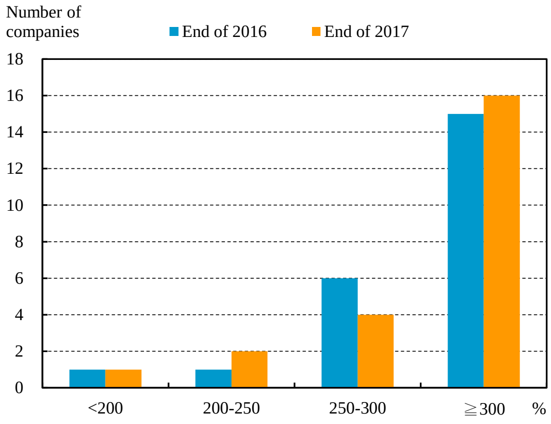
The asset and liability structure of bills finance companies remained roughly unchanged in 2017. On the asset side, bill and bond investments constituted 94.45% of total assets. On the liability side, bills and bonds sold under repo transactions as well as borrowings accounted for 86.50% of total assets, while equity only accounted for 11.84% (Chart 3.48).

Credit risk increased moderately

Guarantee liabilities grew moderately while credit concentration in real estate trended up

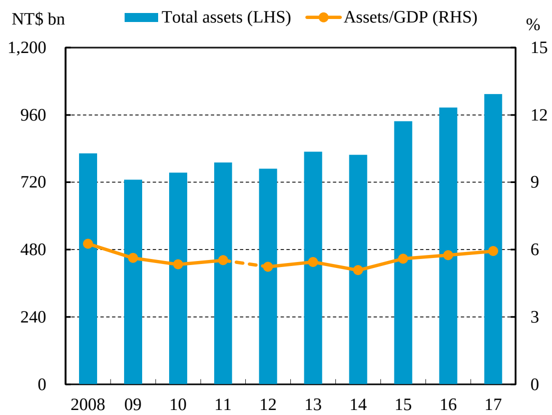
Owing to rising funding demands of corporates in money markets spurred by low short-term

Chart 3.46 Life insurance companies classified by RBC ratios



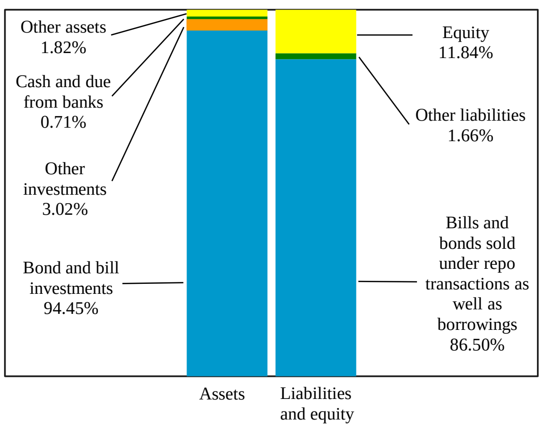
Note: Figures for 2016 are exclusive of Chaoyang Life Insurance.
Source: FSC.

Chart 3.47 Total assets of bills finance companies



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

Chart 3.48 Asset/liability structure of bills finance companies



Note: Figures are as of the end of 2017.
Sources: CBC and FSC.

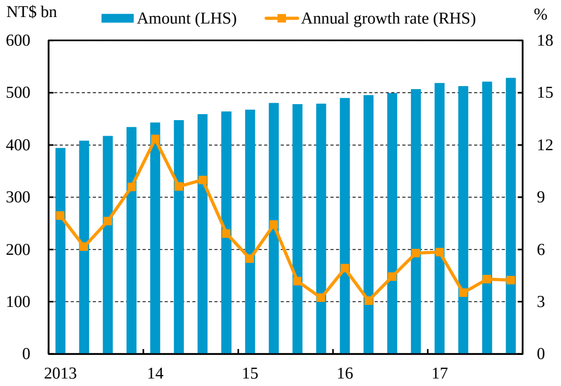
market rates, CP guaranteed by bills finance companies registered NT$527.8 billion at the end of 2017, an increase of NT$21.5 billion year on year; nevertheless, the annual growth rate moderated to 4.24% (Chart 3.49). As a result, the average multiple of guarantee liabilities to equity rose to 4.88 times at the end of 2017, compared to 4.67 times a year before. The multiple of each company, however, was still below the regulatory ceiling of 5.5 times.

At the end of 2017, guarantees granted to the real estate and construction industries and the credits secured by real estate slightly ascended to 29.04% and 35.91%, respectively, of total credits of bills finance companies. Both ratios remained at high levels. As the outlook for the domestic housing market remains conservative, bills finance companies should closely monitor real estate related credit risks.

Credit quality remained sound

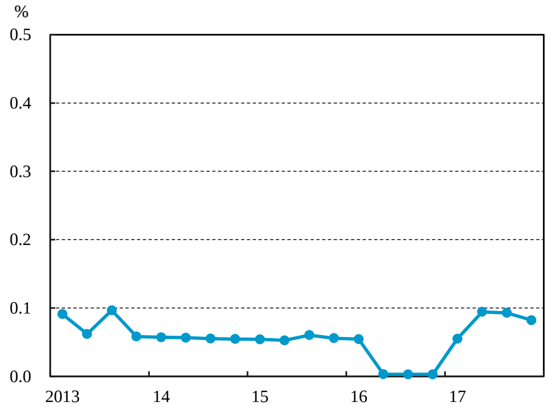
The credit quality of bills finance companies remained sound in 2017, as the non-performing credit ratio stayed at a low level of 0.082% at the end of the year (Chart 3.50). Meanwhile, the credit loss reserves to non-performing credit ratio stood at 18.58 times, reflecting sufficient reserves to cover potential credit losses.

Chart 3.49 Outstanding CP guaranteed by bills finance companies



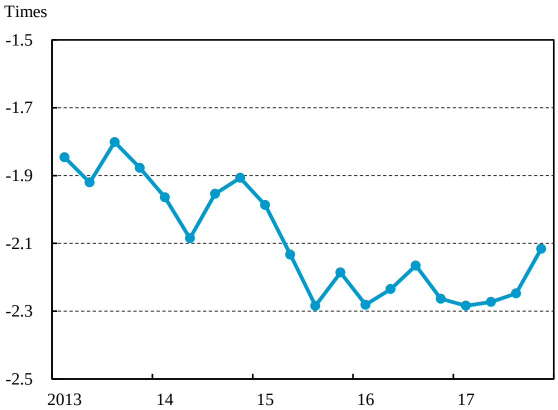
Source: CBC.

Chart 3.50 Non-performing credit ratio of bills finance companies



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

Chart 3.51 0-60 days maturity gap to equity of bills finance companies



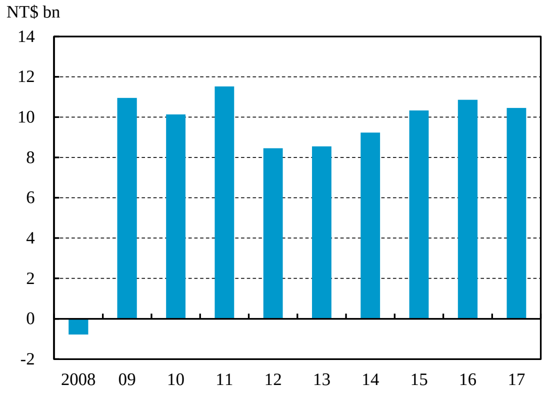
Note: 0-60 days maturity gap = cash inflow of major assets within 0-60 days - cash outflow of major liabilities within 0-60 days.
Source: CBC.

Liquidity risk remained high

Bills finance companies still faced a significant maturity mismatch between assets and liabilities, as more than 90% of their assets were invested in bills and bonds, 43.22% of which were long-term bonds. In addition, more than 80% of their liabilities were from short-term interbank call loans and repo transactions. Although the 0-60 day maturity gap to equity shrunk to -2.12 times, the liquidity risk in bills finance companies remained high (Chart 3.51).

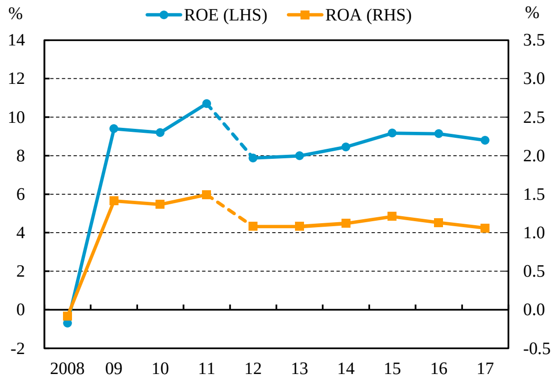
Moreover, major liabilities[57] in bills finance companies grew by 5.05% in 2017, bringing the major liabilities to equity ratio to increase from 7.88 times a year before to 8.29 times at the end of the year. However, the multiple of each company was still below the regulatory ceilings of ten or twelve times.

Chart 3.52 Net income before tax of bills finance companies



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

Chart 3.53 ROE & ROA of bills finance companies



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

Profitability slightly weakened

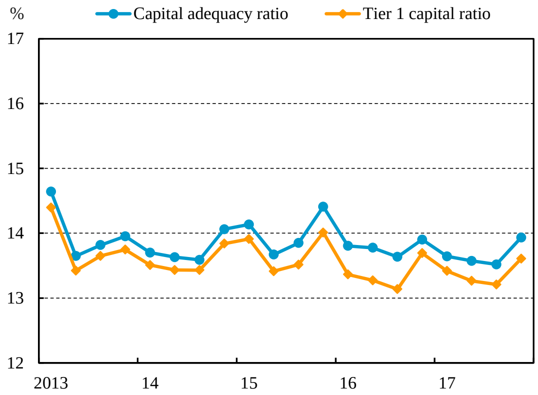
Bills finance companies posted a net income before tax of NT$10.5 billion in 2017, a decrease of 3.74% year on year (Chart 3.52). The decline was mainly driven by a decrease in commission fee income amid intense competition in the CP underwriting business, and an increase in the yielding cost of foreign currency bonds. Owing to contraction in profits and the growth in equities and assets, the average ROE and ROA mildly fell to 8.80% and 1.06%, respectively, reflecting a slight weakening of profitability (Chart 3.53).

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

Average capital adequacy ratio mildly rose

The average capital adequacy ratio of bills finance companies mildly ascended to 13.93% at the end of 2017, although the Tier 1 capital ratio slightly declined to 13.61%. Moreover, the capital adequacy ratio for each company remained higher than 13%, well above the statutory minimum of 8% (Chart 3.54).

Chart 3.54 Average capital adequacy ratios of bills finance companies



Source: CBC.

Box 3
Overseas expansion of demestic banks: Current conditions and challenges

In recent years, the government has successively relaxed regulations and promoted overseas expansion policies for banks. Against this backdrop, and faced with the challenges of overbanking, excessive competition, and thin interest margins, domestic banks proactively set up overseas business units. As banks' overseas units have earned a continuously rising share of profits, they have become critical for the future development of domestic banks.

1. Retrospect and current conditions of overseas expansion

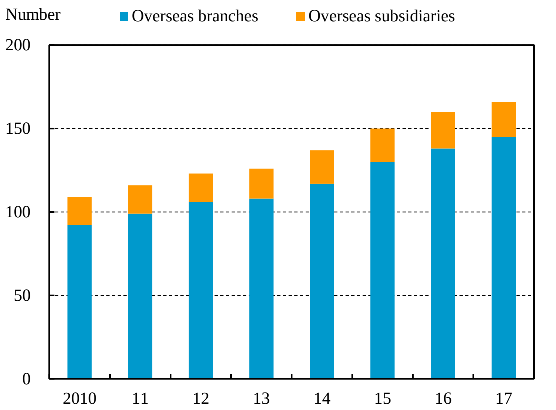
1.1 History of overseas expansion

In the early days, most overseas business units of domestic banks were set up in international financial centers, such as New York, London, and Singapore. However, domestic banks then gradually focused on the countries with Taiwanese enterprise clusters, especially Mainland China. In the past two years, their focus has shifted to New Southbound Policy target countries.[1]

1.2 Most overseas branches and subsidiaries are located in New Southbound Policy target countries

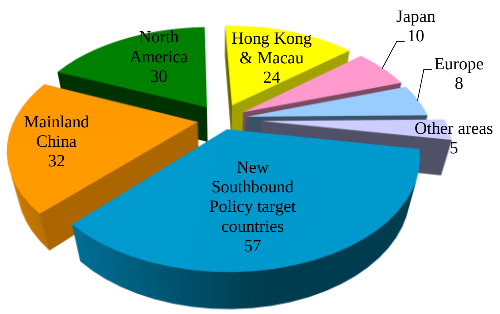
As of the end of 2017, domestic banks had 485 overseas business units,[2] including 145 branches and 21 subsidiaries, both greater than the respective numbers in 2010 (Chart B3.1). As for geographical distribution, most overseas branches or subsidiaries were set up in New Southbound Policy target countries (57), followed by Mainland China (32), North America

Chart B3.1 Number of overseas business units of domestic banks



Source: CBC.

Chart B3.2 Geographical distribution of overseas business units



Note: Figures are as of the end of 2017 and denote the number of business units.
Source: CBC.

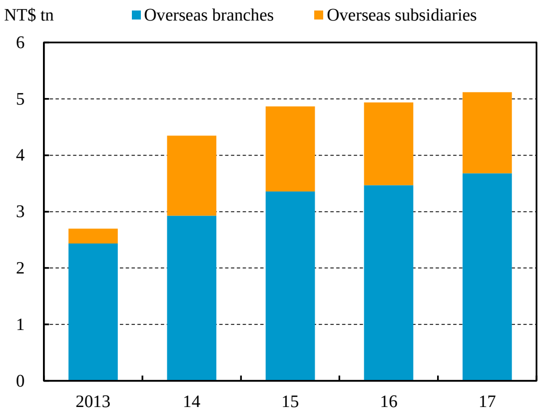
(30), and Hong Kong & Macau (24) (Chart B3.2). This demonstrates that overseas expansion strategies of most domestic banks still focused on the areas where Taiwanese enterprises have trade or investment relationships.

2. Profile and management of overseas business units

2.1 Overseas business units in Hong Kong & Macau and New Southbound Policy target areas have relatively large asset scales

While domestic banks continued overseas expansion, total assets of those units grew gradually and reached NT$5.12 trillion at the end of 2017, with overseas branches and subsidiaries accounting for 71.88% and 28.12%, respectively (Chart B3.3). Among all areas, total assets of those in Hong Kong & Macau was the largest (NT$1.37 trillion), while those in New Southbound Policy target areas (NT$0.96 trillion), North America (NT$0.89 trillion), Japan (NT$0.86 trillion), and Mainland China (NT$0.85 trillion) had similar levels of assets.

Chart B3.3 Total assets of overseas business units

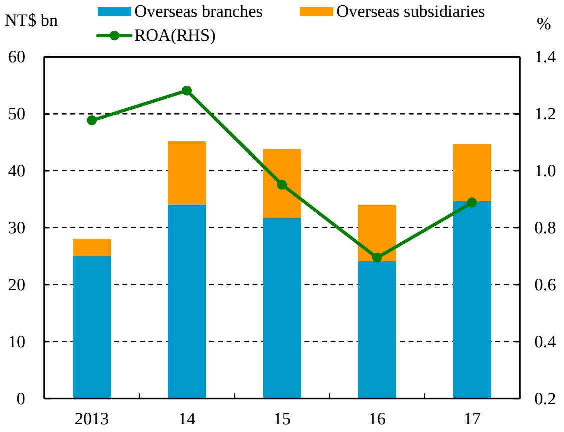


Source: CBC.

2.2 Total profit rebounded in 2017, with Hong Kong & Macau registering the highest

Owing to rising non-interest income and falling loan loss provisions, the total net income before tax of overseas branches and subsidiaries increased markedly by 31.16% year on year to NT$44.6 billion in 2017. Their average ROA rose to 0.89% (Chart B3.4), higher than domestic banks' overall average of 0.66%. Among all areas, overseas units in Hong Kong & Macau posted net income before tax of NT$13.8 billion,

Chart B3.4 Total net income before tax of overseas business units



Source: CBC.

making the largest contribution, followed by North America at NT$9 billion and New Southbound Policy target areas at NT$8.6 billion.

2.3 Business concentrated on loan extension and capital market activities

As domestic banks have a limited number of overseas branches, they face greater challenges to enter foreign retail markets. As a result, corporate finance and capital markets have become the core business lines of their overseas branches. Against this backdrop, syndicated loans granted by some domestic banks accounted for more than 80% of their overseas loans. Therefore, a default on any of those syndicated loans may simultaneously create impacts on the profits of several domestic banks. However, because overseas branches were aggressive in writing off bad loans, their NPL ratios remained low with the average ratio sitting at 0.15% as of the end of 2017.

2.4 Headquarters have enhanced management of overseas business units recently

In recent years, domestic banks have strengthened the management of overseas business units. Most of them have adopted a matrix management framework on overseas branches, requiring the business line or management function of overseas branches to report directly to respective authorized units in headquarters. As for overseas subsidiaries, indirect management was employed through the designation of subsidiary board members and senior managers. Meanwhile, most domestic banks set up a specialized department in headquarters so as to effectively integrate and monitor the operation of overseas branches and subsidiaries. Furthermore, the risks of overseas branches were controlled in the bank-wide risk management framework, including the implementation of risks or trading limits as well as significant events reporting mechanisms.

3. Opportunities and challenges of domestic banks' overseas expansion

3.1 With strong growth momentum and wide interest margins, ASEAN countries have become the key expansion areas of several domestic banks

The Association of Southeast Asian Nations (ASEAN)[3] countries have rapid economic growth, huge domestic needs, high demographic dividends, and strong infrastructure construction demands. In light of the potential these strengths represent and encouraged by the government's New Southbound Policy, many domestic banks favored ASEAN countries when choosing expansion locations. Moreover, as Taiwanese enterprises have strong business presence in several ASEAN countries, and the interest margins there are higher than those in Taiwan, these markets have appealed strongly to domestic banks.

3.2 Several ASEAN countries set entry barriers, hindering overseas expansions of domestic banks

Many domestic banks desire to set up business units in ASEAN countries. However, except for Singapore and the Philippines, most ASEAN countries set entry barriers for foreign banks. Although some ASEAN countries allow foreign entry through mergers or acquisitions, uncertainty surrounding the closure of such deals has become relatively high.

3.3 Difficulties in the operation and management of overseas business units

Owing to differences in ethnicity, culture, and language, domestic banks faced challenges building up large scale localized business in ASEAN countries. Moreover, it is not easy to recruit and train talent in overseas markets. This, together with high employee turnover rates, increased the difficulties with regard to the management of overseas business units.

4. Conclusion

Domestic banks proactively carried out overseas expansion strategies in recent years. While this effort creates new growth momentum for the banking industry in Taiwan, it also presents several challenges to domestic banks. To smoothly join and expand their business in foreign markets, domestic banks should enhance risk management and reinforce compliance and anti-money laundering (AML) activities. The competent authorities should, on the one hand, amend relevant regulations to strengthen banks' management of overseas branches. On the other hand, the authorities should make great effort to sign the memorandums of understanding with foreign counterparties on financial supervision, in order to foster effective supervision of overseas business units and prevent unsound operations of those units from having negative spillover effects on Taiwan's financial stability.

Notes: 1. New Southbound Policy target countries include Thailand, Indonesia, the Philippines, Malaysia, Singapore, Brunei, Vietnam, Myanmar, Cambodia, Laos, India, Pakistan, Bangladesh, Nepal, Sri Lanka, Bhutan, Australia, and New Zealand.

2. Overseas business units include overseas branches and their sub-branches, overseas subsidiaries and their branches, representative offices, finance companies, etc.

3. ASEAN consists of ten countries, including Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam.

3.3 Financial infrastructure

3.3.1 Payment and settlement systems

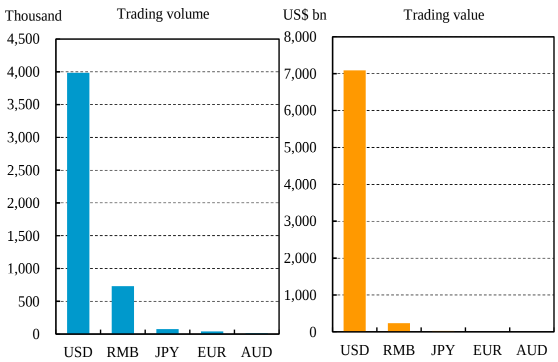
Overview of the three NTD SIPSs

There are three SIPSs in Taiwan, including the CBC Interbank Funds-Transfer System (CIFS), the Interbank Remittance System (IRS) and the Check Clearing House System (CCHS), which provide clearing and settlement services for NTD electronic payment and check clearing. Compared to the previous year, the funds transferred via the CIFS and IRS increased by 7.6% and 3.3%, respectively, while those via the CCHS slightly decreased by 0.7% owing to the emergence of electronic payment instruments.

Overview of the foreign currency clearing platform

The foreign currency clearing platform provides US dollar, renminbi, Japanese yen, euro and Australian dollar remittance services, as well as delivery-versus-payment (DVP)[58] and payment-versus-payment (PVP)[59] mechanisms for settlement services. The functions of AML/CFT were also integrated into this platform in 2017. By the end of 2017, the accumulated trading volume and value of funds transferred via this platform recorded 4.85 million and US$7.4 trillion (equivalent to NT$ 216 trillion), respectively (Chart 3.55). Because domestic remittances can be settled directly through the foreign currency clearing platform rather than through foreign third parties, remittance fees paid by the public are estimated to have decreased by the substantial amount of NT$2.9 billion from the first day of platform operation to the end of 2017.

Chart 3.55 Trading volume and value via the foreign currency clearing platform



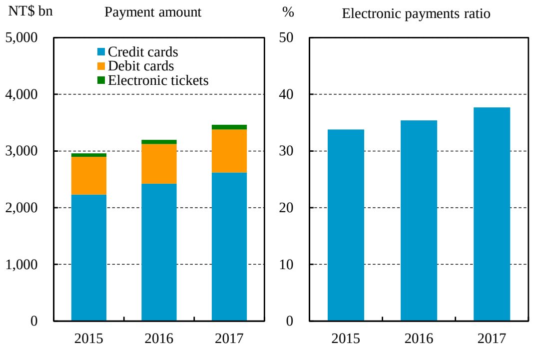
Note: Figures are from March 2013 to the end of 2017.
Source: CBC.

58 DVP is a clearing mechanism that complies with international standards and ensures that the party that delivers securities (or payment) actually receives the payment (or securities) so as to effectively prevent the risk of default.

59 PVP is a mechanism to control the settlement risk of FX transactions. Taking the USD/NTD currency swap as an example, the PVP mechanism can ensure that one party that pays in USD (or NTD) will receive NTD (or USD) without settlement default risk.

Overview of electronic payment transactions

Chart 3.56 Growth of electronic payments



Note: Electronic payment ratio refers to the ratio of the trading value of card-based payment to private consumption expenditure.
Sources: FSC and FISC.

The financial infrastructure in Taiwan is well established, as large-valued payments have been fully digitized and retail payments can also be carried out through diverse and convenient electronic payment instruments. Among them, card-based payments, such as those with credit cards, debit cards and stored-value cards have increased in the past three years. Their total trading value registered NT$3.5 trillion in 2017, which accounted for 37.7% of total private consumption expenditure of NT$9.2 trillion in the year (Chart 3.56).

The transaction value of domestic mobile payments posted substantial growth in 2017.[60] However, as mobile payment companies were dedicated to developing their own brands, the systems, card reading machines and QR codes provided by different companies failed to be fully integrated. Consequently, there is still room for improving the mobile payment penetration rate among merchants and consumers. In order to increase the adoption of mobile payments, the government has set a policy target of achieving a 90% mobile payment penetration rate by 2025,[61] and has been promoting it by coordinating the related ministries and agencies. In 2017, the FISC, urged by the CBC, actively helped private hospitals to establish an E-Health Pay platform and developed common standards for QR codes to deepen financial inclusion (Box 4).

Concerns over the applications of DLT in clearing and payment services

In recent years, central banks in Canada, the UK, Europe, Japan, and Singapore have conducted DLT[62] experimentation for interbank clearing and payments. The results showed that at this stage, DLT technology was not mature enough and therefore unsuitable for practical uses while some problems remained to be solved.[63]

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60 According to the FSC's statistics, from January to November in 2017, the transaction value of domestic mobile payments was approximately NT$15.1 billion, 5.4 times higher than the NT$2.36 billion recorded in 2016.

61 The penetration rate of mobile payments refers to the ratio of mobile payment users to mobile device users.

62 According to the definition by the Bank for International Settlements (BIS), DLT refers to a technology that allows computers in different locations to propose and validate transactions and update records in a synchronized way. See BIS (2017), *International Banking and Financial Market Developments*, Quarterly Review, September.

63 DLT has the problems of poor processing speed and single point of failure as follows: (1) to reach an agreement of all nodes on the ledger, it takes time to conduct a consensus algorithm, resulting in lower processing speed than the existing centralized system; (2) if the operation relies on one node, the dysfunction of this node may cause a breakdown of the entire system, and thus fails to meet the intended purpose of DLT which is avoiding single point of failures.

In order to understand whether DLT can be adopted in domestic payment and settlement systems, the CBC assisted the Taiwan Clearing House (TCH) to cooperate with academic institutions in carrying out a DLT trial on interbank automated clearing house (ACH)[64] transactions and their clearing and settlements. The trial aimed to investigate the efficiency of DLT employed in real time gross settlement (RTGS) systems and hybrid systems when dealing with those transactions. The results showed that processing speeds in both types of systems when adopting DLT were much slower than in the current ACH centralized system, indicating that DLT technology was not yet fully mature and needed to be further improved. In the future, the CBC will continuously work with external professional teams to conduct other case studies such as using DLT technology in the Central Government Securities Settlement System (CGSS), and urge the FISC and the TCH to cooperate with banks in testing other application cases such as blockchain-based financial confirmations and e-checks.

3.3.2 Measures to enhance information security in Taiwan

In recent years, cyber attacks on domestic financial institutions have become more relentless in terms of frequency, showing that information security (InfoSec) protection is the main issue in financial security management. As major countries in the world have successively established financial security information sharing and analysis institutions, the FSC opened the F-ISAC in December 2017 so as to enhance cyber security protection in the domestic financial system.

The FSC entrusted the FISC to operate the F-ISAC. The Center aims to provide financial institutions, including banking, insurance, securities and futures, and securities investment trust and consulting industries, with nine services, such as security breach notification, information analysis, cyber security information sharing, etc. The objective of the Center is to gradually build a joint financial defense system for InfoSec in Taiwan.

To increase the awareness of InfoSec for financial industries, the FSC amended the internal control regulations of financial holding companies, banking, insurance, and securities and futures industries. The amendments required those financial institutions to establish an InfoSec unit and appoint a delegate to take charge of InfoSec activities, as well as allocating adequate human resources and equipment for InfoSec. The FSC also conducted differentiated supervision according to financial institutions' asset scale and business models. Additionally, the FSC would strengthen examinations on InfoSec management of financial institutions.

[64] The existing ACH system handles interbank fund transfers by way of designated timing, batches, and net settlement.

3.3.3 Assessing the feasibility of implementing a D-SIBs framework in Taiwan

At present, Taiwan's domestic banks are not identified by the Financial Stability Board (FSB) as global systemically important banks (G-SIBs). However, some domestic financial institutions such as large financial holding companies or banks are considered to be domestically systemic important in terms of size, interconnectedness, substitutability and complexity. In order to reinforce financial supervision and comply with international supervisory standards, the FSC has collected information regarding a D-SIBs identification and supervision framework from the Basel Committee on Banking Supervision (BCBS) and other countries to assess the feasibility of its implementation. In addition, aiming to strengthen the evaluation and supervision of D-SIBs, the TCH of the CBC has entrusted academics to conduct research on D-SIBs identification and evaluation[65] for reference relating to financial stability assessment.

3.3.4 Enforcing Regulations Governing the Implementation of the Common Standard on Reporting and Due Diligence for Financial Institutions

As the world is strengthening standards for information transparency and in order to safeguard taxation fairness and ensure appropriate tax revenues, the Ministry of Finance (MOF) formulated the *Regulations Governing the Implementation of the Common Standard on Reporting and Due Diligence for Financial Institutions* in November 2017. The Regulations is in reference to the *Common Standard on Reporting and Due Diligence for Financial Account Information ("Common Reporting Standards," CRS)* set out in the *Standard for Automatic Exchange of Financial Account Information in Tax Matters* released by the Organization for Economic Co-operation and Development (OECD). Any financial institution[66] within the territory of the Republic of China (ROC) shall perform due diligence for financial account information in tax matters of foreign residents, and report the information of reportable persons to tax authorities. These regulations mainly include: (1) stipulating review time limits and due diligence procedures for reporting financial institution accounts; (2) requiring the reporting financial institution to identify indicia associated with the countries or jurisdictions of residence[67] and status identification of account holders; (3)

[65] Yu-Ning Hwang and Nan-Kuang Chen (2016), *Identifying and Evaluating Domestic Systemically Important Banks in Taiwan*, TCH internal paper, May.

[66] The term "financial institutions" shall mean any of the following: depository institutions, custodial institutions, investment institutions or specified insurance companies. Governmental entities, international organizations, or central banks are exempted from the obligation of performing due diligence and reporting requirements.

[67] In Taiwan's case, the wider approach is applied. The financial institutions should identify all the information covering the countries or jurisdictions of residence of account holders. The approach is different from that of the *Foreign Account Tax Compliance Act* (*FATCA*), which merely requires financial institutions to identify if the account holder is a US citizen or resident.

formulating the reporting time limits and the related information for reporting financial institutions.

3.3.5 Implementation of the Financial Technology Development and Innovative Experimentation Act in Taiwan

To promote Taiwan's financial technology innovation, the *Financial Technology Development and Innovative Experimentation Act* ("*Experimentation Act*") became effective on 30 April 2018.[68] The *Experimentation Act* provides a legal basis for building a financial technology innovative experimentation mechanism in Taiwan. The key points of the *Experimentation Act* are as follows:

- Regardless of whether they are financial or non-financial service firms, all start-ups can apply for innovative experiments to the extent that the proposed innovative technologies are regarded as chartered financial services approved by the FSC.
- The experimental period is up to one year and the applicant may apply for a one-time extension up to six months if necessary. However, when the relevant regulations are to or need to be amended, the experimental period is not subject to the restriction of a one-time extension and the overall period can be prolonged up to three years.
- To protect the interests of participants in the experiment, the *Experimentation Act* applies provisions regarding dispute resolution procedures of the *Financial Consumer Protection Act*. Moreover, if the innovative experimentation involves a situation that is materially adverse to financial markets or to the interests of experimental participants, the FSC may revoke the approval for the innovative experimentation.

3.3.6 FX regulation amendments

Relaxing FX regulations for banks

In order to promote development of the financial services industry in the context of financial globalization and liberalization, the CBC revised the *Regulations Governing Foreign Exchange Business of Banking Enterprises* and related regulations in January 2018. The main amendments included the following: (1) approving authorized banks to engage in the opening of digital foreign currency deposit accounts conducted by customers via the Internet; (2)

[68] Three related pieces of regulations were enacted along with the *Experimentation Act* on the same day for regulatory compliance by relevant industries, and follow-up sub-laws will be drafted in the future as required.

stipulating application procedures and matters of compliance for authorized banks conducting foreign currency trust business and issuing foreign currency bank debentures outside the ROC; and (3) simplifying application procedures for authorized banks engaging in FX business with customers through electronic and communications equipment.

Relaxing FX regulations related to securities firms

In order to strengthen the competitiveness of securities firms, expand their business scope, and provide customers with additional services, the CBC amended the *Regulations Governing Foreign Exchange Business of Securities Enterprises* in March and December 2017, so as to help securities firms to expand their FX business. The key amendments included the following: (1) allowing a securities firm to conduct spot FX transactions between the NTD and foreign currencies, and expanding its FX business to derivative products involving the NTD exchange rate and other foreign currencies; (2) allowing a securities firm, which accepts orders to trade foreign securities with receipt/payment in foreign currencies, to set up the customer’s personal subaccount in a segregated foreign currency account opened under the securities firm’s account with the authorized bank for custody of settlement funds purposes; and (3) allowing the settlement payment for a securities firm upon maturity, which intends to engage in business that involves repo trade of foreign currency securities, to come from FX against the NTD, upon being approved by the CBC.

Box 4
Recent developments to enhance mobile payments in Taiwan

Thanks to high penetration of the internet and ubiquitous use of mobile devices, especially among the young Touch-Screen Generation, mobile commerce has flourished rapidly and is driving the demand for mobile payments. Together, these developments have created favorable conditions in the market to enhance mobile payments in Taiwan.

1. Mobile payment tools in Taiwan

Benefiting from the high penetration rate of smart phones in Taiwan and increasing understanding of mobile payment usages by the public, mobile payments have become a popular tool for making purchases and transferring funds. Currently, user-binding payment tools provided by operators include credit cards, debit cards/VISA debit cards, bank accounts, and electronic tickets. In addition, contactless and QR code-based payments are the main payment methods (Table B4.1).

Table B4.1 Categories of mobile payment methods

Payment methods	User-binding payment tools			
	Credit cards	Debit cards	Bank accounts	Electronic tickets
Contactless	✓	✓		✓
QR code-based	✓	✓	✓	✓

Note: Debit cards include VISA debit cards.
Source: CBC.

2. Current problems

As international mobile payment providers entered the Taiwan market, the trading volume of mobile payments grew in 2017, but the penetration rate still has room for improvement.

(1) Various mobile payment tools with different brands and standards

In terms of contactless payment, because of different standards of sensor devices, merchants have to install various card reading machines. Consumers also need to own mobile devices that meet certain standards. These setbacks result in limited usage scenarios. As for QR code payment, because respective operators develop their own codes, merchants are forced to post different kinds of QR codes, which are difficult to recognize and do not allow cross-usage.

(2) Intense market competition

While the domestic mobile payment market is small, there are various mobile payment operators vying for it, including banks, telecommunications companies, mobile phone manufacturers, e-commerce companies, and electronic tickets issuing institutions. Strong competition and little collaboration in the market make it hard to gain the benefits of economies of scale.

3.Measures promoted by the government

To accelerate the popularity of mobile payments, the National Development Council proposed a cross-ministry plan in 2017 to promote mobile payments. Moreover, in accordance with government policies, the FSC implemented a number of measures, such as developing multiple payment tools, expanding payment channels, and reviewing related regulations.

Furthermore, to assist the development of mobile payments, the CBC urged the Financial Information Service Co., Ltd. (FISC) to implement the following measures in 2017:

(1) Helping the establishment of the E-Health Pay platform

The FISC cooperated with private hospitals, clinics and VISA to establish the medical mobile payment platform, E-Health Pay. It allows the public to complete payment by mobile phone for medical bills in certain hospitals or clinics. Currently, 70 hospitals and clinics have joined this platform. In the future, it will be promoted further to increase the convenience of medical payments.

(2) Setting up a standardized QR code in collaboration with financial institutions and promoting it among micro businesses

The FISC has worked with financial institutions to promulgate a domestic standard for QR codes and has already provided functions such as P2P transfer, bill payment, tax payment, and consumption with debit cards. In 2018, they plan to cooperate with international credit card organizations to bring credit cards into QR code payment services.[1]

4. Conclusion

In view of the popularity of mobile payments, the Financial Stability Board (FSB) issued a report[2] in 2017, reminding authorities around the world to be aware of cyber risk and to urge third-party service providers to meet safety standards, so as to avoid erosion of public confidence in mobile payments arising from disorderly events.[3] The trading volume of domestic mobile payments is modest now, but market potential presents an optimistic outlook. The CBC will continue to urge the FISC to promote mobile payments in order to deepen financial inclusion.

Notes: 1. International organizations, such as VISA and MasterCard, plan to carry out a global QR code standard. They will cooperate with the FISC in the future to integrate standards into one.

2. FSB (2017), *Financial Stability Implications from FinTech: Supervisory and Regulatory Issues that Merit Authorities' Attention*, June.

3. Considering the difficulties in mitigating significant cyber attacks, the FSB suggests that related authorities should adopt measures such as contingency plans, information security sharing, monitoring, and the incorporation of cyber-security mechanisms into the early design of systems, in order to minimise the potential impact of cyber events on financial stability.