Central Bank of the Republic of China (Taiwan)

Financial Stability Report

May 2018 | Issue No. 12

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About the Financial Stability Report

Key points of the task to promote financial stability

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

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

Purpose of this report

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

Definition of financial stability

There is as yet no universally accepted definition of "financial stability" Defined positively, "financial stability" can be thought of in terms of the financial system's ability to: (1) facilitate an efficient allocation of economic resources both spatially and intertemporally; (2) assess and manage financial risks; and (3) withstand adverse shocks. From a negative view, “financial instability” refers to the occurrence of currency, banking, or foreign debt crises, or inability of the financial system to absorb adverse endogenous or exogenous shocks and allocate resources efficiently, with the result that it cannot facilitate real economic performance in a sustained manner.

Note: ***Except as otherwise noted, all data and information cited in this report are current as of April 30, 2018.***

Abstract

The international economic recovery gained strength in 2017. Although the global financial system continued to improve, there are still several challenges ahead. Taiwan's economy experienced a steady recovery, and the corporate and household sectors as well as the real estate market remained stable. Against this backdrop, domestic financial markets operated smoothly and the health of financial institutions was sound. These circumstances, coupled with orderly functioning of payment systems, underpinned a stable financial system.

International and domestic macro environmental factors potentially affecting Taiwan's financial system

Regarding the global economy, the recovery in advanced economies remained steady in 2017. The US economy displayed robust growth, while the euro area and Japan saw sustained expansions in output growth. Meanwhile, growth in emerging economies gathered momentum. As predicted by IHS Markit, the recovery in advanced and emerging economies is expected to proceed at a steady pace in 2018. With regard to international financial conditions, the health of the global banking industry improved, benefiting from a stable global economic recovery. Nevertheless, the US stock market slumped in early 2018, exacerbating volatility in global financial markets. On the premise that tighter monetary policies will be implemented by major central banks, a reversal in asset prices, along with international trade disputes and geopolitical conflicts in the future, may lead to heightened future asset price fluctuations that potentially pose a threat to the stability of global financial markets.

Regarding the domestic economy, thanks to the global economic recovery and demand for semiconductors and machinery in 2017, Taiwan's exports increased substantially and economic growth remained steady along with mild inflation. Owing to successive balance of payments surpluses, foreign exchange (FX) reserves remained ample, and external debt-servicing capacity remained sound. The government's fiscal deficits reversed to increase but the debt scale leveled off and was kept within a manageable range. The leverage ratios of listed companies rose marginally; however, their short-term debt-servicing capacity remained

sound. Moreover, their profitability enhanced, and the credit quality of corporate loans stayed healthy. Household borrowing and the debt burden increased mildly, while credit quality remained satisfactory. Real estate market trading volumes rebounded, while house prices fluctuated within a narrow range. Nevertheless, the mortgage burden remained heavy.

Financial markets, institutions, and infrastructure operated smoothly

As for financial markets, bill and bond issuance in the primary market increased and the bill trading volume in the secondary market rose; however, the turnover rates of outright transactions of bonds remained at a lower level. Stock indices fluctuated with an upward trend and FX markets remained dynamically stable. As for financial institutions, the profitability of domestic banks enhanced and asset quality remained sound; capital levels rose and ample liquidity persisted. Life insurance companies showed increasing profitability but faced higher market risks. Bills finance companies saw lower pretax net income, and liquidity risks still warrant close attention. With regard to financial infrastructure, the major payment systems operated smoothly during 2017 and the CBC continued to expand the functions of the foreign currency-clearing platform. Meanwhile, the CBC and the Financial Supervisory Commission (FSC) actively responded to the development of domestic financial technology (FinTech).

The CBC and the FSC continually took measures to promote financial stability

From 2017 onwards, the CBC successively adopted appropriate monetary, credit, and FX policy measures in response to the uncertainties surrounding the evolution of global and domestic economic and financial conditions. The underlying measures included continuing to take targeted prudential measures for high-value housing loans, implementing a flexible managed float FX rate regime, and maintaining dynamic stability of the NT dollar exchange rate. Moreover, to pursue the operating objective of promoting financial stability, the CBC also revised FX regulations to keep in line with the government’s anti-money laundering (AML) policies. With respect to the FSC, in addition to proactively promoting financial development, the commission has also reinforced financial supervision, strengthened regulations governing anti-money laundering and countering the financing of terrorism (AML/CFT), and persistently enhanced risk management and risk-bearing abilities of banks and insurance companies, so as to maintain financial stability.

Taiwan's financial system remained stable

In 2017, although facing changing international and domestic economic conditions, financial markets operated smoothly. The profitability and asset quality of domestic financial institutions remained at a satisfactory level. Meanwhile, their financial conditions exhibited better fundamentals. All three major payment systems functioned in an orderly manner. With the aim of promoting financial stability, the CBC and the FSC adopted adequate policies and measures. Overall, the financial system in Taiwan remained stable. Looking ahead, the CBC and the FSC will keep closely monitoring the impact of global and domestic economic and financial conditions on the domestic financial system and implement the appropriate policy responses to promote financial stability.

I. Overview

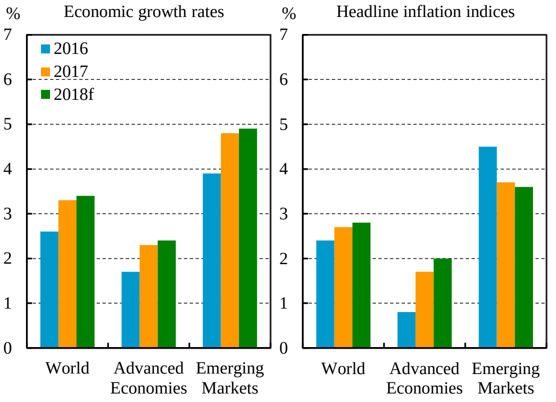
Potential macro environmental risk factors

Global economic recovery momentum enhanced, and the international financial system continued to improve

Global economy recovered steadily, and inflation rose moderately

As the recovery in global investment and trade took hold in 2017, the global economy improved steadily, and the global economic growth rate edged up to a five-year high of 3.3%. Among advanced economies, the acceleration of economic growth in the US was spurred on by an improvement in personal consumption expenditures and fixed investment. The economies in the euro area and Japan expanded steadily, supported by increasing demand in both domestic and export markets. Furthermore, growth rates in the euro area reached a 10-year high. Meanwhile, with rising commodity prices and global demand, as well as economic growth in Mainland China picking up pace for the first time in seven years, growth momentum in emerging economies increased. Looking ahead to 2018, IHS Markit predicts[1] global gross domestic product (GDP) growth to expand to 3.4%. Among them, economic growth in advanced economies is projected to rise to 2.4% driven by US tax reform. During the same period, the average growth rate in emerging economies is forecast to increase to 4.9% on the back of an improving economic outlook bolstered by a pickup in commodity prices (Chart 1.1).

Chart 1.1 Global economic growth rates and headline inflation indices



Note: Figures for 2018 are IHS Markit estimates.
Source: IHS Markit (2018/5/15).

[1] IHS Markit estimate on May 15, 2018.

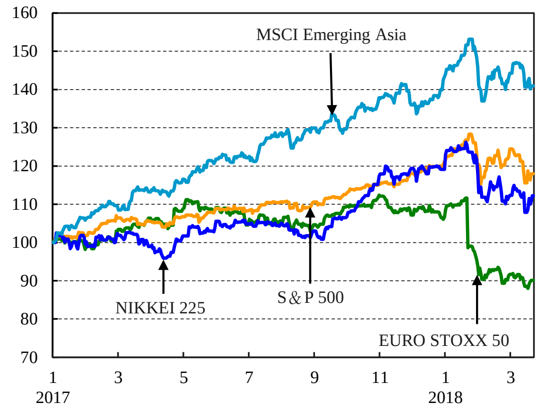
Regarding consumer prices, fluctuating food prices, as well as elevated commodity and oil prices, moderately pushed up global inflation. The global consumer price index (CPI) inflation rate rose to 2.7%. Among them, the headline inflation rate in advanced economies picked up to 1.7%, reflecting the upward trend of US inflation. On the other hand, the headline inflation rate in emerging economies reduced to 3.7% as a result of a more moderate inflation rate in Brazil.[2] IHS Markit predicts that the global headline inflation rate will continue rising to 2.8% owing to the recovery in the global economy and elevating commodity prices (Chart 1.1).

The global banking industry has regained its health, yet financial market risks elevated

In 2017, thanks to the strengthening global economic recovery, the international banking industry has regained its health. However, prolonged easy monetary policies have intensified the search for high-yield assets, leading to risks shifting from the banking sector to financial markets, which have experienced compressed risk premiums and volatility. Furthermore, private sector indebtedness significantly surged, resulting in rising medium-term vulnerabilities.

In most advanced economies, the banking industry has generally regained its health, but some banks still need to improve their balance sheets. In emerging economies, massive international capital inflows have pushed up asset prices and external debt. Meanwhile, nonfinancial sector debt mounted; thus, if the occurrence of unfavorable events trigger capital outflows and tighter financial conditions, it might jeopardize the stability of financial institutions and markets.

Chart 1.2 Performance of international equity indices



Notes: 1. January 1, 2017 = 100.
2. The EURO STOXX 50 Index is derived from 50 stock indices in 12 major economic bodies in the euro area.

Source: Bloomberg.

Global stock markets trended upwards in 2017 (Chart 1.2). With regard to the euro, Japanese yen and major Asian currencies, most of them displayed appreciating trends against the US dollar. Additionally, volatility and yields in

[2] On May 15, 2018, IHS Markit predicted the headline inflation rate of Brazil would decrease significantly to 3.4% in 2017 from 8.7% in 2016.

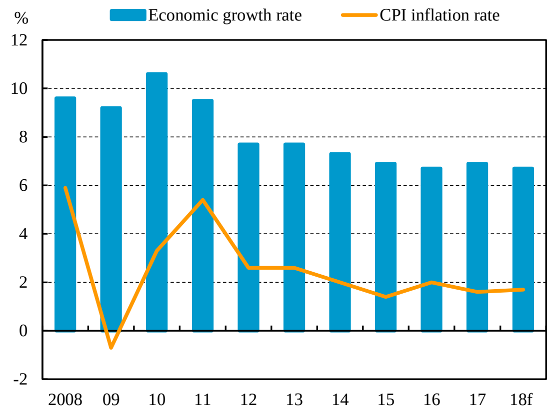
bond markets dropped significantly over the same period. Nevertheless, volatility in global financial markets saw a considerable rise in early February 2018. Among them, global stock markets plunged following a sharp fall in US stock indices (Chart 1.2). In the future, tightening monetary policies by major central banks, coupled with mounting fears of a possible correction of rocketing asset prices as well as intensified trade tensions and geopolitical disputes, may induce dramatic fluctuations in asset prices, jeopardizing the stability of global financial markets.

Mainland China's economic growth accelerated and the renminbi appreciated significantly

Mainland China's economic growth picked up to 6.9% throughout 2017 from 6.7% a year before. Nevertheless, IHS Markit predicts the growth rate to slightly fall to 6.7% in 2018 owing to domestic and international factors. Regarding consumer prices, the CPI inflation rate of Mainland China stood at 1.6% in 2017, lower than the 2.0% of the previous year. IHS Markit projects the annual CPI inflation rate of 2018 to increase marginally to 1.7% (Chart 1.3).

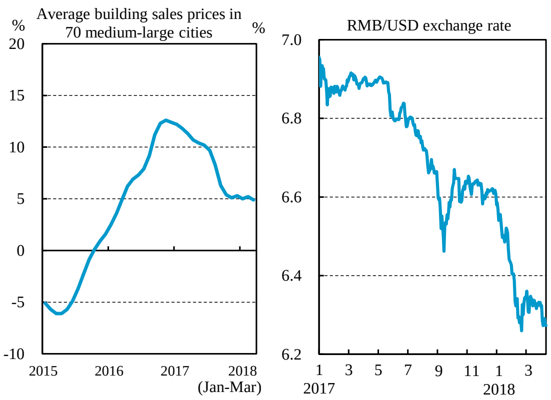
In 2017, the annual growth rate of housing prices in Mainland China declined significantly. Meanwhile, the renminbi has appreciated substantially against the US dollar from May 2017 onwards and this trend has continued until 2018 Q1 (Chart 1.4). In addition, the Shanghai Stock Exchange (SSE) Composite Index fluctuated upwards in 2017, but plunged in February 2018 owing to a marked fall in US stock indices. Afterwards, the SSE composite index rebounded and stabilized.

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



Note: Figures for 2018 are IHS Markit projections.
Sources: National Bureau of Statistics of China and IHS Markit (2018/5/15).

Chart 1.4 Building sales prices of Mainland China and renminbi exchange rate



Sources: Thomson Reuters Datastream and CBC.

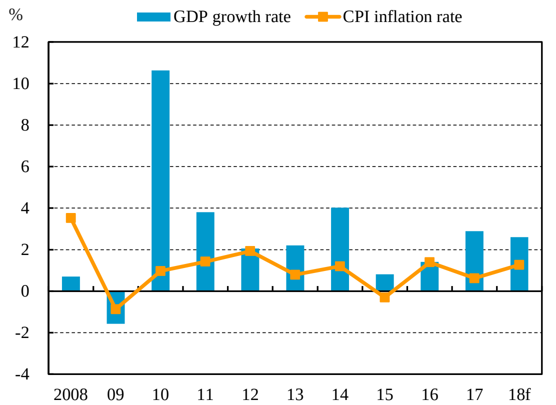
To cope with the growing non-performing loans (NPLs) of commercial banks, Mainland China's government successively launched various preemptive measures for monitoring local government debt so as to reduce their default risk. However, the elevating debt in Mainland China's non-financial sector still warrants close attention.

Domestic macro environment

Domestic economy recovered steadily, while consumer prices rose mildly and external debt servicing capacity remained sound

In 2017, bolstered by strongly expanding exports, coupled with private consumption growth driven by the improvement of employment conditions, the annual economic growth rate in Taiwan rose to 2.89%, noticeably higher than the 1.41% of the previous year. Meanwhile, domestic prices rose mildly throughout 2017. The annual CPI inflation rate registered 0.62%, lower than the 1.39% of the previous year. Taking a glance into 2018, growth in both private investment and consumption are expected to increase and the continued steady growth of the global economy will likely be beneficial to maintaining Taiwan's export growth momentum. Nevertheless, uncertainties stemming from rising trade protectionism and geopolitical tensions may partially curb domestic growth momentum. As a result, the Directorate-General of Budget, Accounting and Statistics of the Executive Yuan (DGBAS) forecasts Taiwan's annual economic growth rate to slightly moderate to 2.60% [3] in 2018. The CBC projects the annual CPI inflation rate to ascend to 1.27%, [4] indicating prospects of mild inflation (Chart 1.5).

Chart 1.5 Economic growth rate and CPI inflation rate of Taiwan



Note: Figure for economic growth rate in 2018 is DGBAS projection on May 25, 2018; figure for CPI in 2018 is CBC estimate on March 22, 2018.
Sources: CBC and DGBAS.

Taiwan's external debt increased to US$181.9 billion at the end of 2017, but FX reserves remained at a sufficient level of US$451.5 billion, implying a robust capacity to service external debt. Meanwhile, the amount of the

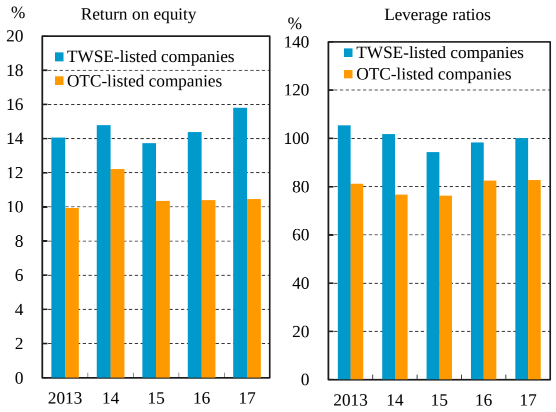
[3] The figures are based on a DGBAS press release on May 25, 2018.
[4] The figures are based on a CBC press release on March 22, 2018.

fiscal deficit saw a rebound, increasing to 1.38%[5] of annual GDP in 2017. The outstanding public debt at all levels of government leveled off at the end of the year, but the ratio of total public debt to annual GDP slightly fell to 35.65%,[6] indicating that total government debt stayed within a manageable level.

Corporate sector posted elevated profitability and credit quality of corporate loans remained sound

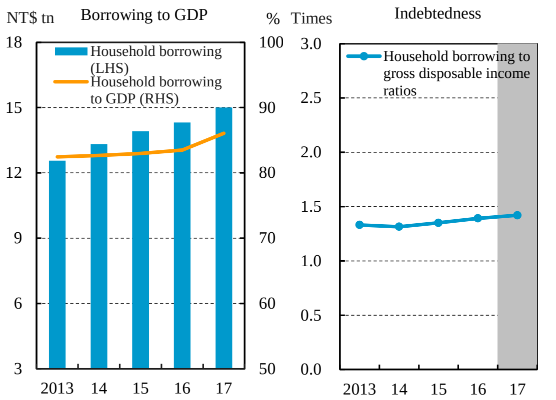
In 2017, thanks to the steady recovery in the global economy and Taiwan's expanding exports, the profitability of Taiwan Stock Exchange (TWSE) and over-the-counter (OTC) listed companies enhanced. Although their leverage ratios elevated marginally (Chart 1.6), short-term debt servicing capacity remained at an adequate level.

Chart 1.6 Return on equity and leverage ratios in corporate sector



Notes: 1. Return on equity = net income before interest and tax/average equity.
2. Leverage ratio = total liabilities/total equity.
Source: TEJ.

Chart 1.7 Household indebtedness



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

At the end of 2017, the NPL ratio for corporate loans from financial institutions rose marginally to 0.39% but still stayed at a healthy level. Nevertheless, in view of the industrial supply chain localization in Mainland China, the rise of trade protectionism, and global geopolitical risks, the outlook for future operations of corporations in Taiwan remains challenging.

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

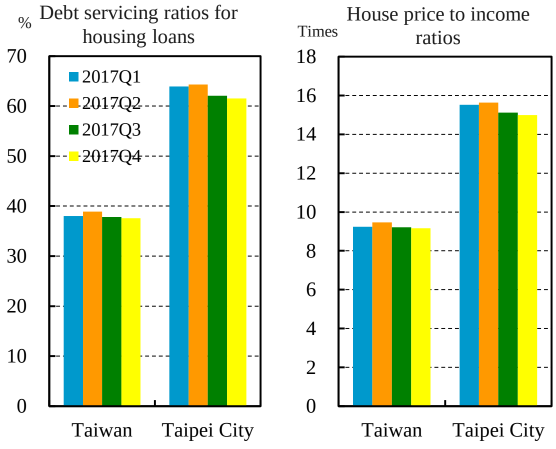
[6] As a comparison, outstanding debt in European Union (EU) member nations is not allowed to exceed 60% of GDP according to the *Maastricht Treaty* and the subsequent *Stability and Growth Pact*.

Household debt burden rose slightly, but credit quality of household borrowing remained satisfactory

At the end of 2017, total household borrowing expanded to NT$15 trillion, equivalent to 86.07% of annual GDP. The ratio of household borrowing to total disposable income rose slightly to 1.42, reflecting an increase in the household debt burden (Chart 1.7).

At the end of 2017, the NPL ratio of household borrowing elevated slightly but remained at a low level of 0.27%. Credit quality didn’t worsen significantly, but related risks should be closely monitored. The household saving rate and total household net worth are relatively high in Taiwan, indicating sound household financial conditions. Moreover, the falling domestic unemployment rate, together with prolonged low interest rates on domestic loans, should help sustain the debt servicing capacity of households.

Chart 1.8 Debt servicing ratios for housing loans and house price to income ratios



Notes: 1. Debt servicing ratio for housing loans = median housing loans monthly payments/median household monthly disposable income.
2. House price to income ratio = median house price/median household annual disposable income.

Source: Housing Price Affordability Indicator Statistics, Construction and Planning Agency of the MOI.

Real estate market saw steady trading volume and housing prices fluctuating within a narrow range, while mortgage burden remained heavy

In 2017, trading volume in the housing market stabilized. The number of building ownership transfers for transaction increased by 8.43% year on year. The volume continued its upward trend in 2018 Q1 with an annual growth rate of 10.63%. From 2017 onwards, the Sinyi housing price index (for existing residential buildings) fluctuated within a narrow range. During the same period, the Cathay housing price index rose moderately owing to new residential building sales slightly picking up; however, the index decreased marginally in 2018 Q1.

In 2017 Q4, the debt servicing ratio for housing loans and the house price to income ratio for Taiwan declined modestly year on year to 37.58% and 9.16, respectively. Among all areas, the ratios in Taipei City were the highest, reaching 61.52% and 14.99, respectively, implying a still-heavy debt burden (Chart 1.8).

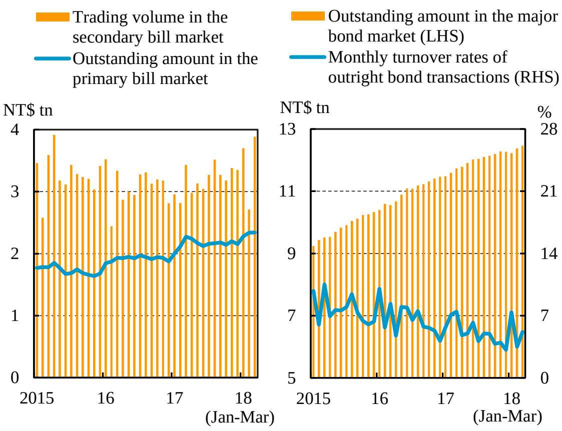
Financial system assessment

Financial markets

Bill and bond issuance in the primary market expanded, whereas the bond trading volume in the secondary market fell

At the end of 2017, the outstanding amount of bill issuance in the primary market substantially increased by 15% year on year. Following the expansion in the primary market, the bill trading volume in the secondary market also picked up. As for the bond market, the outstanding amount of bond issuance rose by 6.98% yearly over the same period. Nevertheless, trading volume in the secondary bond market contracted owing to an amplified concentration of bonds held by life insurance companies and banks. Among them, the monthly turnover rates of major bonds[7] in the secondary market continued to decline, but slightly rebounded in 2018 Q1 (Chart 1.9).

Chart 1.9 Primary and secondary bill and bond markets



Notes: 1. Major bonds include government bonds, international bonds, corporate bonds, and financial debentures.
2. Monthly turnover rate = trading value in the month/average 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.

Sources: CBC and FSC.

The short-term interbank overnight call loan rate stayed at a low level in 2017. In addition, the yield on Taiwan's long-term 10-year government bonds moved downwards, registering a low of 0.915% in January 2018. Gradual interest rate hikes by the Federal Reserve System (Fed) and more US government bond issuance after tax cuts might push up the yields on US government bonds and, in turn, trigger a rise in the yield on Taiwan's government bonds. Therefore, interest rate risks concerning bond investments warrant close attention.

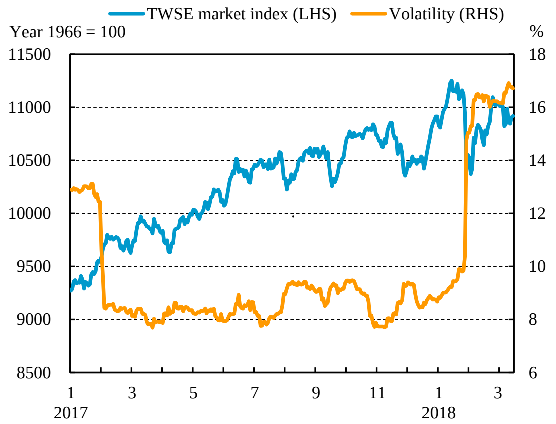
[7] It includes government bonds, international bonds, corporate bonds, and financial debentures.

Stock indices gradually trended up, while volatility increased in early 2018

Affected by US stock markets hitting new highs and massive net buying by foreign investors, the Taiwan Stock Exchange Weighted Index (TAIEX) of the TWSE market trended upwards and registered 10,643 at the end of the year, posting an increase of 15.01% year on year. In February 2018, the TAIEX saw an abrupt drop following plummeting US stock markets, but rebounded and remained stable afterwards (Chart 1.10).

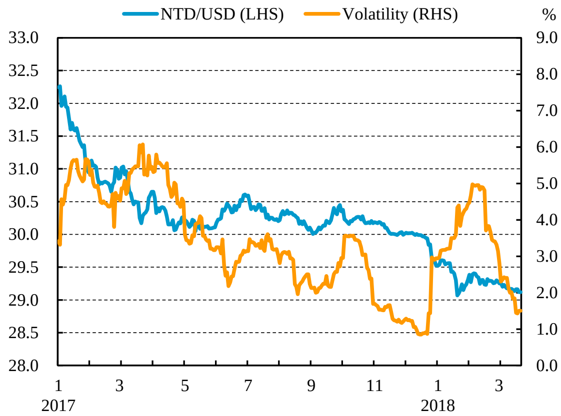
In 2017, volatility in the TWSE market dropped sharply from its respective high of 13.11% in the beginning of the year and stood at merely 8.80% at the end of December. In 2018 Q1, however, affected by fluctuations in international stock markets, volatility surged to 16.71% at the end of March (Chart 1.10).

Chart 1.10 TWSE market index and volatility



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

Chart 1.11 Movements of NT dollar exchange rate against US dollar



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

The NT dollar exchange rate fluctuated upwards, and its volatility remained relatively stable compared to other currencies

In 2017, owing to sustained foreign capital inflows to Asian economies, the NT dollar exchange rate fluctuated with an upward trajectory during the whole year and stood at 29.848 at the end of the year, with an annual appreciation of 8.14%. In 2018 Q1, affected by persistent foreign capital inflows, the NT dollar exchange rate continued appreciating against the US dollar and rose to 29.120 at the end of March[8] (Chart 1.11).

[8] In April 2018, the NT dollar exchange rate depreciated because of a stronger US dollar.

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 the rate moved between 1.43% and 4.97% during 2018 Q1 (Chart 1.11). 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.

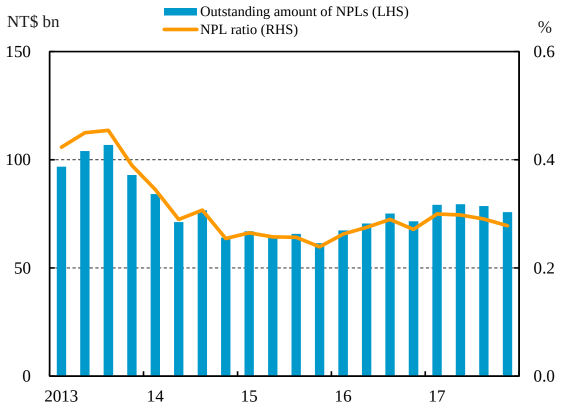
Financial institutions

Domestic banks maintained healthy asset quality and reported higher net income before tax as well as average capital adequacy ratios

In 2017, customer loans of domestic banks grew steadily. Meanwhile, the concentration of credit exposure in real estate increased marginally whereas that of corporate loans decreased slightly. The NPL ratio of domestic banks increased moderately year on year but still held at a sound level (Chart 1.12) along with sufficeint loss provisions. On the other hand, the aggregate amount of exposure to Mainland China turned to increase. At the end of 2017, the exposures to banks' net worth picked up to 54%, but none of the domestic banks exceeded the statutory limit of 100%.

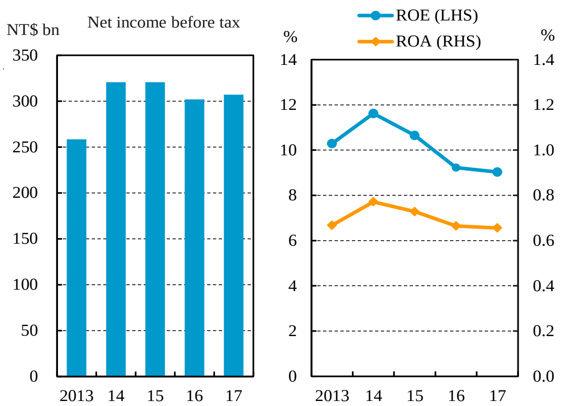
The net income before tax of domestic banks was NT$307 billion in 2017, increasing by 1.71% year on year. The average return on equity (ROE) dropped to 9.03% owing to a greater increase in equity, while average return on assets (ROA) remained at a sound level of 0.66% (Chart 1.13). At the end of 2017, the average capital adequacy ratio of domestic banks continually rose to 14.17% with satisfactory capital quality, which may help reinforce their loss-bearing capacity.

Chart 1.12 NPL ratio of domestic banks



Note: Excludes interbank loans.
Source: CBC.

Chart 1.13 Profitability of domestic banks



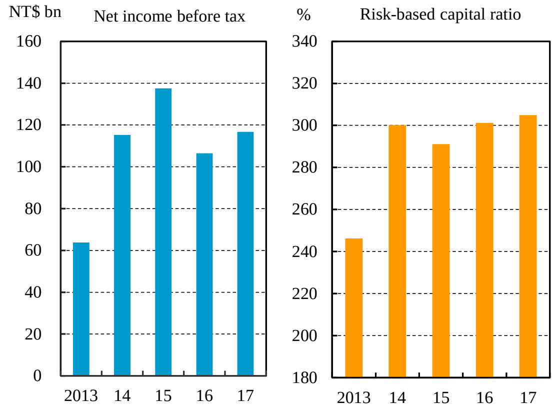
Notes: 1. ROE = net income before tax/average equity.
2. ROA = net income before tax/average total assets.
Source: CBC.

Life insurance companies saw a pickup in net income before tax, and their financial condition still exhibited sound fundamentals

Life insurance companies reported a net income before tax of NT$116.7 billion in 2017, increasing markedly by 9.59% over the previous year (Chart 1.14). This was chiefly driven by the growth in interest revenue and the gain on securities investments, as well as the decrease in policy underwriting expenses.

In 2017, life insurance companies strengthened their capital through accumulation of operating profits and issuance of subordinated debt. As a result, the average risk-based capital (RBC) ratio rose to 304.9% at the end of the year (Chart 1.14), implying sound financial fundamentals. From early 2018 onwards, however, volatility in international stock and bond markets has heightened. This, coupled with enormous foreign portfolio positions held by life insurance companies, might cause those firms to face higher market risk.

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

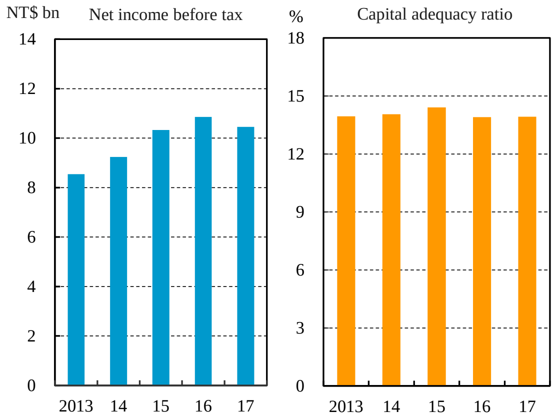


Note: Figures for risk-based capital ratios exclude insurance companies taken into receivership by the FSC.
Source: FSC.

Bills finance companies reported lower net income before tax and liquidity risk remained at a high level

Owing to rising funding demands of corporates in money markets spurred by low short-term market rates, commercial paper (CP) guaranteed by bills finance companies grew mildly and credit quality remained sound. On the other hand, considering that maturity mismatches between assets and liabilities persisted in bills finance companies, their liquidity risk remained high.

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



Source: CBC.

Bills finance companies posted a net income before tax of NT$10.5 billion in 2017, a decrease of 3.74% year on year. The decline was mainly driven by a decrease in commission fee income and an increase in the yielding cost of foreign currency bonds. The average capital adequacy ratio of bills finance companies moderately ascended to 13.93% at the end of 2017 (Chart 1.15), and the ratio for each company was higher than 13%.

Financial infrastructure

The CBC continued to expand the functions of the foreign currency clearing platform and worked with other institutions to accelerate popularization of electronic payments

In 2017, all three systemically important payment systems (SIPSs)[9] in Taiwan were functioning smoothly. Additionally, the foreign currency clearing platform provides US dollar, renminbi, Japanese yen, euro and Australian dollar remittance services. The functions of AML/CFT were also integrated into this platform. The remittances can be settled directly through the platform rather than through foreign third parties, which were estimated to have reduced remittance fees paid by the public by the amount of NT$2.9 billion or so from the first day of platform operation to the end of 2017.

Moreover, for the purpose of keeping in line with the government's policy of promoting electronic payments, the CBC urged the Financial Information Service Co., Ltd. (FISC) to actively establish an E-Health Pay platform and develop common standards for QR codes to deepen financial inclusion. In addition, the CBC will continually collaborate with external professional teams to conduct feasibility studies related to applying distributed ledger technology (DLT) to payment and settlement systems in Taiwan.

Other measures to strengthen the financial system

The FSC opened the Financial Information Sharing and Analysis Center (F-ISAC) in December 2017 so as to enhance cyber security protection in the domestic financial system.

[9] The three SIPSs include the CBC Interbank Funds-Transfer System (CIFS), the Interbank Remittance System (IRS) and the Check Clearing House System (CCHS).

Moreover, in order to reinforce financial supervision and comply with international supervisory standards, the FSC has collected information on the domestic systemically important banks (D-SIBs) identification and supervision framework from other countries to assess the feasibility of its implementation. Additionally, the *Financial Technology Development and Innovative Experimentation Act* was promulgated in January 2018 and became effective on 30 April of the same year, which could promote Taiwan’s financial technology development to enhance the effectiveness of financial services.

In order to conform with the strengthening standards for information transparency internationally, Taiwan formulated the *Regulations Governing the Implementation of the Common Standard on Reporting and Due Diligence for Financial Institutions* in November 2017. In addition, the CBC continued to relax FX regulations of financial institutions in 2017, aiming to promote the development of the financial services industry.

Taiwan’s financial system remained stable

In 2017, global economic growth rose steadily and inflation stayed stable. Against this backdrop, domestic financial markets operated smoothly. The profitability of domestic financial institutions remained solid, while asset quality weakened slightly but still stood at a healthy level. Meanwhile, the capital adequacy ratio of most domestic financial institutions increased continually. The three major payment systems also functioned along an orderly trajectory. By and large, the financial system in Taiwan remained stable.

Confronted with the far-reaching changes in economic and financial conditions both domestically and globally, especially monetary policy normalization of the Fed, European Central Bank (ECB), and Bank of Japan (BOJ), the rise in trade protectionism, elevated debt levels in Mainland China, a possible global financial market correction, and the rising risk of capital outflows from emerging economies, the CBC will continually monitor the above impacts on the domestic economy and financial system and implement adequate monetary, credit, and FX policies as warranted. Meanwhile, the FSC will continue to revamp financial regulations and enhance financial supervisory measures in the hope of facilitating the soundness of financial institutions and promoting financial stability.

II. Potential macro environmental risk factors

2.1 International economic and financial conditions

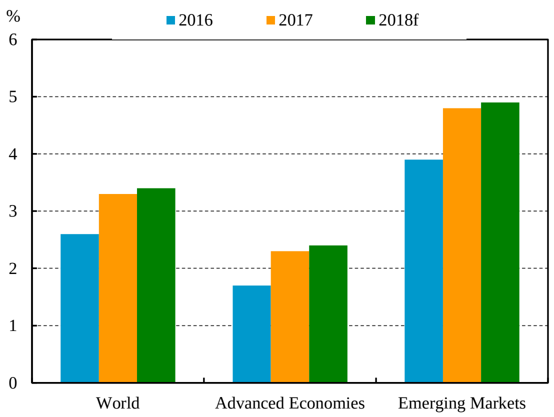
2.1.1 International economic conditions

Global economic growth momentum strengthened further in 2017 and the upswing is expected to continue into 2018

As the recovery in global investment and trade took hold in 2017, growth in advanced and emerging economies rose steadily. The global economic growth rate edged up to a five-year high of 3.3%. Among advanced economies, the acceleration of economic growth in the US has been spurred on by an improvement in personal consumption expenditures and fixed investment. Thanks to higher consumer and business confidence, together with stronger global growth and brighter labor market conditions, the growth rate for the euro area reached a 10-year high in 2017. Japan's economy expanded steadily, supported by a bounce in domestic demand and gross fixed capital formation. Meanwhile, with rising commodity prices and global demand, as well as economic growth in Mainland China picking up pace for the first time in seven years, emerging economies regained growth momentum.

Looking ahead to 2018, IHS Markit predicts[10] global GDP growth to expand to 3.4%. Among its components, economic growth in advanced economies is projected to rise to 2.4% driven by US tax reform. At the same time, in spite of the expected economic slowdown in Mainland China, Asian newly industrialized economies (ANIEs) and ASEAN-10 (Association of South East Asian Nations) economies,[11] the average growth

Chart 2.1 Global economic growth rates



Note: Figures for 2018 are IHS Markit estimates.
Source: IHS Markit (2018/5/15).

[10] See Note 1.
[11] IHS Markit anticipates that the economic growth rates for Mainland China, ANIEs, and ASEAN-10 will drop to 6.7%, 2.9%, and 5.1%, respectively, in 2018.

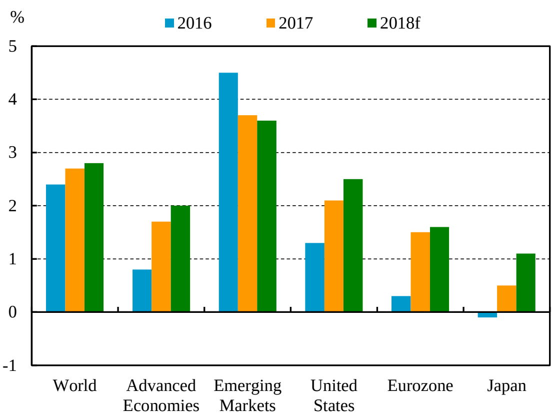
rate in emerging economies is forecast to increase to 4.9% on the back of an improving economic outlook in other emerging economies bolstered by a pickup in commodity prices (Chart 2.1).

Although the global economy is gradually gaining momentum, the International Monetary Fund (IMF) and IHS Markit[12] have warned that faster-than-expected monetary policy normalization by major central banks, protectionist policies, trade negotiations between the US and Mainland China, elevated debt levels in Mainland China,[13] and geopolitical tensions could threaten to choke off a broad-based recovery.

Global inflation rose steadily

In the first half of 2017, the price of Brent crude oil fell below $50 per barrel. However, affected by the fact that the Organization of the Petroleum Exporting Countries (OPEC) extended their agreement of oil production cuts until the end of 2018 and deepening political instability in some member economies, oil prices rebounded from the second half of 2017 onwards. In the meantime, the international prices of cereals, vegetable oil, and dairy oscillated within a narrow range, while metal prices increased. With fluctuating food prices, as well as elevated commodity and oil prices, global inflation rose moderately and lifted the CPI inflation rate to 2.7% in 2017. Among them, the headline inflation rate in advanced economies picked up to 1.7%, reflecting the upward trend of US inflation. On the other hand, the headline inflation rate in emerging economies fell to 3.7% as a result of a more moderate inflation rate in Brazil (Chart 2.2).[14]

Chart 2.2 Global headline inflation indices



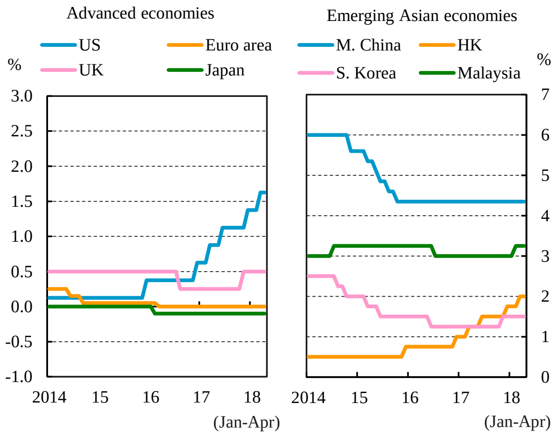
Note: Figures for 2018 are IHS Markit estimates.
Source: IHS Markit (2018/5/15).

As the world's biggest oil producers have extended a deal to curb oil production throughout 2018, oil prices are expected to continue their upward trajectory. Meanwhile, commodity prices are projected to rise, owing to an increase in demand for commodities and oil resulting from a recovery in the global economy. Accordingly, IHS Markit predicts that the global headline inflation rate will

[12] IMF (2018), *World Economic Outlook*, January; IMF (2018), *World Economic Outlook*, April; IHS Markit (2018), *Global Executive Summary*, May.
[13] IMF (2017), *IMF Country Report*, No. 17/358, December.
[14] See Note 2.

continue rising to 2.8%. The headline inflation rate in advanced economies will increase to 2.0%, while the rate in emerging economies is expected to moderate to 3.6% (Chart 2.2).

Chart 2.3 Policy rates in selected economies



Notes: 1. Advanced economies: figure for the US is based on the target federal funds rate; for the euro area, the main refinancing operations fixed rate; for the UK, official bank rate; for Japan, interest on excess reserves (before 2016/2/16, uncollateralized overnight call rate).
2. Emerging Asia: figure for Mainland China is based on financial institution one-year lending base rate; for Hong Kong, base rate; for South Korea, Bank of Korea base rate; for Malaysia, overnight policy rate.
3. Figures are as of April 30, 2018.

Sources: Central banks and monetary authority websites.

Advanced economies adopted monetary policy normalization, while emerging economies took divergent paths

From 2017 onwards, monetary policies in advanced and emerging economies remained divergent. Among them, in view of solid growth in the US labor market and economic activity, as well as accelerating core inflation close to the 2% target, the Fed hiked its target band for the federal funds rate four times (during March 2017 to March 2018) by a total of 100 basis points (bps) to 1.5-1.75%. Moreover, the Fed has gradually begun the task of unwinding its balance sheet since October 2017, showing its path toward balance sheet normalization (Chart 2.3).

Meanwhile, since most indicators of inflation in the euro area stayed below their targets, the ECB held interest rates steady in 2017. However, the ECB scaled down its net asset purchases by €20 billion and €30 billion in April 2017 and January 2018, respectively, resulting in asset purchases decreasing from €80 billion to €30 billion per month.[15] The BOJ also kept its interest rate target and yield curve control policy[16] unchanged as the inflation rate remained muted in Japan. In contrast, in response to inflation caused by increasing import costs owing to depreciation of the pound in the wake of the Brexit, the BoE hiked its official bank rate by 25 bps to 0.5% in November 2017 to relieve inflationary pressures. It was the first interest rate rise in a decade (Chart 2.3).

[15] Recently, the head of Germany's central bank, Jens Weidmann, together with Klaas Knot, the Dutch central bank president, commented that the ECB should end its asset purchases as soon as possible.

[16] The Bank of Japan (BOJ) Governor, Haruhiko Kuroda, said that the BOJ would start thinking about how to exit its massive monetary stimulus program in the 2019 fiscal year if inflation reaches its 2% target.

From 2017 onwards, emerging Asian economies adopted different monetary policies. Among these countries, the People's Bank of China (PBC) left interest rates unchanged but reduced required reserve ratios twice by a total of 150 bps to support the development of inclusive financial services for financial institutions. The reduction would also be used to repay the medium-term lending facilities (MLF) borrowed by banks. South Korea and Malaysia both raised their policy rates by 25 bps so as to mitigate the impact of capital outflow caused by US interest rate rises. The hike also underscored their confidence in the economic recovery. The Hong Kong Monetary Authority (HKMA) followed the Fed's rate hikes and raised the base rate charged through its overnight discount window four times (during March 2017 to March 2018) by 25 bps each to maintain the effective operation of the linked exchange rate system (Chart 2.3).

The US has recently adopted trade protectionist policies, which could pose a threat to the global economy

In the face of a chronic trade deficit of commodities and a worsening trade deficit to GDP ratio that has not effectively improved, the US government consecutively resorted to protectionist measures to reduce trade imbalances following President Trump taking office. In response, the Ministry of Finance in Mainland China immediately unveiled that it would impose additional tariffs on a list of products imported from the US. The date of implementation will depend on when the US government imposes the additional tariffs on Mainland China's products.

While negotiations regarding measures of retaliatory tariffs between Mainland China and the US are in progress, there is a concern that when the US implements the new Section 301 action, it could trigger a domino effect. The IMF and WTO also warned that US trade protectionist policies would cause damage not only outside the US, but also to the US economy itself,[17] and result in potential trade disputes.[18]

2.1.2 International financial conditions

The global banking industry regained its health, yet financial market risks elevated

In 2017, thanks to the strengthening global economic recovery, the international banking industry regained its health. However, prolonged easy monetary policies have intensified the search for yield in markets, leading to risks shifting from the banking sector to financial markets, which have

[17] IMF (2018), *Statement by IMF Spokesperson on Announced U.S. Import Tariffs*, IMF Press Release, March; Meredith, Sam (2018), *IMF's Lagarde Says Nobody Wins in a Trade War, Reuters News*, March.

[18] Miles, Tom (2018), *WTO Chief Makes Rare Warning of Trade War over U.S. Tariff Plan*, Reuters News, March; WTO (2018), *Azevêdo Calls on Members to Avoid Triggering an Escalation in Trade Barriers*, Press Release, March.

experienced compressed risk premiums and volatility. Furthermore, private sector indebtedness significantly surged against the backdrop of a persistently low-interest-rate environment. As a result, the medium-term vulnerabilities rose. In addition, the gradual normalization of monetary policy in major economies and rising trade protectionism spurred financial market volatility, which might further increase financial vulnerability.

Banks in advanced economies have strengthened their balance sheets

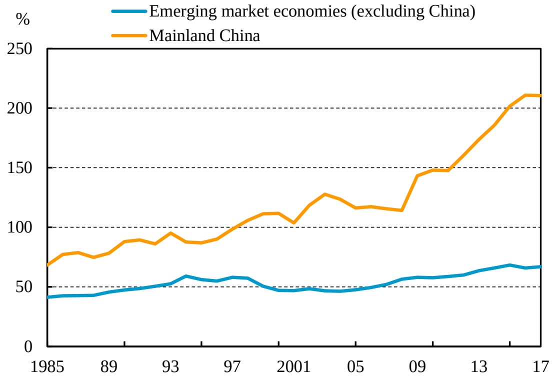
In 2017, ongoing improvement in banks' capital and liquidity levels has strengthened their balance sheets in most advanced economies. Among them, US banks' profits were higher in 2017 than their performance a year earlier. Nonetheless, the US passed the rollback of a number of financial regulations with the aim of relaxing crisis-era regulatory restrictions that had been placed on small and medium-sized banks. In this regard, further observation of the influence of the above regulatory rollback on banks' soundness and profitability is needed.

Profitability of European banks also slightly enhanced owing to an increase in non-interest income and a decrease in asset impairment. By contrast, Japanese banks' profits in 2017 didn't witness an upturn mainly because of the adverse impacts stemming from the negative interest rate policy, overbanking and cut-throat competition for granting new loans. Whether future profits improve will depend on Japan's economic prospects and the effectiveness of structural reform of the banking industry.

Emerging economies continued to face the risks of capital outflows and debt overhang

In emerging economies, strengthening economic growth and decreasing economic risks attracted massive international capital inflows searching for high-yield assets, which has compressed government and corporate bond yields, as well as pushed up asset prices and external debt. Should the monetary policy normalization by major economies move at an unexpected pace, it might cause international capital inflows to reverse to outflows and, in turn, impact their financial system stability.

Chart 2.4 Debt-to-GDP ratios of non-financial sectors in emerging economies and Mainland China



Source: IMF (2018), Global Financial Stability Report, April.

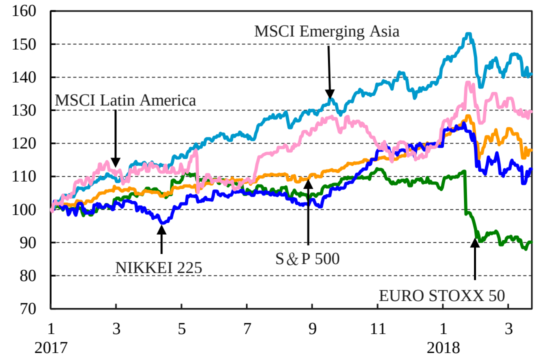
In addition, large capital inflows buoyed emerging economies with ample funds. This, coupled with rapid credit growth spurred by the low-interest-rate environment, led to a rise in nonfinancial sector debt, especially in Mainland China (Chart 2.4). For some emerging economies, excessive corporate and household debt growth could increase their debt burdens; thus, if the occurrence of unfavorable events triggers a tightening of financial conditions, the corporate and household sectors might face high debt servicing pressures, sparking off a rise in their default rates and, in turn, affect the stability of financial institutions and markets.

Global financial market volatility fell in 2017, but elevated in early 2018

The US stock market kept hitting record highs in 2017, which boosted global stock markets to steadily trend upwards. In early February 2018, the acceleration of wage growth fueled market concerns that a rising inflation rate may lead to the Fed hiking interest rates at a faster pace. This, coupled with the concerns that US tax cuts could jeopardize its fiscal stability, led the US stock market to tumble and induced international stock markets to plunge nearly 10% over the same period. Thereafter, international stock markets rebounded gradually, while volatility dramatically increased. In regard to the performance of key international equity indices, most Asian stock markets trended upwards supported by continuous international capital inflows in 2017. Accordingly, MSCI emerging Asia index increased by 40% (Chart 2.5).

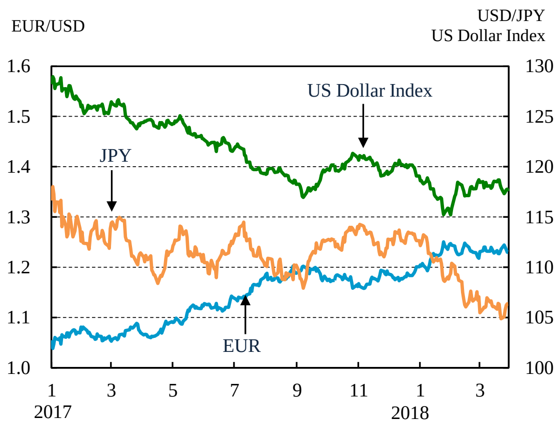
The US dollar displayed a depreciating trend in the first three quarters of 2017; by contrast, the euro continually appreciated against the US dollar. The Japanese yen fluctuated with the trend of the US dollar and the movement of hedging needs resulting from geopolitical risks. In the fourth quarter, the US dollar turned to a strengthening trend. Nonetheless, in 2018 Q1, affected by market concerns over fiscal stability

Chart 2.5 Performance of key international equity indices



Notes: 1. January 1, 2017 = 100.
2. The Euro STOXX 50 refers to a stock index consisting of the largest 50 stocks in the 12 major economies of the euro area.
Source: Bloomberg.

Chart 2.6 Movements of various currencies against the US dollar

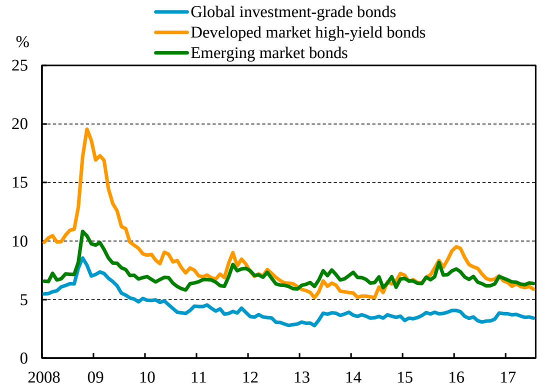


Note: US Dollar Index is introduced by the Fed, which is the weighted average of the FX value of the U.S. dollar against the currencies of 26 major U.S. trading partners (Jan 1997 = 100).
Sources: Fed and Thomson Reuters Datastream.

owing to US tax reform as well as the strengthening economic recovery attracting capital inflows to the euro area and emerging economies, the US dollar index declined again and the euro appreciated against the US dollar. The Japanese yen also saw an appreciating trend against the US dollar driven by hedging needs (Chart 2.6). With regard to major Asian currencies, in 2017, most of them displayed appreciating trends against the US dollar owing to the higher-than-expected economic growth rates among Asian economies attracting massive international capital inflows.

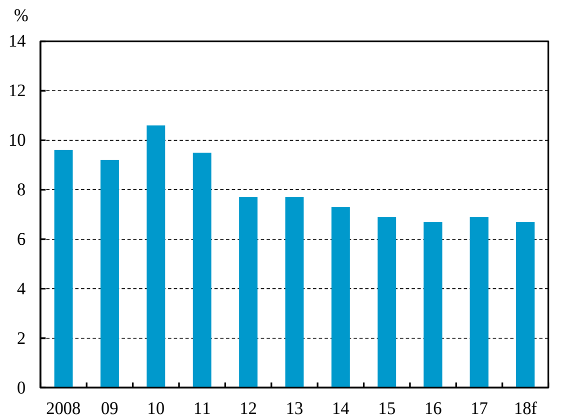
In addition, the low-interest-rate environment has facilitated investors' search for yield over recent years. As a result, compressed market spreads led to lower credit and market risk premiums and volatility in bond markets as well as a sharp decline in investment-grade and high-yield corporate bond yields (Chart2.7). Moreover, lower borrowing costs boosted an increase in the issuance of government and corporate bonds that escalated their financial leverage, and raised the sensitivity of the financial system to market risks.

Chart 2.7 US dollar bond yield



Source: IMF (2017), Global Financial Stability Report, October.

Chart 2.8 Economic growth rate of Mainland China



Note: Figure for 2018 is an IHS Markit estimate.
Sources: National Bureau of Statistics of China and IHS Markit (2018/5/15).

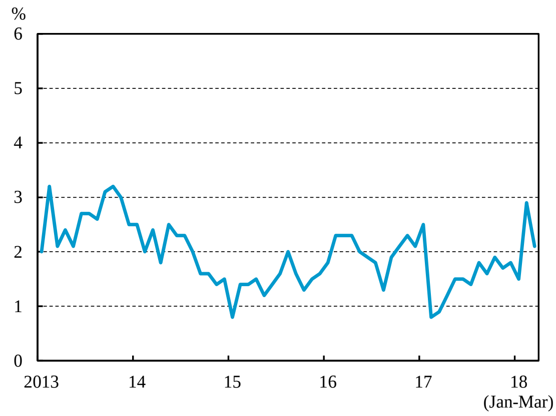
As a whole, volatility in major stock, bond and FX markets fell dramatically in 2017 but saw a considerable rise in early 2018. Tightening monetary policies by major central banks, coupled with mounting fears of a possible correction for rocketing asset prices as well as intensified trade tensions and geopolitical disputes, might induce dramatic fluctuations in asset prices, jeopardizing the stability of global financial markets.

2.1.3 Mainland China's economic and financial conditions

Economic growth accelerated for the first time in seven years

In 2017, thanks to the strong rebound in exports, Mainland China's economic growth rate rose to a higher-than-expected level of 6.9% from 6.7% in 2016, posting its first growth pick-up in seven years. However, in view of Mainland China's government taking more draconian measures on the domestic housing market and implementing stricter financial regulations, coupled with its mounting debt levels and US-China trade tensions, IHS Markit projects the economic growth rate to fall slightly to 6.7% in 2018 (Chart 2.8).

Chart 2.9 CPI Inflation rate of Mainland China

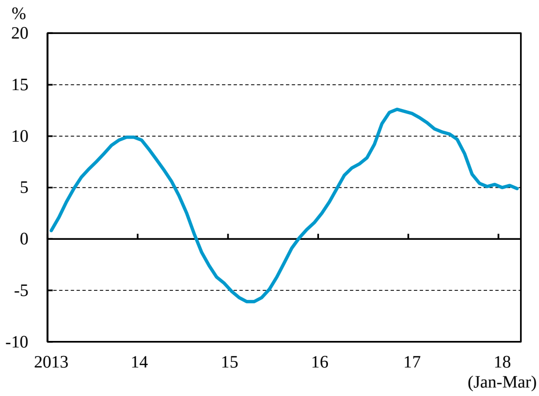


Source: National Bureau of Statistics of China.

Prices rose mildly and housing prices increased moderately

Affected by a fall in food prices, the CPI inflation rate of Mainland China was 1.6% throughout 2017, reflecting the fact that consumer prices rose mildly. In the beginning of 2018, owing to an increase in food prices after the Lunar New Year, the CPI inflation rate rose to 2.1% in March. IHS Markit projects the annual CPI inflation rate of 2018 to increase slightly to 1.7% (Chart 2.9).

Chart 2.10 Average annual growth rates of building sales price in 70 medium-large cities of Mainland China



Source: Thomson Reuters Datastream.

In 2017, the average housing prices in 70 medium-large cities trended up uninterruptedly, though at a slower pace. The annual growth rate of housing prices declined significantly to 5.3% in December from 12.4% a year earlier. With Mainland China's government continuously reinforcing risk control of the housing market in the beginning of 2018, the annual growth rate further fell to 4.9% in March (Chart 2.10).

PBC continued to implement stable and neutral monetary policies

In 2017, in an effort to control financial risks, the PBC continued to implement stable and neutral monetary policies, keeping its policy rate unchanged. Meanwhile, the PBC adopted different monetary policy tools[19] to keep market liquidity stable. In the beginning of 2018, the PBC cut its reserve requirement ratios twice by 50bps and 100bps, respectively, so as to

[19] The tools included pledged supplementary lending (PSL), temporary liquidity facility (TLF), repurchase agreements (repos), MLF and standing lending facility (SLF).

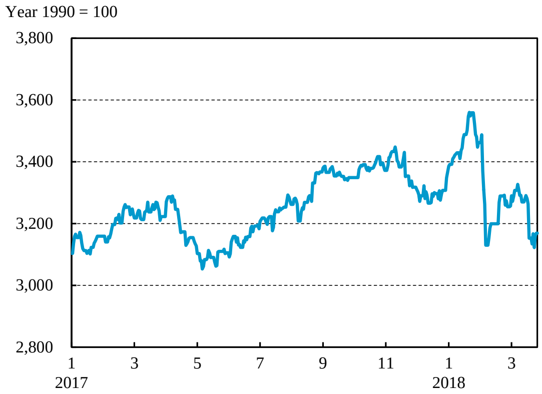
support financial institutions to develop financial inclusion and assist banks to repay their expired MLF loans borrowed from the PBC.

Stock markets saw a fall after experiencing a moderate increase, whereas the FX rate appreciated sharply

In June 2017, affected by the fact that MSCI announced the inclusion of Mainland China's shares into its MSCI Emerging Markets Index from June 2018 onwards, along with bullish international stock markets, the SSE Composite Index fluctuated with an upward trend and reached 3,307 at the end of December, an annual increase of 6.56%. In the beginning of 2018, driven by a marked fall in US stocks indices, the SSE Composite Index plunged for four consecutive business days from February 6, totaling a drop of 10.26%. Afterwards, the SSE Composite Index gradually rebounded and reached 3,169 at the end of March (Chart 2.11).

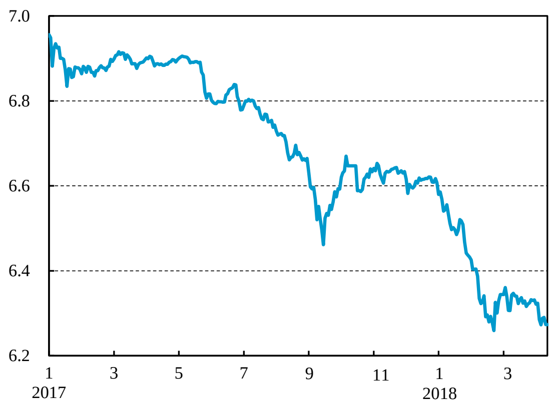
Regarding the FX market, the renminbi exchange rate against the US dollar remained stable in the first four months of 2017, while the renminbi turned to appreciate against the US dollar from May onwards. To mitigate the impact of overvaluation of the renminbi against the US dollar in the short term, the PBC announced it would lower the FX risk reserve ratio, which is required for financial institutions undertaking "forward FX sales" business on behalf of clients, from 20% to 0% in September. Although this measure initiated temporary depreciation of the renminbi against the US dollar, the renminbi exchange rate rebounded to 6.512 at the end of December, an annual appreciation of 6.72%. The main reason behind this was that Mainland China's stronger-than-expected trade figures promoted market participants to expect an ongoing appreciation of the

Chart 2.11 Shanghai Stock Exchange Composite index



Source: Bloomberg.

Chart 2.12 RMB/USD exchange rate



Source: CBC.

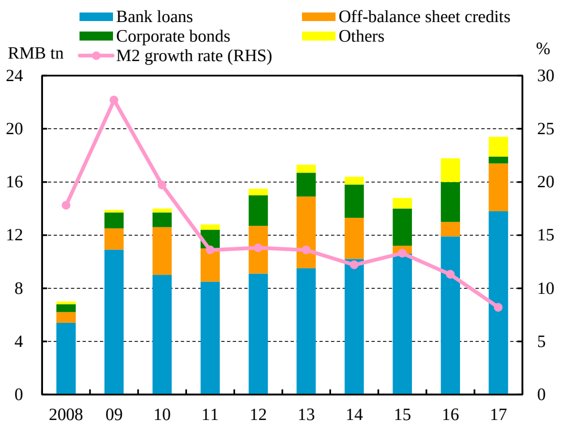
renminbi against the US dollar. In the beginning of 2018, the renminbi saw continuous appreciation against the US dollar and the exchange rate stood at 6.273 at the end of March (Chart 2.12).

The increment in aggregate financing to the real economy elevated, and NPLs of banks constantly trended up

With a backdrop of Mainland China government's deleveraging measures and gradual enhancement of financial supervision, the annual growth rate of broad money supply M2 decreased to 8.2% at the end of 2017, lower than the official annual target of 12%. Meanwhile, aggregate financing to the real economy rose by RMB19.4 trillion in 2017 (Chart 2.13), while the annual growth rate of the outstanding amount slightly decreased to 12.0% from 12.8% a year earlier.

At the end of 2017, the NPLs of commercial banks continued to trend upwards and stood at RMB1.71 trillion, while the NPL ratio leveled off at a high level of 1.74% (Chart 2.14).

Chart 2.13 Aggregate financing to the real economy and annual growth rate of M2 in Mainland China

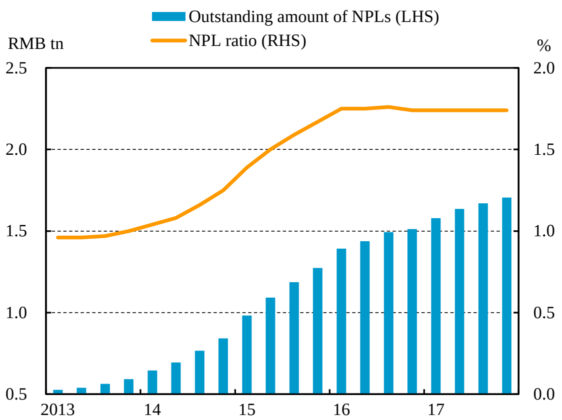


Source: PBC.

With local government debts coming due, various preemptive measures were successively launched

Mainland China's government expanded the local government debt-swap program by RMB2.77 trillion in 2017 to enable local governments to tackle their debt due problems. Meanwhile, the State Council decided to adopt a local government debt ceiling and impose permanent accountability for local debt surveillance in order to reduce the default risk of local government debts.

Chart 2.14 NPL ratio of Mainland China's commercial banks



Source: China Banking Regulatory Commission.

2.2 Domestic macro environment

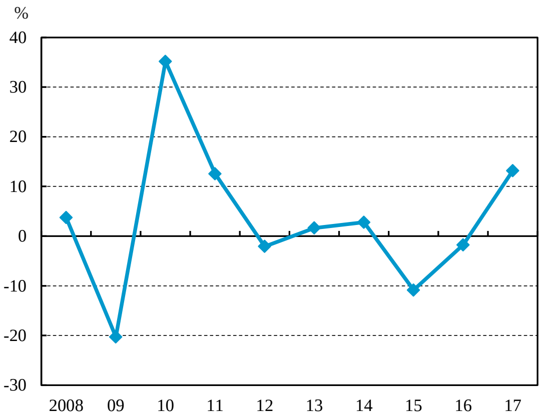
2.2.1 Domestic economic and fiscal conditions

In 2017, thanks to a strong improvement in exports and modest growth in private consumption, the domestic economy recovered steadily and inflation remained stable. Short-term external debt servicing ability remained strong on the back of a persistent surplus in the balance of payments and ample FX reserves. Although the scale of external debt slightly increased, overall external debt servicing capacity stayed robust. While the government's fiscal deficits rebounded, outstanding government public debt leveled off. Total government debt stayed within a manageable level.

Exports increased considerably and the domestic economy recovered soundly

Benefiting from the global economic recovery, increasing demand for semiconductors and machinery, as well as active promotion of the *New Southbound Policy* by the government, Taiwan's annual export growth rate significantly rose to 13.17% in 2017 (Chart 2.15). As a result of a substantial increase in exports, coupled with private consumption growth driven by the improvement of employment conditions, the annual economic growth rate in Taiwan rose to 2.89%, noticeably higher than the 1.41% of the previous year (Chart 2.16)

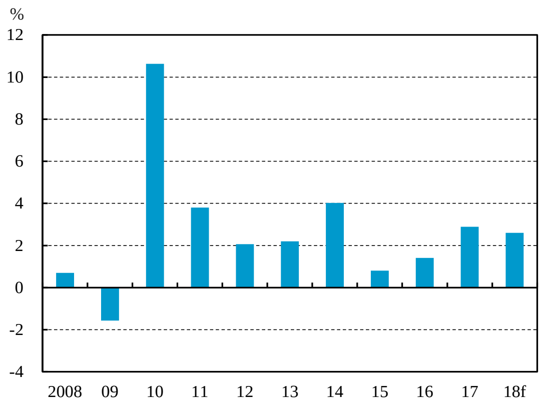
Chart 2.15 Growth rate of exports



Source: MOF.

Taking a glance into 2018, the continued steady growth of the global economy will be beneficial to maintaining Taiwan's export growth momentum. Moreover, a number of measures taken by the government, such as the *Forward-looking Infrastructure Development Program* and pay raises for military, government, and teaching personnel, are expected to encourage growth in both private investment and consumption to underpin the domestic economy. However,

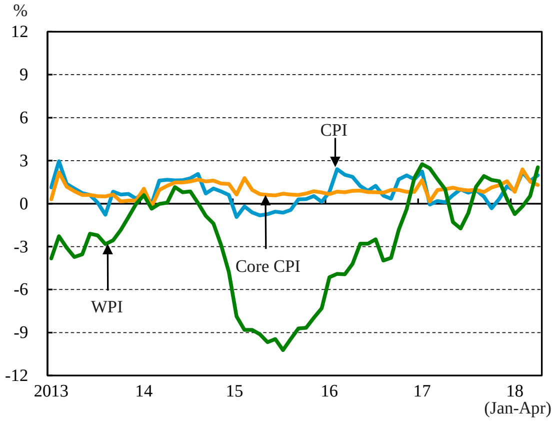
Chart 2.16 Economic growth rate in Taiwan



Note: Figure for 2018 is forecast by DGBAS.
Source: DGBAS.

uncertainties stemming from rising trade protectionism and geopolitical tensions may partially curb domestic growth momentum, which may in turn jeopardize the strength of Taiwan's economic growth. As a result, the DGBAS forecasts Taiwan's annual economic growth rate to slightly moderate to 2.60%[20] in 2018 (Chart 2.16). Moreover, paying close attention to the evolution of the US-China trade dispute and its potential impact on Taiwan's economy is advisable.

Chart 2.17 Consumer and wholesale price indices

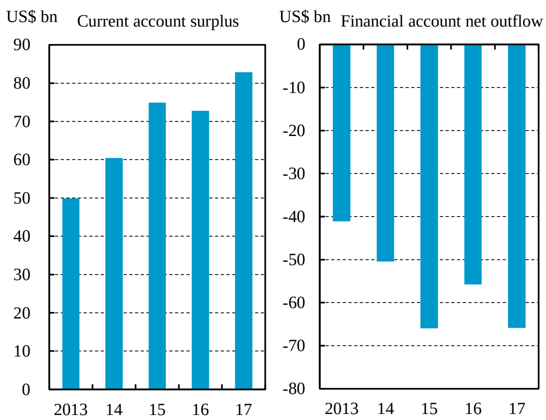


Note: Figures are measured on a year-on-year change basis.
Source: DGBAS.

Domestic prices rose mildly

In 2017, affected by fluctuations in the international prices of raw materials such as crude oil, and the appreciation of the NT dollar exchange rate against the US dollar, the annual wholesale price index (WPI) inflation rate registered 0.90%, higher than the -2.98% recorded in 2016 (Chart 2.17). The DGBAS projects the annual WPI inflation rate to climb to 2.42% in 2018.[21]

Chart 2.18 Current account surplus and financial account net outflow



Source: CBC.

The annual CPI inflation rate registered 0.62% in 2017, lower than the 1.39% of the previous year. Domestic prices rose mildly mainly because the appreciation of the NT dollar against the US dollar eased imported inflation, and a fall in vegetable prices owing to a higher base period in the previous year approximately offset a rise in other prices. Meanwhile, the core CPI inflation rate in 2017 also increased moderately and reached 1.04%, slightly higher than the 0.84% recorded in 2016 (Chart 2.17). Reflecting the above developments, the CBC forecasts the annual CPI inflation rate to ascend to 1.27% in 2018.[22]

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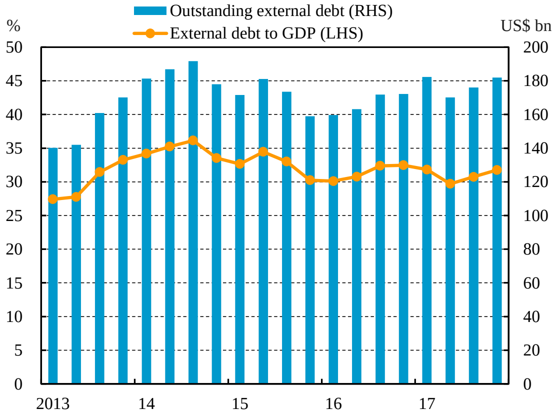
[20] See Note 3.
[21] See Note 3.
[22] See Note 4.

Current account saw a sustained surplus and FX reserves stayed abundant

In 2017, the merchandise trade surplus trended up on account of exports increasing more than imports, causing the annual current account surplus to expand to US$82.9 billion, or 14.47%[23] of annual GDP, an increase of US$10.1 billion or 13.88% compared to 2016. The financial account posted continued outflows driven by the expansion of foreign investments by insurance companies. The annual balance of outflows reached US$65.9 billion (Chart 2.18). With a greater rise in the current account surplus, the balance of payments surplus expanded to US$12.5 billion in 2017, increasing by 16.92% from the previous year.

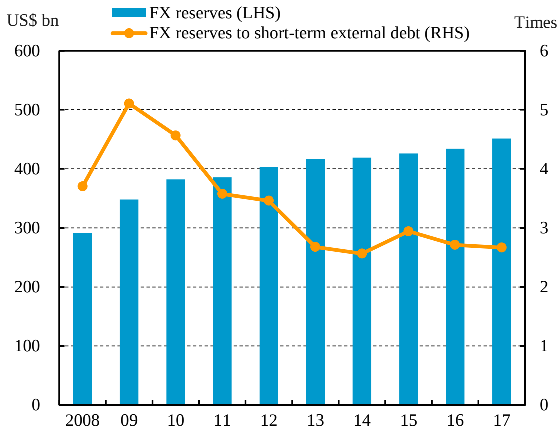
With the accumulation of earnings from portfolio investment of FX reserve assets, FX reserves climbed to US$451.5 billion at the end of 2017, rising by 3.98% from a year earlier. At the end of April 2018, the amount of FX reserves steadily increased to US$457.1 billion.

Chart 2.19 External debt servicing capacity



Sources: CBC and DGBAS.

Chart 2.20 Short-term external debt servicing capacity



Source: CBC.

Scale of external debt expanded slightly, while debt-servicing capacity remained strong

Owing to the increase in the short-term external debt of the banking sector, Taiwan's external debt[24] showed an upward trend after the second quarter of 2017. As a result, external debt registered US$181.9 billion at the end of the year, or 31.76% of annual GDP, increasing by

[23] For the ratio of current account deficit to GDP, the cutoff point for risk is 3%. A country in which the reading is greater than 3% and has risen by at least 5 percentage points from the previous year is considered to be relatively high risk.

[24] External debt refers to the combined amount owed to foreign parties by Taiwan's public and private sectors, including long-term debt with a maturity of greater than one year and short-term debt with a maturity of one year or less. The term "public external debt" refers to debt that the public sector is either obligated to repay directly or has guaranteed. The term "private external debt" refers to private-sector foreign debt not guaranteed by the public sector.

5.63% compared to a year earlier (Chart 2.19). Taiwan's capacity to service external debt remained robust, although the scale of external debt expanded slightly.[25]

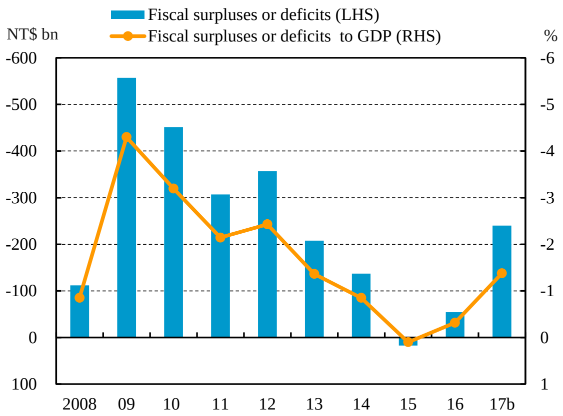
Furthermore, at the end of 2017, the ratio of FX reserves to short-term external debt fell to 2.67 times owing to a greater rise in short-term external debt. Nevertheless, it was higher than internationally recognized minimum levels,[26] implying that Taiwan's FX reserves have a robust capacity to meet payment obligations (Chart 2.20).

Fiscal deficits rebounded but government debt leveled off

Fiscal revenues and expenditures had improved significantly after the government implemented the *Fiscal Health Plan* from 2014 onwards. In 2017, however, the government adopted the *Forward-looking Infrastructure Development Program* in response to economic conditions, resulting in an expansion of annual expenditures for both central and local governments. As a result, fiscal deficits rebounded to NT$240.2 billion or 1.38%[27] of annual GDP (Chart 2.21).

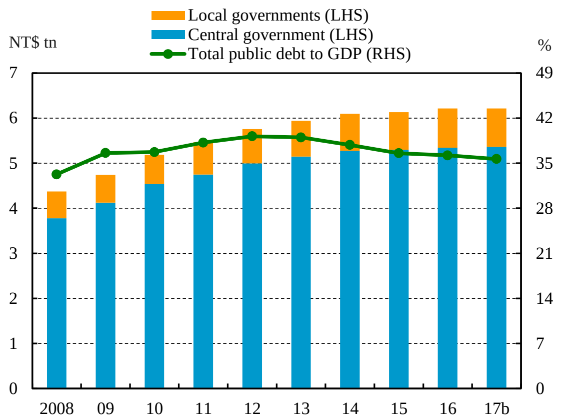
At the end of 2017, outstanding public debt at all levels of government[28] stayed at NT$6.21

Chart 2.21 Fiscal deficits position



Notes: 1. Fiscal position data include those of central and local governments.
2. Data of fiscal deficits are annual figures. Figures for 2017 are final accounts and budgets for the central government and local governments, respectively.
Sources: MOF and DGBAS.

Chart 2.22 Public debt



Notes: 1. Outstanding public debt refers to non-self-liquidating debt with a maturity of one year or longer, excluding external debt.
2. Figures for 2017 are preliminary final accounts and final accounts for the central government and local governments, respectively.
Sources: MOF and DGBAS.

25 The general international consensus is that a country with a ratio of external debt to GDP lower than 50% is deemed to be relatively low risk.
26 The general international consensus is that a country with a ratio of FX reserves to short-term external debt higher than 100% is deemed to be relatively low risk.
27 See Note 5.
28 The term "outstanding debt at all levels of government" as used in this report refers to outstanding non-self-liquidating debt with a maturity of one year or longer.

trillion.[29] However, the ratio of total public debt to annual GDP slightly fell to 35.65%[30] on account of GDP growth (Chart 2.22). In general, total government debt stayed within a manageable level.

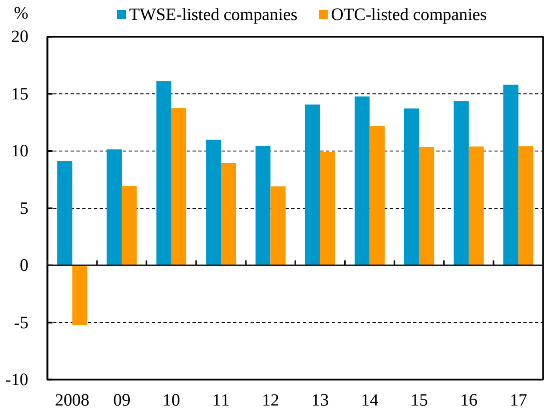
2.2.2 Corporate sector[31]

In 2017, listed companies saw enhanced profitability, rising financial leverage ratios, and adequate short-term debt servicing capacity. The NPL ratio for corporate loans granted by financial institutions grew slightly but remained at a low level at the end of the year, indicating sound credit quality of corporate loans. Nevertheless, the outlook for the corporate sector's future operation remains challenging.

Profitability of listed companies enhanced in 2017

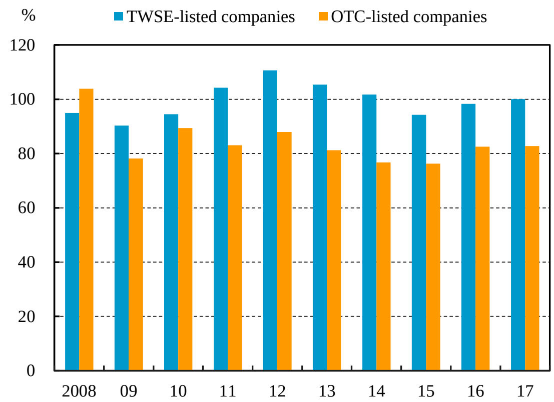
In 2017, benefiting from the steady recovery in the global economy, Taiwan's exports continued to expand. As a result, the average ROE of TWSE-listed companies jumped to 15.81%, while that of OTC-listed companies rose moderately to 10.44% (Chart 2.23). Such enhancements were mainly contributed to by the increasing profitability in the semiconductor, plastics, and shipping & transportation industries.

Chart 2.23 Return on equity in corporate sector



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

Chart 2.24 Leverage ratios in corporate sector



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

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[29] At the end of 2017, outstanding non-self-liquidating debt at all levels of government with a maturity of one year or longer was NT$6.21 trillion, including NT$5.36 trillion and NT$0.85 trillion for central government and local governments, respectively. As of April 2018, the outstanding one-year-or-longer non-self-liquidating public debt is NT$6.14 trillion, including NT$5.39 trillion, NT$0.60 trillion, NT$0.15 trillion, and NT$0.3 billion for central government, municipalities, counties, and townships, respectively. The figures account for 31.47%, 3.47%, 0.89%, and 0.002% of the average GDP for the preceding three fiscal years, which are below the ceilings of 40.6%, 7.65%, 1.63%, and 0.12% for central government, municipalities, counties, and townships, separately, as set out in the Public Debt Act.

[30] See Note 6.

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

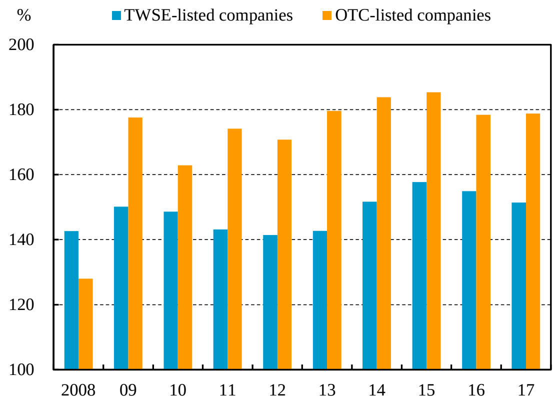
Leverage ratios rose moderately for listed companies

At the end of 2017, the average leverage ratio for TWSE-listed companies rose continually to 100.07%, while that for OTC-listed companies also increased moderately to 82.73% (Chart 2.24). Leverage ratios rose mainly because of an increase in listed companies' accounts payable and notes payable driven by expanding revenues and a rise in their borrowings from banks in response to their operational needs.

Short-term debt servicing capacity for listed companies held at an adequate level

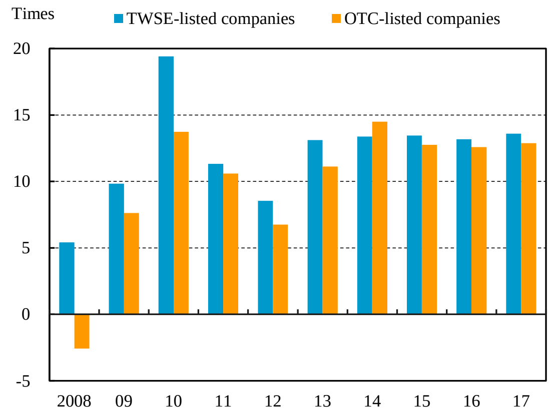
Owing to a greater increase in current liabilities, the current ratio for TWSE-listed companies dropped to 151% at the end of 2017, but the interest coverage ratio elevated to 13.6 over the same period, indicating sound short-term debt servicing capacity. Meanwhile, the current ratio and the interest coverage ratio for OTC-listed companies lifted to 179% and 12.88, respectively, demonstrating improved short-term debt servicing capacity (Chart 2.25 and 2.26). For listed companies as a whole, short-term debt servicing capacity remained at an adequate level in 2017, underpinned by the fact that their current assets were sufficiently able to meet short-term obligations along with a strong capacity to meet their interest obligations from operating earnings.

Chart 2.25 Current ratios in corporate sector



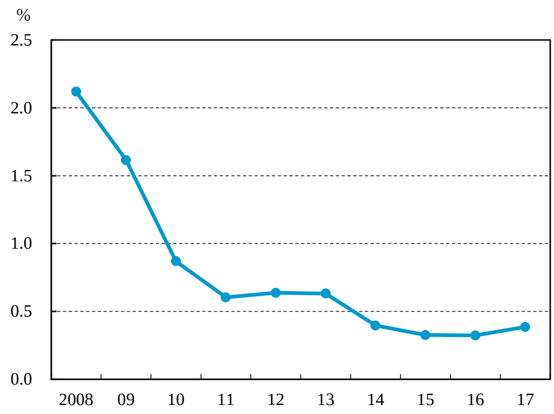
Note: Current ratio = current assets/current liabilities.
Source: TEJ.

Chart 2.26 Interest coverage ratios in corporate sector



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

Chart 2.27 NPL ratio of corporate loans



Source: JCIC.

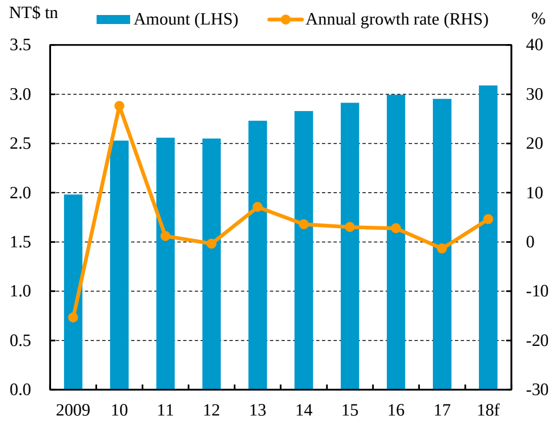
Credit quality of corporate[32] loans remained sound

In 2017, affected by an increase in past-due loans of some corporations, the NPL ratio for corporate loans from financial institutions rose marginally to 0.39% but stayed at a relatively low level at the end of the year, reflecting sound credit quality for the corporate sector (Chart 2.27).

Corporate investment is expected to rebound, yet the outlook for future operations still faces challenges

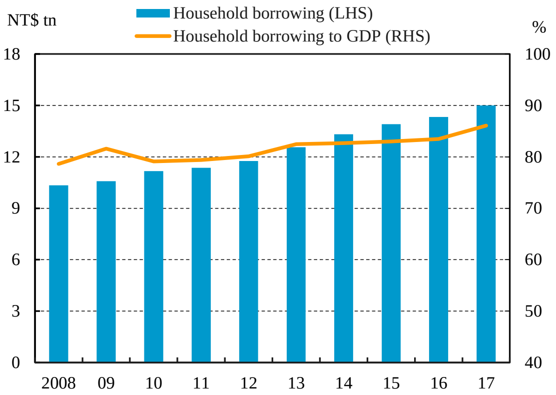
Considering the *Forward-looking Infrastructure Development Program* promoted by the government, the DGBAS predicts the growth rate of domestic private real investment to rebound to 4.61% in 2018, which would help enhance the growth momentum of corporate profits in the future (Chart 2.28). However, in view of the industrial supply chain localization in Mainland China, the rise of trade protectionism, and global geopolitical risks, the outlook for future operations of corporations in Taiwan remains challenging.

Chart 2.28 Private investment



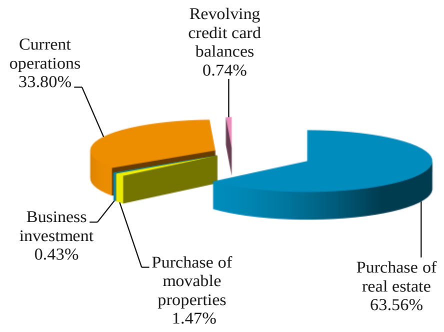
Notes: 1. Total private investment and growth rate are expressed in real terms.
2. Figure for 2018 is forecast by DGBAS.
Source: DGBAS.

Chart 2.29 Household borrowing to GDP



Sources: CBC, JCIC and DGBAS.

Chart 2.30 Household borrowing by purpose



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

[32] The data for the corporate sector herein are on the basis of listed and unlisted corporations provided by the Joint Credit Information Center (JCIC).

2.2.3 Household sector

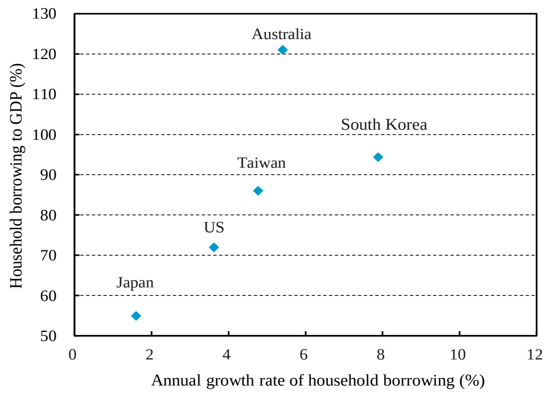
The household debt burden rose slightly as the balance of total household borrowing expanded successively. However, the overall credit quality of household borrowing remained satisfactory. This, combined with the falling unemployment rate and growing regular earnings, should help underpin the debt servicing capacity of households.

Household borrowing increased continually

At the end of 2017, total household borrowing saw a slight expansion and reached NT$15 trillion, equivalent to 86.07% of annual GDP (Chart 2.29). The largest share of household borrowing went for the purchase of real estate (63.56%), followed by current operation loans[33] (33.80%). The rest of the household borrowing categories took only minor percentages (Chart 2.30).

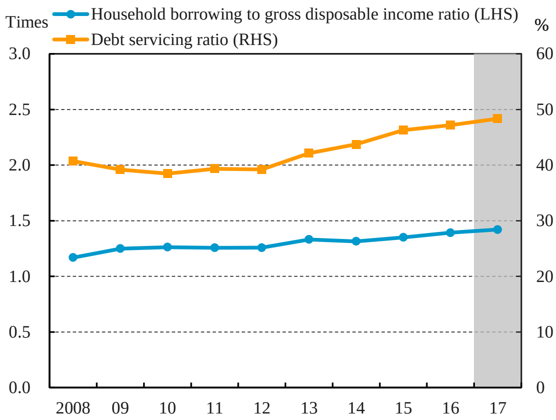
In 2017, the annual growth rate of total household borrowing rose to 4.77% from 2.97% a year earlier, mainly resulting from an increase in current operation loans. Compared to other countries, the growth of total household borrowing and total household borrowing as a percentage of GDP in Taiwan were both lower than those in South Korea and Australia, but higher than those in the US and Japan (Chart 2.31).

Chart 2.31 Household indebtedness in selected countries



Note: Figures are as of the end of 2017.
Sources: Fed, BOJ, BOK, ABS, IMF, DGBAS, CBC and JCIC.

Chart 2.32 Household indebtedness and debt servicing ratio



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

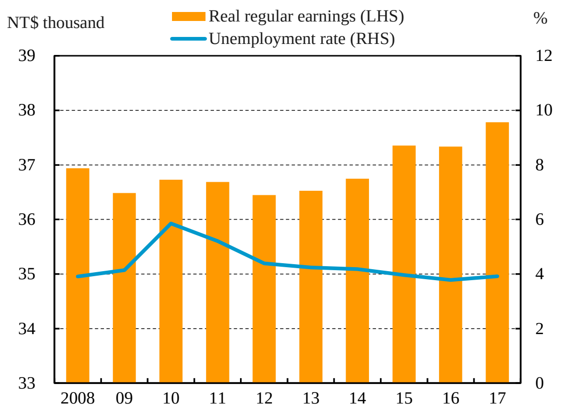
Household debt burden rose slightly

As total household borrowing grew at a faster pace than disposable income in 2017, the ratio of household borrowing to total disposable income[34] rose slightly to 1.42 at the end of the

[33] The term "current operation loans" includes outstanding debit card loans.
[34] Total disposable income = disposable income + rental expenses + interest expenses.

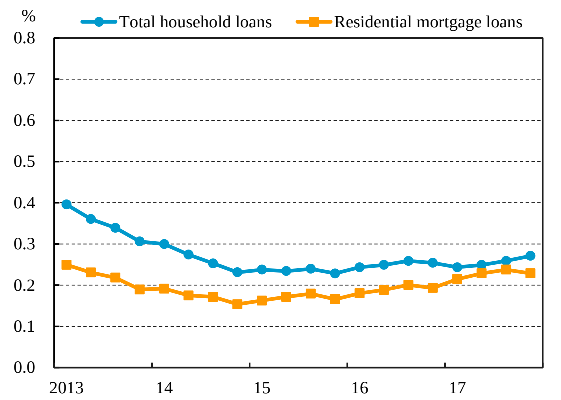
year from 1.39 a year earlier, reflecting a rise in the household debt burden. Moreover, owing to the increase in loans for current operations, which typically have a shorter term, the debt servicing ratio also elevated to 48.34% from 47.16% (Chart 2.32), thereby indicating that short-term household debt servicing pressure mounted slightly. Nevertheless, prolonged low interest rates on domestic loans in recent years, together with the falling domestic unemployment rate and improving regular earnings in the industrial and service sectors, should help sustain the debt servicing capacity of households (Chart 2.33).

Chart 2.33 Unemployment rate and regular earnings



Sources: DGBAS and Ministry of Labor.

Chart 2.34 NPL ratios of household borrowing



Source: JCIC.

Credit quality of household borrowing remained satisfactory

In 2017, the NPL ratio of household borrowing and loans to purchase real estate grew slightly but remained at low levels of 0.27% and 0.23%, respectively, at the end of the year. Credit quality didn't worsen significantly, but related risks should be closely monitored (Chart 2.34).

In recent years, rising global household debt has drawn wide attention. Although Taiwan's household debt burden has risen in recent years, the household saving rate and total household net worth to GDP ratio have been relatively high, indicating sound household financial conditions. Moreover, the default rate of household borrowing from banks has still been low. As a result, household debt does not yet pose a significant risk to the overall economic and financial environment (Box 1).

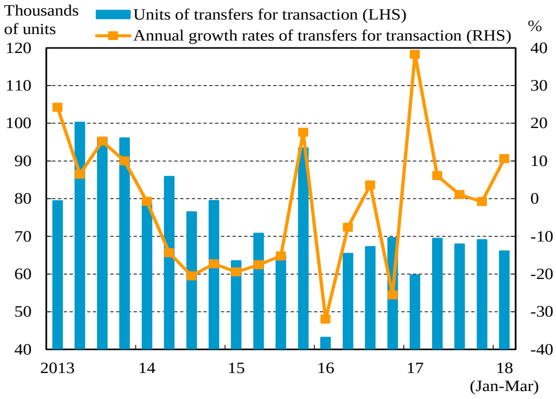
2.2.4 Real estate market

In 2017, trading volume in the housing market recovered and house prices fluctuated within a narrow range. In addition, housing loans and construction loans grew steadily, and mortgage interest rates remained at low levels. In 2018 Q1, transactions in the housing market grew continuously.

Trading volume in the real estate market recovered

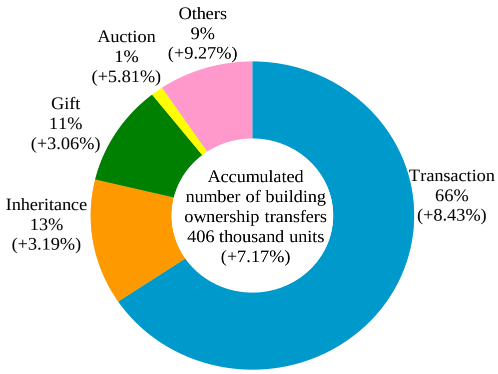
In 2017 Q1, although the total number of building ownership transfers for transaction decreased quarter by quarter, it increased dramatically by 38.29% year on year. The main reasons were a lower base period owing to the levying of a consolidated housing and land income tax in 2016 Q1 and an increase in the release of new buildings in 2017 Q1. From Q2 onwards, transactions in the housing market remained steady and the extent of the increase narrowed quarter by quarter, while it turned to negative growth of 0.79% in Q4 (Chart 2.35).

Chart 2.35 Building ownership transfers for transaction



Source: Monthly Bulletin of Interior Statistics, MOI.

Chart 2.36 Building ownership transfers and annual growth rate in 2017



Source: Monthly Bulletin of Interior Statistics, MOI.

The number of building ownership transfers was 406 thousand units in 2017, increasing by 7.17% year on year. The number of those transfers for transaction, accounting for 66%, rebounded to 266 thousand units from a record low of 245 thousand units in 2016 and increased by 8.43% year on year. Owing to high-net-worth individuals rushing to gift real estate before the implementation of the new gift tax system,[35] the number of transfers for gift, making up 11.0% of the total transfers, also increased by 3.06% year on year (Chart 2.36).

In 2018 Q1, the total number of building ownership transfers for transaction recorded an annual growth rate of 10.63%, mainly driven by a pickup in housing market transactions

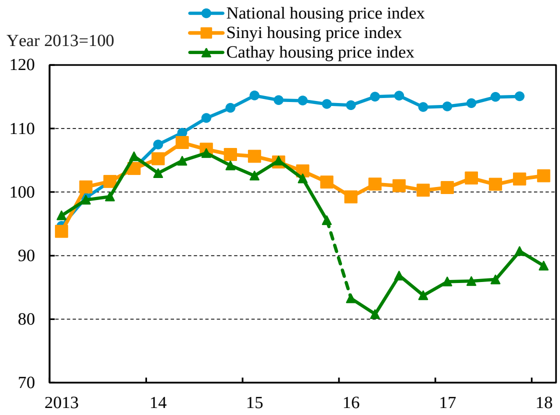
35 The new system of estate and gift tax was implemented on May 12, 2017, which was adjusted from a single tax rate of 10% to a three-tier progressive tax rate of 10%, 15%, and 20%, respectively.

and a gradual rise in the release of new buildings. In April, owing to real estate market participants turning hesitant in their buying as well as a slowdown in the release of new buildings, the total number of building ownership transfers for transaction decreased by 3.30% year on year. Nevertheless, it still grew by 7.15% for the period of January to April 2018.

Real estate prices fluctuated within a narrow range

With the housing market gaining momentum, the national housing price index[36] rose gradually quarter by quarter from 2017 Q1 onwards. As of the end of Q4, the annual growth rate registered 1.49%, bringing the index to only 0.10% lower than its peak in 2015 Q1 (Chart 2.37).

Chart 2.37 House price indices

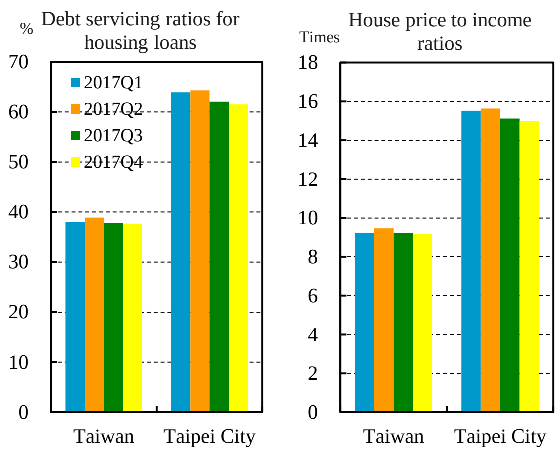


Notes: 1. The Cathay housing price index adjusted the possible transaction price model from 2016 Q1 and used 2015 Q4 as the connection point to retrospectively correct the data. In 2018 Q1, the model's parameters were revised, and from January 2017 the opening price, transaction price, and index of each quarter were recalculated.
2. For comparison purposes, all four indices use the same base year of 2013 (2013 average = 100).

Sources: MOI, Cathay Real Estate, and Sinyi Real Estate Inc.

From 2017 onwards, the Sinyi housing price index (for existing residential buildings) fluctuated within a narrow range (Chart 2.37). In 2018 Q1, the index roughly returned to the level of 2015 Q4. Owing to new residential building sales slightly picking up, the Cathay housing price index rose moderately throughout 2017. In 2018 Q1, the index decreased slightly quarter by quarter, mainly driven by a decline in prices of new residential buildings both in Taipei City and New Taipei City (Chart 2.37).

Chart 2.38 Debt servicing ratios for housing loans and house price to income ratios



Notes: 1. Debt servicing ratio for housing loans = median housing loan monthly payment/median household monthly disposable income.
2. House price to income ratio = median house price/median household annual disposable income.

Source: Housing Price Affordability Indicator Statistics, Construction and Planning Agency of the MOI.

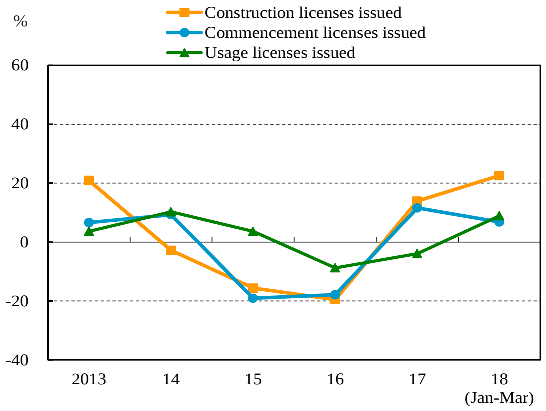
Mortgage burden stayed high

In 2017 Q2, the debt servicing ratio for housing loans increased to the highest point

[36] The housing price index compiled by the Construction and Planning Agency, Ministry of the Interior, registered 115.07 in 2017 Q4.

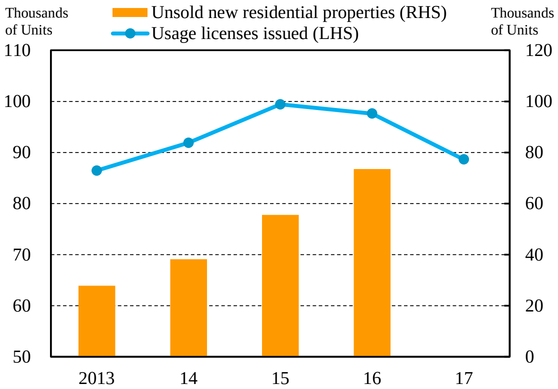
of 38.90% and then fell to 37.58% in Q4, a slight decrease of 0.76 percentage points year on year (Chart 2.38). Similarly, the house price to income ratio trended up to the highest point of 9.46 in 2017 Q2 before moderately dropping to 9.16 in Q4 (Chart 2.38), declining by 0.16 year on year. Among the six metropolitan areas, Tainan City had the lowest mortgage burden, while the debt servicing ratio for housing loans and the house price to income ratio in Taipei City registered 61.52% and 14.99, respectively (Chart 2.38), showing the heaviest mortgage burden.

Chart 2.39 Annual growth rates of floor space of construction, commencement, and usage licenses issued



Note: The data in 2018 are the annual growth rates of Q1.
Source: Monthly Bulletin of Interior Statistics, MOI.

Chart 2.40 Unsold new residential properties and usage licenses issued for residential properties



Note: Unsold new residential properties were the residential properties built within the last five years, still maintaining the first registration and having the possibility of being for sale. The data are currently published to 2016 Q4.
Source: Monthly Bulletin of Interior Statistics, Real estate information platform, MOI.

Commencement licenses issued expanded, while the expansion of unsold new residential properties remained a concern

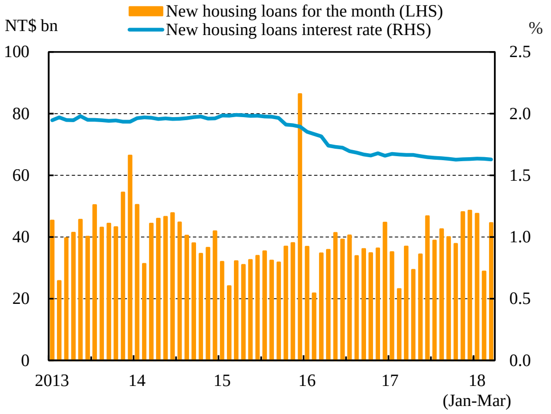
In 2017, with transactions in the housing market gradually increasing, a recovery in residential properties construction projects, as well as increasing demand from enterprises launching new stores and expanding plants, the total floor space of commencement licenses issued rose by 11.56% year on year (Chart 2.39), with residential properties increasing by 7.79%. In 2018 Q1, the total floor space of commencement licenses issued successively increased by 6.81% year on year, with residential properties increasing dramatically by 28.32%. The main reasons were that construction companies’ confidence in investing in the real estate market was restored as well as continual commencement of social housing and industrial and commercial buildings constructions.

From the second half of 2015 to the beginning of 2017, owing to construction companies reducing construction projects, the total floor space of usage licenses issued decreased by 3.90%

year on year in 2017, with residential properties decreasing by 12.38%. However, the extent of the decrease narrowed (Chart 2.39). In 2018 Q1, the total floor space increased at an annual rate of 8.89%, with residential properties increasing by 7.35% year on year, mainly driven by a rise in the release of new buildings.

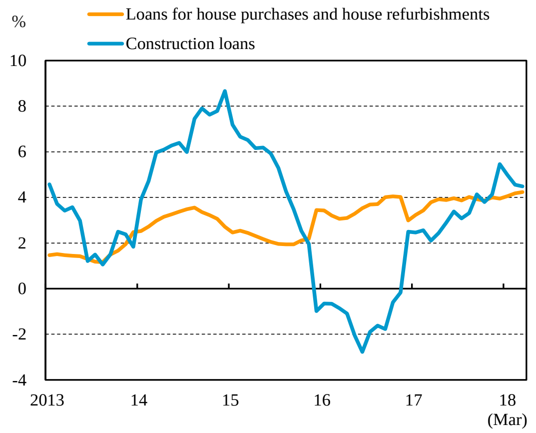
At the end of 2016, unsold new residential properties registered 74 thousand units, increasing by around 18 thousand units or 32.3% year on year. In 2017, usage licenses issued for residential properties amounted to 89 thousand units, decreasing by 9 thousand units or 9.2% year on year (Chart 2.40). This, along with active promotion from construction companies for their projects, helped reduce the pressure on unsold new residential properties. However, given that construction companies resumed a large number of construction projects even though demand in the house-purchase for self-use market did not expand significantly, the expansion of unsold new residential properties remained a concern.

Chart 2.41 New housing loans – amount and interest rate



Source: CBC.

Chart 2.42 Annual growth rates of real estate loans



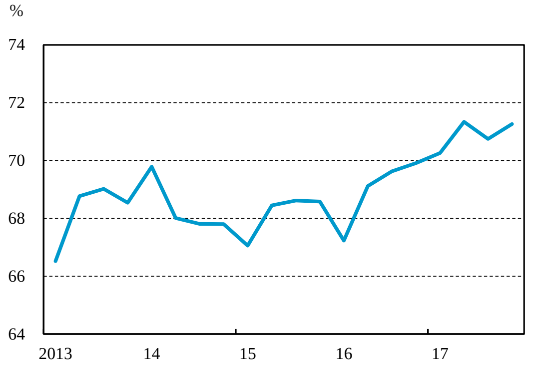
Source: CBC.

Real estate loans grew steadily as mortgage interest rates successively decreased

With the housing market gathering momentum, the total new housing loans granted by the top five banks registered NT$461.4 billion in 2017, increasing by 5.90% year on year. In 2018 Q1, the figure increased by 27.16% year on year. In 2017, the interest rate for new housing loans fell, and rebounded slightly after dropping to the lowest point of 1.627% in October. However, the interest rate for new housing loans still stayed at a low level, registering 1.628% in March 2018 (Chart 2.41).

From 2017 onwards, the sum of outstanding loans for house purchases and house refurbishments granted by banks[37] maintained steady growth, registering an annual growth rate of 4.23% as of the end of March 2018. Meanwhile, outstanding construction loans turned to positive growth at the end of December 2016. The annual growth rate fell slightly after rising to 5.46% at the end of December 2017, registering 4.48% at the end of March 2018 (Chart 2.42).

Chart 2.43 Average loan-to-value ratio for new housing loans



Note: Figures are the average loan-to-value ratio for new housing loans extended by all financial institutions.
Source: JCIC.

Banks assumed self-discipline on real estate loans

The CBC repealed most rules imposed on housing loans and land collateralized loans in March 2016, except for high-value housing loans. At the same time, financial institutions were required to strengthen self-discipline on mortgage-related credit risk. In 2017, the average loan-to-value ratio for new housing loans registered 70.90%, slightly higher than the ratio of 68.97% in 2016 (Chart 2.43). Moreover, the average loan-to-value ratio for high-value housing loans was 57.22%, equivalent to the ratio reported in 2016.

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

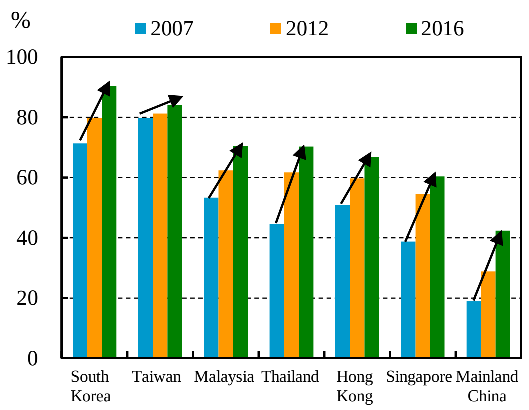
Box 1
Analysis of Taiwan's household debt and debt servicing capacity

Recently, some central banks warned against rising global household debt.[1] Also, the economic and financial risks arising from continuously rising household debt have drawn wide attention. Although Taiwan's household debt to GDP ratio[2] has risen in recent years, it grew at a slower pace than neighboring Asian economies. Moreover, the default rate of household borrowing from banks has remained low. This, coupled with a high household saving rate and total household net worth to GDP ratio, indicates sound household financial conditions. Thus, household debt does not yet pose a significant risk to the overall economic and financial environment.

1. Household debt to GDP ratio in Taiwan was higher than that in some neighboring Asian economies but grew at a slower pace

Taiwan's households prefer to purchase properties and the owners of small and medium enterprises tend to apply for loans in their own name for operation purposes. These factors, along with a boom in the banking industry, led to a high household debt to GDP ratio, equivalent to that in advanced economies, such as those in Europe and the US. In the last decade, the household debt to GDP ratio in Taiwan ranged from 78% to 86%, higher than that in neighboring Asian economies except South Korea.[3] Nonetheless, household debt to GDP ratios in Malaysia, Thailand and Mainland China soared rapidly in recent years. In contrast, the ratio in Taiwan trended upwards but at a relatively mild pace over the same period (Chart B1.1).[4]

Chart B1.1 Household debt to GDP ratios of Taiwan and other neighboring Asian economies

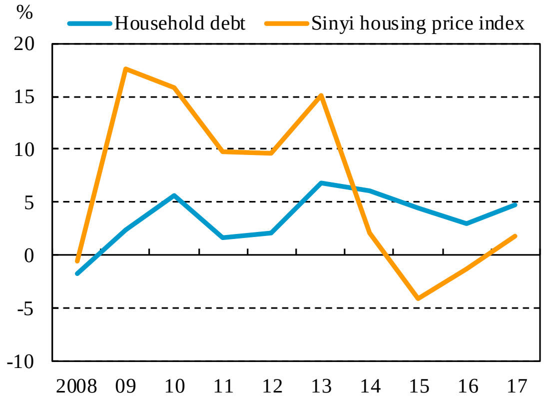


Note: Economies are sorted by descending order of their corresponding ratios in 2016.
Sources: BIS and CBC.

2. The largest share of household borrowing went for the purchase of real estate, which grew moderately in recent years

At the end of 2017, total household borrowing expanded to NT$15 trillion, of which the purchase of real estate accounted for the largest share (more than 60% of total household borrowing). Yet, the share of the purchase of real estate continued to trend downwards in recent years mainly because the growth of real estate loans moderated amid the cooling of the real estate market. The annual growth rate of household borrowing fell to 4.77% in 2017 from its peak of 6.77% in 2013 (Chart B1.2).

Chart B1.2 The annual growth rates of household debt and housing price index

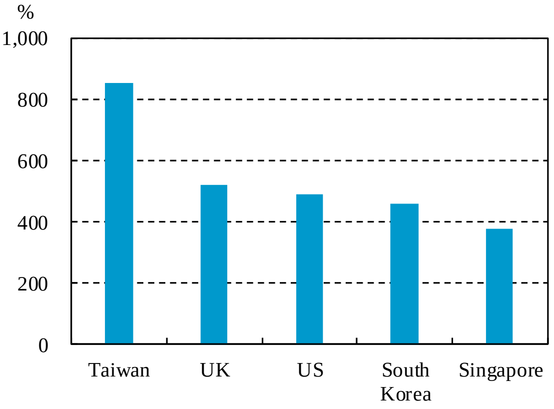


Sources: Sinyi Real Estate Inc and CBC.

3. Household net worth to GDP ratio has been high, implying sound financial conditions

The household saving rate in Taiwan is high and has averaged 21.25% over the last decade, much higher than that in some major economies such as Germany, the US and Japan.[5] This provided an adequate source of repayment. In addition, household net worth to GDP was around 8.5 times, also higher than in the UK, the US, South Korea and Singapore (Chart B1.3), partly reflecting sound household financial conditions in Taiwan.

Chart B1.3 Household net worth to GDP ratios



Notes: 1. Households include non-profit institutions serving households.
2. Figures are for 2016.
Sources: Official websites of selected countries.

The purchase of real estate accounted for 60% or more of Taiwan's total household borrowing and most of those real estate loans were fully collateralized. Also, most current operation loans were secured by collateral. Reflecting this, banks' credit risks were still within a manageable level. In 2017, the NPL ratio of household borrowing stayed at a low level of 0.27%, indicating satisfactory credit quality. Furthermore, the domestic unemployment rate and interest rate on loans have remained low in recent years, which could help sustain the debt servicing capacity of households.

4. Conclusions

(1) Taiwan's financial system remained stable. Although the household debt to GDP ratio was high, the NPL ratio of household borrowing was still at a low level. This,

coupled with the fact that the household saving rate was high and the total assets of households far exceeded their total debt, reflects sound financial conditions. As a result, household debt does not yet pose a significant risk to the economic and financial environment.

(2) In recent years, the real estate market has gradually returned to fundamentals. Nonetheless, the purchase of real estate to total household borrowing ratio has stayed at a high level of 60% or more. In response, banks should continually monitor the credit risk of real estate loans and examine their real estate loan policies in a timely manner to cope with such impacts.

(3) With gradual monetary policy normalization in major economies, Taiwan's interest rate may trend up and, in turn, increase household debt servicing pressure. Accordingly, this warrants banks closely monitoring the evolution of international economic and financial conditions, and reminding borrowers to pay attention to the influence of future interest rate fluctuations on their debt servicing capacity, so as to prevent adverse impacts on the financial system.

Notes: 1. From 2017 onwards, the central banks of Australia, Canada, the UK, South Africa, and Chile have successively warned about rising global household debt.

2. A rise of household debt to GDP ratio represents that the per dollar output needed to repay household debt increases, reflecting a heavier household debt burden.

3. South Korea's household debt to GDP ratio kept rising year by year. This mainly resulted from the fact that the South Korean government implemented a policy with the aim of boosting a sluggish economy which encouraged the public to apply for real estate loans to sustain the development of the real estate market. As a result, household debt increased sharply.

4. Michael Heise, the chief Economist of Allianz SE in Germany, indicated that Taiwan's debt growth has remained relatively stable in the past few years, which is a good trend. See Focus Taiwan News Channel (2017), *Taiwan's Private Wealth Per Person Ranked 5th Highest Globally*, September.

5. The household saving rate is defined as household saving divided by disposable income. The figure for Taiwan is the average from 2007 to 2016. According to the Organization for Economic Co-operation and Development (OECD), for the average household saving rate over the last decade, Taiwan was lower than that in Mainland China (37.37% from 2006 to 2015) but higher than that in Germany (9.72% from 2007 to 2016), the US (5.68% from 2007 to 2016), and Japan (2.26% from 2006 to 2015).

III. Financial system assessment

3.1 Financial markets

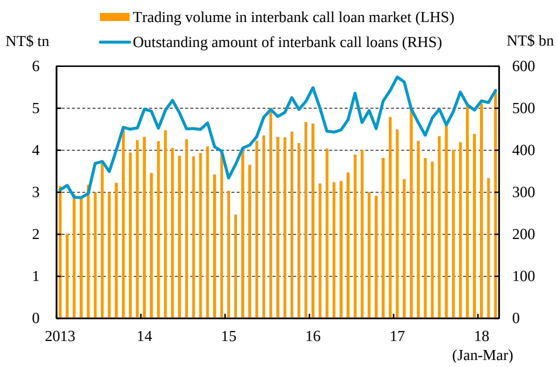
With respect to money and bond markets in 2017, the interbank call loan market expanded and the outstanding amount of bill and bond issuance in the primary market increased, but the turnover rates of outright transactions in the secondary bond market declined. In the same period, short-term market rates 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

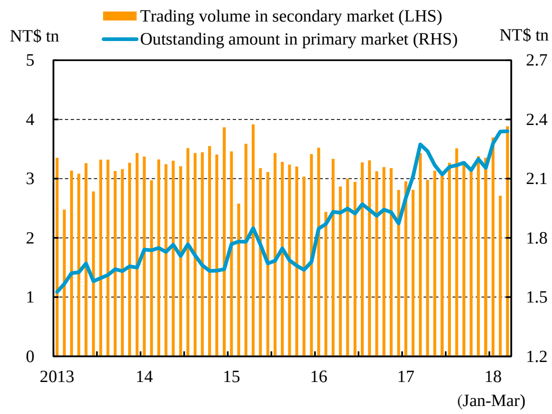
The average daily outstanding amount of interbank call loans in 2017 registered NT$500.5 billion, increasing by 2.38% year on year. The main reason was that bills finance companies increased interbank borrowing owing to low interest rates, and the turnover rates of call loans surged. As a result, the 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

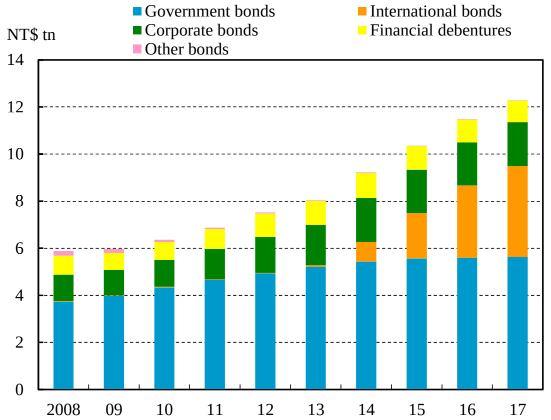
At the end of 2017, the outstanding amount of bill issuance in the primary market stood at NT$2.15 trillion, substantially increasing by 15% year on year owing to the expansion of CP issuance and banks' negotiable certificates of deposit (NCDs). In 2018 Q1, the outstanding amount of bill issuance continued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

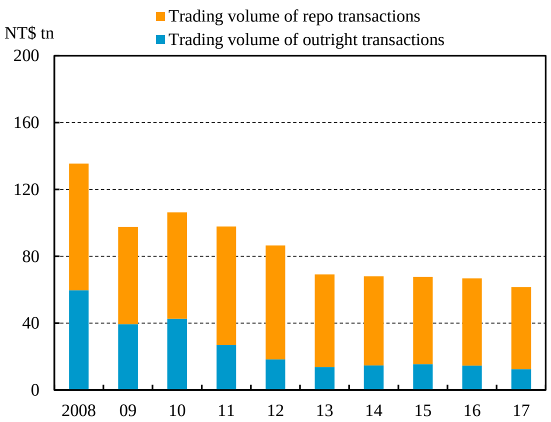
At the end of 2017, the outstanding amount of bond issuance stood at NT$12.29 trillion and increased by 6.98% on a year-on-year basis, mainly driven by significant growth of international bond issuance.[38] However, after the FSC stipulated the regulations on international bond investments[39] of life 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

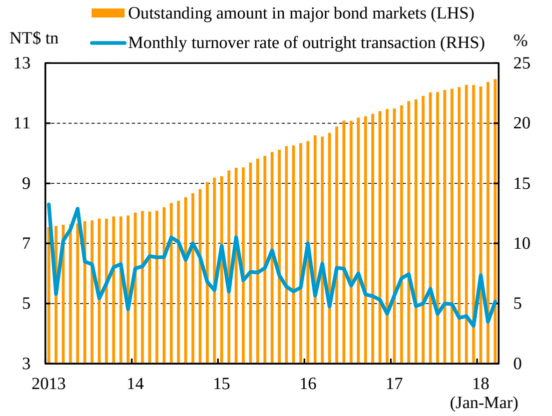


Source: CBC.

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

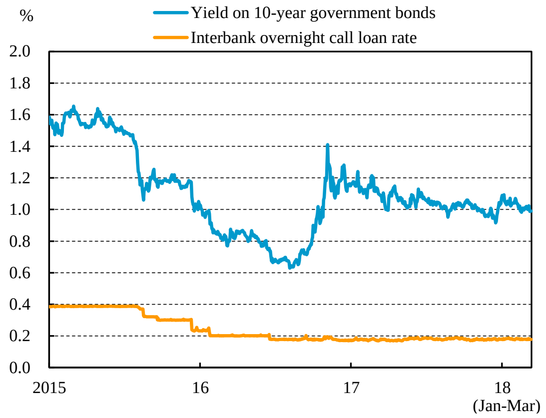


Notes: 1. Major bonds include government bonds, international bonds, corporate bonds, and financial debentures.
2. Monthly turnover rate = trading value in the month/ average bonds issued outstanding amount.
Average bonds issued outstanding amount = (outstanding amount at the end of the month + outstanding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

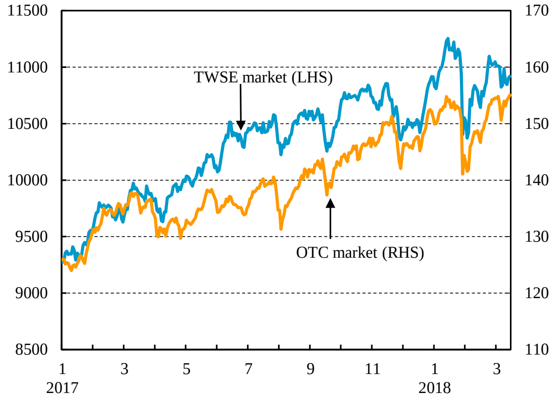
[40] See Note 7.

3.1.2 Equity markets

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

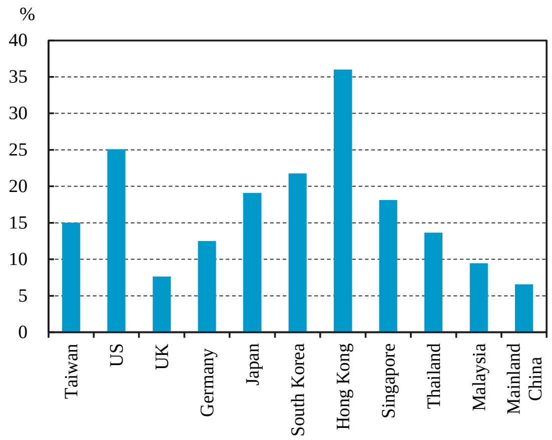
Affected by US stock markets hitting new highs and massive net buying by foreign investors, both the TWSE and the OTC markets trended up in the first half of 2017, especially the TAIEX of the TWSE market which stood above 10,000 from May onwards. In the second half of the year, stock markets initially 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



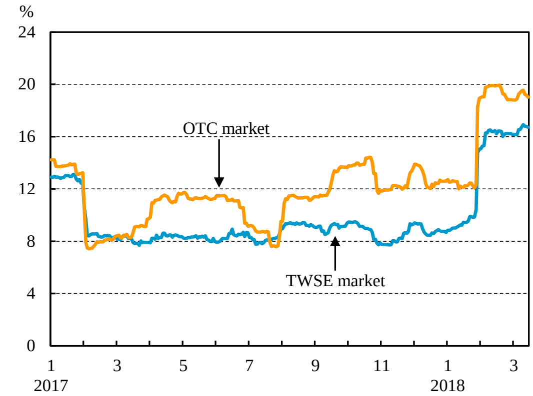
Notes: 1. Figures are for 2017.
2. Market performance is based on TWSE Weighted Index for Taiwan, DJIA Index for the US, FTSE-100 Index for the UK, DAX Index for Germany, NK-225 Index for Japan, KOSPI Index for South Korea, Hang Seng Index for Hong Kong, Straits Times Index for Singapore, SET Index for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

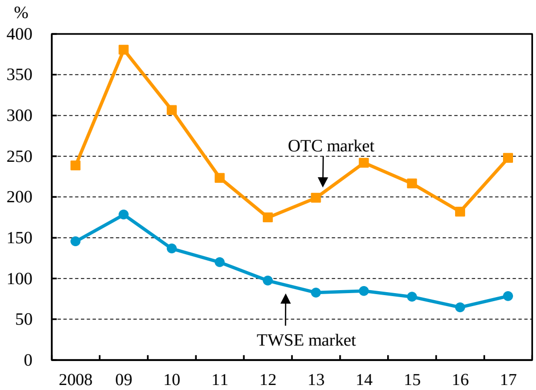


Note: Volatility refers to the annualized standard deviation of 60-day daily index returns.
Sources: TWSE, TPEx, and CBC.

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).

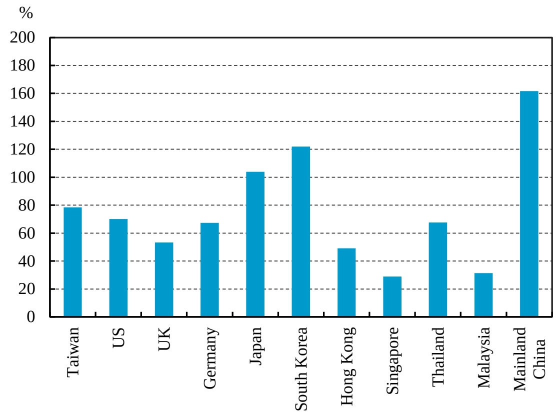
Chart 3.10 Annual turnover rates in Taiwan's stock markets



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



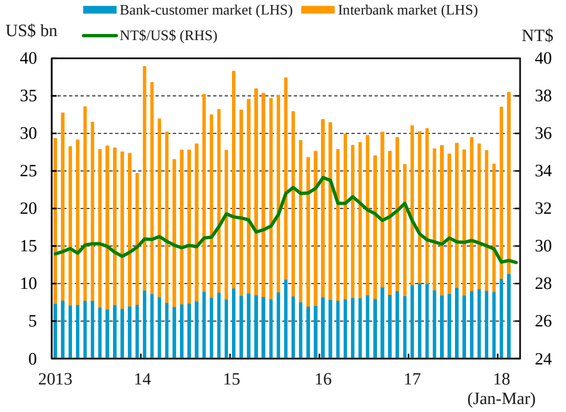
Notes: 1. Figures refer to accumulated turnover rates in 2017.
2. As for the stock market in each country, please see Chart 3.8 note 2.
Source: TWSE.

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

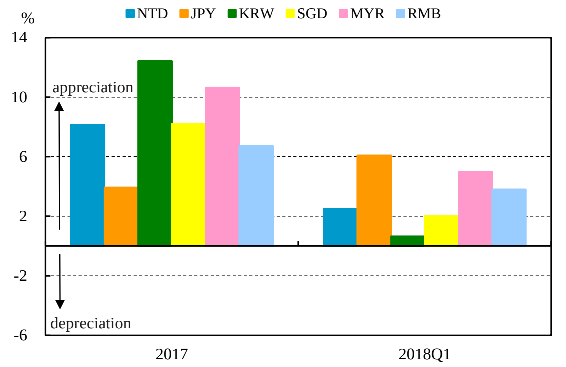


Notes: 1. Trading volume is the monthly average of daily data, while exchange rate is end-of-period data.
2. The latest data for trading volume are as of February 2018.

Source: CBC.

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).

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



Source: CBC.

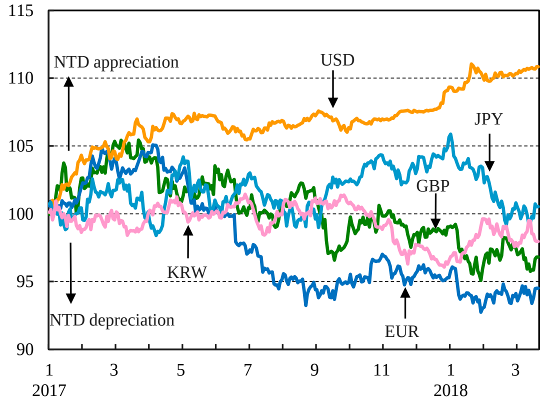
41 See Note 8.

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

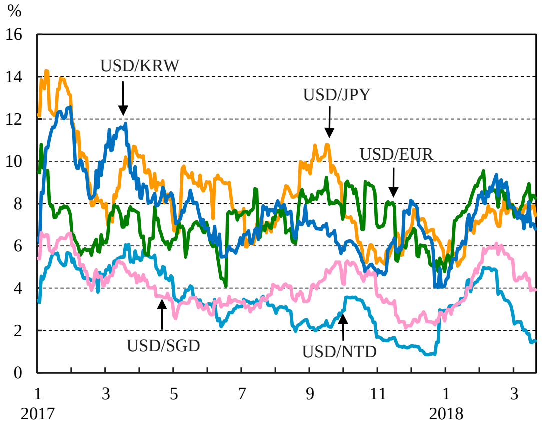
Volatility in the NT dollar exchange rate against the US dollar shifted between 0.85% and 6.07% and registered an annual average of 3.41% in 2017, while moving between 1.43% and 4.97% during 2018 Q1. Compared to major currencies such as the Japanese yen, the euro, the Korean won, and the Singapore dollar,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

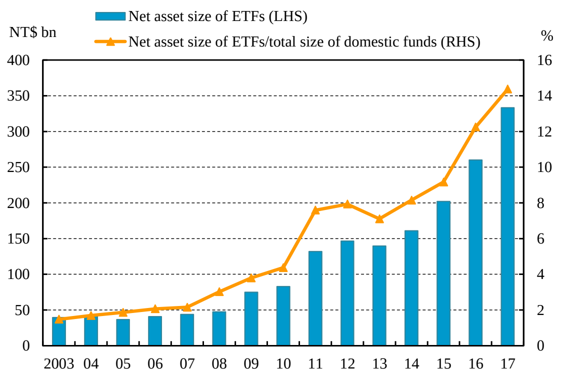
Thanks to transaction convenience and lower transaction costs, the global assets of exchange-traded funds (ETFs) have grown rapidly. Among them, passive investment funds such as equity ETFs have gradually nibbled away at the market share of actively managed funds. In the US, for example, with growth 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

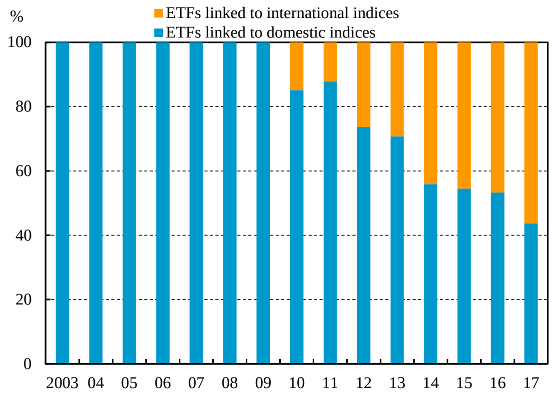
Taiwan's first ETF (P-shares Taiwan Top 50 ETF) was issued in 2003, but the domestic ETF market has grown rapidly since 2009. Against a backdrop of declining transactions in actively managed funds, the ETF assets as a share of total

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

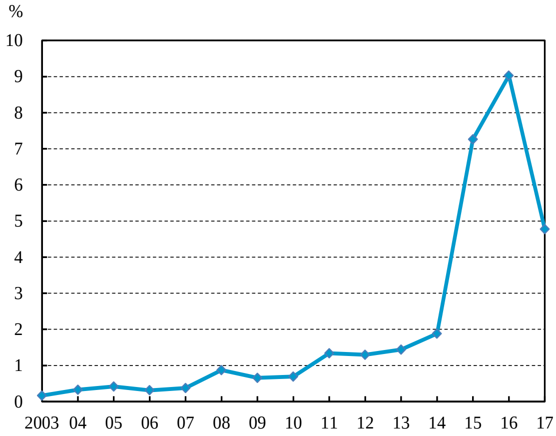


Source: SITCA.

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.

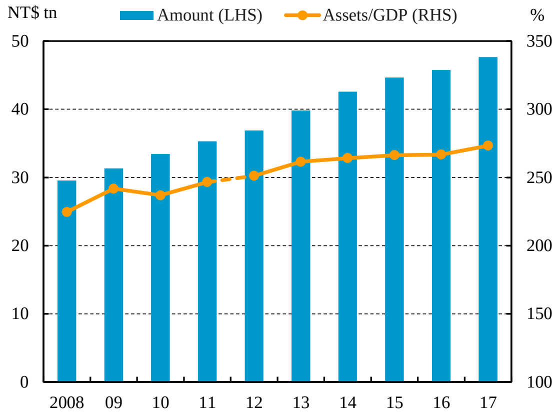
Notes: 1. SEC (2015), *Research Note: Equity Market Volatility on August 24*, U.S. SEC Report, December.
2. Campbell, Dakin et al. (2018), *Volatility Inc.: Inside Wall Street's $8 Billion Mess*, Bloomberg, February.
3. Borio, Claudio et al. (2018), *BIS Quarterly Review: International banking and financial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

3.2 Financial institutions

3.2.1 Domestic banks

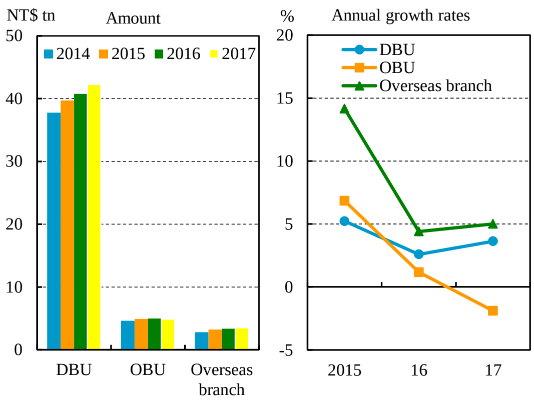
The total assets of domestic banks[42] expanded at a faster pace in 2017. Asset quality remained satisfactory, and the concentration of corporate loans decreased slightly, whereas that of credit exposures to real estate loans mildly increased. Considering that the outlook for the real estate market remains 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).

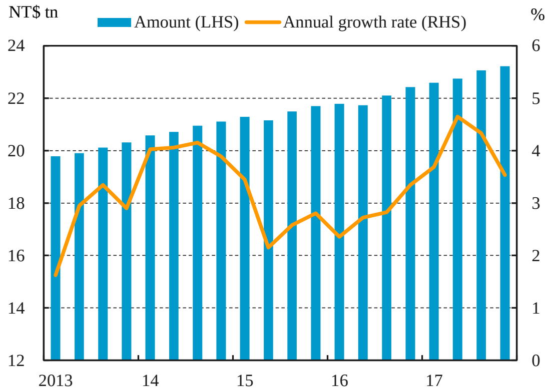
[42] There were 39 domestic banks (including Agricultural Bank of Taiwan) in 2017.
[43] The rise was mainly due to a significant increase of hold-to-maturity financial investments and continued growth of loans.

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

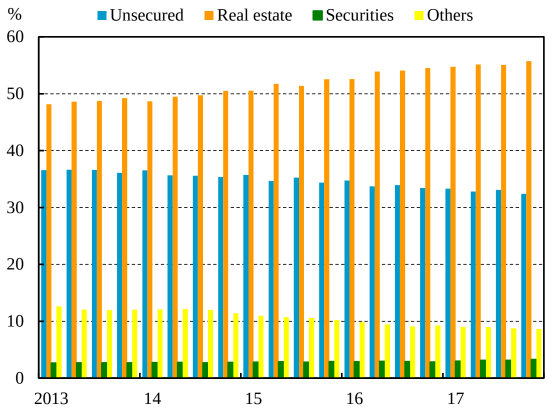


Note: Loans of OBUs and overseas branches were excluded.
Source: CBC.

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).

Chart 3.19 Credit by type of collateral in domestic banks



Source: CBC.

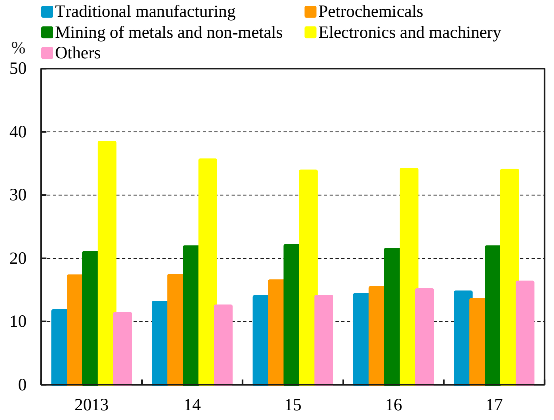
As the real estate trading volume recovered but prices stagnated after falling, prospects for the real estate market remained dim. Banks should prudently readjust loan strategies and strengthen risk management to contain related credit risks.

[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



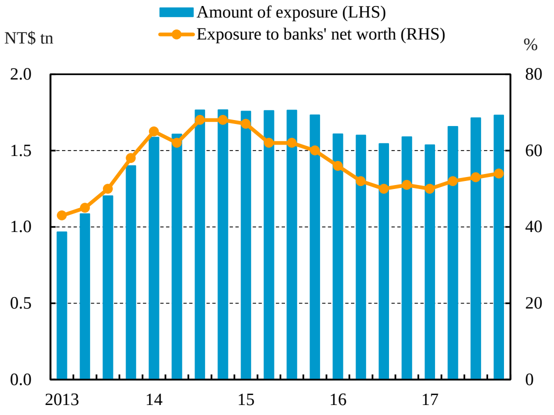
Notes: 1. Exposure to each sector = loans to each sector/loans to the whole manufacturing sector.
2. Exposures of OBUs and overseas branches were excluded.

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.

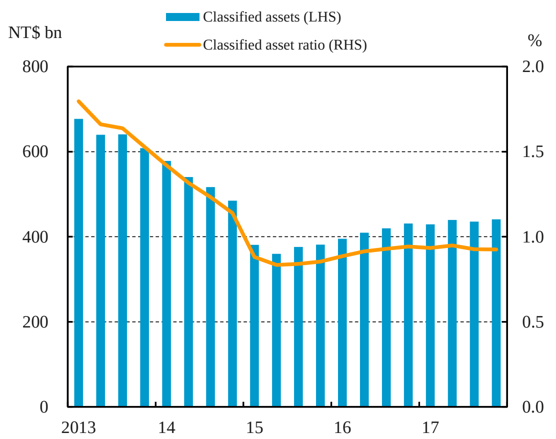
[46] See CBC (2015), *Financial Stability Report*, Chapter IV, May and CBC (2017), *Financial Stability Report*, Chapter III, May.

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.

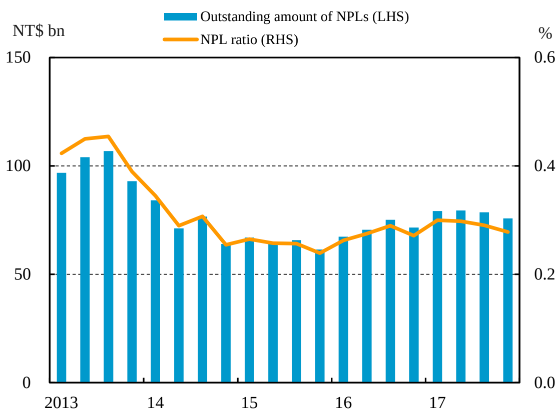
Furthermore, the outstanding NPLs of domestic banks registered NT$75.8 billion at the end of 2017. Although the average NPL ratio slightly rose to 0.28% (Chart 3.23), it was much lower than those in the US and neighboring Asian countries (Chart 3.24). Among 39 domestic banks, almost all had NPL ratios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

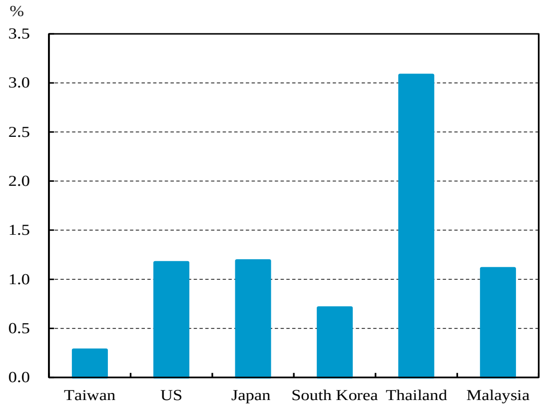
48 Loss herein refers to the losses from loans, acceptances, guarantees, credit cards, and factoring without recourse.

Market risk

Estimated value-at-risk for market risk exposures decreased

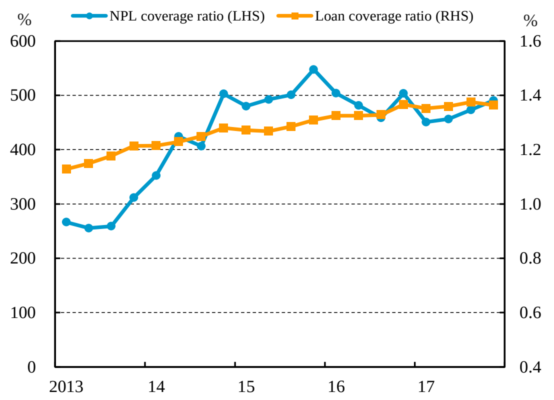
At the end of 2017, the net position of debt securities accounted for the largest share of total market risk exposures of domestic banks, followed by the net positions of FX and of equity securities. Based on the CBC's VaR model,[49] the estimated total VaR for market risk exposures of domestic banks 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

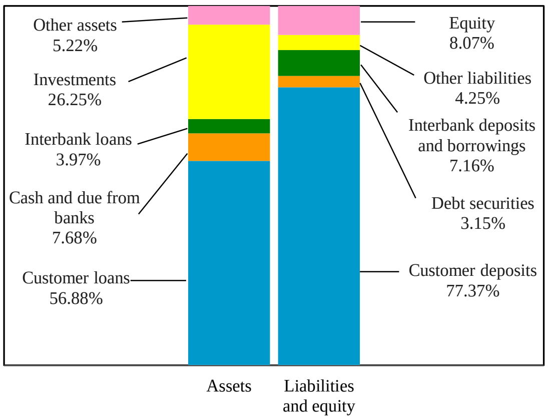
According to the estimation mentioned above, the total VaR would lead to a decrease of 0.15 percentage points in the average capital adequacy ratio of domestic banks and cause the ratio to drop from the current 14.17% to 14.02%. Nevertheless, it would still be higher than the statutory minimum of 9.25%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

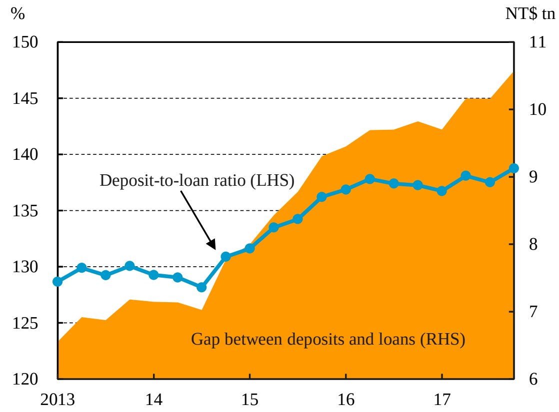
Chart 3.26 Asset/liability structure of domestic banks



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).

Chart 3.27 Deposit-to-loan ratio of domestic banks

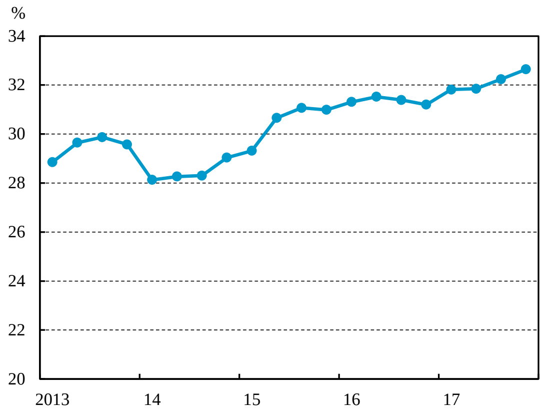


Note: Deposit-to-loan ratio = total deposits/total loans.
Source: CBC.

Overall liquidity risk remained relatively low

The average NT dollar liquid reserve ratio of domestic banks was well above the statutory minimum of 10% in every month of 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 3.28 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).

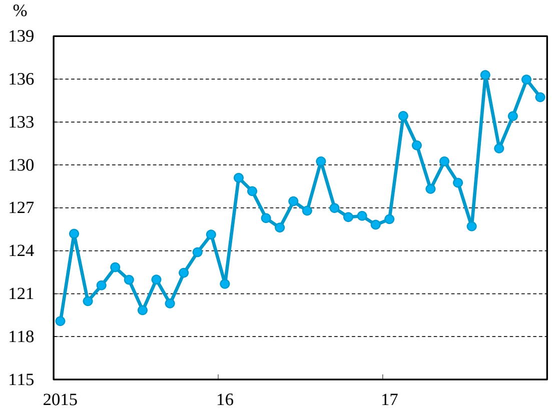
Almost all domestic banks were profitable in 2017, except for one whose profits turned to a loss because of substantial loan loss provisions. As in the previous year, 13 banks achieved a profitable ROE of 10% or more and four banks had ROAs above the international standard of 1% (Chart 3.33). Compared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

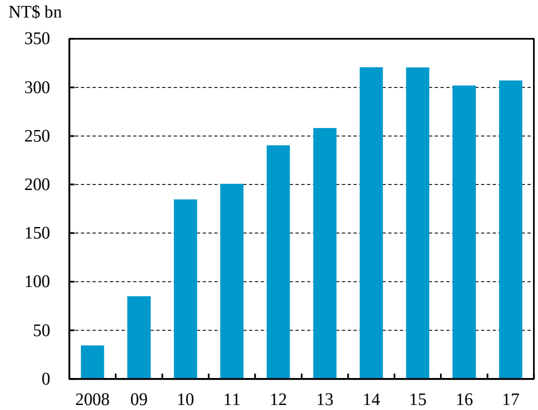
Furthermore, owing to overbanking in the domestic market, coupled with regulation relaxations and government policies encouraging banks to develop overseas

Chart 3.29 Liquidity coverage ratio of domestic banks



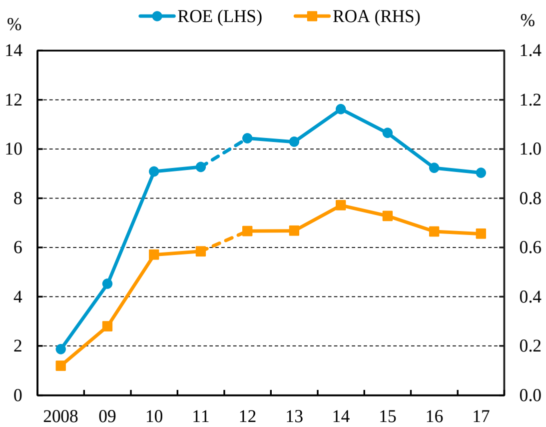
Source: CBC.

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).

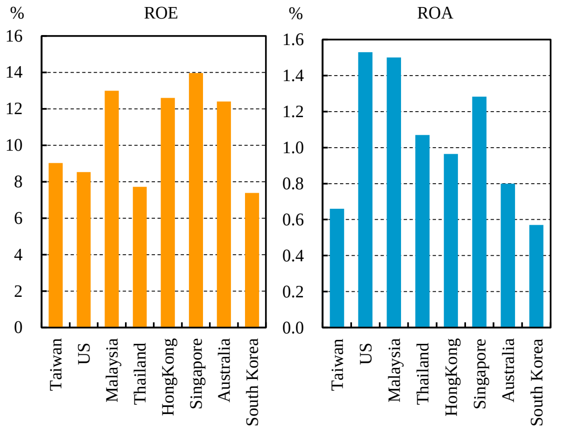
Capital adequacy

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).

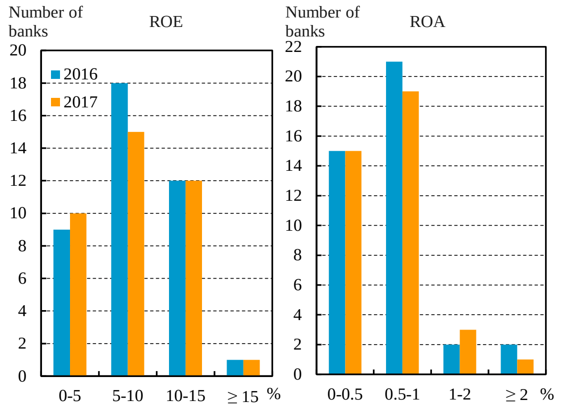
Further breaking down the components of regulatory capital, common equity Tier 1 capital, which features the best loss-bearing capacity, accounted for 78.94% of eligible capital. This showed that the capital quality of domestic banks was satisfactory.

Chart 3.32 ROEs and ROAs of banks in selected economies



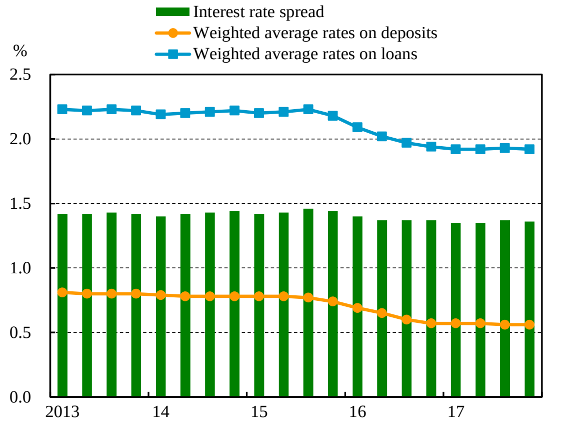
Note: Figures are 2017 data.
Sources: CBC, FDIC, BNM, BOT, APRA, FSS and IMF.

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

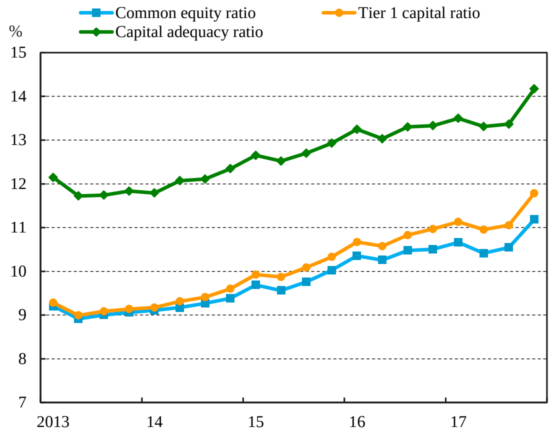
At the end of 2017, the common equity ratios, Tier 1 capital ratios, and capital adequacy ratios for all domestic banks remained above the statutory minimum requirements[51] for 2017 (Chart 3.37). The average leverage ratio[52] of domestic banks at the end of 2017 stood at 6.42%, higher than a year before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

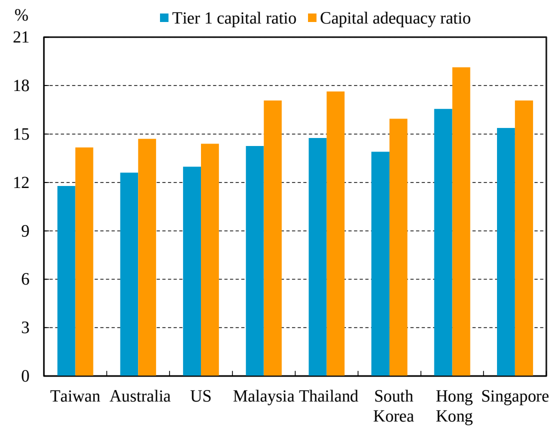
Chart 3.35 Capital ratios of domestic banks



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.

[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

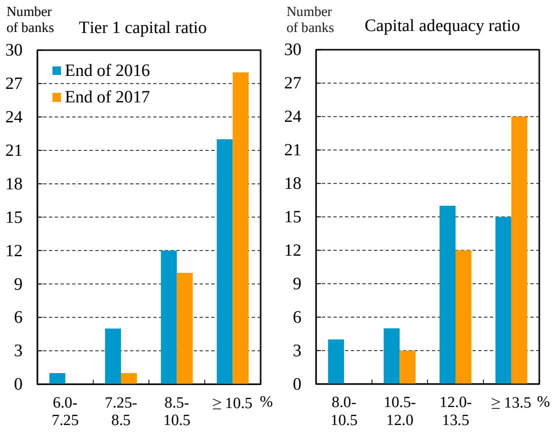
[52] With a view to keeping in line with international standards published by the Basel Committee on Banking Supervision (BCBS), the FSC required all banks to calculate Basel III leverage ratios from 2013 onwards and disclose the ratios starting from 2015. Moreover, the leverage ratio will be incorporated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

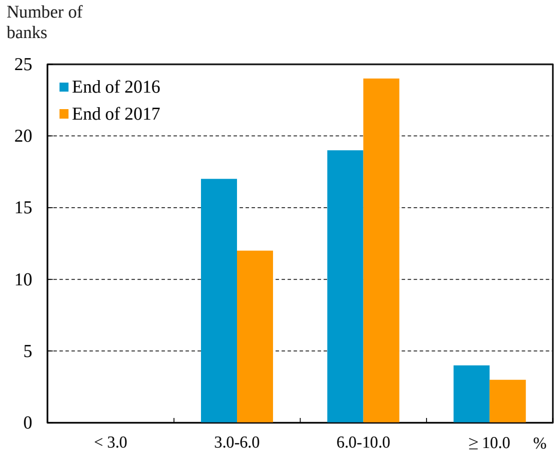
All domestic banks received ratings by credit rating agencies. The average credit rating of domestic banks further improved in 2017, as the credit rating index[55] went up slightly compared to 2016 (Chart 3.39).

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.

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.

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

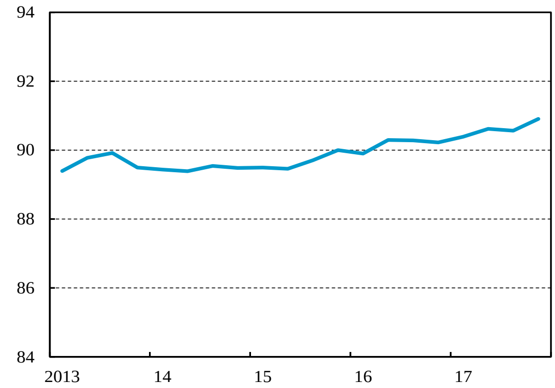
Life insurance companies reported net income before tax of NT$116.7 billion in 2017, a substantial year-on-year increase of NT$10.2 billion or 9.59% (Chart 3.43). This

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

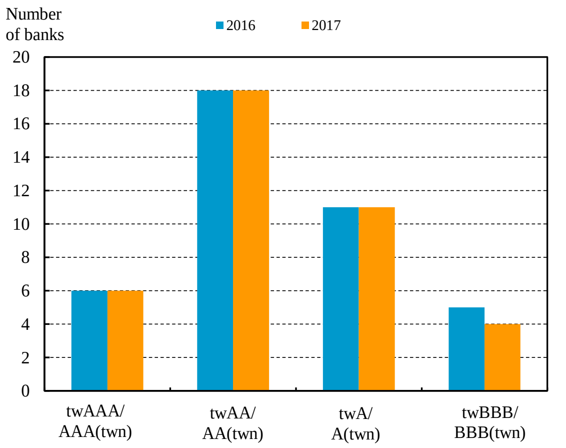
Sources: Standard & Poor's and Fitch Ratings.

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.

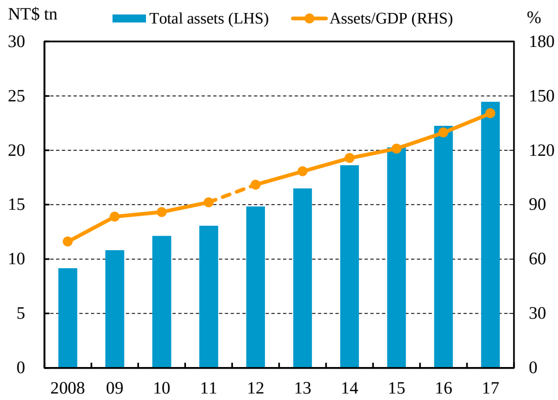
Average RBC ratio further improved

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

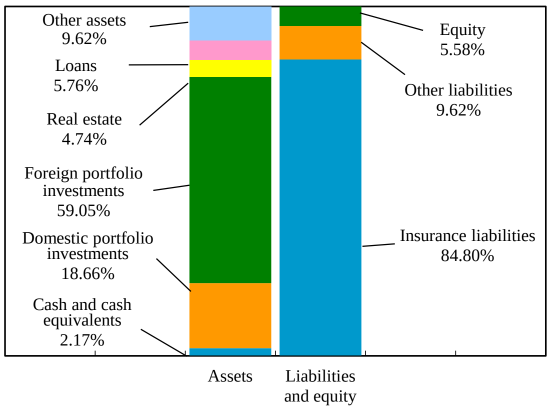
Among the 12 life insurance companies rated by Taiwan Ratings or Fitch Ratings, most received unchanged credit ratings in 2017. As of the end of the year, all rated life insurance companies maintained credit ratings above twA or its equivalent, and most received positive or stable credit outlooks.

Chart 3.41 Total assets of life insurance companies



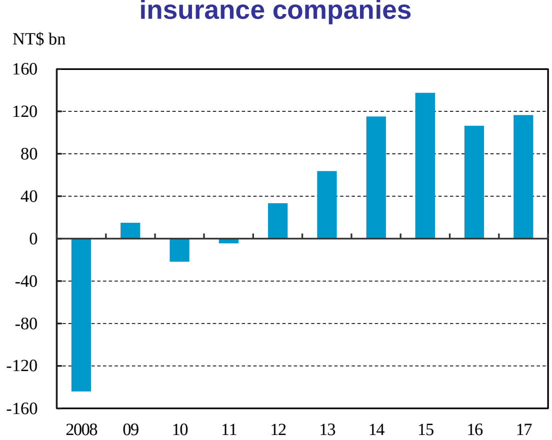
Note: Figures from 2012 forward are on the TIFRSs basis. Figures of prior years are on the ROC GAAP basis..
Sources: FSC and DGBAS.

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



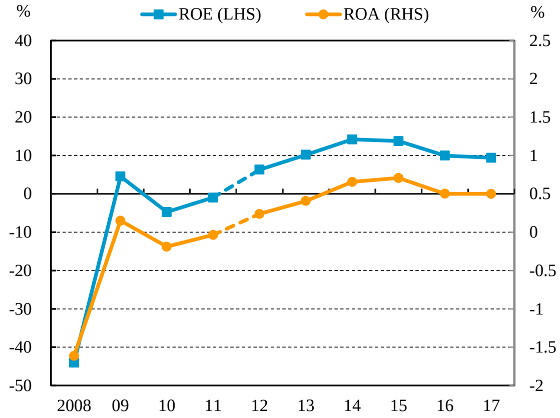
Note: Figures from 2012 forward are on the TIFRSs basis. Figures of prior years are on the ROC GAAP basis.
Source: FSC.

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.

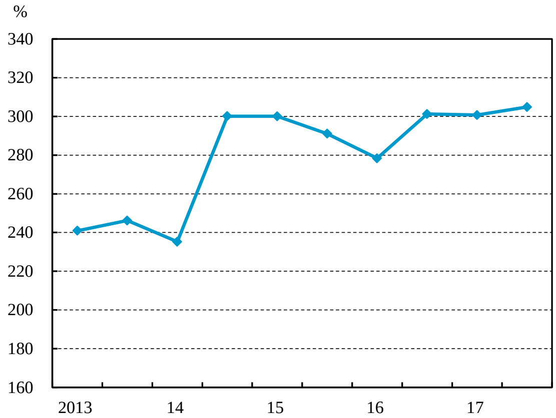
In addition, volatility in international stock and bond markets heightened in 2018, and, should the US-China trade dispute heat up, downward pressure on global stock prices may further increase. Moreover, considering that the yield on Taiwan government bonds may follow the upward trend of US government 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.

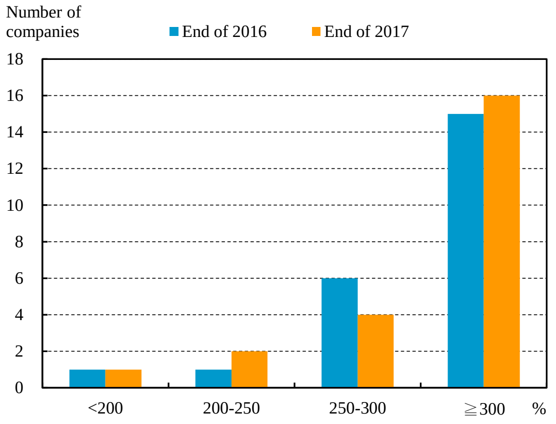
The asset and liability structure of bills finance companies remained roughly unchanged in 2017. On the asset side, bill and bond investments constituted 94.45% of total assets. On the liability side, bills and bonds sold under repo transactions as well as borrowings accounted for 86.50% of total assets,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

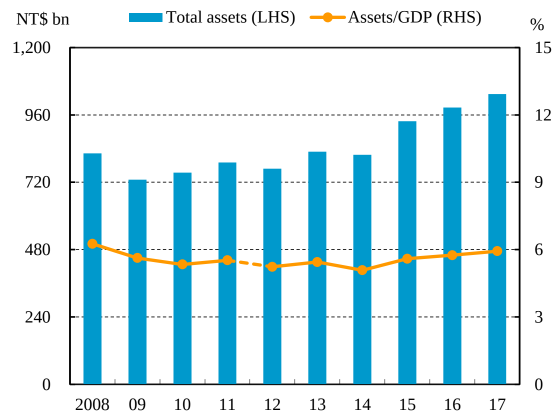
Owing to rising funding demands of corporates in money markets spurred by low short-term

Chart 3.46 Life insurance companies classified by RBC ratios



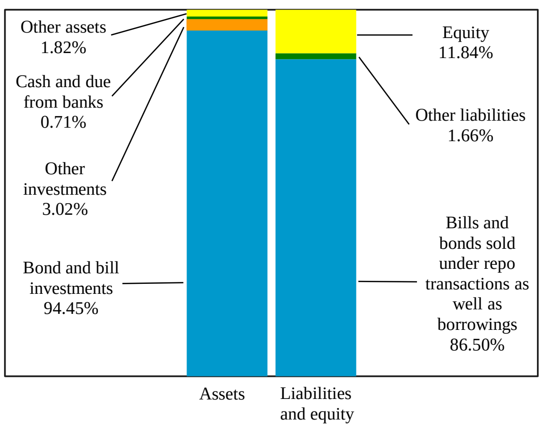
Note: Figures for 2016 are exclusive of Chaoyang Life Insurance.
Source: FSC.

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.

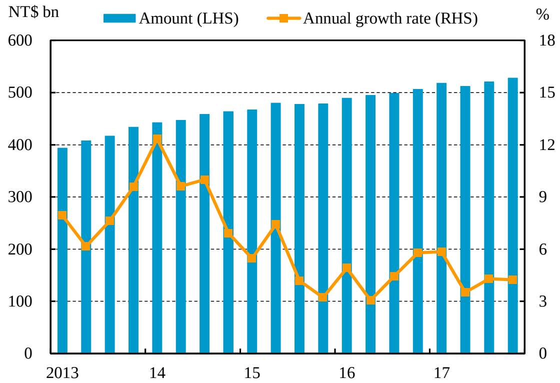
market rates, CP guaranteed by bills finance companies registered NT$527.8 billion at the end of 2017, an increase of NT$21.5 billion year on year; nevertheless, the annual growth rate moderated to 4.24% (Chart 3.49). As a result, the average multiple of guarantee liabilities to equity rose to 4.88 times 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

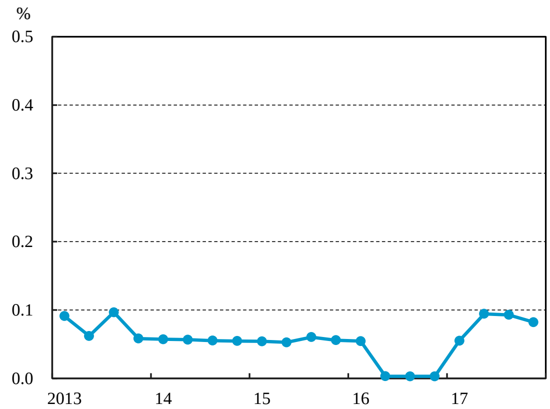
The credit quality of bills finance companies remained sound in 2017, as the non-performing credit ratio stayed at a low level of 0.082% at the end of the year (Chart 3.50). Meanwhile, the credit loss reserves to non-performing credit ratio stood at 18.58 times, reflecting sufficient reserves to cover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

Chart 3.49 Outstanding CP guaranteed by bills finance companies



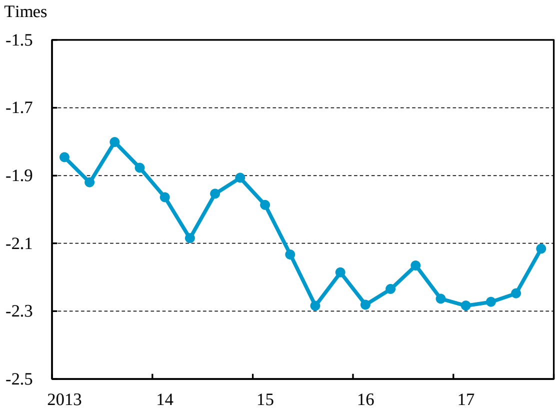
Source: CBC.

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



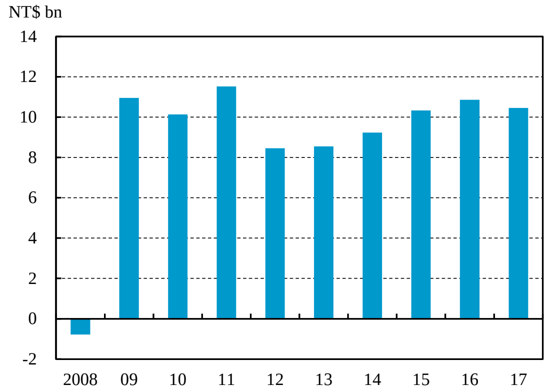
Note: 0-60 days maturity gap = cash inflow of major assets within 0-60 days - cash outflow of major liabilities within 0-60 days.
Source: CBC.

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).

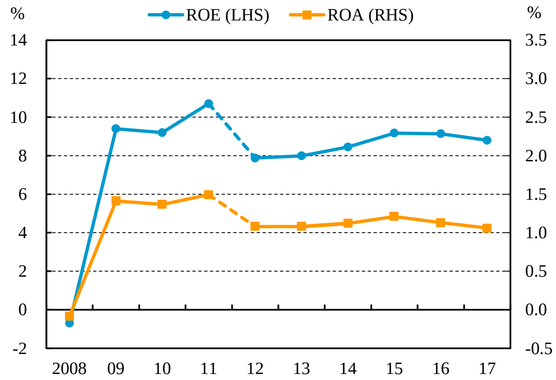
Moreover, major liabilities[57] in bills finance companies grew by 5.05% in 2017, bringing the major liabilities to equity ratio to increase from 7.88 times a year before to 8.29 times at the end of the year. However, the multiple of each company was still below the regulatory ceilings of ten or twelve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

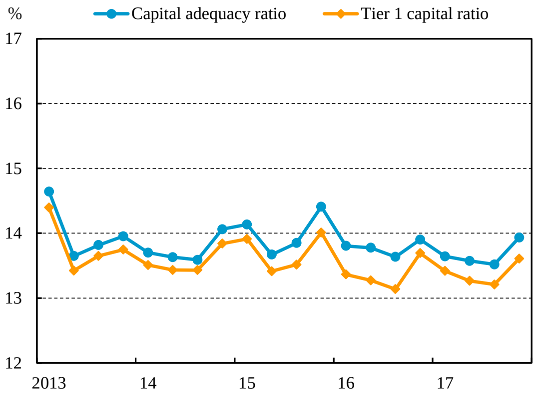
Bills finance companies posted a net income before tax of NT$10.5 billion in 2017, a decrease of 3.74% year on year (Chart 3.52). The decline was mainly driven by a decrease in commission fee income amid intense competition in the CP underwriting business, and an increase in the yielding cost of foreign 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

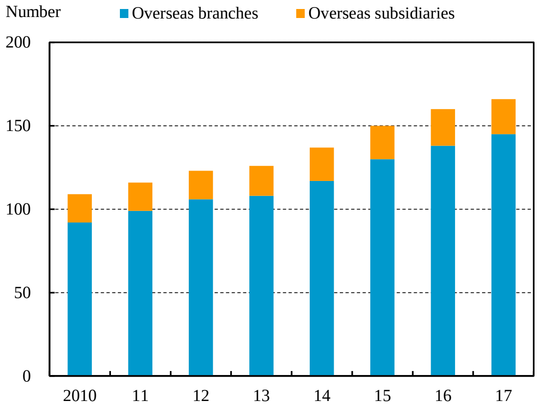
1.1 History of overseas expansion

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

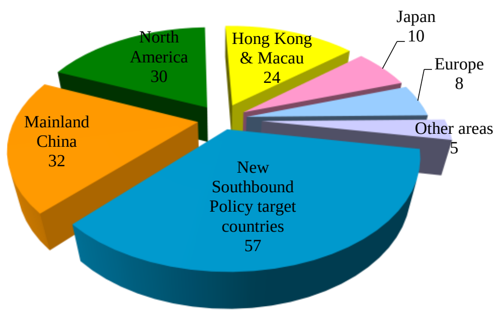
As of the end of 2017, domestic banks had 485 overseas business units,[2] including 145 branches and 21 subsidiaries, both greater than the respective numbers in 2010 (Chart B3.1). As for geographical distribution, most overseas branches or subsidiaries were set up in New Southbound Policy target countries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

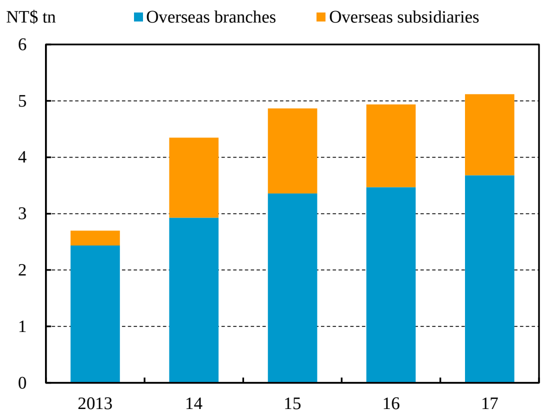
(30), and Hong Kong & Macau (24) (Chart B3.2). This demonstrates that overseas expansion strategies of most domestic banks still focused on the areas where Taiwanese enterprises have trade or investment relationships.

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.

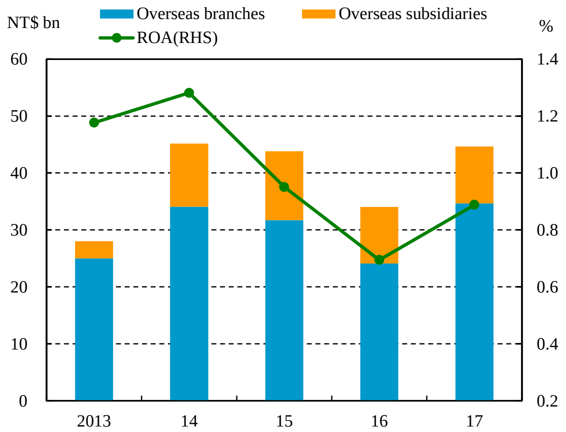
Chart B3.3 Total assets of overseas business units



Source: CBC.

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

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



Source: CBC.

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, 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

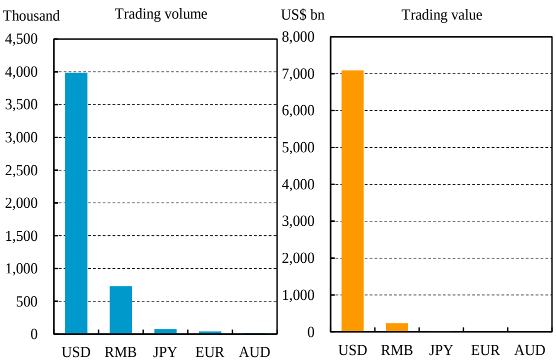
Overview of the three NTD SIPSs

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.

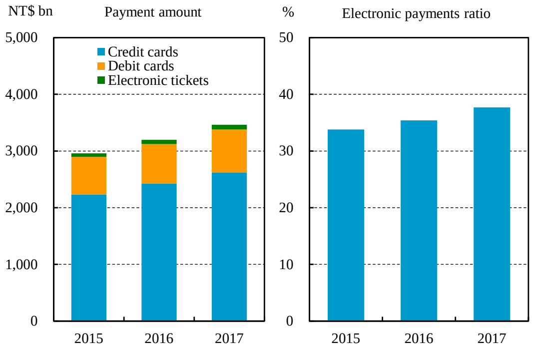
[58] DVP is a clearing mechanism that complies with international standards and ensures that the party that delivers securities (or payment) actually receives the payment (or securities) so as to effectively prevent the risk of default.

[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

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).

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 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.

IV. Measures to maintain financial stability

In 2017, under the circumstances of modest international and domestic economic recoveries as well as mild inflation, Taiwan's financial markets and financial infrastructure maintained smooth operations and sound development. Profitability of financial institutions remained satisfactory, while asset quality, though slightly declining, stayed at an appropriate level, and capital levels continued improving. As a whole, Taiwan's financial system remained stable.

In spite of stable growth in advanced and emerging economies, international financial markets are likely to fluctuate sharply during the period of gradual monetary policy normalization by major central banks. Facing the changes in global and domestic economic and financial conditions, especially monetary policy normalization by the Fed, ECB and BOJ, the rise in trade protectionism, elevated debt levels in Mainland China, a possible major correction in global financial markets and capital outflows from emerging economies, the CBC will continue to closely monitor their influence on the domestic economy and financial system and adopt appropriate monetary, credit, and FX policies as warranted. Meanwhile, the FSC also continues to amend financial laws and regulations and undertake measures to strengthen financial supervision, aiming to foster the soundness of financial institutions and improve financial stability.

4.1 Measures taken by the CBC to promote financial stability

In view of moderate domestic economic recovery and mild inflation, the CBC held policy rates unchanged in 2017. Moreover, the CBC persistently implemented restrictions on high-value housing loans owing to their higher price volatility. The CBC also continually adopted a managed floating exchange rate regime and maintained dynamic stability of the NT dollar exchange rate, as well as timely amending relevant FX regulations.

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

The CBC kept policy rates unchanged

On account of an uncertain global economic outlook and a moderate domestic economic growth, coupled with a negative output gap, mild inflationary pressures and future inflation expectations, tightening financial conditions, and an appropriate level of real interest rates compared to major economies, the CBC kept policy rates unchanged in 2017. The discount rate, the rate on accommodations with collateral, and the rate on accommodations without collateral remained at 1.375%, 1.75%, and 3.625%, respectively.

Reserve money growth remained moderate

The CBC conducted open market operations to keep market liquidity at an appropriate level. In 2017, the excess reserves in all financial institutions remained at a higher level. The total loans and investments in the banking industry grew by 4.79%, while the monetary aggregate M2 increased by 3.75% year on year. Both rates were higher than the GDP growth rate of 2.89%, indicating that market liquidity was sufficient to support economic activity.

The CBC will continue to implement appropriate monetary policies

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

4.1.2 The CBC continued to implement targeted prudential measures on high-value housing loans

In March 2016, the CBC repealed most of the targeted prudential measures imposed on real estate loans, except for high-value housing loans because of higher risks faced by banks resulting from greater volatility in high-value housing prices, and urged banks to exercise self-discipline on mortgage-related credit risk management. In the future, the CBC will continue to monitor financial institutions' credit risk management on real estate loans and the developments in the real estate market, and undertake appropriate policy actions in a timely manner as needed to ensure financial stability.

4.1.3 Safeguarding stability of the NT dollar exchange rate

Adopting flexible FX rate policies

In order to maintain dynamic stability of the NT dollar exchange rate, the CBC adopts a flexible managed floating exchange rate regime. The exchange rate of the NT dollar is in principle decided by market forces. Nevertheless, when seasonal or irregular factors (such as massive inflows or outflows of short-term capital) lead to excess volatility and disorderly movements in the NT dollar exchange rate with adverse implications for domestic economic and financial stability, the CBC will, in line with its mandate, aptly maintain FX market order.

Maintaining an orderly FX market and promoting its sound development

In 2017, the CBC continued to undertake appropriate management measures[69] to safeguard FX market order and promote its sound development. These measures mainly included: (1) continuing to adopt management measures targeting international capital inflows and outflows; (2) urging authorized FX banks to strengthen their FX risk management; (3) strengthening targeted examinations on forward transactions to ensure they are undertaken for real demand purposes; (4) requiring combined position limits of NTD non-delivery forwards (NDFs) and FX options for each authorized FX bank not to exceed one-fifth of its total positions.

4.1.4 Strengthening the AML/CFT mechanism in FX business

Along with the reinforcement of money laundering supervision, the CBC successively amended the regulations governing the FX business of securities firms and banks in December 2017 and January 2018, respectively. Those amendments aimed at urging the banking and securities industries to comply with the *Money Laundering Control Act*, the *Counter-Terrorism Financing Act* and the associated directions when conducting FX business related to confirming customer identity, keeping records, reporting cash transactions exceeding certain amounts as well as declaring suspicious money laundering or terrorism financing transactions, and reporting entities or individuals designated on the sanction list of terrorism financing.

[69] See CBC (2017), *Financial Stability Report*, Chapter IV, May.

4.2 Measures undertaken by the FSC to maintain financial stability

From 2017 onwards, the FSC has continued promoting green financing and building a digital financial environment, as well as encouraging the development of FinTech and supporting industries to realize new business opportunities under the government’s New Southbound Policy. Additionally, the FSC has strengthened financial supervision and risk management of financial institutions so as to maintain financial stability.

4.2.1 Strengthening Taiwan’s AML/CFT measures

1. To enhance Taiwan’s AML/CFT mechanisms and to prepare Taiwan for the *Mutual Evaluation* by the APG in November 2018, the FSC has introduced amendments to the related regulations:

   (1) In May and August 2017, the FSC amended the rules governing OBUs, offshore securities units (OSUs) and offshore insurance units (OIUs), requiring them to perform customer due diligence and incorporate relevant schemes into their internal control and audit systems according to the regulations related to money laundering, as well as industry codes issued by each industry’s association.

   (2) The FSC completed and put the *Regulations Governing Anti-Money Laundering of Financial Institutions* into effect in June 2017. The directions governing internal control systems of AML/CFT of the banking sector, securities and futures industry, as well as the insurance industry were also amended in line with the contents of the aforementioned regulations.

2. The FSC has brought the compliance with AML/CFT regulations into its financial examination focus. The FSC will strengthen financial inspection and urge financial institutions to remedy deficiencies found during examinations.

4.2.2 Persistently enhancing risk management of the banking industry and financial holding companies

1. To enhance banks’ risk management of financial derivatives and to protect customers’ interests, the FSC introduced amendments to the regulations in May 2017 and February 2018, requiring banks to conduct better “Know Your Customer" procedures and evaluation of customer attributes and control of structured product transactions.

2. The FSC amended the *Implementation Rules of Internal Audit and Internal Control System of Financial Holding Companies and Banking Industries* in March 2018. The key amendments were as follows: (1) requiring big banks[70] to set up legal compliance units; (2) stipulating that banks should establish an InfoSec unit and appoint a delegate in charge of InfoSec activities; and (3) requiring financial holding companies and banks to establish an internal whistleblower mechanism.
3. In November 2017, to reinforce the supervisory mechanisms relating to financial holding companies and banks reinvesting in their financial leasing subsidiaries, the FSC required them to establish supervision and management mechanisms and to ensure full implementation of such mechanisms.

4.2.3 Continually reinforcing the insurance industry's risk management and risk-bearing abilities

1. In June 2017, the FSC amended the *Regulations Governing Foreign Investments by Insurance Companies* in order to address insurers' maturity mismatch between assets and liabilities. The amendments require that insurance companies can only invest in callable international bonds that may be redeemed no less than five years from the issue date. For such callable bonds traded in the secondary market, insurance companies can only purchase those that will be redeemed no less than three years after the settlement date.
2. In January 2018, the FSC amended the mechanisms for FX valuation reserves held by life insurance companies. The amendments include: (1) increasing the fixed percentage that shall be set aside for monthly reserves to 0.05%; (2) changing the calculation formula for minimum reserve requirements after FX loss offsetting; (3) raising the valuation change reserves ratio to 75% when the reserves decrease to the minimum level for three consecutive months until the actual reserves recover to more than three times the minimum reserve requirements.

4.2.4 Urging banks to enhance credit checking and post-loan management of syndicated loans

The FSC required banks to strengthen credit checking and loan management of syndicated loans, including: (1) reinforcing credit investigation and financial analysis prior to providing a loan; (2) strengthening the evaluation of each customer's working capital gap and own funds; (3) verifying transaction authenticity and capital flows; (4) fully carrying out post-loan management; and (5) establishing borrower's early warning mechanism.

[70] Big banks include those with total assets of the previous year over NT$1 trillion as audited by a CPA.

4.2.5 Constantly making efforts to establish mechanism for reinforcing management of InfoSec in financial markets

In view of Fintech development and InfoSec incidents that have taken place at home and abroad, the FSC urged financial institutions to strengthen the management of InfoSec in 2017. The measures included reporting the results of InfoSec execution to the board of directors on an annual basis and promoting the integration of financial supervision and InfoSec. Moreover, the FSC conducted InfoSec targeted examinations focusing on both digital financial services and their SWIFT systems, and required financial industry associations to review relevant InfoSec rules and guidelines.

Appendix: Financial soundness indicators[71]

Table 1: Domestic Banks

Unit: %

Items \ Year (end of year)	2012	2013	2014	2015	2016	2017
Earnings and profitability						
Return on assets (ROA)	0.67	0.67	0.77	0.73	0.66	0.66
Return on equity (ROE)	10.44	10.29	11.62	10.65	9.23	9.03
Net interest income to gross income	63.37	60.97	59.34	60.85	60.04	60.03
Non-interest expenses to gross income	54.71	52.81	50.15	52.62	52.01	52.74
Gains and losses on financial instruments to gross income	11.74	14.63	14.11	9.60	11.37	14.75
Employee benefits expenses to non-interest expenses	59.66	59.32	57.50	55.90	56.29	56.75
Spread between lending and deposit rates (basis points)	1.42	1.42	1.42	1.44	1.38	1.36
Asset quality						
Non-performing loans to total loans	0.41	0.39	0.25	0.24	0.27	0.28
Provision coverage ratio	269.07	311.65	502.87	547.66	503.45	490.59
Capital adequacy						
Regulatory capital to risk-weighted assets	12.54	11.83	R12.35	12.93	13.33	14.17
Tier 1 capital to risk-weighted assets	9.49	9.14	9.60	R10.33	10.97	11.78
Common equity Tier 1 capital to risk-weighted assets	-	9.06	9.38	10.03	10.50	11.19
Capital to total assets	6.59	6.60	6.85	7.12	7.37	7.35
Non-performing loans net of provisions to capital	-0.82	-3.24	-3.86	-3.03	-2.49	-2.18
Leverage ratio	-	-	-	5.90	6.29	6.42
Liquidity						
Customer deposits to total loans	129.06	130.06	130.89	136.21	137.25	138.76
Liquid assets to total assets	9.77	13.40	13.17	12.18	10.55	9.75
Liquid assets to short-term liabilities	14.00	18.42	18.32	16.85	14.98	13.37
Liquidity coverage ratio	-	-	-	125.13	125.81	134.76

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

Table 1: Domestic Banks (cont.)

Unit: %

Items \ Year (end of year)	2012	2013	2014	2015	2016	2017
Credit risk concentration						
Household loans to total loans	46.36	47.73	48.67	49.79	50.10	50.93
Corporate loans to total loans	44.82	44.65	44.32	43.74	43.79	43.63
Large exposures to capital	60.60	52.40	42.21	36.97	34.74	31.88
Gross asset positions in financial derivatives to capital	5.84	6.79	15.61	16.62	12.33	6.29
Gross liability positions in financial derivatives to capital	6.11	8.09	15.53	17.35	12.67	7.76
Sensitivity to market risk						
Net open position in foreign exchange to capital	2.91	3.04	2.69	2.91	4.21	3.95
Foreign-currency-denominated loans to total loans	18.10	19.90	21.22	21.55	20.8	20.35
Net open position in equities to capital	22.13	22.71	24.33	22.52	21.73	21.42
Foreign-currency-denominated liabilities to total liabilities	21.84	27.01	29.01	30.58	29.49	26.31

Notes: 1. Figures for “Earnings and profitability” from 2012 are on the TIFRSs basis, while prior years are on the ROC GAAP basis.
2. Figures for “return on assets”and “return on equity” from 2013 are based on the daily average assets and daily average equity.
3. Figures for “Spread between lending and deposit rates” exclude the data of preferred deposits rates of retired government empolyees and central government lending rates.
4. Figures for “Capital adequacy” from 2013 are on the Basel III basis.
5. Figures for “Leverage ratio” and “Liquidity coverage ratio” are published from 2015.
6. Figures for “Large exposures” are revised to the total amount of credit to the first 20 private enterprises at domestic banks after integration.
7. Figures with “R” are revised data.

Table 2: Non-financial Corporate Sector

Units: %, times

Items \ Year (end of year)	2012	2013	2014	2015	2016	2017
Total liabilities to equity						
TWSE-listed companies	110.61	105.35	101.77	94.29	98.33	100.07
OTC-listed companies	87.95	81.22	76.76	76.26	82.52	82.73
Return on equity						
TWSE-listed companies	10.45	14.06	14.78	13.73	14.38	15.81
OTC-listed companies	6.91	9.92	12.21	10.36	10.39	10.44
Net income before interest and tax / interest expenses (times)						
TWSE-listed companies	8.55	13.11	13.38	13.45	13.18	13.60
OTC-listed companies	6.75	11.12	14.50	12.75	12.59	12.88

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

Table 3: Household Sector

Unit: %

Year (end of year) / Items	2012	2013	2014	2015	2016	2017
Household borrowing to GDP	80.09	82.46	82.66	82.98	R 83.49	86.07
Borrowing service and principal payments to gross disposable income	39.21	42.14	43.74	R 46.28	R 47.16	48.34

Notes: 1. Figures for "gross disposable income" are the sum of household disposable income, rent expense and interest expense.
2. Figure of gross disposable income for 2017 is a CBC estimate.
3. Figures with "R" are revised data.

Table 4: Real Estate Market

Unit: index, %

Year (end of year) / Items	2012	2013	2014	2015	2016	2017
Land price index	96.32	105.79	115.07	119.28	118.91	117.24
Residential real estate loans to total loans	28.21	27.91	28.04	28.96	29.35	29.82
Commercial real estate loans to total loans	14.14	14.26	14.70	15.87	16.60	17.54

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

Table 5: Market Liquidity

Unit: %

Year (end of year) / Items	2012	2013	2014	2015	2016	2017
The turnover ratio of trading value in stock market	97.33	82.64	84.63	77.54	64.60	78.40
The monthly average turnover ratio in bond market	12.26	8.59	8.64	7.67	6.62	5.10

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

Abbreviations

ABS	Australian Bureau of Statistics
ACH	Automated clearing house
AML	Anti-money laundering
ANIEs	Asian Newly Industrialized Economies
APG	Asia/Pacific Group on Money Laundering
APRA	Australian Prudential Regulation Authority
ASEAN	Association of South East Asian Nations
BCBS	Basel Committee on Banking Supervision
BICRA	Banking Industry Country Risk Assessment
BIS	Bank for International Settlements
BNM	Bank Negara Malaysia
BOJ	Bank of Japan
BOK	Bank of Korea
BOT	Bank of Thailand
BSI	Banking System Indicator
CBC	Central Bank of the Republic of China (Taiwan)
CBOE	Chicago Board Options Exchange
CCHS	Check Clearing House System
CFT	Countering the financing of terrorism
CGSS	Central Government Securities Settlement System
CIFS	CBC Interbank Funds Transfer System
CP	Commercial paper
CPI	Consumer price index
CRS	Common Standard on Reporting and Due Diligence for Financial Account Information ("Common Reporting Standards")
DBUs	Domestic banking units

DGBAS	Directorate-General of Budget, Accounting and Statistics of the Executive Yuan
DLT	Distributed ledger technology
D-SIBs	Domestic systemically important banks
DVP	Delivery-versus-payment
ECB	European Central Bank
ETF	Exchange-traded fund
ETPs	Exchange-traded products
EU	European Union
EUR	Euro
FATCA	Foreign Account Tax Compliance Act
FDIC	Federal Deposit Insurance Corporation
Fed	Federal Reserve System
FinTech	Financial technology
FISC	Financial Information Service Co., Ltd
F-ISAC	Financial Information Sharing and Analysis Center
FSA	Financial Services Agency, Japan
FSB	Financial Stability Board
FSC	Financial Supervisory Commission
FSIs	Financial soundness indicators
FSS	Financial Supervisory Service, South Korea
FX	Foreign exchange
GAAP	Generally accepted accounting principles
GBP	British pound
GDP	Gross domestic product
G-SIBs	Global systemically important banks
HKMA	Hong Kong Monetary Authority
IFRSs	International Financial Reporting Standards
IMF	International Monetary Fund
InfoSec	Information security
IOSCO	International Organization of Securities Commissions
IRS	Interbank Remittance System
JCIC	Joint Credit Information Center

JPY	Japanese yen
KRW	Korean won
LCR	Liquidity coverage ratio
MLF	Medium-term lending facility
MOF	Ministry of Finance
MOI	Ministry of Interior
MPI	Macro-prudential indicator
NCDs	Negotiable certificates of deposit
NDFs	Non-delivery forwards
NPL	Non-performing loan
NTD	New Taiwan dollar
OBUs	Offshore banking units
OECD	Organization for Economic Co-operation and Development
OIUs	Offshore insurance units
OPEC	Organization of the Petroleum Exporting Countries
OSUs	Offshore securities units
OTC	Over-the-counter
PBC	People's Bank of China
PP	Percentage point
PSL	Pledged supplementary lending
PVP	Payment-versus-payment
RBC	Risk-based capital
repos	Repurchase agreements
RMB	Renminbi
ROA	Return on assets
ROC	Republic of China
ROE	Return on equity
RTGS	Real time gross settlement
SEC	US Securities and Exchange Commission
SIPSs	Systemically important payment systems
SLF	Standing lending facility
SSE	Shanghai Stock Exchange
TAIEX	Taiwan Stock Exchange Weighted Index

TCH	Taiwan Clearing House
TEJ	Taiwan Economic Journal Co., Ltd
TIFRSs	Taiwan-IFRSs
TLF	Temporary liquidity facilities
TPEx	Taipei Exchange Capitalization Weighted Stock Index
TWSE	Taiwan Stock Exchange
USD	US dollar
VaR	Value at risk
VIX	Volatility index
WPI	Wholesale price index

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