Central Bank of the Republic of China (Taiwan)

Financial Stability Report

May 2017 | Issue No. 11

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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 is current as of April 30, 2017.

Abstract

In 2016, the global economy rebounded following a slowdown. Though facing challenges and uncertainties, international financial markets improved continually. Meanwhile, the growth momentum of Taiwan's economy picked up. 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 growth in advanced economies was less than expected in 2016. The growth rate in the US economy recovered after a slowdown, while the recovery in the euro area and Japan remained tepid, and the economic performances across emerging economies appeared uneven. The recovery in advanced economies is expected to proceed at a moderate pace in 2017, as predicted by IHS Global Insight, while growth momentum in emerging economies will increase. With regard to international financial conditions, short-term risks affecting global financial stability decreased in 2016. However, owing to uncertainties surrounding US economic and trade policies, and political and economic conditions in the euro area, along with weakening profitability of banks in the euro area, and high corporate leverage in several emerging economies, global financial stability faces severe challenges.

Regarding the domestic economy, in 2016, exports expanded substantially and the growth momentum enhanced along with stable inflation. Because of successive balance of payments surpluses, the amount of foreign exchange reserves climbed, while the external debt-servicing capacity remained sound. Fiscal deficits reversed to increase and the government's debt level mounted marginally. The *Fiscal Health Plan* was carried out continuously to enhance fiscal soundness. The profitability of listed companies rose and their short-term debt-servicing capacity decreased; however, the credit quality of corporate loans stayed healthy. Household

borrowing slowed down, the debt burden lessened and credit quality remained satisfactory. Real estate market trading volume contracted while house prices declined gradually. Nevertheless, the mortgage burden remained heavy.

Financial markets, financial institutions and financial infrastructures operated smoothly

As for financial markets, the bill and bond issuance in the primary market increased; stock indices fluctuated with an upward trend and foreign exchange markets remained dynamically stable. With respect to financial institutions, the profitability and asset quality of domestic banks, though slightly lower in 2016, remained sound, capital levels rose and ample liquidity persisted. Life insurance companies saw decreasing profitability and faced higher foreign exchange risks; however, financial conditions still exhibited sound fundamentals. Bills finance companies reported higher pretax net income, but still needed to pay attention to liquidity risks. With regard to financial infrastructures, the major payment systems operated smoothly during 2016. The CBC continued to expand the functions of the foreign currency-clearing platform to provide the Australian dollar remittance service. Meanwhile, the CBC and the FSC also took active measures promoting sound domestic FinTech development.

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

From 2016 onwards, the CBC successively adopted appropriate monetary, credit, and foreign exchange policy measures in response to the uncertainties surrounding the evolution of global and domestic economic and financial conditions. The underlying measures included lowering policy rates two times, maintaining the growth of broad monetary aggregates at appropriate levels, unwinding most targeted prudential measures for real estate loans and implementing a flexible managed float foreign exchange rate regime. Moreover, to pursue the operating objective of promoting financial stability, the CBC also revised foreign exchange regulations to keep in line with the government's anti-money laundering policies. Meanwhile, the FSC has strengthened regulations governing anti-money laundering and countering the financing of terrorism (AML/CFT) and persistently enhanced banks' risk management and risk-bearing abilities, including requiring domestic banks to carry out stress tests, improving banks' management of complex, high risk financial derivatives, and promulgating the *Standards Implementing the Net Stable Funding Ratio of Banks* together with the CBC to maintain

financial stability.

Taiwan's financial system remained stable

In 2016, although facing changing international and domestic economic conditions, financial markets operated smoothly. The profitability and asset quality of domestic financial institutions remained at a healthy level. Meanwhile, their financial conditions exhibited better fundamentals. All three major payment systems functioned along an orderly trajectory. In the hope of promoting financial stability, the CBC and the FSC formulated adequate policies and measures. Overall, the financial system in Taiwan remained stable. In the future, the CBC and the FSC will continue to closely monitor the influence of global and domestic economic and financial conditions on the domestic financial system and adopt appropriate policies to improve financial stability.

I. Overview

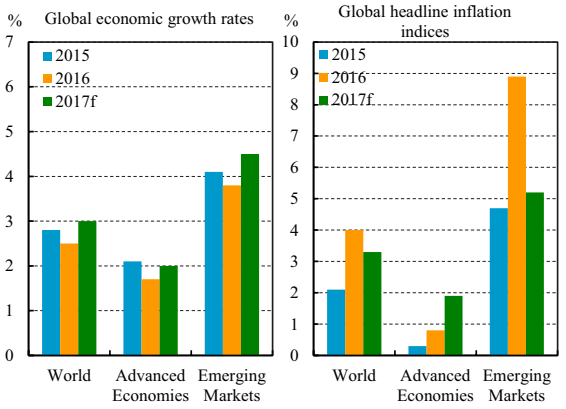
Macro environmental factors potentially affecting financial system

Global economy rebounded after experiencing deceleration, and international financial markets improved continually

Global economy resumed growth after experiencing deceleration, and inflation rose gradually

In 2016, the global economy saw its weakest growth since the subprime financial crisis, and the recovery of major economies was sluggish. The growth in the US was less-than-expected owing to decreases in inventory and energy sector investments. The recovery in the euro area and Japan, affected by various unfavorable factors, remained tepid. Moreover, growth momentum in emerging economies waned, reflecting decelerated economic growth in Mainland China and Latin American economies. IHS Global Insight predicts [1] world real GDP growth to rebound to 3.0% in 2017. Real GDP in advanced economies, driven by an acceleration in US growth, is projected to increase to 2.0%. Meanwhile, the average growth rate in emerging economies is expected to increase to 4.5%, thanks to a pickup in commodity and oil prices that is likely to bolster economic growth (Chart 1.1).

Chart 1.1 Global economic growth rates and headline inflation indices



Note: Figures for 2017 are IHS Global Insight estimates.
Source: IHS Global Insight (2017/5/15).

[1] IHS Global Insight estimate on May 15, 2017.

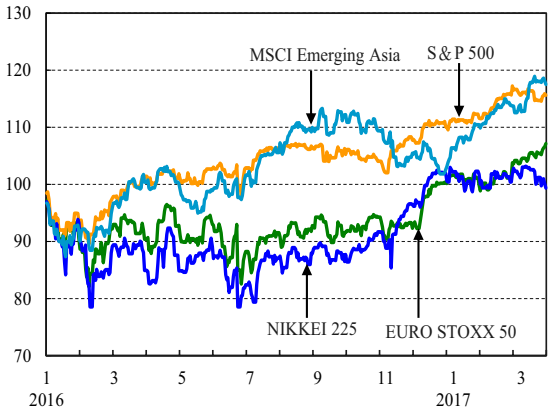
Regarding consumer prices, owing to the stabilization of commodity, oil and cereals prices, consumer price index (CPI) inflation rates in advanced economies increased marginally to 0.8% in 2016. Nonetheless, during the same period, the CPI for emerging economies hiked to 8.9%, reflecting a soaring inflation rate in Venezuela, and in turn pushed up the global CPI inflation rate to 4.0%. IHS Global Insight predicts the global headline inflation rate to fall to 3.3% in 2017, dragged by descending headline inflation in emerging economies[2] (Chart 1.1).

Global financial stability risks decreased, but prolonged low interest rates as well as political and policy uncertainties will present challenges

From 2016 onwards, commodity prices stabilized and economic conditions in several economies improved. Meanwhile, long-term interest rates rose gradually, enhancing the interest margins and long-term profitability of banks and insurance companies. Consequently, global financial stability risks decreased. However, political and economic policy uncertainties arising from protectionism and a possible change in US policy direction, as well as the prolonged low growth and low interest rate environment that has impaired the profitability of banks and solvency of insurance companies and pension funds, will continue to pose challenges for global financial markets.

The profitability of banks in certain advanced economies was weak and might face higher risks in the future. Though US banks had better performance, European banks' large stock of nonperforming assets might become a drag on their future profits. Meanwhile, Japanese banks reported weak performance because of narrowing interest spreads. Against this backdrop, stock prices in the US rose continually in 2016, while those in the euro area and Japan remained low in the first three quarters and rebounded in Q4 (Chart 1.2). Nevertheless, the Japanese yen, driven by mounting hedging needs, appreciated greatly in the first three quarters of 2016, while the

Chart 1.2 Performance of international equity indices



Notes: 1. January 1, 2016 = 100.
2. The EURO STOXX 50 Index is derived from 50 stock indices in 12 major economic bodies in the euro area.
Source: Bloomberg.

[2] On May 15, 2017, IHS Global Insight predicted the headline inflation rates of Latin America and Russia to decrease to 11.6% and 4.2% in 2017 from 29.3% and 7.0% in 2016, respectively, leading to a fall in the CPI inflation rate in emerging economies.

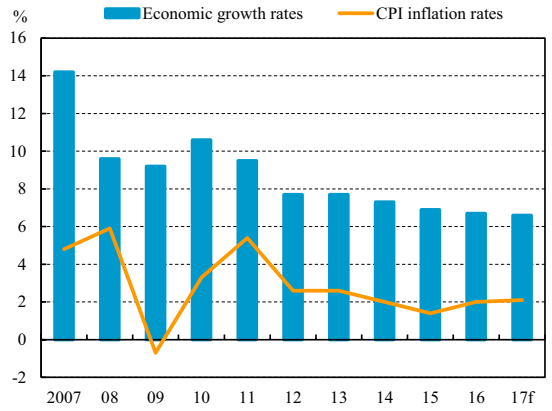
British pound and the euro depreciated after the Brexit referendum in June. Later in November, the outcome of the US presidential election and the Fed's interest rate hike pushed up the US dollar. Afterwards, the Japanese yen, the British pound and the euro depreciated markedly before they turned to appreciation in 2017 Q1.

In 2016, thanks to stabilization of commodity prices and improvements in economic conditions in several economies, the short-term financial risks in emerging markets abated. However, the overall financial stability risks remained high owing to elevated corporate leverage in several emerging economies and negative spillover effects stemming from political and policy uncertainties in major advanced economies. If international capital reverses to outflow and induces disorderly deleveraging in the future, corporates will see their funding costs increase and profits decrease, which may pose severe challenges to banks. Moreover, Mainland China, with a rising credit overhang and maturity mismatches between assets and liabilities in many of their financial institutions, faced moderate credit and liquidity risks. Underpinned by massive international capital inflows, stock prices in Asian economies rose in the first three quarters of 2016. However, the stock prices displayed a downtrend in Q4 owing to capital outflows triggered by the Fed's interest rate hike (Chart 1.2). In the meantime, their currencies depreciated after a period of appreciation.

Mainland China's economic growth momentum waned, while the renminbi depreciated considerably

Mainland China's economic growth rate dipped to 6.7% throughout 2016 from 6.9% a year before. IHS Global Insight predicts the growth rate to continue falling to 6.6% in 2017. Regarding consumer prices, the CPI inflation rate of Mainland China stood at 2.0% in 2016, lower than the official target of 3.0%. IHS Global Insight projects the annual CPI inflation rate of 2017 to increase to 2.1% (Chart 1.3).

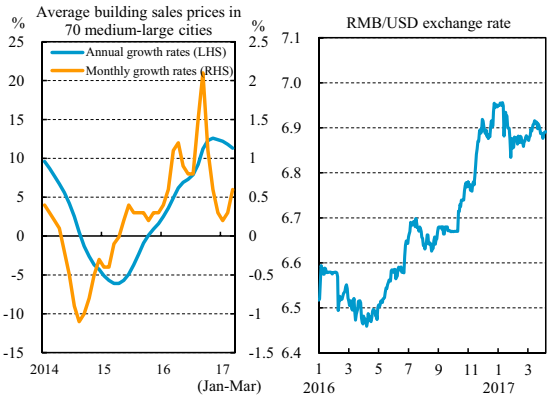
Chart 1.3 Economic growth rates and CPI inflation rates of Mainland China



Note: Figures for 2017 are IHS Global Insight projections.
Sources: National Bureau of Statistics of China and IHS Global Insight (2017/5/15).

In 2016, driven by Mainland China's easy monetary policy, massive capital flew into its housing market, leading to a steep rise in housing prices of the first- and second-tier cities. In the beginning of 2017, the upward trend continued, causing housing prices of the third- and fourth-tier cities to rise. In response to that, Mainland China's government implemented diverse control policies in different cities[3] to stabilize housing prices. In the first half of 2016, the renminbi exchange rate depreciated after appreciating. Moreover, owing to the combined effect of capital outflows and expectations of the renminbi's depreciation, the renminbi depreciated more in the second half of the year. In 2017 Q1, the renminbi rebounded slightly (Chart 1.4). In addition, the Shanghai Stock Exchange (SSE) Composite index stayed low and fluctuated within a narrow range triggered by capital outflow.

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



Sources: Thomson Reuters and CBC.

Meanwhile, the annual growth rate of aggregate financing to the real economy in 2016 rose to 12.8% from 12.4% a year earlier, mainly resulting from increases in mortgage and off-balance sheet financing. Moreover, credit risks elevated as the NPL ratio of commercial banks edged up to 1.74% at the end of 2016. With local government debts coming due, debt-swap programs and debt-ceiling measures were successively launched in response.

Domestic macro environment

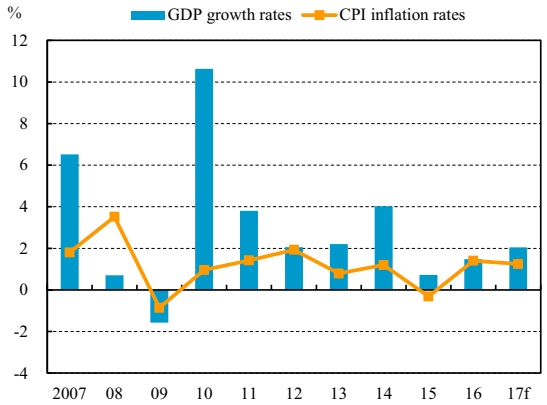
Domestic growth momentum picked up, while consumer prices rose mildly and the external debt servicing capacity remained sound

Bolstered by expanding exports as well as moderately growing private consumption and investment, the annual domestic economic growth rate registered 1.48% in 2016, higher than the 0.72% of the previous year. Meanwhile, domestic prices rose mildly throughout 2016, reflecting the fact that the average CPI inflation rate increased to 1.4% from the -0.31%

[3] The control policies refer to restrictions on home purchases, mortgages, and sales implemented in cities with surging house prices. The policies include: (1) limiting the quantity and size of housing units purchased by residents with or without household registrations; (2) raising the down payment for a mortgage; (3) prohibiting individuals or legal persons from transferring properties within a specified period after acquiring the property ownership certificates.

recorded a year earlier. It is expected that, in 2017, external demand will continue picking up, and private consumption will grow mildly. Meanwhile, the government will carry out its *Forward-looking Infrastructure Development Program* to boost investment momentum. As a result, the DGBAS forecasts[4] Taiwan's economic growth rate to increase continually to 2.05% in 2017. The CBC projects the annual CPI inflation rate to post 1.25%,[5] indicating prospects of mild inflation (Chart 1.5).

Chart 1.5 Economic growth rates and CPI inflation rates of Taiwan



Note: Figure for economic growth rate in 2017 is DGBAS projection on May 26, 2017; figure for CPI in 2017 is CBC estimate on March 23, 2017.
Sources: CBC and DGBAS.

Taiwan's external debt increased slightly to US$172.2 billion at the end of 2016 while foreign exchange reserves remained at a sufficient level of US$434.2 billion, implying a robust capacity to service external debt. Regarding the government's fiscal position, the amount of the fiscal deficit saw an expansion, increasing to 0.79%[6] of annual GDP in 2016. The outstanding public debt at all levels of government in 2016 grew but at a slower pace than GDP. Consequently, the ratio of outstanding public debt to annual GDP declined marginally to 36.46%.[7] The Ministry of Finance continued implementing the *Fiscal Health Plan* and *Central Government Debt Improvement Plan* to improve the structures of fiscal revenue and expenditure, and control the scale of public debt.

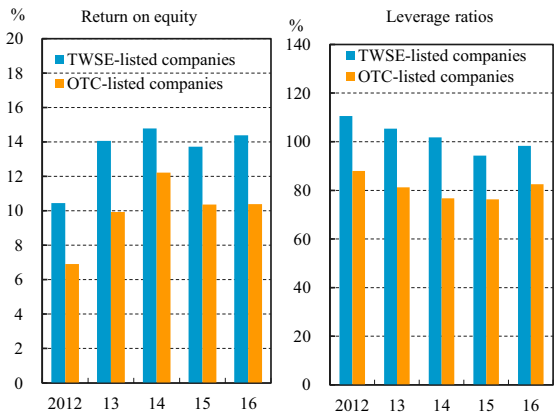
Corporate sector saw better profitability and sound credit quality

In 2016, thanks to a rebound of international raw material prices and expanding exports in Taiwan, the profitability of Taiwan Stock Exchange (TWSE) listed and over-the-counter (OTC) listed companies enhanced. Although their leverage ratios elevated (Chart 1.6) and short-term debt servicing capacity fell, both remained at a heathy level.

[4] The figures are based on a DGBAS press release on May 26, 2017.
[5] The CBC estimate on March 23, 2017.
[6] 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*.
[7] As a comparison, outstanding debt in EU member nations is not allowed to exceed 60% of GDP, according to the *Maastricht Treaty* and the subsequent *Stability and Growth Pact*.

The NPL ratio of corporate loans continued to decline to 0.32% at the end of 2016, the lowest level on record, reflecting sound credit quality for the corporate sector. However, pressure from intense global competition, trade protectionism, and the crowding-out effect caused by industrial supply chain localization in Mainland China may have impacts on future operation and investment growth of domestic corporates, which warrants close attention.

Chart 1.6 Return on equity and leverage ratios in corporate sector

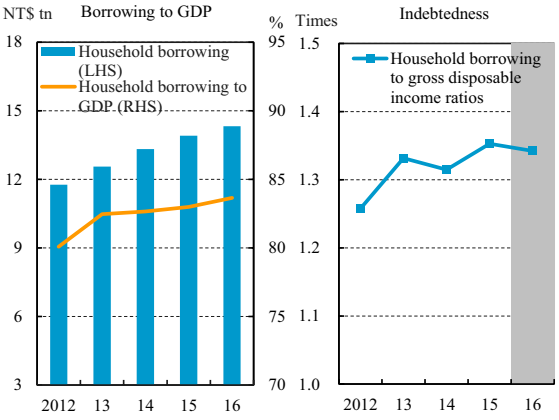


Notes: 1. Return on equity = net income before interest and tax/average equity.
2. Leverage ratio = total liabilities/total equity.
Source: TEJ.

Household debt burden alleviated slightly and credit quality remained sound

In 2016, total household borrowing continued to grow at a slower pace and reached NT$14.32 trillion at the end of the year, equivalent to 83.65% of annual GDP. As total disposable income grew at a faster pace in 2016, the ratio of household borrowing to total disposable income shrank to 1.34 at the end of the year, reflecting a lessening of the household debt burden (Chart 1.7).

Chart 1.7 Household indebtedness



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

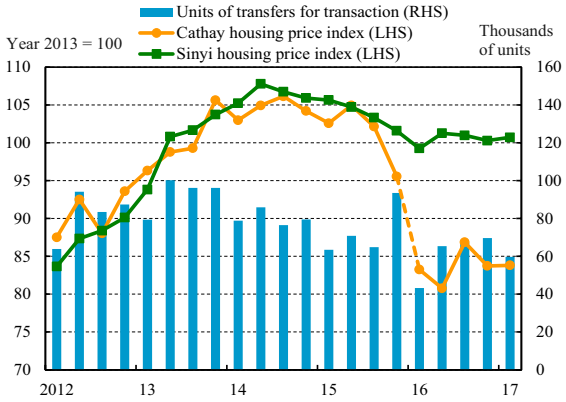
At the end of 2016, the NPL ratio of household borrowing elevated slightly but only to a low level of 0.25%, indicating satisfactory credit quality. Moreover, the domestic unemployment rate and interest rate on loans remained low, which could help sustain the debt servicing capacity of households.

Real estate market saw contracting trading volume and sliding housing prices, while mortgage burden remained heavy

In 2016, since the real estate market remained gloomy, and the property tax burden became

heavier, the total number of building ownership transfers for transaction declined by 16.12% compared to that of the previous year, showing that the trading volume in the real estate market kept contracting. In 2016, housing prices declined slowly as both the Sinyi housing price index (for existing residential buildings) and Cathay housing price index (for new residential buildings) in Q4 remained lower than the highest points recorded in 2014 (Chart 1.8). However, the real estate market showed signs of stabilization in 2017 Q1.

Chart 1.8 Building ownership transfers for transaction and real estate price indices



Notes: 1. For comparison purposes, the two indices use the same base year of 2013.
2. Cathay housing price index changed its compilation method in 2016 Q1, using a new definition of standard housing units and amending the bargaining rate estimation techniques.

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

In 2016, housing prices and mortgage interest rates trended downwards, and the growth of household disposable income slowed. As a result, in Q3, the debt servicing ratio for housing loans and the house price to income ratio for Taiwan declined year on year to 38.49% and 9.35, respectively. Among all areas, the debt servicing ratio for housing loans and the house price to income ratio in Taipei City were the highest, reaching 63.71% and 15.47, respectively, implying a still-heavy debt burden.

Financial system assessment

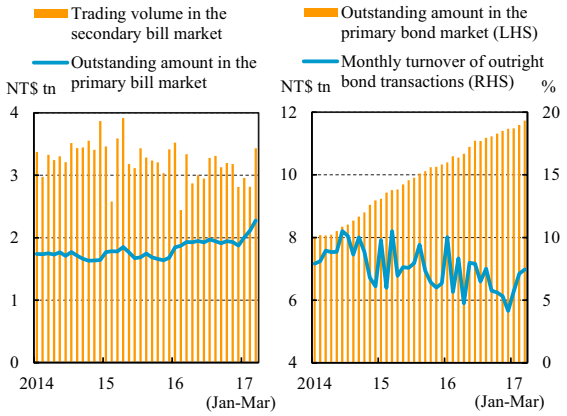
Financial markets

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

The total amount of bills outstanding in the primary market at the end of 2016 increased markedly by 11.67% year on year. However, trading volume in the secondary market decreased by 6.16% over the same period. It reflected the fact that most of the bills underwritten by bills finance companies were immediately sold outright to banks in the secondary market after issuance, while banks that purchased the bills generally adopted a buy-and-hold strategy to those positions. In 2017 Q1, the amount of bill issuance in the

primary market continued to expand while trading volume in the secondary market remained roughly flat. Meanwhile, the total amount of bonds outstanding at the end of 2016 ascended by 11.0% year on year. The reason was mainly that the issuance of international bonds grew sharply. However, trading volume in the secondary bond market contracted, owing to an amplified concentration of bonds held by life insurance companies and banks. In December 2016, the monthly turnover ratio of outright transactions of the major bonds[8] in the secondary market dipped to a new low of 4.14% but rebounded slightly in 2017 Q1 (Chart 1.9).

Chart 1.9 Primary and secondary bill and bond markets



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

Sources: CBC and FSC.

As for market rates, the interbank overnight call loan rate stayed low in 2016, affected by the two policy rate cuts of the CBC. The yield on Taiwan's long-term 10-year government bonds also tumbled to a record low of 0.63% in August, but rebounded after the Fed signaled a possible interest rate hike. In 2017 Q1, the yield fluctuated within a narrow range. Looking forward, considering that global economic and financial conditions have changed dramatically and long-term interest rates in Taiwan may follow the movement of US government bond yields and trend upwards, the related interest rate risk warrants close attention.

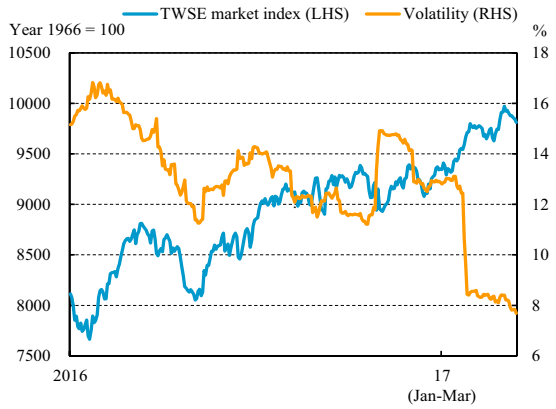
Stock indices trended up amid falling volatility

In 2016, thanks to the pickup in major international stock markets and domestic economic growth, the Taiwan Stock Exchange Weighted Index (TAIEX) of the TWSE market trended upwards after fluctuating and registered 9,254 at the end of the year, posting an increase of 10.98% year on year. In 2017 Q1, the TAIEX continued its upward path, buoyed by the fact that the US stock market continued hitting new highs and massive foreign capital flew into domestic markets (Chart 1.10).

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

In 2016, volatility in the TWSE market dropped gradually from the high level of 16.82% registered in the beginning of the year to 12.94% at the end of the year. In 2017, volatility fell continually to 7.69% at the end of March (Chart 1.10).

Chart 1.10 TWSE market index and volatility

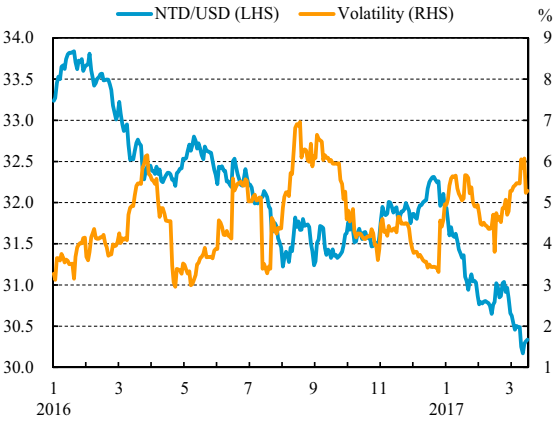


Note: Volatility refers to the annualized standard deviation of 60-day daily index returns.
Sources: TWSE and CBC.

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

In the first three quarters of 2016, owing to massive foreign capital inflows, the NT dollar exchange rate appreciated against the US dollar, reaching a high level of 31.225 on August 10. In Q4, owing to the expectations that the US might increase fiscal expenditure and the Fed's interest rate hike in December, the NT dollar exchange rate turned to depreciation against the US dollar. At the end of 2016, the NT dollar exchange rate stood at 32.279, with annual appreciation of 2.44%. In 2017 Q1, affected by continuous foreign capital inflows, the NT dollar exchange rate returned to appreciation, posting 30.336 against the US dollar at the end of March (Chart 1.11).

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.

Volatility in the NT dollar exchange rate against the US dollar fluctuated between 2.96% and 6.96% in 2016, and registered an annual average of 4.52%. In 2017 Q1, volatility moved between 3.32% and 6.07% (Chart 1.11). However, the NT dollar exchange rate was relatively stable compared to volatility in the exchange rates of major currencies such as the Japanese yen, euro, Korean won and Singapore dollar against the US dollar.

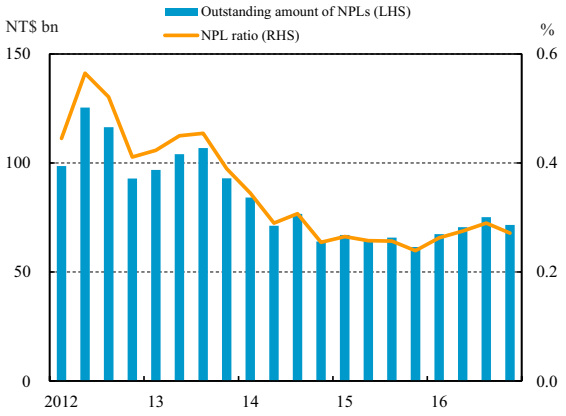
Financial institutions

Domestic banks maintained healthy asset quality and profitability, and reported a higher average capital adequacy ratio

In 2016, customer loans of domestic banks grew steadily. In terms of borrowers of loans, the credit concentration of corporate loans increased slightly whereas that of real estate loans descended marginally. As of the end of 2016, the NPL ratio of domestic banks slightly increased year on year but still held at a sound level (Chart 1.12), while loan loss reserves remained ample. Meanwhile, the aggregate amount of exposure to Mainland China contracted continually. At the end of 2016, the ratio of the aggregate amount of such exposure to banks' net worth decreased to 51%, within the statutory limit and with no domestic bank exceeding the limit.

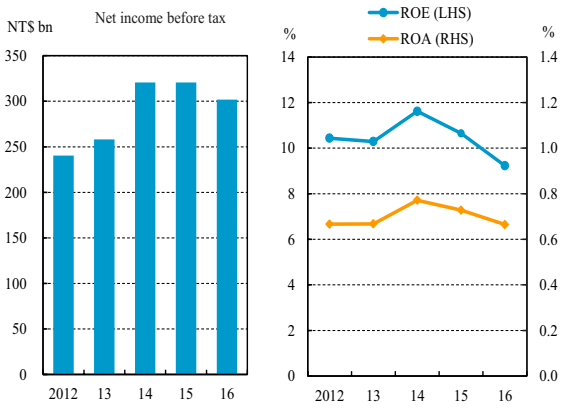
The net income before tax of domestic banks was NT$301.9 billion in 2016, decreasing by 5.85% year on year. The average return on equity (ROE) and return on assets (ROA) remained sound; however, they fell respectively to 9.23% and 0.66% (Chart 1.13). At the end of 2016, the average capital adequacy ratio of domestic banks continually rose to 13.33% with satisfactory capital quality, which may help reinforce their loss-absorbing capacity.

Chart 1.12 NPL ratios 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.

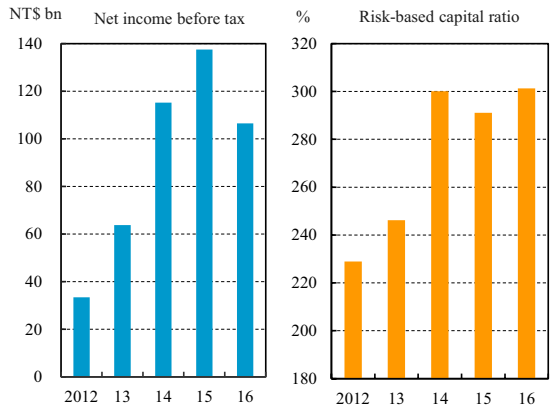
Life insurance companies saw decreasing profitability, but their financial condition still exhibited sound fundamentals

Life insurance companies reported a net income before tax of NT$106.5 billion in

2016, decreasing by 22.58% over the previous year (Chart 1.14). This was chiefly driven by foreign exchange losses deriving from the appreciation of the NT dollar exchange rate against the US dollar, as well as increases in commission expenses and policy provisions for new insurance policies.

In 2016, life insurance companies strengthened their capital positions through operating profits and issuance of subordinated debt. As a result, the average risk-based capital (RBC) ratio elevated to 301.25% at the end of the year (Chart 1.14), implying sound financial fundamentals. As for their market risks, foreign exchange markets exhibited heightened volatility recently. Consequently, life insurance companies with large unhedged foreign currency positions might face higher foreign exchange risk.

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



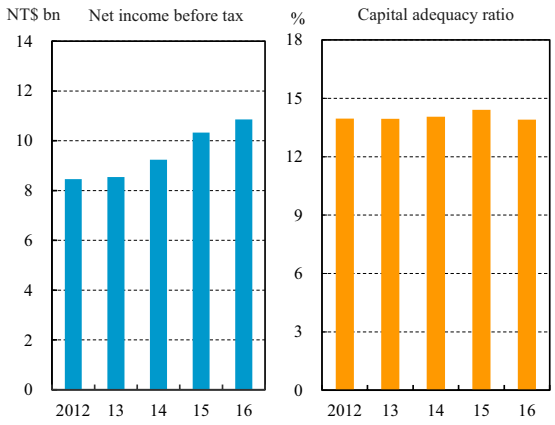
Note: Figures for risk-based capital ratios exclude insurance companies taken into receivership by the FSC.
Source: FSC.

Bills finance companies reported higher net income before tax, but liquidity risk warrants close attention

In 2016, short-term interest rates continued to stay low, attracting corporates to raise funds through money markets. Against this backdrop, the outstanding guarantees business undertaken by bills finance companies increased continually at the end of 2016, while credit quality remained satisfactory. Considering that maturity mismatches between assets and liabilities persisted in bills finance companies, their liquidity risk warrants close attention.

Nonetheless, thanks to the widening spread in yielding operations and an increase in underwriting revenue, bills finance companies

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



Source: CBC.

posted a net income before tax of NT$10.9 billion in 2016, increasing by 5.13% year on year. Their average capital adequacy ratio declined to 13.90% (Chart 1.15), due to an increase in total risk-weighted assets driven by mounting non-government bond investment positions. However, individual ratios for each bills finance company remained higher than 12%.

Financial infrastructure

The CBC continued to expand the functions of the foreign currency clearing platform and responded proactively to FinTech developments

In 2016, all three systemically important payment systems (SIPSs)[9] in Taiwan were functioning smoothly. The CBC continued to expand the functions of the foreign currency clearing platform, currently providing US dollar, renminbi, Japanese yen, euro and Australian dollar remittance services. The remittances transferred via the platform were processed without intermediary banks, which have saved approximately NT$2.1 billion of remittance fees for customers as of the end of 2016.

Moreover, in response to the developments of FinTech, the CBC not only established the Digital Finance Group dedicated to researching issues related to blockchain and virtual currencies, but also urged the Financial Information Service Co., Ltd. (FISC) to invite financial institutions to jointly establish a committee aiming at conducting financial blockchain research and experimentation. In addition, the FISC actively assisted local financial institutions in providing mobile payment services for online fund transfers, bill and tax payments, and shopping, as well as establishing safe and convenient identity authentication mechanisms.

Other financial regulatory reforms

To strengthen banks' liquidity risk management and follow international standards, in December 2016, the FSC, together with the CBC, promulgated the *Standards Implementing the Net Stable Funding Ratio of Banks*, which will be implemented from January 1, 2018. In addition, to promote sound domestic FinTech development, the FSC amended related regulations and planned to set up a FinTech innovation experiment mechanism, with an aim

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

to encourage the domestic financial services industry as well as other related industries to apply technology innovations to enhance the effectiveness of financial services.

In order to reinforce the mechanism of AML/CFT, Taiwan's government promulgated the *Money Laundering Control Act* as well as the *Terrorism Financing Prevention Act*[10] in 2016. In March 2017, the Anti-Money Laundering Office was established, demonstrating Taiwan's resolution to fight against money laundering. Moreover, to continue converging with the *International Financial Reporting Standards* (IFRS), entities in Taiwan will adopt the IFRS 9 *Financial Instruments* from 2018 onwards. Considering that the IFRS 9 is expected to have a wide range of impacts, the affected entities shall be well-advised to evaluate potential impacts and develop responsive measures. In addition, to promote development of the financial services industry, the CBC continued to relax foreign exchange regulations of financial institutions in 2016.

Taiwan's financial system remained stable

In 2016, domestic economic growth picked up, while consumer prices rose mildly. Against this backdrop, domestic financial markets operated smoothly. The profitability and asset quality of domestic financial institutions deteriorated slightly but still remained at a healthy level. Meanwhile, the capital adequacy ratio of most domestic financial institutions increased. The three major payment systems also functioned along an orderly trajectory. By and large, the financial system in Taiwan remained stable.

The upcoming events emanating from the evolution of domestic and international economic and financial conditions that may have impacts on Taiwan's real economy and financial system necessitate increased vigilance. Above all, the possible US policy outcomes, the timetable of the Fed's interest rate hikes, the rise of protectionism, the Brexit negotiation process, the political and economic conditions of the euro area, and the spillovers from Mainland China's economic transformation and financial risks deserve special attention. In response, the CBC will pay close attention and formulate adequate monetary, credit and foreign exchange policies to mitigate the impacts. Meanwhile, the FSC will persist in revamping financial regulations and enhancing financial supervisory measures in the hope of facilitating the soundness of financial institutions and promoting financial stability.

[10] "Terrorism financing" referred to in the *Terrorism Financing Prevention Act* are activities that provide financing to terrorist activities, terrorist groups, or individual terrorists.

II. Macro environmental factors potentially affecting financial system

2.1 International economic and financial conditions

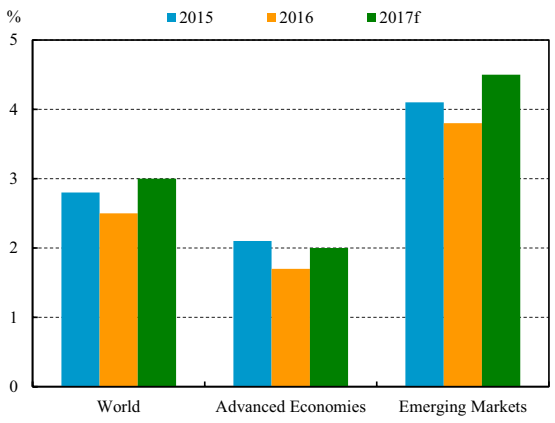
2.1.1 International economic conditions

Global economic growth waned in 2016 but momentum has been building

Affected by the lower-than-expected growth in advanced economies and the slowdown in emerging economies, the global economic growth rate was merely 2.5% in 2016, the lowest level since the 2008-09 financial crisis. Among advanced economies, economic growth in the US was below expectations owing to lackluster growth in inventory, energy sector investment, and exports. By contrast, euro area growth remained steady despite this region facing increasing political and financial risks. Japan continued with its accommodative monetary policy and fiscal stimulus, but sluggish consumption clouded its economic growth. Meanwhile, growth in emerging economies continued decelerating, reflecting the impacts of weaker growth in Mainland China and some Latin American countries.

Looking ahead to 2017, IHS Global Insight predicts[11] world real GDP growth to be 3.0%. Among them, economic growth in advanced economies is projected to increase to 2.0% driven by the recovery in the US. In the meantime, in spite of the economic slowdown in Mainland China, the average growth rate in emerging economies is forecast to increase to 4.5% thanks to a more stable economy in Brazil and Russia, buoyed by increasing commodity and oil prices (Chart 2.1). Although the global economy is gradually gaining momentum, uncertainties surrounding

Chart 2.1 Global economic growth rates

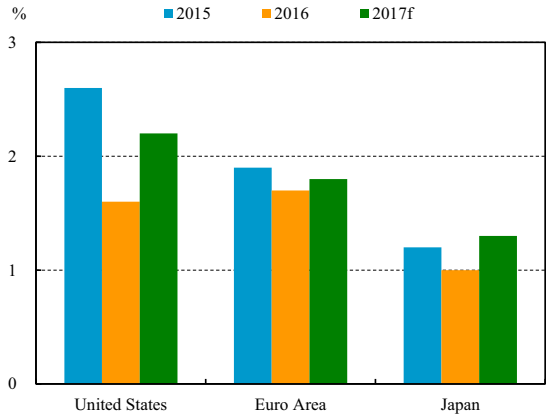


Note: Figures for 2017 are IHS Global Insight estimates.
Source: IHS Global Insight (2017/5/15).

[11] See Note 1.

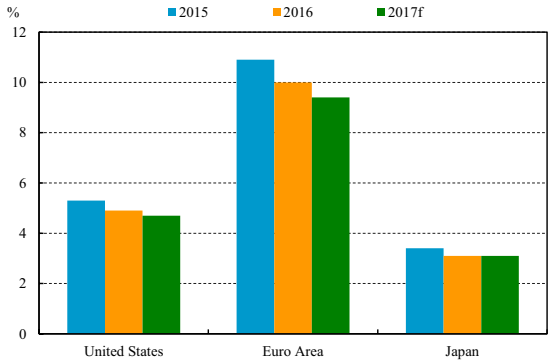
US policy actions, slower growth in Mainland China and the threat of deepening geopolitical tensions may cause higher global economic risks. In addition, despite the fact that rapid development of free trade has boosted global income, it has always been accompanied by increased income inequality and a shift toward trade protectionism. These factors could trigger uncertainties surrounding political and economic policies, which warrant close attention.

Chart 2.2 Economic growth rates in US, Euro area and Japan



Note: Figures for 2017 are IHS Global Insight estimates.
Sources: Official websites of the selected economies and IHS Global Insight (2017/5/15).

Chart 2.3 Unemployment rates in US, Euro area and Japan



Note: Figures for 2017 are IMF estimates.
Sources: Official websites of the selected economies, IHS Global Insight (2017/5/15) and IMF (2017/4).

Advanced economies experienced a growth slowdown

Economic activity rebounded strongly in the US following a slowdown

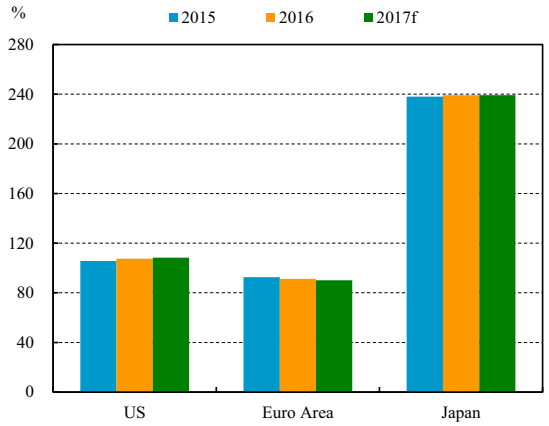
In the first half of 2016, although private consumption increased in the US, the growth rate was below expectations owing to the sluggish growth in inventory as well as investment in the energy sector. Recovery gained momentum in the second half of 2016 because of the increases in private consumption and investment. The annual economic growth rate was 1.6%, lower than the 2.6% registered in 2015. As the Trump administration is going to launch a fiscal stimulus package which will fuel the growth momentum, IHS Global Insight predicts the US economic growth rate to increase to 2.2% in 2017 (Chart 2.2).

The labor market in the US kept improving in 2016 with the unemployment rate dropping to a nine-year low of 4.9%. Since the labor market outlook remained bright, the IMF anticipates the unemployment rate to fall to an annual rate of 4.7%[12] in 2017 (Chart 2.3).

[12] Forecasts for unemployment rates in 2017 are IMF estimates. See IMF (2017), *World Economic Outlook*, April.

In fiscal year 2016, a dramatic increase in medical and social welfare expenditures raised the US deficit to US$587.4 billion. The ratio of gross fiscal deficit to annual GDP also elevated from the 2.4% recorded in 2015 to 3.2%, the first increase in 7 years. Since the Trump administration plans higher fiscal expenditure and lower tax rates, together with higher borrowing costs after lifting the policy rate, the IMF forecasts the ratio of outstanding government debt relative to annual GDP to continue rising to 108.3%[13] in 2017 (Chart 2.4).

Chart 2.4 Government debt-to-GDP ratios in US, Euro area and Japan



Note: Figures for 2017 are IMF estimates.
Source: IMF (2017), *Fiscal Monitor*, April.

The euro area economy slowed down

In 2016, the UK's referendum on exiting the European Union (Brexit) and Italian constitutional referendum resulted in heightened political and economic uncertainties in the euro area. Fortunately, the effect of the Brexit referendum was less than expected. The economic growth rate in the euro area slightly fell to 1.7% in 2016 and the unemployment rate decreased to 10%. From 2017 onwards, considering the diminishing political risk after the French election, IHS Global Insight expects the euro area economic growth rate to rise to 1.8%, and the IMF anticipates the unemployment rate to reduce further to 9.4 % (Chart 2.2, 2.3).

Regarding government finance, the euro area countries made an effort to shrink their fiscal deficits, causing the fiscal deficit to GDP ratio to drop to a nine-year low of 1.7% in 2016. Moreover, the outstanding government debt-to-GDP ratio continued declining to 91.3%. As economic activity in the euro area keeps gaining momentum and the interest rate remains low, the IMF forecasts the ratio to fall slightly to 90.1% in 2017 (Chart 2.4).

Limited economic growth in Japan

In order to revive economic growth and achieve the targeted inflation rate, the BOJ adopted a negative interest rate policy for the first time in February 2016. Additionally, the Japanese

[13] Forecasts for ratios of outstanding government debt relative to annual GDP in 2017 are IMF estimates. See IMF (2016), *Fiscal Monitor*, April.

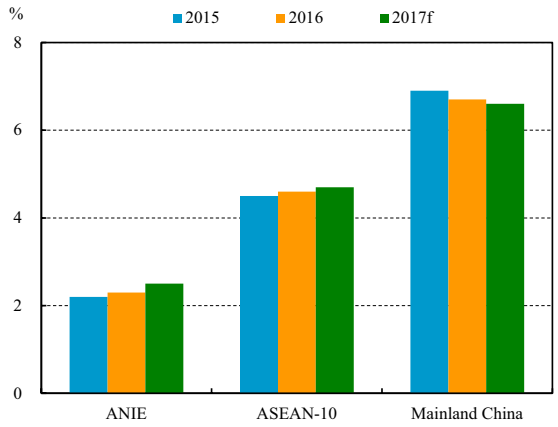
government announced that corporate tax rates would be cut, effective from April 2016, as well as postponing the second sales-tax hike. The Japanese cabinet further approved a strong economic package aiming at carrying out investment for the future in August 2016. The 28.1 trillion yen stimulus package was targeted at backing infrastructure investment and shoring up small and medium-sized enterprises (SMEs). However, the annual growth rate decreased to 1% in 2016 owing to the sluggish growth in private consumption and inventory investment (Chart 2.2).

In consideration of the upcoming economic stimulus measures, IHS Global Insight estimates Japanese economic growth to increase slightly to 1.3% in 2017 and the IMF predicts the unemployment rate to stand at 3.1%, the same figure as in 2016 (Chart 2.2, 2.3). In regard to government finance, as a result of ballooning social welfare expenditures and limited economic growth offering little improvement to Japanese fiscal conditions, the IMF predicts the outstanding government debt-to-GDP ratio to remain at 239.2% in 2017 (Chart 2.4).

Asian emerging economies took divergent growth paths

In 2016, Mainland China's economic slowdown and stagnant world trade left economic growth of Asian emerging economies unchanged. GDP growth in export-oriented Asian newly industrialized economies (ANIEs) merely rose to 2.3%. Likewise, in the ASEAN-10 (Association of South East Asian Nations) countries, the economic growth rate increased slightly to 4.6% mainly because Indonesian's GDP (accounting for about 40% of ASEAN-10's GDP) grew steadily owing to expansionary fiscal policy and easy monetary policy. By contrast, economic activity in Malaysia weakened owing to the anemic global trade environment and a downturn in oil prices. In Mainland China, accumulating local government debt as well as supply-side structural reforms lowered economic growth further to 6.7% (Chart 2.5).

Chart 2.5 Economic growth rates in Asian emerging economies

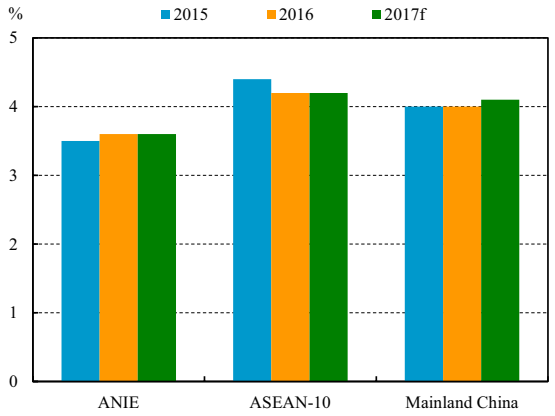


Notes: 1. Figures for 2017 are IHS Global Insight estimates.
2. ANIE refers to Asian Newly Industrialized Economies, including Taiwan, Hong Kong, Singapore and South Korea.
3. ASEAN-10 refers to the 10 member countries of the Association of South East Asian Nations, including Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam.
Sources: Official websites of the selected economies and IHS Global Insight (2017/5/15).

IHS Global Insight anticipates that the economic growth rates in the ANIEs and

ASEAN-10 will improve to 2.5% and 4.7%, respectively, in 2017 thanks to a more solid global economy and stronger external demand. Conversely, Mainland China's annual growth rate is projected to lower to 6.6% in 2017, reflecting a structural adjustment[14] together with the effect of new economic and trade policies in the US (Chart 2.5). Additionally, the unemployment rates in the ANIEs and the ASEAN-10 are expected to remain at 3.6% and 4.2% in 2017, while the unemployment rate in Mainland China is projected to rise slightly to 4.1% (Chart 2.6).

Chart 2.6 Unemployment rates in Asian emerging economies



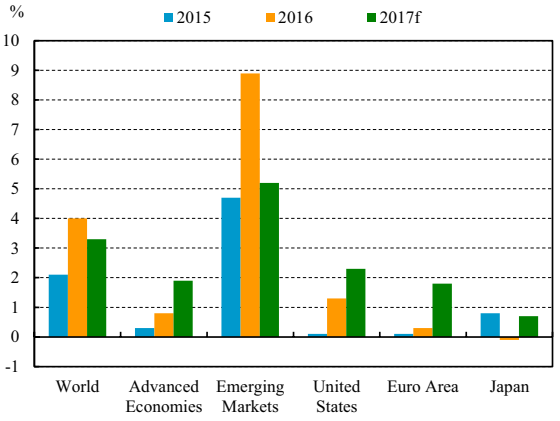
Notes: 1. Figures for 2017 are IHS Global Insight estimates.
2. For ANIE and ASEAN-10, see Notes 2 & 3 in Chart 2.5.

Sources: Official websites of the selected economies and IHS Global Insight (2017/5/15).

Global inflation rose in 2016

In 2016, the price of crude oil bounced back from a 13-year low. The upturn of oil prices was more significant after the Organization of the Petroleum Exporting Countries (OPEC) reached an agreement to freeze output on November 30. At the end of December, the price of Brent crude oil nudged above US$50 to US$54.56 per barrel. In the meantime, a rebound of metal prices in January was due to increasing demand for base metals in China as well as tightening supply and inventory. The international prices of cereals, vegetable oil, dairy, sugar and meat also grew steadily.[15] Reflecting more solid growth in commodity, oil and food prices, the global CPI inflation rate rose in 2016. Among them, the headline inflation rate in advanced economies picked up marginally to 0.8%. Moreover, the global headline inflation rate rose to 4.0% as the headline inflation rate in emerging economies accelerated significantly

Chart 2.7 Global headline inflation indices



Note: Figures for 2017 are IHS Global Insight estimates.

Sources: Official websites of the selected economies and IHS Global Insight (2017/5/15).

[14] In order to avoid financial risks and achieve sustainable growth, Mainland China changed its growth pattern from industrial sector to service sector, from investment-driven market to demand-driven market, and from export-oriented economy to domestic demand-oriented economy.

[15] In 2016, the Food and Agriculture Organization of the United Nations (FAO) food price index increased from 149.3 at the end of January to 170.2 at the end of December. The index consists of the average of five commodity group (meat, dairy, cereal, vegetable oil and sugar) price indices.

to 8.9% as a result of Venezuela's crisis of mounting deficits and high inflation (Chart 2.7).[16]

In early 2017, the global price of crude oil continued its upward trend. Thereafter, oil prices reversed to drop in March because of a significant increase in US shale oil production, yet the price was still above the figure registered at the beginning of the year. With regard to international cereals, sufficient export supply led to a slight decline in cereal prices in March, though they were still higher than the same period of the previous year. In sum, IHS Global Insight predicts that the global headline inflation rate will decline, whereas the headline inflation rate in advanced economies will continue increasing to 1.9% owing to a recovery in inflation. On the other hand, the headline inflation rate in emerging economies is expected to moderate to 5.2% as inflationary pressure in Latin American countries and Russia will ease (Chart 2.7).[17]

The US raised interest rates gradually, while most economies continued to adopt easy monetary policy stances

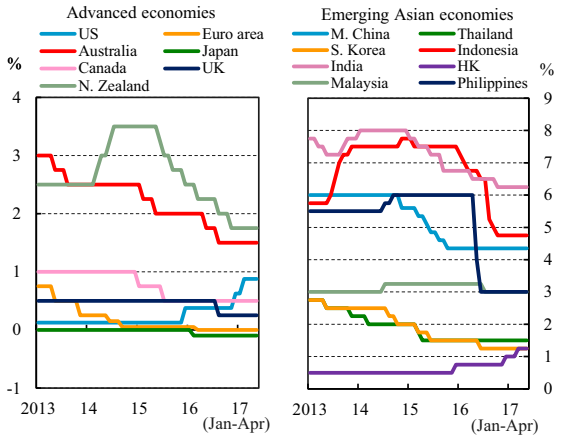
From 2016 onwards, advanced economies continued to adopt different monetary policies. As US economic activity and the labor market grew steadily, the Fed hiked its target band for the federal funds rate twice (in December 2016 and March 2017) by a total of 50 basis points (bps) to 0.75-1%, showing the normalization of US monetary policy. Meanwhile, since most indicators of inflation in the euro area remained muted, in December 2016, the ECB decided to keep running the asset purchase program until the end of December 2017. However, from April 2017, the net asset purchases at the current monthly pace of €80 billion were intended to decrease to a monthly pace of €60 billion.

For stimulating the economy, the BOJ continued implementing its quantitative and qualitative monetary easing (QQE) policy and further cut interest rates into negative territory in February 2016. Moreover, in order to conduct QQE in a more flexible manner, the BOJ introduced QQE with yield curve control upon the original framework in September 2016. The UK cut its official bank rate and expanded QE in August 2016 to mitigate the impact of the Brexit referendum. Australia and New Zealand also lowered their policy rates to boost economic growth in 2016.

[16] According to IHS Global Insight estimates (2017/5/15), the inflation rate in Venezuela accelerated to 558.1% in 2016.
[17] See Note 2.

As for emerging Asian economies, in 2016, most of them kept easing monetary policies to enhance their domestic economies. Among these countries, the Bank Indonesia announced four Bank Indonesia rate (BI rate) cuts by a total of 100 bps and the BI 7-day reverse repurchase rate was trimmed twice by a total of 50 bps. The Reserve Bank of India cut its repurchase rate twice by a total of 50 bps. South Korea and Malaysia cut their policy rates by 25 bps, respectively. The Bangko Sentral ng Pilipinas (BSP) decided to modify the policy rate from overnight repurchase rate to overnight reverse repurchase rate and introduced an interest rate corridor system. The financial institution one-year lending base rate in Mainland China remained unchanged. Still, the People's Bank of China (PBC) cut its reserve requirement ratio in March 2016. To maintain the effective operation of the linked exchange rate system, the Hong Kong Monetary Authority (HKMA) raised the base rate charged through its overnight discount window in December 2016 and March 2017, respectively, by a total of 50 bps (Chart 2.8).

Chart 2.8 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 Australia, cash rate target; for Japan, interest on excess reserves (before 2016/2/16, uncollateralized overnight call rate); for Canada, the target for the overnight rate; for the UK, official bank rate; for New Zealand, official cash rate.

2. Emerging Asia: figure for Mainland China is based on financial institution one-year lending base rate; for Thailand, 1-day repurchase rate; for South Korea, Bank of Korea base rate; for Indonesia, BI 7-day reverse repurchase rate (before 2016/8/19, Bank Indonesia rate); for India, repurchase rate; for Hong Kong, base rate; for Malaysia, overnight policy rate; for Philippines, overnight reverse repurchase rate (before 2016/6/3, overnight repurchase rate).

3. Figures are as of April 30, 2017.

Sources: Central banks' websites.

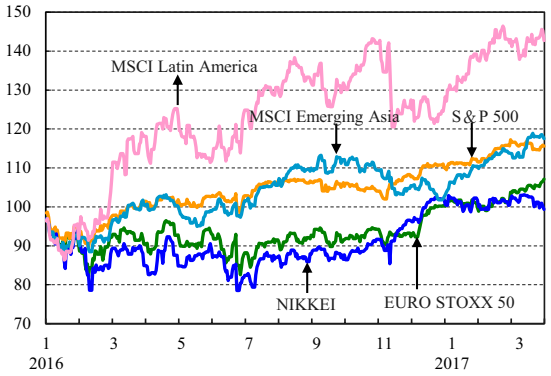
2.1.2 International financial conditions

Financial risks mitigated from 2016 onwards, yet low interest rates, political and policy uncertainties posed challenges

From 2016 onwards, commodity prices regained stability and some countries' economic conditions improved. Long-term interest rates gradually rebounded, which helped enhance interest rate spreads and long-term profitability of banks and insurance companies. Against this backdrop, the global financial stability risk reduced. However, US policy stances and a rise in protectionism brought about economic policy and political uncertainties. These, coupled with a prolonged period of low growth and low interest rates, had adverse impacts on bank profitability as well as the solvency of insurers and pension funds, and posed challenges to global financial markets.

Weak bank profitability in some advanced economies may raise risks in the future

Chart 2.9 Performance of key international equity indices



Notes: 1. January 1, 2016 = 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.

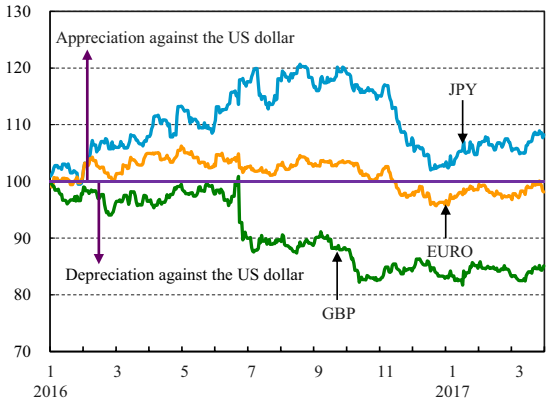
In 2016, financial conditions of banks in advanced economies improved compared to the global financial crisis, but weak bank profitability in some economies, particularly in Europe and Japan, may negatively affect their financial system stability. US banks recovered at a faster pace and had stronger profitability than European and Japanese banks, reflecting lower risks in the US. Nevertheless, the Trump administration advocated relaxing some financial regulations; as a result, the direction and magnitude of regulatory changes in the future will influence bank profitability and their risk-bearing capacity. On the other hand, profitability of European banks weakened owing to a large stock of problem assets. Among these countries, Italian banks' nonperforming loan problems led to a slump in stock and foreign exchange markets for a time. Moreover, uncertainty concerning the outlook of banks in the UK rose resulting from the outcome of the Brexit referendum.[18] Regarding Japanese banks, the erosion of profits accelerated by falling domestic net interest spreads reduced banks' ability to generate capital. The overseas expansion of Japanese banks in recent years increased their demand for short-term US dollar funding. Therefore, higher US rates would raise their funding cost, affect profitability, and increase external funding risk.

In the first quarter of 2016, the stock markets in advanced economies trended downward and fluctuated dramatically on account of unfavorable market sentiment. From the second quarter onwards, stock prices in the US rebounded and progressively hit record highs as the US grew steadily. Stock markets in Japan and the euro area stayed at low levels because of sluggish economic growth. Among them, stock markets in the euro area fluctuated significantly owing to unfavorable market sentiment such as rising bank risks and the Brexit referendum. In the fourth quarter, as the global economy recovered, stock markets in advanced economies generally trended upward and continued on their ascendant paths in the first quarter of 2017 (Chart 2.9).

[18] The IMF indicated that Brexit may lead to several uncertainties for the UK financial sector, including: (1) loss of passporting rights for UK banks may increase banks' operating costs; (2) as some 60 percent of the current financial services rulebook is estimated to be composed of EU rules, the revision would cover several aspects, such as legal, compliance, operational, and information technology changes; (3) protracted negotiations could not only postpone consumption and investment decisions, but also lower physical and human capital inflows and adversely affect economic development. See IMF (2016), *Global Financial Stability Report*, October.

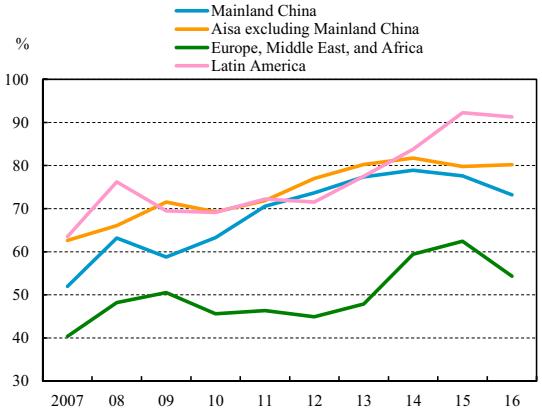
With regard to foreign exchange markets, the Japanese yen appreciated markedly because of investors' hedging demand and no further expansion of monetary easing policies by the BOJ. In addition, increased uncertainty over the economic outlook driven by the Brexit referendum in June has led to massive capital outflows from the UK, resulting in a sharp depreciation of the British pound against the US dollar.[19] Under the influence of Brexit, the euro depreciated as well. Following market expectations of the Trump administration's fiscal expansion and tax cuts in November and the Fed's interest rate hike in December, the US dollar became stronger, while the Japanese yen, the British pound and the euro turned notably weak before reversing to appreciate marginally in the first quarter of 2017 (Chart 2.10).

Chart 2.10 Movements of various currencies against the US dollar



Note: January 1, 2016 = 100.
Source: Bloomberg.

Chart 2.11 Corporate leverage ratios of emerging economies



Note: Leverage ratio = total liabilities/total equity.
Source: IMF (2017), *Global Financial Stability Report*, April.

Financial risks in emerging economies remained high owing to global policy uncertainty

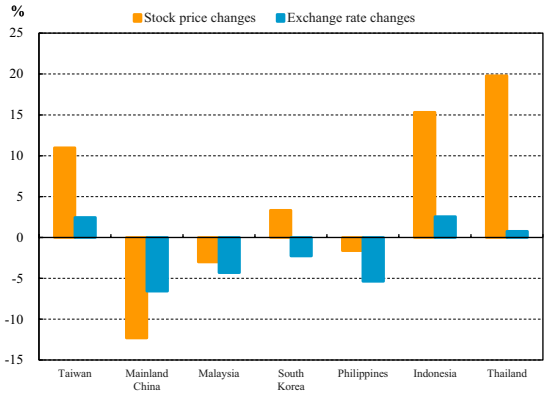
From 2016 onwards, benefiting from stability of commodity prices and improvement in some economies' economic conditions, corporate leverage declined and short-term financial risks receded. Notwithstanding, corporate leverage in some economies remained at high levels (Chart 2.11). Moreover, political and policy uncertainties in major advanced economies may open channels for negative spillovers to emerging economies. Overall, financial risk in emerging economies remained high.

In addition, there were considerable short-term international capital inflows into emerging economies during the second and third quarters of 2016. However, such capital flows were susceptible to shifts in investor sentiment and changes in policies of central banks in major

[19] The British pound exchange rate stood at 1.3679 against the US dollar on June 24, 2016, registering a decline of 8.1% compared to 1.4877 the day before.

economies. A sudden shift in policy or market sentiment could quickly reverse capital flows[20] and may trigger a disorderly deleveraging process. As a result, companies will have higher funding costs and lower corporate earnings, which will increase problem loans and undermine the soundness of the banking system, especially for the economies with insufficient bank loss provisions. In Mainland China, credit grew at a rapid pace and total assets of banks expanded continually.[21] Many financial institutions heavily relied on short-term wholesale financing with sizable asset-liability mismatches, meaning that they faced high credit and liquidity risks.

Chart 2.12 Changes in equity indices and exchange rates among Asian emerging economies



Notes: 1. The comparison is based on the difference between the figures at end-2015 and end-2016.
2. Taiwan uses TWSE Weighted Index; Mainland China uses SSE Composite Index; Malaysia uses Kuala Lumpur Composite Index; South Korea uses KOSPI Index; Philippines uses PSEI Index; Indonesia uses Jakarta Composite Index; Thailand uses SET Index.

Sources: Datastream and Bloomberg.

In 2016, because advanced economies continued their monetary easing policies, along with policy reforms and infrastructure projects launched by some emerging economies (such as Thailand, India and Indonesia, etc.), fundamentals improved gradually and international capital inflow continued, causing stock markets in emerging economies to rally (Chart 2.9). Among Asian emerging economies, stock indices of Thailand, Indonesia and Taiwan rose over 10% year on year (Chart 2.12).

In the first three quarters of 2016, international capital flowed into emerging economies to search for higher yields as the Fed delayed its rate-hike plan. Most Asian emerging economies' currencies appreciated against the US dollar, while those currencies reversed to depreciate after the Fed raised interest rates in the fourth quarter. Among Asian emerging economies, the Philippine peso depreciated considerably against the US dollar, registering a decline of 5.37%, as rising domestic political risks caused capital outflows. As for Mainland China, the depreciation of the renminbi against the US dollar reached 6.56% owing to foreign exchange reform and waning growth momentum (Chart 2.12).

IMF called on national authorities to take measures to promote global financial stability

Given that the effectiveness of a negative interest rate policy is limited and a prolonged

[20] In the third quarter of 2016, emerging economies' capital inflows (equity and debt investments) reached US$57.3 billion. However, this reversed to outflows of US$25.7 billion owing to the Fed's interest rate hike in the fourth quarter. See IMF (2017), *Global Financial Stability Report*, April.

[21] The ratio of total assets to GDP for banks in Mainland China at the end of 2016 was 307.34%, higher than the ratio of 286.02% at the end of 2015. See IMF (2017), *Global Financial Stability Report*, April.

low-interest-rate environment has an adverse influence on the development of financial institutions, the IMF has advocated[22] that national authorities should take measures, apart from macroeconomic and macroprudential policies, to promote a benign cycle between financial markets and the real economy as follows:

- National authorities should adjust regulatory requirements cautiously to avoid rising financial risks resulting from lower regulatory standards and opting out of mutually established regulations in a unilateral manner that may lead to reigniting a race to the bottom in regulatory standards.

- Banks in some advanced economies should reduce large stocks of problem loans as soon as possible and adjust dated business models to maintain financial stability in a low-rate and low-growth environment.

- Emerging economies should engage in a smooth deleveraging path and proactively monitor and address corporate vulnerabilities, arising from excess leverage and foreign exchange exposures, to preserve financial stability.

- Mainland China's corporate debt overhang and financial vulnerabilities of some institutions must be addressed promptly through a comprehensive approach. Furthermore, curbing excessive credit growth and adjusting interbank funding structures would reduce the stress on the financial system.

2.1.3 Mainland China's economic and financial conditions

Economic growth momentum successively waned

In 2016, suffering from the global economic slowdown, supply-side structural reforms, and mounting local government debts, Mainland China's economic growth rate fell to 6.7% from 6.9% in 2015, and recorded the lowest level since 1990 (Chart 2.13).

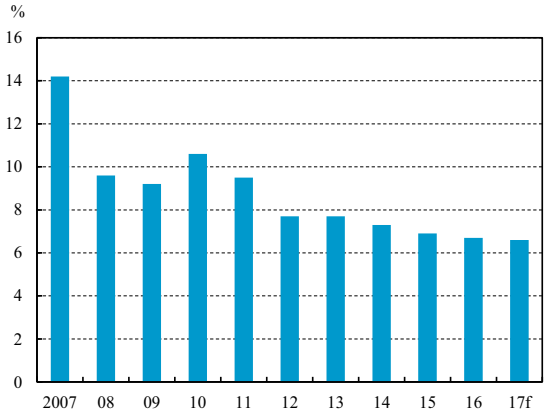
Taking a glance into 2017, owing to international political risks concerning policy uncertainty under the Trump administration and Brexit, Mainland China's National People's Congress (NPC) and Chinese People's Political Consultative Conference (CPPCC) in March targeted an economic growth rate of 6.5%, lower than its previous target range of 6.5% to 7% in 2016. IHS Global Insight projects the economic growth rate to continue falling to 6.6% in 2017 because of weakening property markets and new economic and trade policies of the US (Chart 2.13).

[22] IMF (2016), *Global Financial Stability Report*, October; IMF (2017), *Global Financial Stability Report*, April.

Prices remained stable and housing prices increased

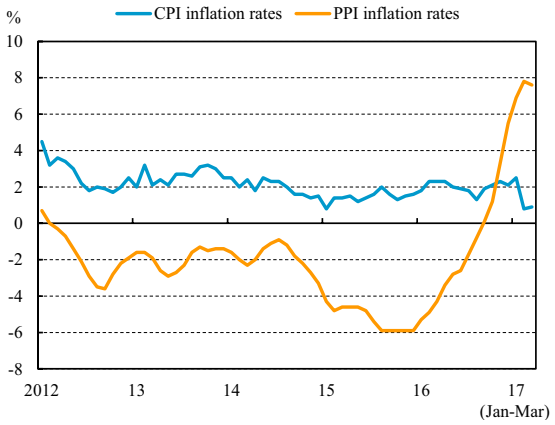
Because of stable food prices, the CPI inflation rate of Mainland China was 2.0% in 2016, lower than the official target of 3.0%. In the beginning of 2017, dragged by a significant decrease in food prices after the Lunar New Year, the CPI inflation rate declined to 0.9% in March. IHS Global Insight projects the annual CPI inflation rate of 2017 to increase to 2.1%. Moreover, the producer price index (PPI) showed negative growth over the longer run caused by destocking and restructuring. In September 2016, the PPI rebounded to 0.1% owing to higher prices for commodities such as coal and steel, thereby ending a 54-month decline. Additionally, affected by imported inflationary pressure arising from the pickup in crude oil prices and depreciation of the renminbi, the growth rate of the PPI has risen at a faster monthly pace since September. Therefore, the PPI inflation rate rose to 5.5% in December, and registered -1.4% for 2016 as a whole. Furthermore, the PPI rose to 7.6% in March 2017 (Chart 2.14).

Chart 2.13 Economic growth rates of Mainland China



Note: Figure for 2017 is an IHS Global Insight estimates.
Sources: National Bureau of Statistics of China and IHS Global Insight (2017/5/15).

Chart 2.14 Inflation rates of Mainland China



Source: National Bureau of Statistics of China.

Resulting from easy monetary policy and stock market index fluctuation at a low level and within a narrow range in 2016, massive capital flowed to housing markets leading to a marked rise in the first- and second-tier cities' housing prices while the third- and fourth-tier cities faced the pressure of stock clearance. Afterwards, Mainland China's government implemented targeted policies[23] that varied among different cities in September; therefore, the monthly growth rate of housing prices in 70 medium-large cities significantly fell to 0.3% at the end of the year from a high level of 2.1% in September, while the corresponding annual

[23] See note 3.

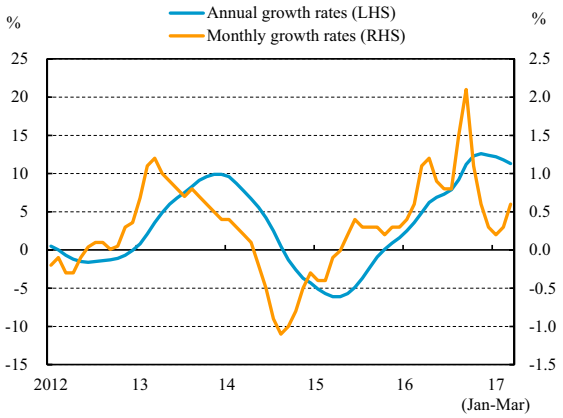
growth rate reached 12.4%. In the beginning of 2017, housing prices continued their upward trend, which was caused by a rise in specific third- and fourth-tier cities. Consequently, Mainland China further launched targeted policies aimed at specific third- and fourth-tier cities in March 2017 in order to stabilize housing prices. As a result, the annual growth rate was 0.6% in March, while the corresponding annual growth rate reached 11.3% (Chart 2.15).

PBC continued to implement prudential monetary policies

In an effort to reduce financing costs with the aim of sustaining economic growth, the People's Bank of China (PBC) lowered the reserve requirement ratio (RRR) for all banks by 50 bps in March. Subsequently, alternative targeted monetary easing measures were taken to inject funds into markets through different policy tools, including launching the medium-term lending facility (MLF) and pledged supplementary lending (PSL). In the beginning of 2017, against a backdrop of persistent depreciation of the renminbi, massive capital outflows and policy measures aimed at preventing housing bubbles, the PBC implemented prudential monetary policies, such as raising repurchase rates twice as well as hiking MLF rates and standing lending facility (SLF) rates resulting in stabilized interest rate spreads and exchange rate margins.

Furthermore, the Shanghai Interbank Offered Rate (SHIBOR) gradually rose from September 2016. Afterwards, the SHIBOR fluctuated dramatically because of prudential monetary policies, expanding inspection items of macro prudential assessment (MPA) and tighter liquidity conditions in the Chinese New Year holidays. Meanwhile, the PBC launched temporary liquidity facilities (TLF)

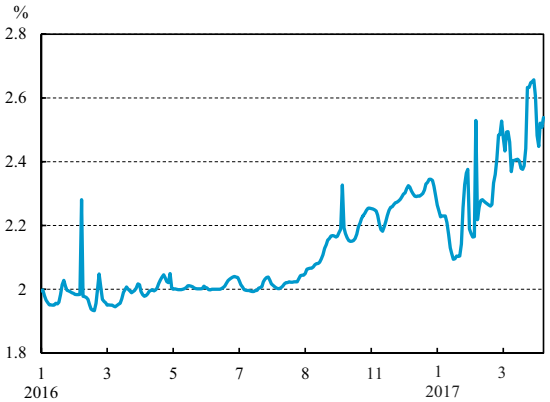
Chart 2.15 Average growth rates of building sales prices in 70 medium-large cities of Mainland China



Note: Figures are estimated by Thomson Reuters based on statistics published by the National Bureau of Statistics of China.

Sources: National Bureau of Statistics of China and Thomson Reuters.

Chart 2.16 Shanghai Interbank Offered Rates



Source: China Foreign Exchange Trading System & National Interbank Funding Center.

to temporarily inject liquidity into the financial system. However, the SHIBOR reached a yearly high, affected by the Fed raising interest rates, in March 2017 (Chart 2.16).

Stock markets fluctuated within a narrow range and at a low level whereas foreign exchange markets sharply fluctuated

In early 2016, owing to a circuit breaker mechanism and capital outflows driven by depreciation of the renminbi, the Shanghai Stock Exchange (SSE) Composite Index sharply declined. Afterwards, the SSE Composite Index gradually stabilized; however, the SSE fluctuated within a narrow range and at a low level because of Mainland China's slowing growth. Despite MSCI inclusion of Mainland China's shares as well as a Shenzhen-Hong Kong stock connect on December 5, 2016, market participants' concern over the slowing growth in Mainland China deepened and the SSE Composite Index reached 3,104 at the end of December, with an annual decrease of 12.3% (Chart 2.17).

Regarding the foreign exchange market, the PBC's intervention in the foreign exchange market to prevent speculative and arbitrage behavior, coupled with market expectations that the Fed would delay raising interest rates, brought the renminbi exchange rate against the US dollar to stabilize in 2016 Q1. However, the renminbi turned to depreciate against the US dollar following the Brexit vote in June. In the second half of 2016, the IMF included the renminbi in the special drawing right (SDR) currency basket, which became effective in October. Nevertheless, market participants' expectations that the momentum of renminbi exchange rate stabilization by the PBC had declined, along with the Fed signaling a faster pace of interest rate hikes, led to a further weakening of the renminbi exchange rate. Meanwhile, the renminbi exchange rate sharply depreciated because of the combined effect of capital outflows and expectations of renminbi depreciation. At the end of December, the renminbi exchange rate stood at 6.9495 against the US dollar, an annual depreciation of 6.56% (Chart 2.18).

Chart 2.17 Shanghai Stock Exchange Composite index

Source: Bloomberg.

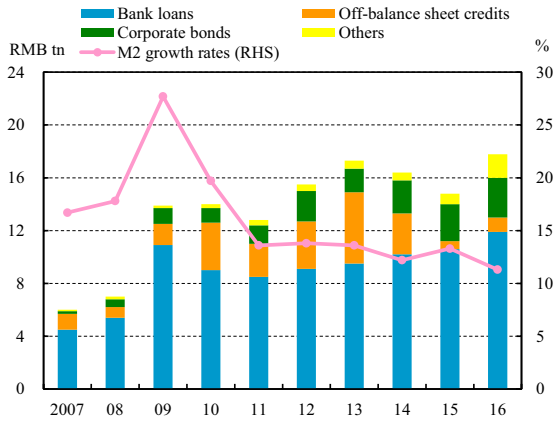
In early January 2017, the renminbi exchange rate dropped to 6.9557 against the US dollar. Afterwards, the PBC intervened to greatly drive up the Hong Kong Interbank Offered Rate (HIBOR) to boost the cost of shorting

the renminbi offshore. In addition, capital outflow restrictions and accelerated sales of the US dollar by the PBC, as well as President Trump's belief that a strong US dollar contributed to the trade imbalance between the US and Mainland China, reversed the downward pressure on the renminbi. Following this, the renminbi exchange rate rebounded to 6.8342.[24] However, following Mainland China's trade deficit in February 2017 and the Fed gradually raising interest rates, the renminbi faced further depreciation pressure.

Chart 2.18 RMB/USD exchange rate

Source: CBC.

Chart 2.19 Aggregate financing to the real economy and annual growth rates of M2 in Mainland China



Source: PBC.

The increment in aggregate financing to the real economy increased, and NPL ratios of banks continually trended up

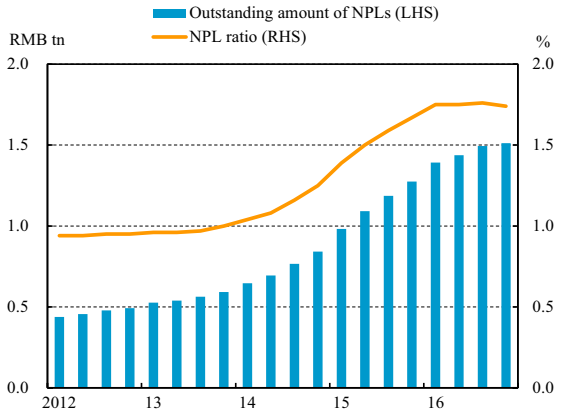
With a backdrop of the renminbi depreciation and capital outflows, the annual growth rate of broad money supply M2 decreased to 11.3% at the end of 2016, lower than the official annual target of 13%; thus, the PBC lowered the M2 growth target for 2017 to 12%. Meanwhile, aggregate financing to the real economy rose by RMB17.8 trillion in 2016 (Chart 2.19). However, slowing economic growth led to capital flowing to real estate, causing rapid mortgage growth as well as an increase in trust loans and entrusted loans. Accordingly, the annual growth rate increased to 12.8% from 12.4% a year earlier.

As a result of moderate economic growth, the NPL ratio of commercial banks edged up to 1.74% at the end of 2016 from the 1.67% recorded a year earlier (Chart 2.20). Because Mainland China's government continually cut excessive industrial capacity and cleaned up indebted corporates, the NPL ratio may continue to increase. However, Mainland China

[24] The renminbi exchange rate against the US dollar on January 18, 2017.

launched a debt-for-equity program in October 2016 in an effort to relieve the corporate debt burden and reduce banks' outstanding amount of NPLs.

Chart 2.20 NPL ratios of Mainland China's commercial banks



Source: China Banking Regulatory Commission.

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

Because of increasing pressure to service their debts[25] amid ongoing economic slowdown, Mainland China's government approved to launch a RMB3.2 trillion local government debt-swap program in 2015 to address the sources of financial stability pressure. Furthermore, Mainland China's government expanded the local government debt-swap program by RMB4.9 trillion in 2016 to enable local governments to tackle their debt due problems. Meanwhile, the State Council decided to adopt a local government debt ceiling in order to reduce default risk of local government debts.

2.2 Domestic macro environment

2.2.1 Domestic economic and fiscal conditions

In 2016, thanks to a gradual recovery in exports and modest growth in investment, domestic economic growth momentum strengthened and inflation remained stable. Short-term external debt servicing ability remained strong on the back of a sustained surplus in the balance of payments and ample foreign exchange reserves. Although the scale of external debt slightly increased, overall external debt servicing capacity stayed robust. Moreover, the government's fiscal deficits rebounded and the total government debt level slightly mounted; nevertheless, the government continued implementing the *Fiscal Health Plan* to enhance a sound fiscal system.

Export growth improved and the domestic economy rebounded progressively

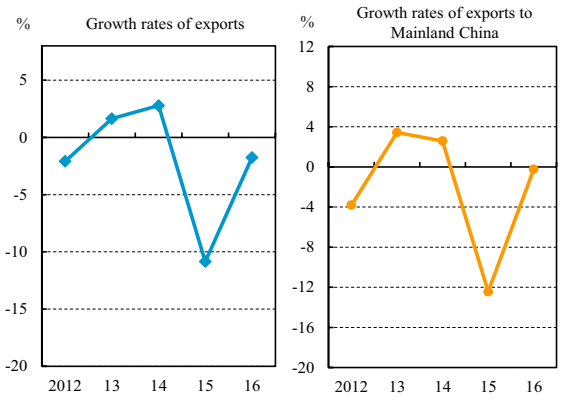
With the moderate global economic recovery and increasing demand for semiconductors, Taiwan's export growth improved significantly in 2016. The decrease in the annual export growth rate sharply recovered to -1.76% from -10.86% a year earlier, in line with the drop in

[25] The National Audit Office of the People's Republic of China published the audit findings of public debts at all levels of government in December 2013. Based on the report, about RMB1.52 trillion of the total local government debts fell due in 2016, and about RMB1.08 trillion will fall due in 2017.

exports to Mainland China (including Hong Kong) narrowing from -12.44% recorded a year earlier to -0.23% (Chart 2.21). The gradual recovery in exports and modest growth in both investment and private consumption underpinned the positive economic growth rate which increased continuously from Q2 2016 and even reached 2.79% in Q4. Overall, the annual economic growth rate stood at 1.48%, higher than the 0.72% of the previous year (Chart 2.22).

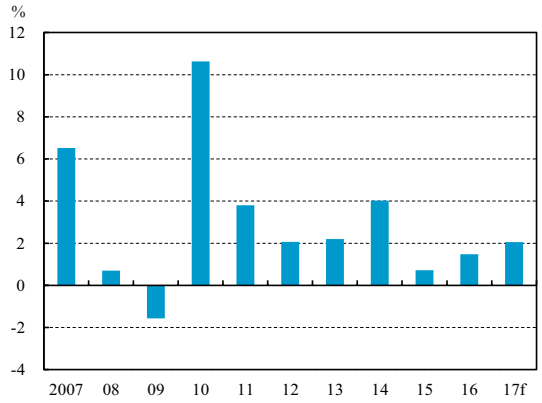
Taking a glance into 2017, the growth of the global economy and international trade is expected to boost exports. Moreover, the government has adopted an expansionary fiscal policy and is carrying out the *Forward-looking Infrastructure Development Program* to elevate investment momentum. Furthermore, private consumption is experiencing mild growth. As a result, the DGBAS forecasts Taiwan's annual economic growth rate to increase to 2.05%[26] in 2017 (Chart 2.22).

Chart 2.21 Growth rates of exports



Source: MOF.

Chart 2.22 Economic growth rates in Taiwan



Note: Figure for 2017 is forecast by DGBAS.
Source: DGBAS.

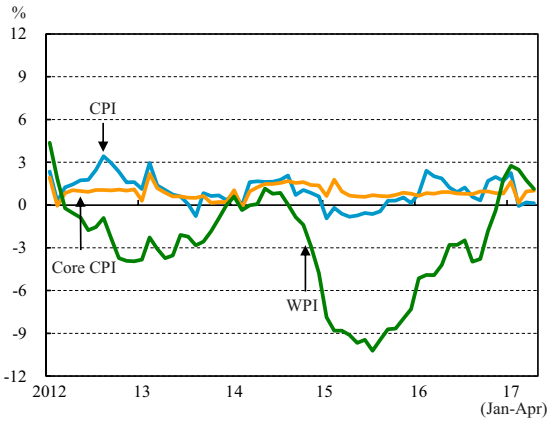
Domestic prices rose mildly

In 2016, pushed up by the gradual increase in the international prices of raw materials, such as crude oil, the pace of the decrease in the wholesale price index (WPI) inflation rate gradually abated and the annual WPI inflation rate registered 1.79% in December (Chart 2.23). Moreover, the annual WPI inflation rate stood at -2.99% in 2016, higher than the -8.84% recorded in 2015. The DGBAS projects the annual WPI inflation rate to climb successively to 0.50% in 2017.[27]

[26] See Note 4.
[27] See Note 4.

Attributed to severe coldness and the Lunar New Year holidays in early 2016, the CPI inflation rate rose to a peak of 2.41% in February. In subsequent months, the CPI inflation rate reversed to a downtrend. However, affected by the ascending prices of crude oil and the lagged effect of typhoons and torrential rain, the CPI inflation rate rebounded from October and rose to 1.69% in December. Overall, the annual CPI inflation rate registered 1.40% in 2016, higher than the -0.31% of the previous year, while the core CPI inflation rate rose moderately and reached 0.84%, slightly higher than the 0.79% recorded in 2015 (Chart 2.23).

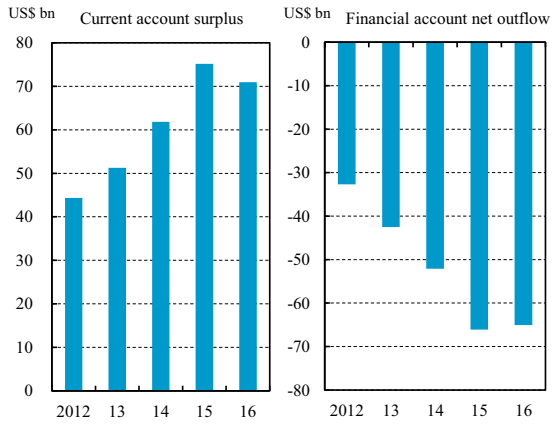
Chart 2.23 Consumer and wholesale price inflation rates



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

In 2017, although the international prices of raw materials are showing an upward trend, the inflation rate is expected to rise mildly owing to recent NT dollar appreciation easing imported inflation pressure, moderate domestic demand and a negative output gap. The CBC forecasts the annual CPI inflation rate and the core CPI inflation rate to stand at 1.25% and 1.06%,[28] respectively.

Chart 2.24 Current account surplus and financial account net outflow



Source: CBC.

Current account surplus persisted and foreign exchange reserves stayed abundant

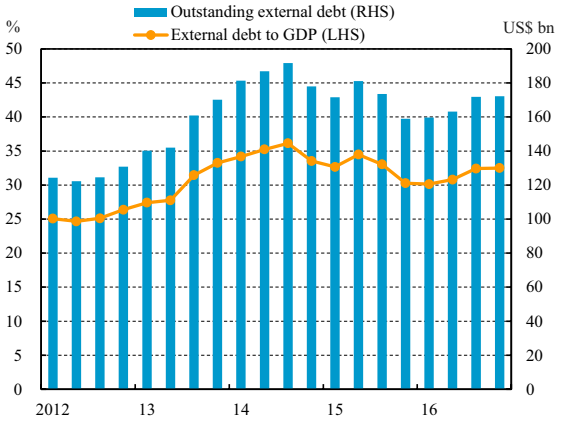
In 2016, although both merchandise exports and imports decreased compared to the previous year, the trade surplus declined as exports decreased more than imports, causing the annual current account surplus to shrink to US$70.9 billion, or 13.39%[29] of annual GDP, a decrease of US$4.2 billion or 5.64% compared to 2015. As for the financial account, in spite of the increase in foreign investments by insurance companies, the annual balance of outflows

[28] See Note 5.
[29] 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 at relatively high risk.

slightly shrank to US$65.0 billion as the outflows were partially offset by increases of inflows in both non-resident deposits and short-term foreign loans (Chart 2.24). With a greater decrease in the current account surplus, the balance of payments surplus shrank to US$10.7 billion in 2016, decreasing by 28.97% from the previous year.

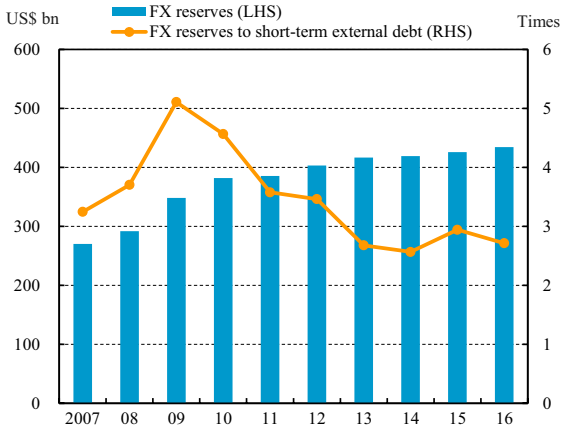
With the accumulation of earnings from portfolio investment of foreign exchange reserve assets, the foreign exchange reserves climbed to US$434.2 billion at the end of 2016, a slight increase of 1.92% from a year earlier. At the end of April 2017, the amount of foreign exchange reserves continued to increase to US$438.4 billion.

Chart 2.25 External debt servicing capacity



Sources: CBC and DGBAS.

Chart 2.26 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[30] showed an upward trend in the first three quarters of 2016, but slowed down in Q4. As a result, external debt registered US$172.2 billion, or 32.50% of annual GDP, at the end of the year (Chart 2.25).[31] Taiwan's capacity to service external debt remained robust, although the scale of external debt expanded slightly.

Furthermore, at the end of 2016, the ratio of foreign exchange reserves to short-term external debt fell to 2.71 times owing to a greater rise in short-term external debt. Nevertheless, it was

[30] The CBC defines external debt as 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 (starting from December 2004, figures for public external debt include outstanding foreign debt arising from repo transactions between the CBC and international financial institutions). The term "private external debt" refers to private-sector foreign debt not guaranteed by the public sector.

[31] 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.

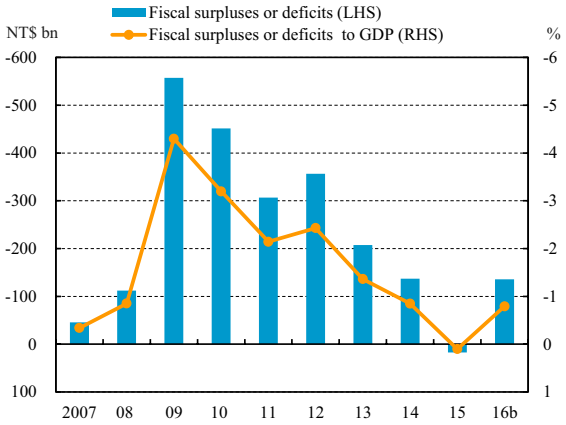
higher than internationally recognized minimum levels,[32] implying that Taiwan's foreign exchange reserves have a robust capacity to meet payment obligations (Chart 2.26).

Fiscal deficits rebounded and government debt slightly rose

Since the government implemented the *Fiscal Health Plan* from 2014 and the annual revenues in 2015 were higher than expected, fiscal revenues and expenditures had improved significantly. In 2016, the government appropriately increased annual expenditures in response to economic conditions, causing fiscal deficits to rebound to NT$135.7 billion, or 0.79%[33] of annual GDP (Chart 2.27).

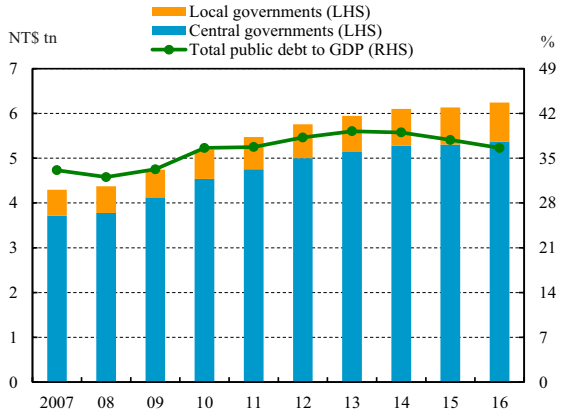
As fiscal deficits remained a concern and both central and local governments relied on debt issuance to finance debt servicing expenditures, outstanding public debt at all levels of government[34] in 2016 slightly expanded to NT$6.24 trillion[35] from the NT$6.13 trillion registered in the previous year. However, the ratio of total public debt to annual GDP slightly fell to 36.46%[36] on account of a higher increase in GDP growth (Chart 2.28).

Chart 2.27 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 2016 are final accounts and budgets for the central government and local governments, respectively.
Sources: MOF and DGBAS.

Chart 2.28 Public debts



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 2016 are preliminary final accounts for both the central government and local governments.
Sources: MOF and DGBAS.

[32] The general international consensus is that a country with a ratio of foreign exchange reserves to short-term external debt higher than 100% is deemed to be relatively low risk.
[33] See Note 6.
[34] 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.
[35] At the end of 2016, outstanding non-self-liquidating debt at all levels of government with a maturity of one year or longer was NT$6.24 trillion, including NT$5.37 trillion and NT$0.87 trillion for central government and local governments, respectively, which are both preliminary final accounts. As of April 2017, the outstanding one-year-or-longer non-self-liquidating public debt is NT$6.20 trillion, including NT$5.44 trillion, NT$0.60 trillion, NT$0.16 trillion, and NT$0.4 billion for central government, municipalities, counties, and townships, respectively. The figures account for 32.63%, 3.63%, 0.94%, and 0.003% 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, set out in the Public Debt Act.
[36] See Note 7.

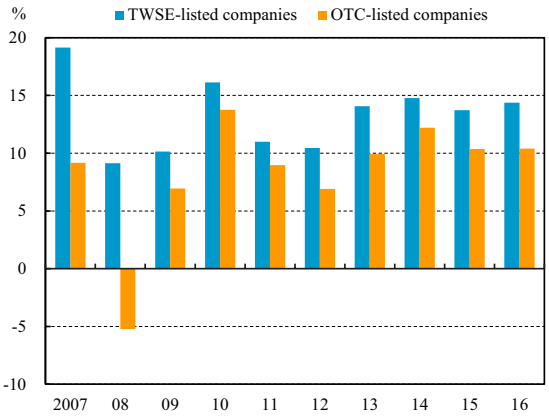
In order to achieve a sound fiscal system, the Ministry of Finance continued to implement the *Fiscal Health Plan* and *Central Government Debt Improvement Plan,* seeking to improve the structures of revenue and expenditure of government and control the scale of debt.

2.2.2 Corporate sector[37]

The profitability of listed companies enhanced in 2016. However, their financial leverage ratio rose and short-term debt servicing capacity dropped, yet remained at an adequate level. At the end of 2016, the NPL ratio for corporate loans granted by financial institutions reached a historical low, indicating sound credit quality of corporate loans. Nevertheless, it is notable that the deceleration in corporate investment growth could affect the long-term development of domestic industries.

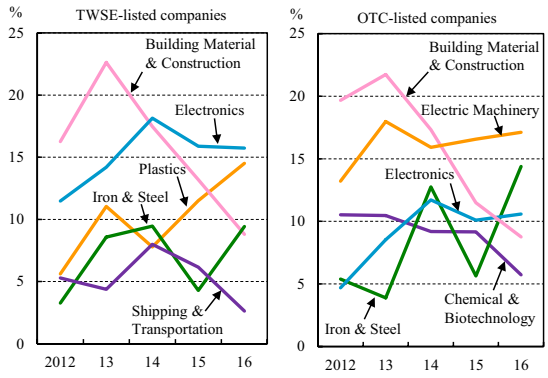
Profitability of listed companies enhanced in 2016

Chart 2.29 Return on equity in corporate sector



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

Chart 2.30 Return on equity of TWSE-listed and OTC-listed companies by major industries



Source: TEJ.

In 2016, benefiting from the rebound in international prices of raw materials and the gradual recovery of exports in Taiwan, the average ROEs of TWSE-listed and OTC-listed companies slightly rose to 14.38% and 10.39%, respectively, marginally higher than a year earlier (Chart 2.29). Profitability enhanced, mainly driven by the improvement in market demand boosting profitability in the plastics and the iron & steel industries.

[37] 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 are under ROC GAAP, while from 2012 are under the TIFRSs. In light of changes in accounting treatment and presentation, readers should interpret these figures prudently when comparing statistics before and after IFRSs adoption.

Except for the building material & construction and the shipping & transportation industries with declining ROEs and the electronics industry with flat ROE, all other industries for TWSE-listed companies reported increasing ROEs in 2016, especially the iron & steel industry. For OTC-listed companies, except for the chemical & biotechnology and the building material & construction industries, all other major industries had better performance (Chart 2.30).

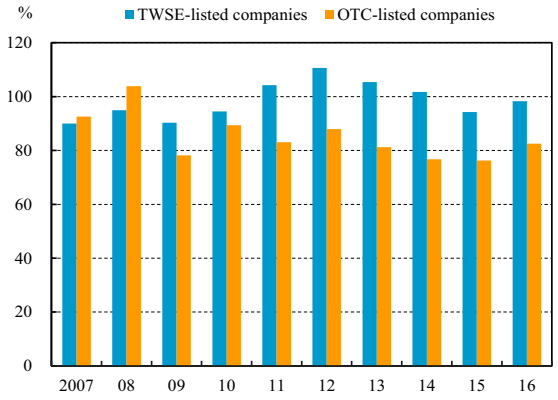
Leverage ratio rose for listed companies

At the end of 2016, the average leverage ratio for TWSE-listed companies rose to 98.33% from 94.29% at the end of the previous year. Similarly, the average leverage ratio for OTC-listed companies also increased to 82.52% from 76.26% a year earlier (Chart 2.31). Leverage ratios rose mainly because listed companies increased borrowing from banks and raised funds through commercial paper in response to the demand for operations.

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

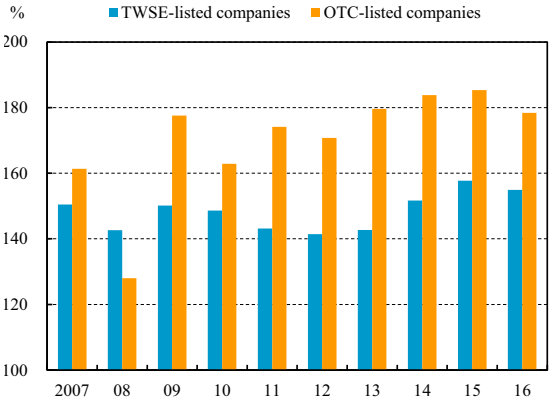
Owing to a greater increase in current liabilities, the current ratio for TWSE-listed companies dropped to 155% at the end of 2016, while the interest coverage ratio

Chart 2.31 Leverage ratios in corporate sector



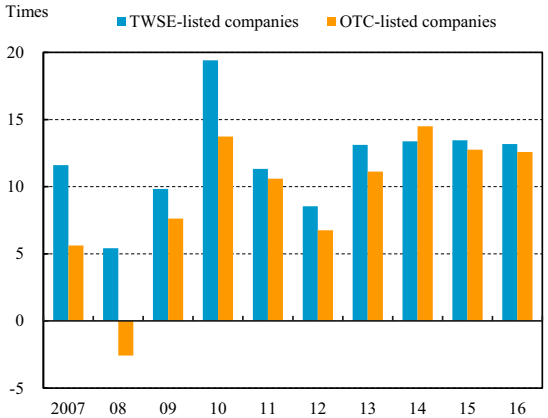
Note: Leverage ratio = total liabilities/total equity.
Source: TEJ.

Chart 2.32 Current ratios in corporate sector



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

Chart 2.33 Interest coverage ratios in corporate sector



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

slightly decreased to 13.18. In addition, the current ratio and the interest coverage ratio for OTC-listed companies also fell to 178% and 12.59, respectively (Chart 2.32 and 2.33). For listed companies as a whole, short-term debt servicing capacity generally dropped, yet still held at an adequate level.

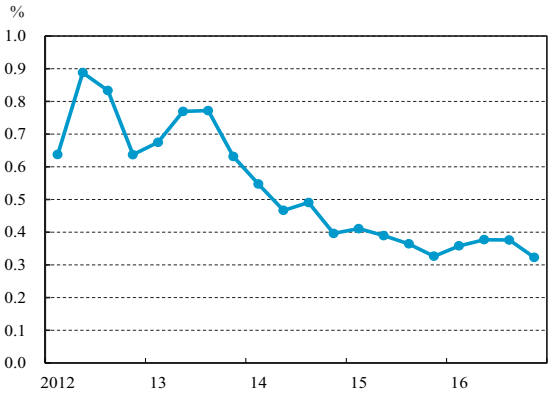
Credit quality of corporate[38] loans remained sound

In the first three quarters of 2016, the NPL ratio for corporate loans from financial institutions rose because of an increase in past-due loans of some corporations. However, the ratio turned to decline to only 0.32% at the end of the year and continued to reach the lowest level on record as a result of partial recoveries of bad debts and write-offs of NPLs by financial institutions, reflecting sound credit quality for the corporate sector (Chart 2.34).

Paying close attention to the deceleration in corporate investment growth

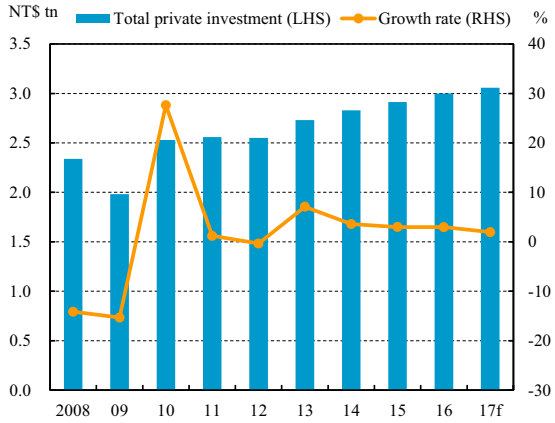
Benefiting from the development of advanced manufacturing in the semiconductor industry and the expansion of aircraft fleets in the aviation industry, the growth rate of domestic private real investment was 2.95% in 2016, still slightly lower than that of the previous year (Chart 2.35). In view of the increasing pressure of

Chart 2.34 NPL ratios of corporate loans



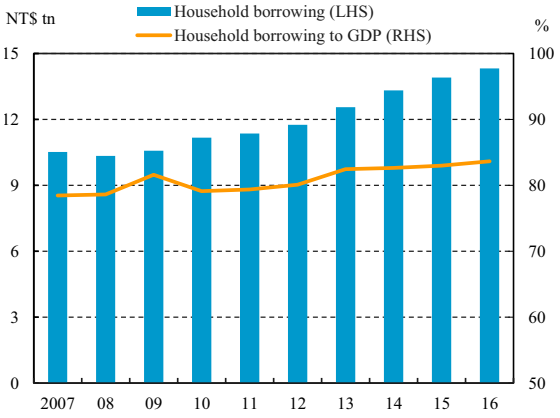
Source: JCIC.

Chart 2.35 Private real investment



Note: Figure for 2017 is forecast by DGBAS.
Source: DGBAS.

Chart 2.36 Household borrowing to GDP



Sources: CBC, JCIC and DGBAS.

[38] The data for the corporate sector herein are on the basis of listed and unlisted corporations provided by the JCIC.

international competition among peers, the rise of trade protectionism, and the crowding-out effect by industrial supply chain localization in Mainland China affecting the corporate sector's future operation and investment, the DGBAS predicts the growth rate of domestic private real investment to fall to 1.95% for 2017. It is noteworthy for banks to pay close attention to the impact of moderating corporate investment growth on their long-term operation and development.

2.2.3 Household sector

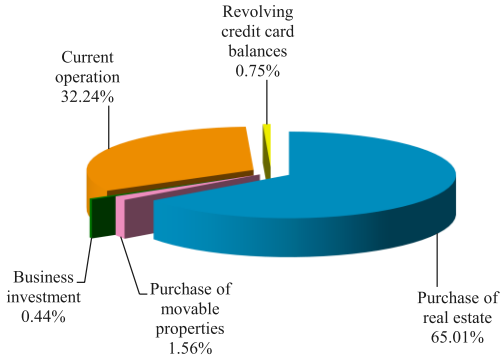
The household debt burden relieved slightly as the balance of total household borrowing expanded more slowly than that of disposable income. The overall credit quality of household borrowing remained satisfactory. Meanwhile, the unemployment rate and interest rates on loans remained low, which should help underpin the debt servicing capacity of households.

Household borrowing increased continually

At the end of 2016, total household borrowing saw a slight expansion and reached NT$14.32 trillion, equivalent to 83.65% of annual GDP (Chart 2.36). The largest share of household borrowing went for the purchase of real estate (65.01%), followed by current operation loans[39] (32.24%). The rest of the household borrowing categories took only minor percentages, including loans to purchase movable properties, largely consisting of vehicle loans, business investment loans, and revolving balances on credit cards (Chart 2.37).

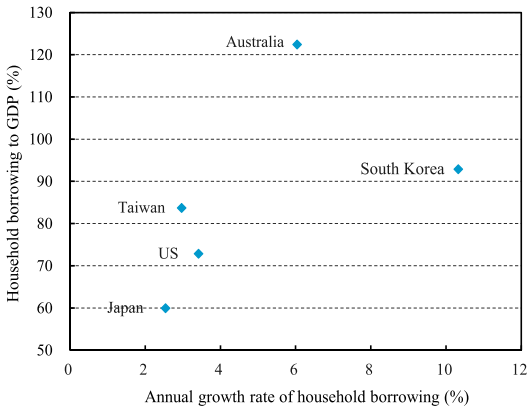
In 2016, total household borrowing grew

Chart 2.37 Household borrowing by purpose



Note: Figures are as of the end of 2016.
Sources: CBC and JCIC.

Chart 2.38 Household indebtedness in selected countries

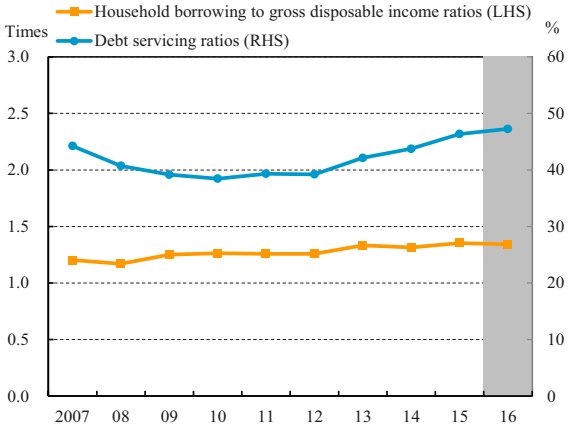


Note: Figures are as of the end of 2016.
Sources: Fed, BOJ, BOK, ABS, IMF, DGBAS, CBC and JCIC.

[39] The term "current operation loans" includes outstanding cash card loans.

moderately, with the annual growth rate falling to 2.97% at the end of the year. The increment of total household borrowing was mainly from an increase in loans for the purchase of real estate and current operation loans. Compared to other countries, the growth of total household borrowing in Taiwan was lower than that in South Korea and Australia, equivalent to that in the US, but higher than that in Japan. In addition, as a percentage of GDP, household borrowing in Taiwan was lower than that in Australia and South Korea, but higher than that in the US and Japan (Chart 2.38).

Chart 2.39 Household indebtedness and debt servicing ratios

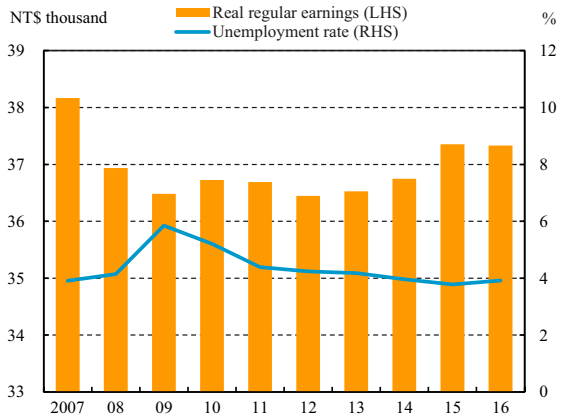


Notes: 1. Gross disposable income in shaded area is CBC estimate.
2. Debt servicing ratios = borrowing service and principal payments/gross disposable income.
Sources: CBC, JCIC and DGBAS.

Household debt burden relieved slightly

As total household borrowing grew at a slower pace than disposable income in 2016, the ratio of household borrowing to total disposable income[40] declined marginally to 1.34 at the end of the year from 1.35 a year earlier, reflecting slight relief of the household debt burden. However, owing to the increase in loans for current operations, which typically have a shorter term, the debt servicing ratio uplifted to 47.27% in 2016 (Chart 2.39), thereby indicating that household short-term debt servicing pressure mounted slightly. Although regular earnings of employees in the industrial and service sectors failed to grow in 2016, the domestic unemployment rate (Chart 2.40) and interest rates on loans stayed low, which could help sustain the debt servicing capacity of households.

Chart 2.40 Unemployment rate and regular earnings



Sources: DGBAS and Ministry of Labor.

[40] Total disposable income = disposable income + rental expenses + interest expenses.

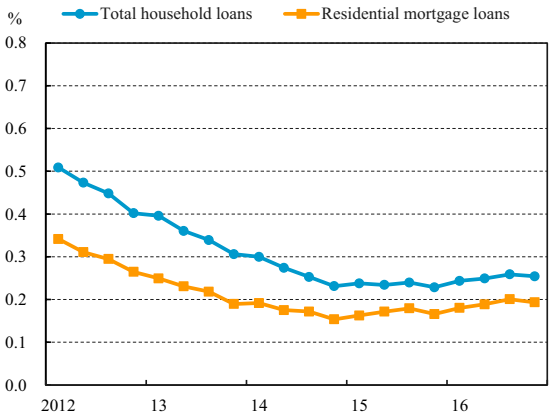
Credit quality of household borrowing remained satisfactory

In 2016, the NPL ratio of household borrowing grew slightly but remained at a low level of 0.25% at the end of the year, reflecting satisfactory credit quality (Chart 2.41).

2.2.4 Real estate market

In 2016, trading volume in the real estate market continuously contracted and house prices declined gradually owing to a downturn in the housing market along with a heavier tax burden on real estate owners. In addition, housing loans and construction loans grew slowly, and mortgage interest rates continued at low levels. With the government's measures aimed at encouraging sound development of the real estate market gradually coming into effect as well as banks improving their risk control of real estate loans, the CBC repealed most of the rules imposed on housing loans and land collateralized loans, except for high-value housing loans, in late March 2016. From early 2017 onwards, transactions in the housing market showed signs of stabilization.

Chart 2.41 NPL ratios of household borrowing

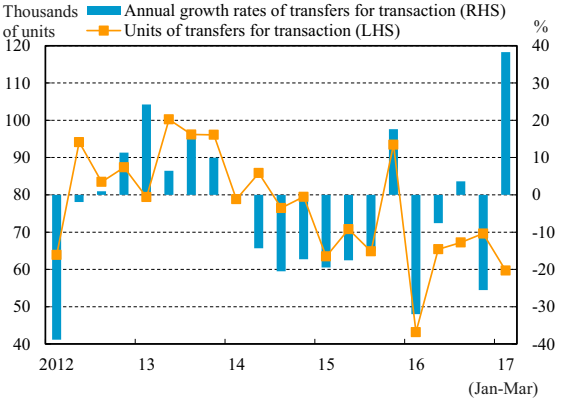


Source: JCIC.

Trading volume in the real estate market stabilized after contracting dramatically

In 2016 Q1, the total number of building ownership transfers for transaction decreased dramatically by 31.97% year on year owing to the levying of a consolidated housing and land income tax, a heavier tax burden on real estate owners, as well as real estate market participants remaining hesitant. Subsequently, affected by improving domestic economic growth, declining housing prices, increasing number of residential property buyers in the housing market, and a rise in the release of new buildings, housing market transactions recovered gradually. In Q2, the extent of the

Chart 2.42 Building ownership transfers for transaction



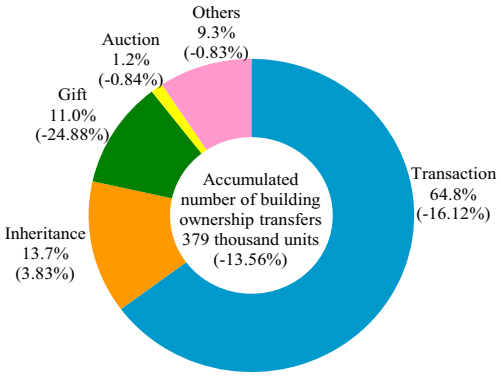
Source: Monthly Bulletin of Interior Statistics, MOI.

decrease narrowed, and later trading volume in the housing market registered positive growth of 3.63% in Q3. However, the annual growth rate decreased to -25.51% in Q4 as a result of a higher base period in the previous year stemming from dramatically increased transactions before the levying of a consolidated housing and land income tax (Chart 2.42).

The accumulated number of building ownership transfers was 379 thousand units in 2016, declining by 13.56% year on year. The number of building ownership transfers for transaction registered a record low of 245 thousand units, accounting for 64.8% of the total transfers and decreasing by 16.12% year on year. The number of transfers for gift, making up 11.0% of the total transfers, also decreased by 24.88% year on year. These figures show that the government's efforts to curb speculation in the housing market have proved effective (Chart 2.43).

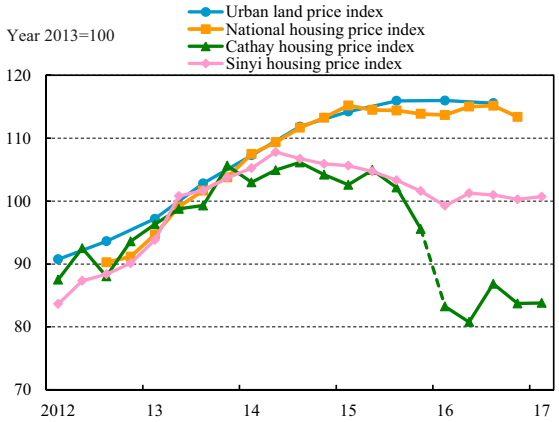
In 2017 Q1, the total number of building ownership transfers for transaction turned to positive growth, with an annual growth rate of 38.3%. The main reasons were a lower base period in 2016 and falling housing prices helping to stabilize the transactions of residential properties.

Chart 2.43 Building ownership transfers and annual growth rate in 2016



Source: Monthly Bulletin of Interior Statistics, MOI.

Chart 2.44 Land and house price indices



Notes: 1. Taiwan land price index is released semiannually. Figures are as of the end of March and September.
2. The Cathay housing price index modified the index basis from 2016 Q1, mainly including applying the new definition of "standard housing" (the newly-defined standard housing represents the typical quality of houses being transacted in a specific area), and amending the calculation of the bargaining rate.
3. 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.

Real estate prices declined slightly

In 2016, dragged by a contracted housing market, land prices also fell gradually. The annual growth rate of the land price index[41] was -0.31% as of the end of September 2016. The

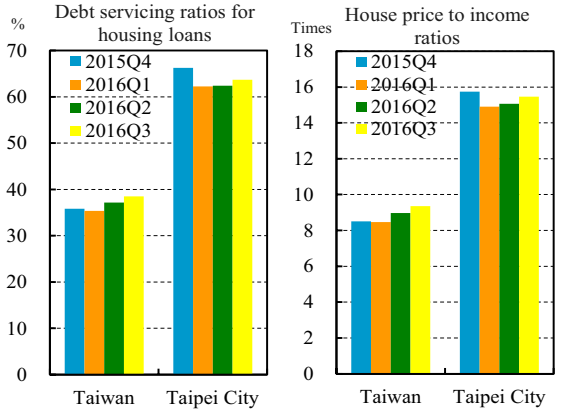
[41] The land price index was 118.91 as the Ministry of Interior re-designated March 31, 2013 as the base period (index = 100).

national housing price index reached its highest point in 2015 Q1 and then fell gradually. As of the end of 2016 Q2, the annual growth rate increased slightly to 0.46%, yet declining by 0.16%[42] from its highest point (Chart 2.44).

The Cathay housing price index[43] (for new residential buildings) has fallen slowly since 2015 Q3. The index rallied slightly on the back of an improving housing market from 2016 Q4 onwards (Chart 2.44).

From 2016 onwards, the Sinyi housing price index (for existing residential buildings) continuously declined at a slower pace (Chart 2.44), but the degree of the decline narrowed quarter by quarter. The index turned to increase by 1.47% in 2017 Q1. However, compared to its highest point in 2014 Q2, the index was still down by 6.56%.

Chart 2.45 Debt servicing ratios for housing loans and house price to income ratios



Notes: 1. Debt servicing ratios for housing loans = median housing loans monthly payments/median household monthly disposable income.
2. House price to income ratios = 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 2016, housing prices declined gradually and mortgage interest rates showed a downward trend. With the growth of household disposable income continuing to slow, the debt servicing ratio for housing loans increased to 38.49% in 2016 Q3, the highest level since statistics began, increasing by 2.39 percentage points year on year. The house price to income ratio trended up to 9.35, the highest level on record, rising by 0.83 year on year (Chart 2.45). Compared to other cities in Taiwan, the debt servicing ratio for housing loans and the house price to income ratio in Taipei City were the highest, reaching 63.71% and 15.47, respectively, followed by New Taipei City, registering 52.33% and 12.70, respectively.

[42] See the "Housing price index" report for 2016 Q2, compiled by the Construction and Planning Agency, the Ministry of the Interior.
[43] In 2017 Q1, the Cathay housing price index retrospectively adjusted the relevant index, including adjusting the base period, applying the new definition of "standard housing" (the newly-defined standard housing represents the typical quality of houses being transacted in a specific area) from 2016 Q1, and amending the calculation of the bargaining rate.

Construction licenses issued contracted, while unsold new residential properties expanded

In 2016, with sluggish housing market growth, a reduction in residential properties construction projects, as well as enterprises decreasing their demand for launching new stores and expanding plants, the total floor space of construction licenses issued decreased by 19.51% year on year (Chart 2.46), with residential properties decreasing by 27.25%. In 2017 Q1, the annual growth rate of the total floor space of construction licenses issued turned to positive growth of 9.98%, mainly driven by a rise in the demand for expanding offices and plants as well as a lower base period in the previous year; however, the floor space of construction licenses issued for residential properties still decreased by 5.20%.

Chart 2.46 Annual growth rates of floor space of construction, commencement, and usage licenses issued

Note: The data in 2017 are the annual growth rates from January to March.
Source: Monthly Bulletin of Interior Statistics, MOI.

Owing to worse-than-expected sales of new construction projects, construction companies were mostly committed to reducing inventory and new buildings constructions. In 2016, the total floor space of commencement licenses issued fell by 17.90% year on year (Chart 2.46), with residential properties decreasing by 19.49%. In 2017 Q1, the total floor space continuously dropped by 12.46% year on year, with residential properties decreasing by 23.77%.

With construction companies reducing construction projects, the total floor space of usage licenses issued decreased by 8.76% year on year in 2016 which was the first negative growth rate since 2011 (Chart 2.46), with residential properties decreasing by 7.04%. In 2017 Q1, the total floor space decreased by 10.38% year on year, with residential properties decreasing by 21.84%.

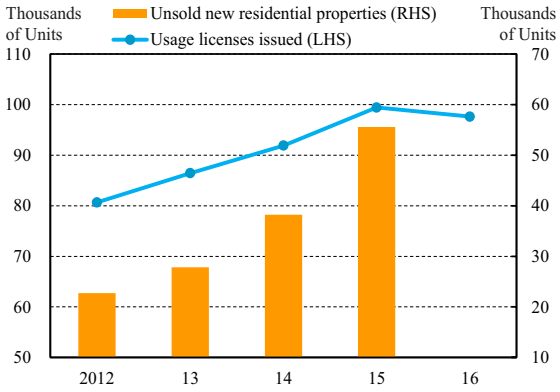
According to the Ministry of Interior, unsold new residential properties registered 56 thousand units at the end of 2015, increasing by around 17 thousand units or 45.36% year on year. In 2016, 98 thousand usage licenses issued were released, decreasing by 2 thousand units or 1.81% year on year (Chart 2.47). Owing to the prices of new residential properties

staying high as well as a sluggish housing market, unsold new residential properties will continuously expand.

Real estate loans grew modestly as mortgage interest rates continuously decreased

With demand in the housing market returning to be dominated by self-use housing buyers, the total new housing loans granted by the top five banks[44] registered NT$435.7 billion in 2016, decreasing by 2.39% year on year, a narrower decline than the previous year. In January 2017, the figure also decreased by 4.71% year on year but turned to positive growth from February onwards, and registered 6.37% in March. The interest rate for new housing loans exhibited a downward trend, and dropped to 1.659% in December 2016. From 2017 onwards, the housing loan interest rate rebounded slightly, but still stayed at a low level, registering 1.665% in March (Chart 2.48).

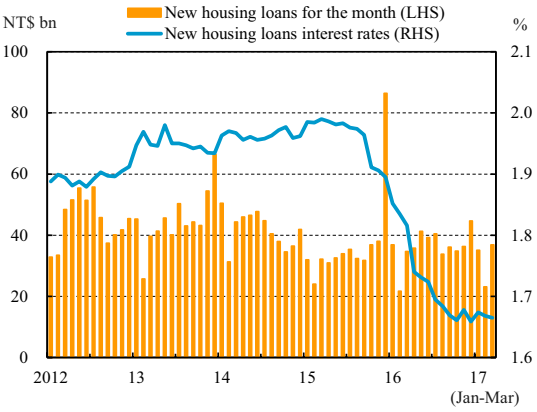
Chart 2.47 Unsold new residential properties and usage licenses issued for residential properties



Note: Unsold new residential properties use data from land registration, house tax registration and Taiwan Power Company, filtering the residential properties built within the last 5 years, still maintaining the first registration and having the possibility of being for sale. The data are currently published to 2015 Q4.

Source: Monthly Bulletin of Interior Statistics, Real estate information platform, MOI.

Chart 2.48 New housing loans – amounts and interest rates



Source: CBC.

From March 2016 onwards, with transactions in the housing market gradually resuming stability, the annual growth rate of the outstanding loans for house purchases and house refurbishments granted by banks[45] showed a moderate upward trend, registering 3.78% as of the end of March 2017 (Chart 2.49). Meanwhile, the decrease in outstanding construction loans narrowed gradually since July 2016. Those loans turned to positive growth as of the end of December, registering an annual growth rate of 2.11% at the end of March 2017 (Chart 2.49).

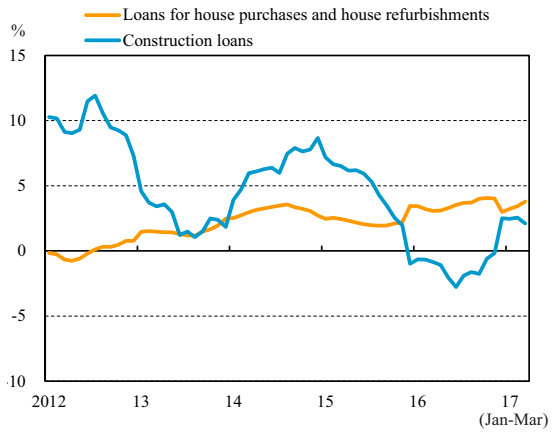
[44] The top five banks refer to Bank of Taiwan, Taiwan Cooperative Bank, First Commercial Bank, Hua Nan Commercial Bank, and Land Bank of Taiwan.

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

The CBC repealed most targeted prudential measures and banks were urged to exercise self-discipline on real estate loans

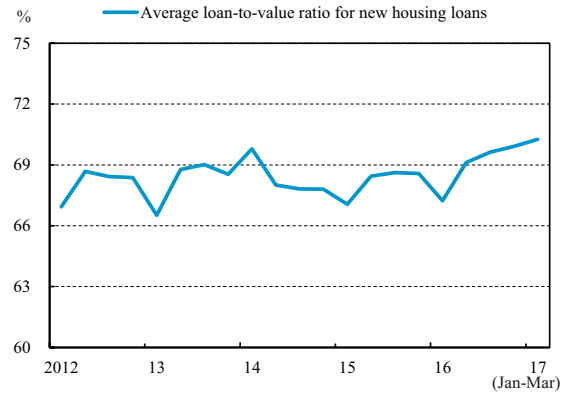
As the regulations governing real estate loans have proved effective, the CBC repealed most rules imposed on housing loans and land collateralized loans, except for high-value housing loans, and required financial institutions to strengthen self-discipline on mortgage-related credit risk. As a result, the average loan-to-value ratio for new housing loans rose at a moderate pace from 67.23% in 2016 Q1 to 70.26% in 2017 Q1 (Chart 2.50). In the future,0 the CBC will continue to monitor banks' real estate lending and developments in the housing market, and adopt appropriate measures in a timely manner to sustain financial stability.

Chart 2.49 Annual growth rates of real estate loans



Source: CBC.

Chart 2.50 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.

III. Financial system assessment

3.1 Financial markets

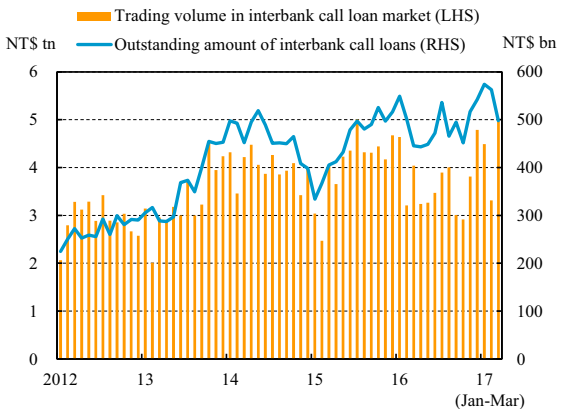
With respect to money and bond markets in 2016, the outstanding amount of interbank call loans increased, but the trading volume declined. The trading volume of bills and bonds in the secondary market fell, although their outstanding amount in the primary market increased. Short-term market rates decreased slightly and then remained at a lower level, while long-term market rates turned to rise after falling. With regard to the stock markets, stock indices trended up, while volatility fluctuated and fell over the same period. In the foreign exchange market, the NT dollar exchange rate against the US dollar fluctuated with an upward trend but volatility remained relatively stable.

3.1.1 Money and bond markets

Outstanding amount of interbank call loans increased, while the trading volume declined

Supported by stronger funding demands from bills finance companies and some small- and medium-sized banks which had weak funding liquidity, the average daily outstanding amount of interbank call loans in 2016 increased by 7.93% year on year. However, the trading volume of interbank call loans decreased by 9.05% year on year owing to a longer term to maturity [46] resulting in a reduction in the frequency of call loan transactions. In January 2017, affected by peak demand for funds before the Lunar New Year holidays, the average daily outstanding amount of interbank call loans reached a five-year high and then declined. Moreover,

Chart 3.1 Interbank call loan market

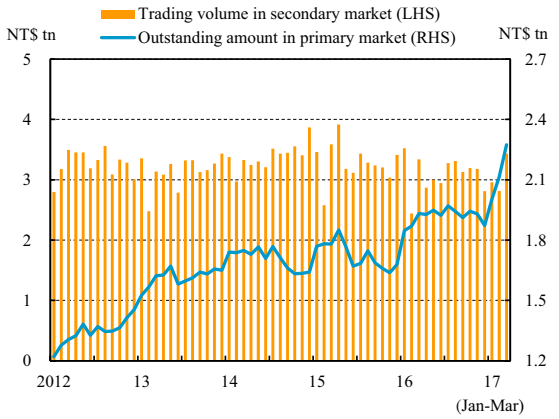


Note: Outstanding amount is the monthly average of daily data.
Source: CBC.

[46] The ratio of overnight call loans to total interbank call loans dropped significantly to 54.5% in 2016 from 63.71% posted a year earlier.

the trading volume of interbank call loans in March increased significantly, compared to the figure in February, reflecting more business days in March(Chart 3.1).

Chart 3.2 Primary and secondary bill markets



Sources: CBC and FSC.

Bill issuance in the primary market increased, but trading volume in the secondary market shrank

At the end of 2016, the total amount of bill outstanding substantially increased by NT$195.7 billion or 11.67% year on year, owing to massive issuance of non-guaranteed commercial paper by state-owned enterprises and large private corporates, as well as an increase in negotiable certificates of deposit (NCDs) issued by banks. The outstanding amount of non-guaranteed commercial paper and NCDs increased by NT$133.4 billion (9.91%) and NT$61.8 billion (26.0%), respectively, over the previous year. In 2017 Q1, the total amount of bill outstanding in the primary market continued to trend upwards as commercial paper issuance increased (Chart 3.2).

In 2016, the total amount of bill outstanding in the primary market saw an increase. On the other hand, the bill trading volume in the secondary market over the same period decreased by NT$2.4 trillion or 6.16% year on year. The main reasons behind this were that non-guaranteed commercial paper underwritten and purchased by bills finance companies was immediately sold in the secondary market, and that a massive amount of short-term bills purchased by banks was primarily used as liquid reserves and held to maturity. In 2017 Q1, the trading volume roughly remaied steady (Chart 3.2).

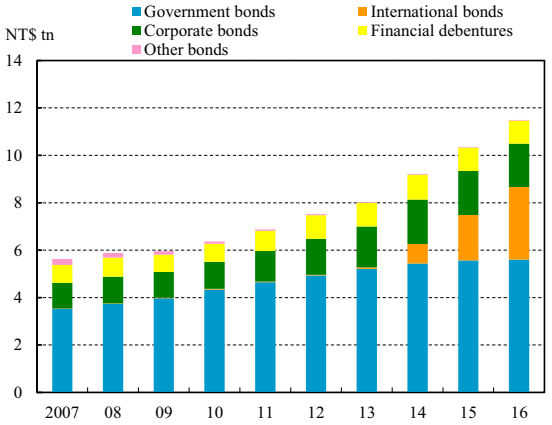
Bond issuance in the primary market expanded, but the turnover of outright transactions in the secondary market remained at a lower level

At the end of 2016, the total amount of bond outstanding increased by NT$1.14 trillion or 11.0% year on year. Analyzed by categories, the outstanding amount of local government bonds was about the same as that of the previous year. Meanwhile, the outstanding amount of international bonds[47] continued to grow sharply by NT$1.15 trillion or 60.04%. It was

[47] Bonds denominated in foreign currencies offered and issued in Taiwan by domestic and overseas issuers are called international bonds.

mainly driven by increased willingness of large international enterprises to raise funds in Taiwan because of rising expectations of the Fed's interest rate hike and convenient access to domestic funds. Moreover, the yields on international bonds were mostly much higher than those of local government bonds with the same maturity and international bonds were excluded from Taiwanese insurers' overseas investment ceilings, attracting life insurance companies to increase investment in international bonds. In addition, owing to weak demand from enterprises for capital expenditures, the outstanding amount of corporate bonds in 2016 decreased by NT$37.61 billion or 2.02% over the previous year. The outstanding amount of financial debentures also decreased by NT$11.48 billion or 1.16% year on year (Chart 3.3).

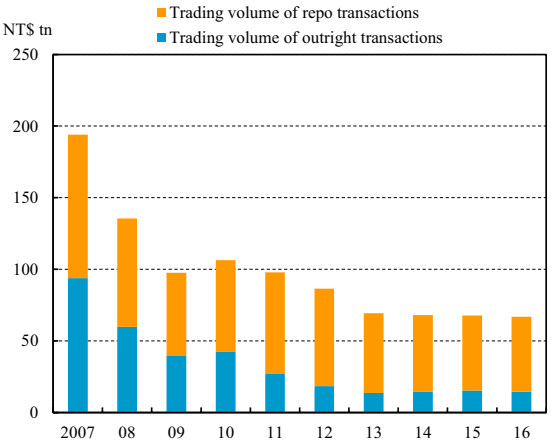
Chart 3.3 Total amount of bond outstanding in the primary market



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

The trading volume in the secondary bond market in 2016 fell by 1.34% year on year (Chart 3.4). The main reasons behind this were that life insurance companies mainly invested in international bonds by adopting buy-and-hold strategies, as well as an amplified concentration of bonds held by banks. In 2017 Q1, the monthly turnover ratio in the secondary major bond market[48] slightly rebounded after descending to a new low level of 4.14% in December 2016, (Chart 3.5).

Chart 3.4 Outright and repo transactions in the bond market



Source: CBC.

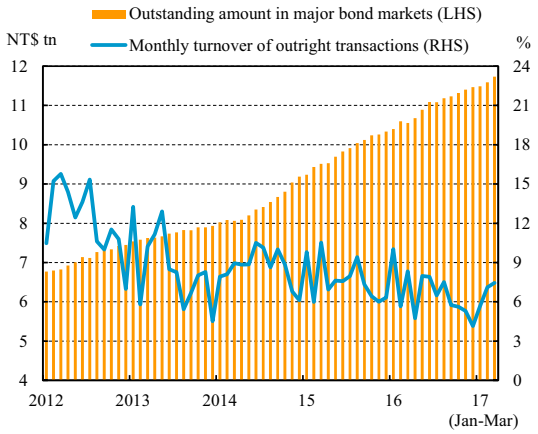
Short-term market rates slightly fell, while long-term market rates reversed to rise after falling

As for short-term market rates, following the CBC's two rate cuts of 12.5 bps in each of the March and June meetings in 2016, coupled with sustaining ample funds in financial markets, the interbank overnight call loan rate slightly fell in the second half of 2016. In 2017 Q1, short-term market rates remained stable at a low level (Chart 3.6).

[48] See Note 8.

In the first half of 2016, long-term bond interest rates continuously dipped, reflecting the fact that market participants expected interest rates to keep falling owing to a lower-than-expected domestic economic growth rate and financial disruption resulting in massive capital flows into the local bond market for hedging. As a result, the yield on Taiwan's 10-year government bonds fell to a historical low of 0.63% on August 18, 2016. Afterwards, affected by rising expectations of the Fed's interest rate hike and elevating international oil prices, Taiwan's 10-year government bond yields sharply rebounded to above 1% on October 28. From mid-November, owing to rising US inflation expectations and slowing domestic economic growth, coupled with the Fed's interest rate hike of 25 bps in mid-December, the yield on Taiwanese government bonds followed the upward trend of US government bond yields. In 2017 Q1, the yield on Taiwanese government bonds fluctuated within a narrow range resulting from a fall in US government bond yields (Chart 3.6).

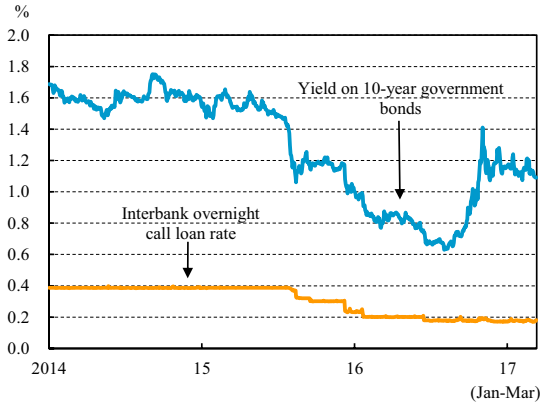
Chart 3.5 Outstanding amount in major bond markets and monthly turnover



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

Source: FSC.

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



Source: Bloomberg.

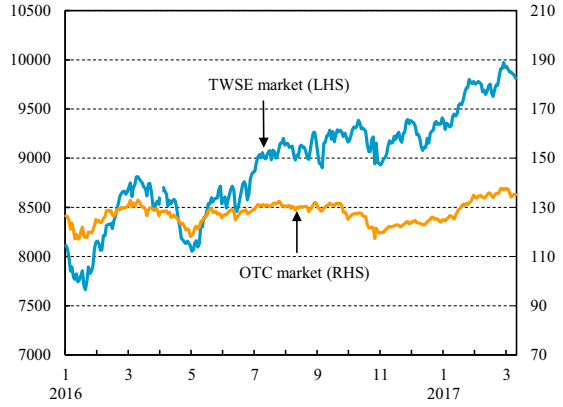
The Fed is expected to keep raising interest rates in 2017. This, coupled with the fact that the yield on Taiwan's government bonds has tended to fluctuate along with those of US government bonds over the past years, mean that the yield on Taiwan's government bonds, which is likely to be affected by that of US government bonds, is expected to trend upwards in the future. Moreover, the mounting uncertainty of international economic and financial conditions may trigger further bouts of global financial market turmoil. Therefore, related interest rate risks warrant close attention.

3.1.2 Equity markets

Stock indices trended up, while volatility fell

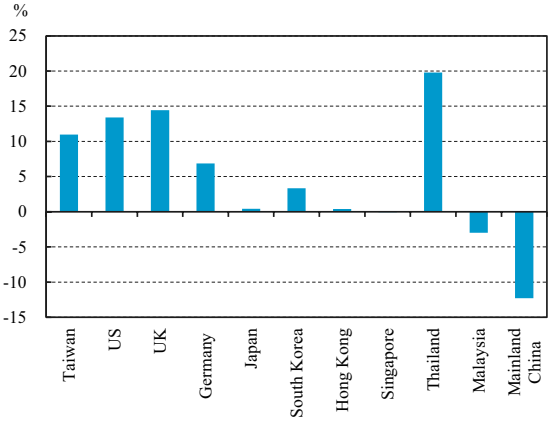
In the first half of 2016, owing to the changes in global stock markets and oil prices, as well as rising expectations of the Fed's interest rate hike, the TAIEX of the TWSE market fluctuated. However, from the second half of 2016 onwards, the rally in international major stock markets, domestic economic recovery and an increase in exports, accompanied by major US stock indices closing at record highs, led the TAIEX on an upward trend to hit a year high of 9,393 on December 9. The TAIEX registered 9,254 at the end of 2016, posting an increase of 10.98% year on year (Chart 3.7). Broken down by sector, the indices for the textile and fiber, automobile, shipping and transportation, tourism, biotechnology & medical care, and chemical, biotechnology & medical care industries reported negative returns, while the indices for the other sectors all rose. In the first quarter of 2017, underpinned by US stock indices constantly hitting record highs and massive net buying by foreign investors, the TAIEX trended up and reached 9,812 at end-March 2017, increasing by 6.03% from the end of 2016 (Chart 3.7).

Chart 3.7 Taiwan's stock market indices



Sources: TWSE and TPEx.

Chart 3.8 Comparison of major stock market performances



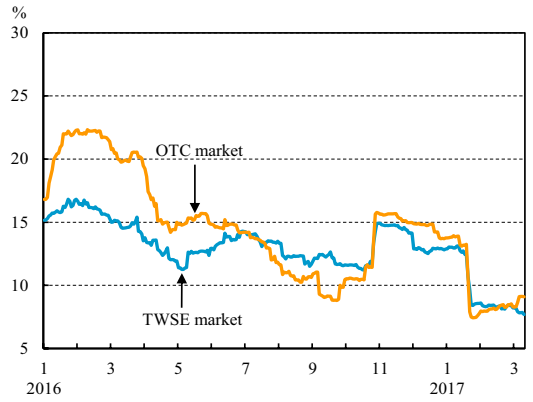
Notes: 1. Figures are for 2016.
2. Taiwan's data are for the TWSE market.
Source: TWSE.

In the OTC market, Taipei Exchange Capitalization Weighted Stock Index (TPEx) fluctuated in the first half of 2016. In the second half of the year, affected by the fall of the indices for cultural & creative and biotechnology & medical care industries, the TPEx moved with a downward trend and closed at 125 at end-December, with an annual drop of 3.00%. The index reversed this trend and climbed in 2017 Q1 to reach 135 at the end of March (Chart 3.7).

Comparing major stock markets around the world, most markets showed positive performances in 2016 except Mainland China and Malaysia, which saw declines in their stock indices, and Singapore, which maintained a similar level to the previous year. Thailand, the UK, and the US outperformed other countries with annual rises of 19.79%, 14.43% and 13.42% (Chart 3.8).

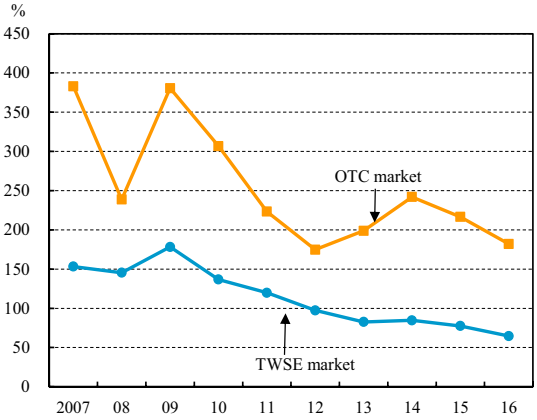
In the first three quarters of 2016, volatility in the TWSE and the OTC markets dropped sharply from their respective highs of 16.82% and 22.33% in the beginning of the year. Subsequently, volatility in those two markets trended upward in the last quarter, standing at 12.94% and 14.84% at the end of December. However, volatility of local stock indices declined to 7.69% and 9.08%, respectively, at the end of March 2017 (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.

Chart 3.10 Annual turnover ratio in Taiwan's stock markets



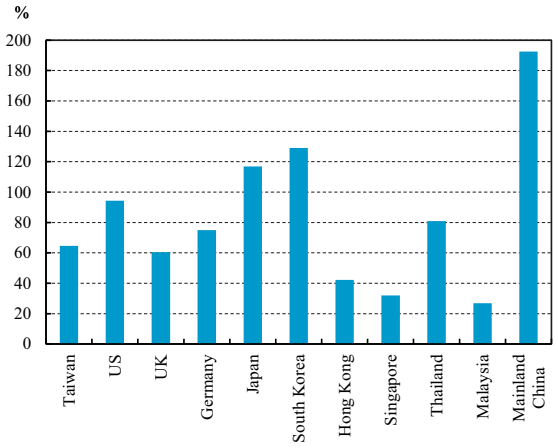
Sources: TWSE and TPEx.

Annual turnover ratio declined

The TWSE and the OTC markets both experienced reductions in trading in 2016. The average monthly trading value in the TWSE market registered NT$1.40 trillion, a decrease of 16.94% year on year, while the annual turnover ratio in terms of trading value declined to 64.60%. In the OTC market, the trading situation was similar to the TWSE market. The average monthly trading value posted NT$420.9 billion in 2016, a decline of 11.23% year on year, while the annual turnover ratio fell to 181.99% (Chart 3.10). The trading value in the TWSE market amplified at the beginning of 2017 and rose to NT$147.9 billion on 2 February, reaching a new high since August 2015. In 2017 Q1, the average monthly trading value in the TWSE and the OTC markets registered NT$1.59 trillion and NT$483.3 billion, respectively. Meanwhile the annual turnover ratio in terms of trading value saw a slight increase and reached 66.56% and 199.79%, respectively, over the same period.

Comparing major stock markets around the world, the annual turnover ratio in Mainland China ranked among the highest in 2016, while that in the stock market in Taiwan was approximately equal to that in the UK, but higher than those in Hong Kong, Singapore, and Malaysia (Chart 3.11).

Chart 3.11 Comparison of turnover ratios in major stock markets



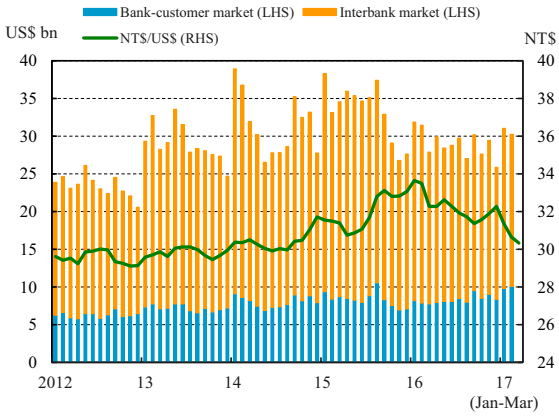
Notes: 1. Figures refer to accumulated turnover ratios in 2016.
2. Taiwan's data are for the TWSE market.
Source: TWSE.

3.1.3 Foreign exchange market

The NT dollar exchange rate reversed to appreciation and the trading volume decreased

From March 2016, the ECB expanding its QE programs, the BoJ continuously adopting a Negative Interest Rate Policy (NIRP) and an expectation of the Fed possibly slowing its interest rate hike schedule caused the US dollar to depreciate. As a result, increasing net foreign capital inflows led the NT dollar exchange rate to appreciate against the US dollar, reaching a yearly high of 31.225 on August 10. Thereafter, starting from October, on account of solid US economic data, President Trump's proposal of expansionary fiscal policy and tax cuts, and the Fed's interest rate hike in mid-December, resulted in the NT dollar exchange rate turning to depreciation against the US dollar. At the end of 2016, the NT dollar exchange rate stood at 32.279, an annual appreciation of 2.44%.

Chart 3.12 NTD/USD exchange rate and foreign exchange 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 2017.
Source: CBC.

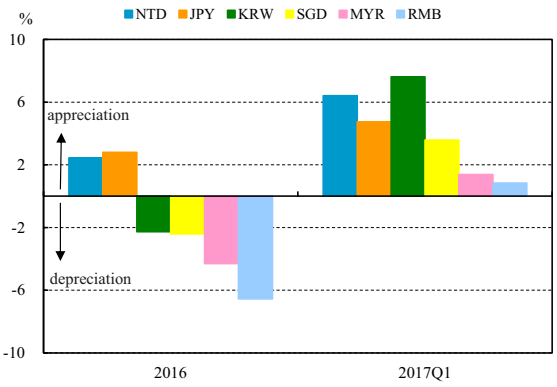
In early 2017, affected by uncertainties surrounding the US President Donald Trump's economic policies, along with a market expectation of weak US dollar policy, the NT dollar exchange rate turned to appreciate against the US dollar and rose to 30.336 at the end of March (Chart 3.12).

The appreciation of the NT dollar against the US dollar at 2.44% was only lower than the Japanese yen's 2.80% in 2016. In the first quarter of 2017, the NT dollar appreciated by 6.40%, while other major Asian currencies also displayed appreciating trends (Chart 3.13).

As for the NT dollar against other key international currencies, in 2016 the NT dollar appreciated by 23.82%, 6.53% and 4.81% against the British pound, the euro and the Korean won, respectively, but depreciated by 0.35% against the Japanese yen over the same period (Chart 3.14).

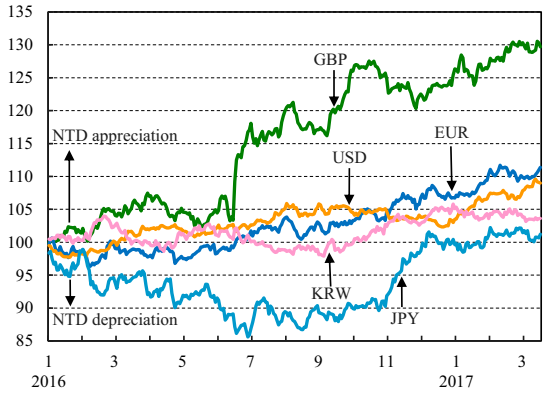
In 2016, the average daily trading volume in Taiwan's foreign exchange market contracted to US$28.9 billion, decreasing by 13.28% compared to US$33.4 billion a year earlier, primarily because of a decrease in the trading volume of the interbank market (Chart 3.12). A breakdown by counterparty showed that the average daily trading volume in the interbank market accounted for 71.22% of the total in 2016, while the bank-customer market made up a 28.78% share. As for types of transactions, foreign exchange swaps accounted for the largest share of 48.22% of the total, followed by spot trading with 39.08%.

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



Source: CBC.

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



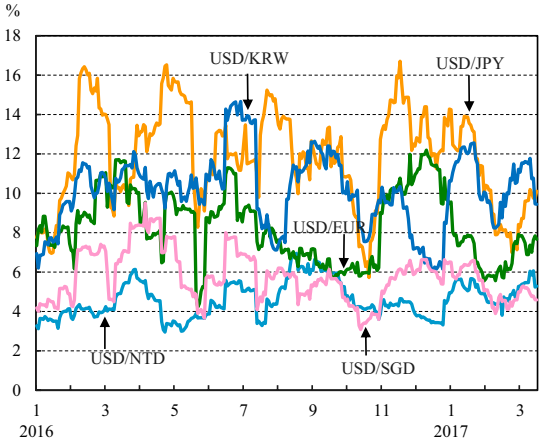
Note: December 31, 2015 = 100.
Source: CBC.

NT dollar exchange rate volatility remained relatively stable

Volatility in the NT dollar exchange rate against the US dollar fluctuated between 2.96% and 6.96% in 2016, and registered an annual average of 4.52%. Volatility in the NT dollar exchange rate against the US dollar moved between 3.32% and 6.07% during 2017 Q1. Since 2016, the NT dollar exchange rate against the US dollar has been relatively stable compared to the exchange rates of major currencies such as the Japanese yen, the euro, the Korean won and the Singapore dollar (Chart 3.15).

Taiwan is a small open economy; therefore, its foreign exchange market may be easily affected by massive and frequent movements of foreign capital. To lessen the effects of short-term inflows and outflows, the IMF has suggested that such economies may take the needed policy steps to raise/lower interest rates, lead local currencies to appreciate/depreciate, or take capital flow management measures.

Chart 3.15 Exchange rate volatility of various currencies versus the US dollar



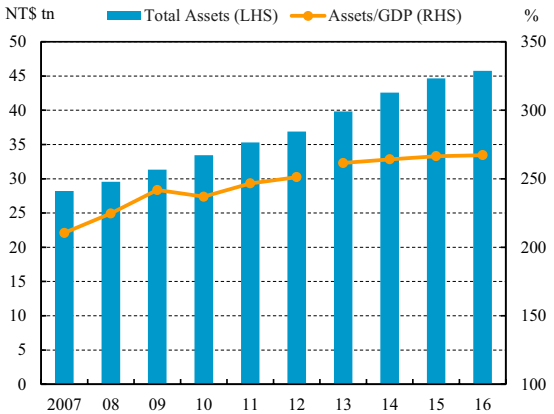
Note: Volatility refers to the annualized standard deviation of 20-day daily returns.
Source: CBC.

3.2 Financial institutions

3.2.1 Domestic banks

The total assets of domestic banks [49] accumulated continuously in 2016, though at a slower pace than in the previous year. Asset quality declined slightly, and the concentration in corporate loans mildly increased while the concentration of credit exposures in real estate loans decreased slightly. Nevertheless, banks should take prudent actions to address related credit risks deriving from a conservative outlook on real estate transactions. The estimated VaR of overall market risk exposures of domestic banks rose but had a limited influence on their capital adequacy. Moreover, liquidity risk was moderate thanks to ample liquidity in the banking system. The profitability of domestic banks in 2016 declined compared to that of the previous year, while the average capital adequacy ratio rose. This revealed that the capacity of domestic banks to bear losses was satisfactory.

Chart 3.16 Total assets of domestic banks



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

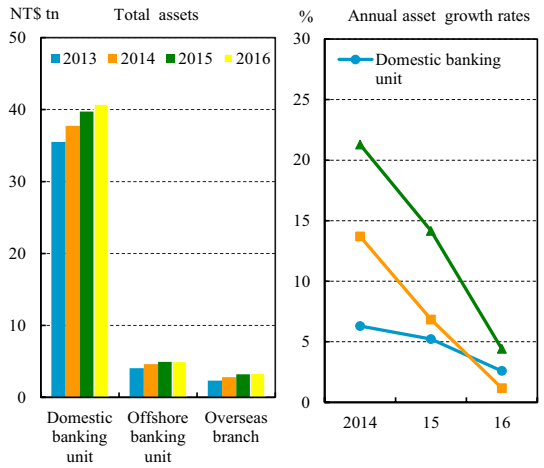
Total assets continued to increase at a moderate pace

The total assets of domestic banks kept increasing, albeit at a more moderate pace, and reached

[49] The 40 domestic banks referred to in this section include the Agricultural Bank of Taiwan.

NT$45.75 trillion at the end of 2016, equivalent to 267.26% of annual GDP (Chart 3.16). The annual growth rate of total assets decreased to 2.44%[50] from 4.94% a year earlier. Broken down by sector, annual growth rates of assets held by domestic banking units (DBUs), offshore banking units (OBUs), and overseas branches declined continuously, particularly offshore banking units and overseas branches (Chart 3.17). This was mainly because banks' policies regarding loans to Mainland China turned more cautious.

Chart 3.17 Total assets and annual asset growth rates of domestic banks (DBUs, OBUs and overseas branches)



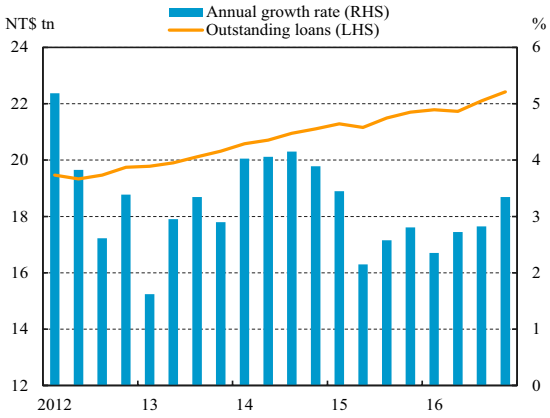
Note: Figures for total assets are inclusive of interbranch transactions.
Source: CBC.

Credit risk

Customer loan growth increased

Customer loans[51] were the major source of credit risk for domestic banks. Outstanding loans of the DBUs stood at NT$22.43 trillion at the end of 2016, accounting for 49.02% of total assets, with the annual growth rate increasing to 3.35% from 2.80% a year earlier (Chart 3.18).

Chart 3.18 Outstanding loans and annual loan growth rate in domestic banks



Source: CBC.

In terms of loan borrowers, the annual growth rate of corporate loans increased to 3.46% at the end of 2016 from 1.48% a year earlier, resulting from higher corporate demand for borrowing when the domestic economic growth gained momentum from Q2 onwards. However, the growth rate of household borrowing fell to 4.00% from 5.17% at the end of the previous year owing to a slowdown in mortgage loan growth, and government loans saw a negative growth rate of -0.45% mainly because increasing government tax revenues lessened the demand for bank borrowing.

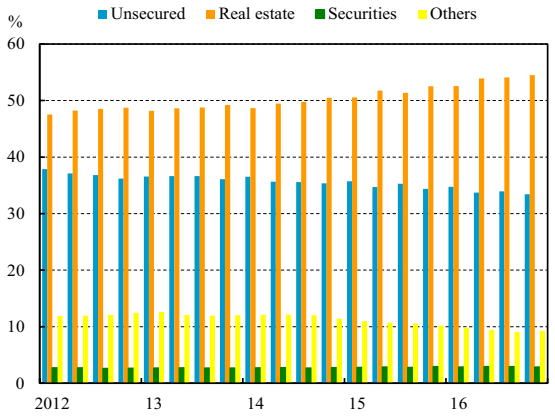
[50] Because life insurance companies obtained some funds from banks' time depositors through endowment policies aimed at expanding their foreign investments, the total assets of domestic banks expanded moderately as a result of slower growth in time deposits.
[51] The term "customer loans" herein refers to discounts, overdrafts, other loans, and import bills purchased. It excludes export bills purchased, non-accrual loans and interbank loans.

Concentration of credit exposure in real estate decreased slightly, but the share of real estate-secured credit elevated

Real estate loans[52] granted by the DBUs of domestic banks amounted to NT$8.14 trillion at the end of 2016, accounting for 36.29% of total loans. The ratio dropped slightly by 0.17 percentage points over the previous year, reflecting lower concentration of credit exposure in real estate loans. However, the total real estate-secured credit granted by domestic banks rose to NT$14.91 trillion, accounting for 54.50% of total credit,[53] with an increase of 1.98 percentage points over the previous year (Chart 3.19).

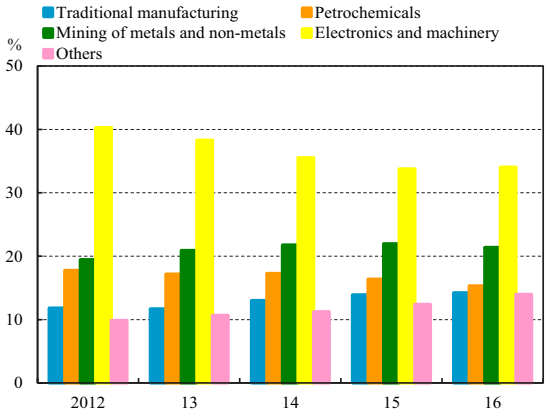
Trading volume in the real estate market contracted and prices trended downwards in 2016 due to the levying of a consolidated housing-and-land income tax and a heavier tax burden on real estate owners. Although the market saw some improvement in early 2017 as its trading volume increased slightly thanks to a gradual recovery of the domestic economy, prospects for the real estate market remained dim. Banks should purdently readjust their loan strategies and strengthen risk management to address related credit risks.

Chart 3.19 Credit by type of collateral in domestic banks



Source: CBC.

Chart 3.20 Exposure to the manufacturing sector by domestic banks



Note: Exposure to each sector = loans to each sector/loans to the whole manufacturing sector.
Source: CBC.

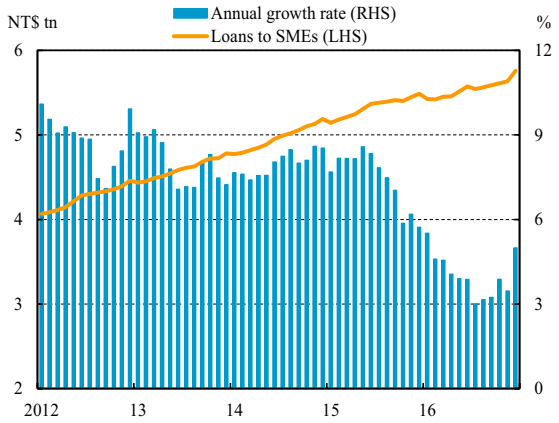
Credit concentration of corporate loans slightly increased

For the DBUs of domestic banks, corporate loans stood at NT$9.82 trillion at the end of 2016, of which loans to the manufacturing sector registered NT$3.85 trillion and accounted for the largest share of 39.20%. Within the manufacturing sector,[54] loans to the electronics

[52] The term "real estate loans" herein refers to house-purchase loans, house-refurbishment loans, and construction loans.
[53] The term "credit" herein includes loans, guarantee payments receivable, and acceptances receivable.
[54] 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.

industry stood at NT$1.31 trillion and accounted for 34.04% of loans to the whole sector, slightly increasing over the previous year. This reflected somewhat higher credit contentration of corporate loans in the electronics industry (Chart 3.20).

Chart 3.21 Loans to SMEs by domestic banks



Source: CBC.

As for credit to small and medium enterprises (SMEs), SME loans by domestic banks steadily expanded to NT$5.76 trillion at the end of 2016, increasing by NT$273.7 billion or 4.99% over the previous year. However, its growth rate fell by 0.73 percentage points compared to the previous year (Chart 3.21). As the ratio of SME loans to total corporate loans kept rising year by year and reached a ten-year high of 58.67% at the end of 2016, this indicated that banks conformed well to government policy to meet SMEs' funding needs under proper risk control. Moreover, the SME loans guaranteed by the Small and Medium Enterprise Credit Guarantee Fund (SMEG) remained at a relatively high level over recent years and stood at NT$801.8 billion at the end of 2016, although decreasing by 2.59% from the end of 2015.

The impact of TRFs and DKOs on banks is expected to diminish as their nominal amount decreased markedly

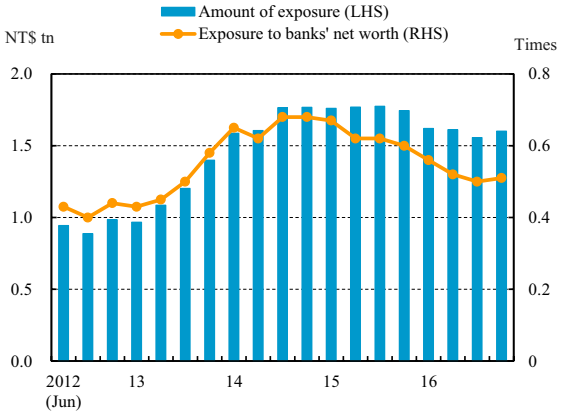
Because of a sharp depreciation in the renminbi from 2014 onwards, domestic banks with large exposures to target redemption forwards (TRFs) and discrete knock-outs (DKOs) faced higher default risk from clients. To address this issue, the FSC has introduced several rounds of supervisory reinforcements during 2014-2017 and banned banks that did not build or implement proper internal control from engaging in such business or levied large fines on such banks.

As most banks have set up sufficient provisions for potential losses from defaults, together with a significant decrease in the nominal amount of TRFs and DKOs and the expiration of most contracts by the end of 2017, its impact on banks is expected to diminish gradually. However, the disputes between banks and investors over such transactions need to be settled appropriately by banks, under the request of the FSC.

Exposure to Mainland China decreased

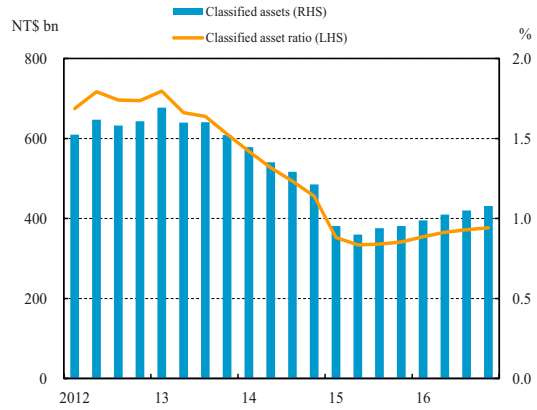
According to Article 12-1 of the *Regulations Governing the Banking Activity and the Establishment and the Investment by Financial Institution Between the Taiwan Area and the Mainland Area*, the aggregate amount of credit, investment, and interbank loans/deposits (hereafter statutory exposure)[55] extended by a domestic bank to customers in the Mainland Area should not exceed 100% of the bank's net worth as of the end of the preceding fiscal year. At the end of 2016, the aggregate amount of such exposure of all domestic banks stood at NT$1.59 trillion, or 51% as a percentage of banks' net worth, lower than 60% a year earlier (Chart 3.22). The exposure level continued to fall and no domestic bank exceeded the limit.

Chart 3.22 Exposure to Mainland China by domestic banks



Note: The FSC has implemented the calculation method of statutory exposure in the Mainland China area since April 2012.
Source: FSC.

Chart 3.23 Classified assets of domestic banks



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

In order to reinforce risk control and risk-bearing capacity for credit exposure of domestic banks to customers in the Mainland Area, the FSC implemented several measures[56] from 2014 onwards. Furthermore, in October 2016 the FSC required domestic banks to review their investment exposure to Mainland China, reinforce risk control measures,[57] and regularly evaluate the effectiveness of supervisory measures. However, financial risks in Mainland China are mounting on account of moderating economic growth, increasing default risks of corporate debts,

[55] Statutory exposure refers to aggregate exposure, but excludes: (1) short-term trade financing within one year; (2) credits and investments backed by guarantees or collateral which are fully secured outside Mainland China. Moreover, specific interbank loans/deposits with remaining maturity less than three months and the underlying counterparty rated at investment-grade are weighted with 20% of the aggregate amount of exposure.

[56] See CBC (2015), *Financial Stability Report*, Chapter IV, May.

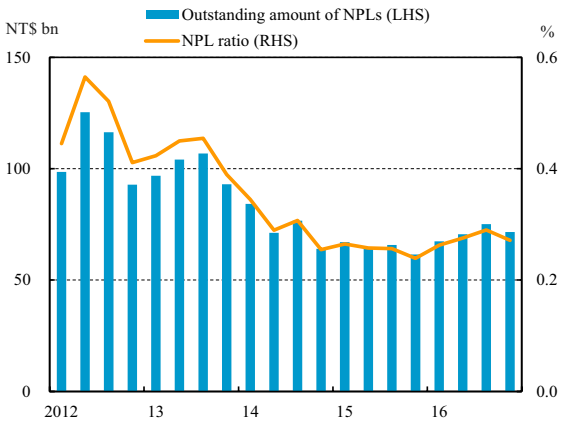
[57] The investment exposure control measures of domestic banks to Mainland China include: (1) requiring banks to review their bond portfolios, and if the investees are non-financial institutions of China's enterprises, banks should strengthen and control their investment risks; (2) examining the concentration of investment exposure to Mainland China, and if the ratios of holdings of bills and bonds issued by China's enterprises to the total amount of investment exposure to Mainland China are more than 30%, banks should re-evaluate their investment policies and reinforce risk control of such portfolios.

heightened volatility in stock and foreign exchange markets, and rising financial risks. Therefore, domestic banks should cautiously monitor economic and financial conditions in Mainland China, as well as prudently controlling their exposure to customers over there.

Asset quality declined slightly

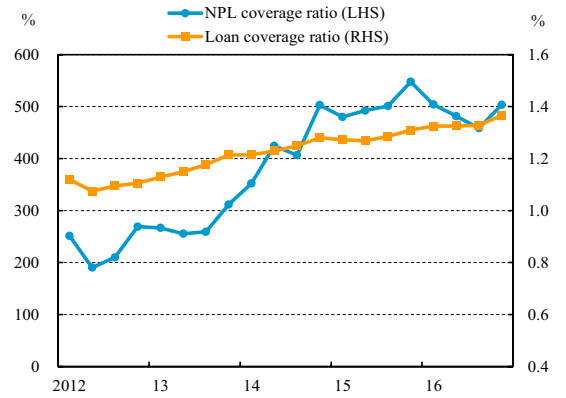
Outstanding classified assets[58] of domestic banks stood at NT$431 billion at the end of 2016, increasing by 13.06% from a year earlier, while the average classified asset ratio also rose to 0.94%, with a modest increase of 0.09 percentage points over the previous year (Chart 3.23). This showed that the asset quality of domestic banks had slightly declined. Meanwhile, the expected losses of classified assets[59] also expanded by NT$6.4 billion or 13.28% from a year earlier to NT$54.7 billion. However, the ratio of expected losses to loss provisions was only 13.55%, indicating domestic banks had sufficient provisions to cover expected losses.

Chart 3.24 NPL ratio of domestic banks



Note: Excludes interbank loans.
Source: CBC.

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.

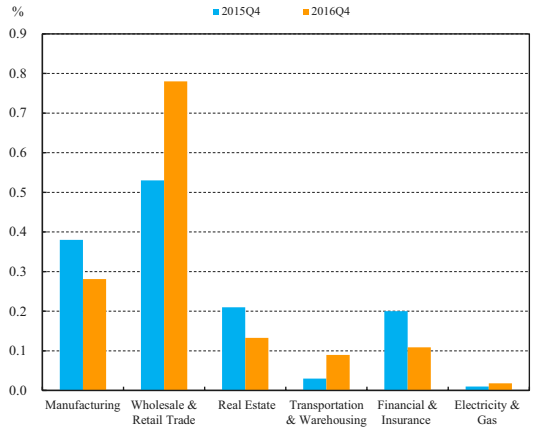
Furthermore, the outstanding NPLs of domestic banks registered NT$71.6 billion at the end of 2016, and the average NPL ratio stood at 0.27%, slightly increasing by 0.03 percentage points year on year (Chart 3.24). As a result of increasing provisions, the loan coverage ratio rose to 1.37% at the end of 2016 (Chart 3.25), but the NPL coverage ratio declined to 503.45% from the previous year due to the larger increase in NPLs over that in provisions. Nevertheless, the capability of domestic banks to cope with potential loan losses remained satisfactory.

[58] The *Regulations Governing the Procedures for Banking Institutions to Evaluate Assets and Deal with Non-performing/Non-accrual Loans* break down all assets into five different categories, including: category one – normal credit assets; category two – credit assets requiring special mention; category three – substandard credit assets; category four – doubtful credit assets; and category five – loss assets. The term "classified assets" herein includes all assets classified as categories two to five.

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

Among 40 domestic banks, almost all had NPL ratios of less than 1% at the end of 2016. In terms of borrowers, the NPL ratio for individual loans climbed by 0.02 percentage points to 0.25%, whereas for corporate loans it declined by 0.03 percentage points to 0.29%, compared to the previous year. Among corporate loans, the NPL ratios saw a rise in the wholesale and retail trade industries, as well as the transportation and warehousing industries, while the NPL ratios of the manufacturing, real estate, and financial and insurance industries decreased (Chart 3.26).

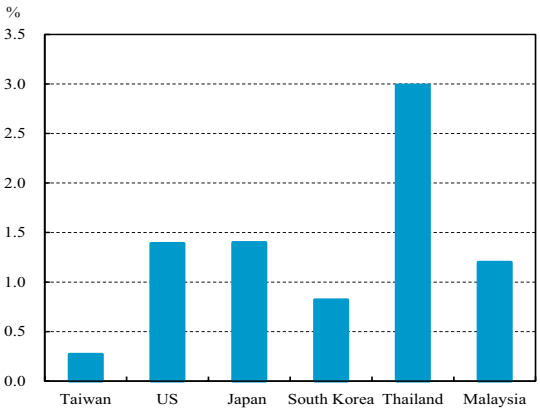
Chart 3.26 NPL ratios of domestic banks in selected industries



Note: Excludes interbank loans.
Source: JCIC.

Compared to the US and neighboring Asian countries, domestic banks in Taiwan had much lower NPL ratios than banks in countries such as the US, Japan and Thailand (Chart 3.27).

Chart 3.27 NPL ratios of banks in selected countries



Note: Figure for Japan is end-September 2016 data, while the others are end-December 2016 data.
Sources: CBC, FDIC, FSA, FSS, BOT and BNM.

Market risk

Estimated value-at-risk for market risk exposures rose slightly

In order to improve market risk assessments and meet the market risk capital requirements under the *Basel Accord*, the CBC developed a value-at-risk (VaR) model[60] for evaluating foreign exchange, interest rate, and equity risks, which is based on the VaR model of Jorion (2006)[61] and the market risk internal model developed by Chung (2015).[62] When estimating different risks, a dynamic Nelson-Siegel term structure model and a vector autoregressive VAR(1) model for multivariate time series were used for interest rate risks, while a random walk model was utilized for foreign exchange risks and an AR(1)-EGARCH(1,1) model for equity risks. In addition to general market risks, specific risks calculated under the

[60] See CBC (2016), *Financial Stability Report*, Box 2, May.
[61] Jorion, Philippe (2006), *Value at Risk: The New Benchmark for Managing Financial Risk*, Third Edition, McGraw-Hill.
[62] Chung, Ching Fang (2015), *The Development of an Internal Model for Measuring Banks' Market Risks under Basel III*, CBC commissioned paper, December.

standardized approach are also incorporated into the model to estimate interest rate risks and equity risks.

At the end of 2016, 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 foreign exchange and of equity securities. Based on the CBC's VaR model, the estimated total VaR for foreign exchange, interest rate, and equity exposures of domestic banks stood at NT$136.7 billion at the end of 2016, up by NT$4.9 billion or 3.72% compared to a year earlier (Table 3.1). Among them, the interest rate and foreign exchange VaRs increased by 6.67% and 23.81%, respectively, mainly owing to more volatility in international and domestic bond and foreign exchange markets. On the other hand, the equity VaR decreased by 27.21% owing to a reduction in its net position (Table 3.1).

The impacts of market risk on capital adequacy ratios were slight

According to the estimation mentioned above, the total VaR would cause a decrease of 0.37 percentage points in the average capital adequacy ratio of domestic banks and cause the ratio to drop from the current 13.33% to 12.96%. Nevertheless, it would still be higher than the statutory minimum of 8.625%.

Table 3.1 Market risks of domestic banks

Unit: NT$ bn

Types of risk	Items	End-Dec. 2015	End-Dec. 2016	Changes	
				Amount	PP;%
Foreign exchange	Net position	208.7	223.4	14.7	7.04
	VaR	4.2	5.2	1	23.81
	VaR/net position (%)	2.01	2.33		0.32
Interest rate	Net position	1,447	1,547.4	100.4	6.94
	VaR	114	121.6	7.6	6.67
	VaR/net position (%)	7.88	7.86		-0.02
Equities	Net position	80.1	64.5	-15.6	-19.48
	VaR	13.6	9.9	-3.7	-27.21
	VaR/net position (%)	16.98	15.35		-1.63
Total VaR		131.8	136.7	4.9	3.72

Note: PP = percentage point.
Source: CBC.

Liquidity risk

Liquidity in the banking system remained ample

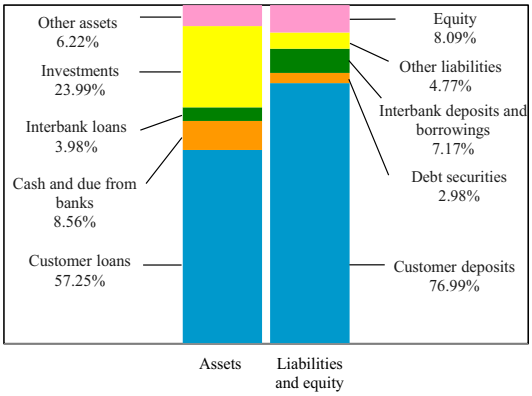
The assets and liabilities structure of domestic banks remained roughly unchanged in 2016. As for the sources of funds, relatively stable customer deposits still made up the largest share of 76.99 % of the total, followed by equity at 8.09%. Regarding the uses of funds, customer loans accounted for the biggest share of 57.25%, followed by securities investments at 23.99% (Chart 3.28).

The average deposit-to-loan ratio of domestic banks stood at 137.25%, higher than 136.21% at the end of the previous year, and the funding surplus (i.e., deposits exceeding loans) also expanded to NT$9.82 trillion. This indicated that the overall liquidity in domestic banks remained abundant (Chart 3.29).

Overall liquidity risk remained relatively low

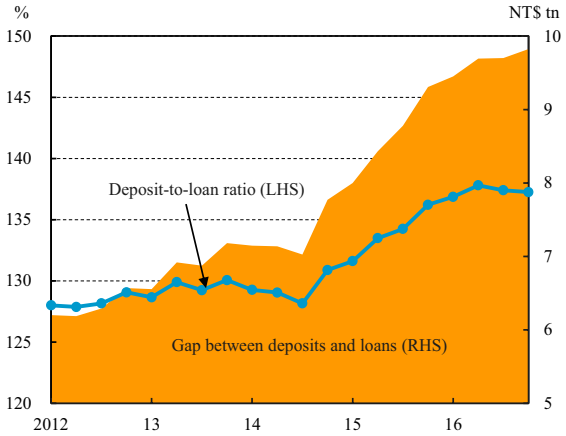
The average NT dollar liquid reserve ratio of domestic banks was well above the statutory minimum of 10% in every month of 2016 and stood at 31.20% in December, an increase of 0.21 percentage points year on year (Chart 3.30). All banks had ratios higher than 15%. Looking at the components of liquid reserves in December 2016, Tier 1 liquid reserves, mainly consisting of

Chart 3.28 Asset/liability structure of domestic banks



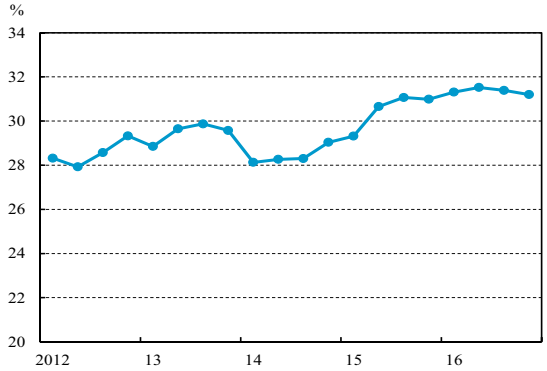
Notes: 1.Figures are as of the end of 2016.
2.Equity includes loss provisions. Interbank deposits include deposits with the CBC.
Source: CBC.

Chart 3.29 Deposit-to-loan ratio of domestic banks



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

Chart 3.30 Liquid reserve ratio of domestic banks



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

certificates of deposit issued by the CBC, accounted for 86.81% of the total, while Tier 2 and other reserves accounted for a total of 13.19%. The quality of liquid assets held by domestic banks remained satisfactory.

Moreover, the average liquidity coverage ratio (LCR) of domestic banks was 126% at the end of 2016, slightly higher than 125% a year ealier (Chart 3.31). The average ratios of state-owned banks and private banks were 120% and 127%, respectively. All banks met the minimum LCR requirement in 2016. Therefore, overall liquidity risk of domestic banks was relatively low.

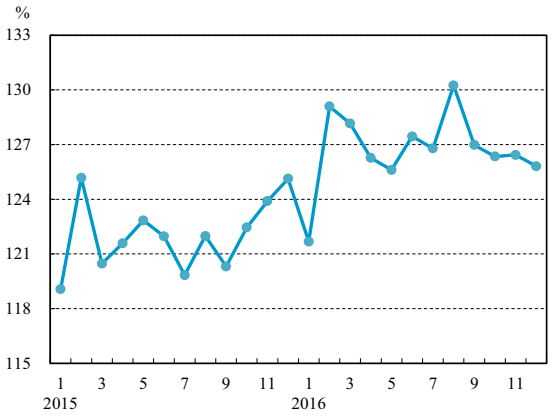
Profitability

Profitability decreased moderately

The net income before tax of domestic banks was NT$301.9 billion in 2016, decreasing by NT$18.7 billion or 5.85% year on year (Chart 3.32). The decrease was mainly due to rising provisions of most banks and additional losses from a US$180 million (about NT$5.7 billion) penalty paid by Mega Bank for its New York branch for not strictly fulfilling the requirements set forth in the US AML regulations. Moreover, the higher income base in 2015 resulting from CTBC bank recognizing a one-time gain from selling its Sinyi headquarters building was also one of the reasons for the decrease.

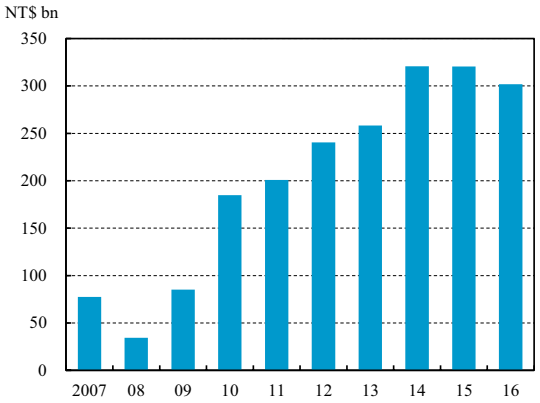
Affected by a decline in net income before tax and continuous increases in equity and

Chart 3.31 Liquidity coverage ratio of domestic banks



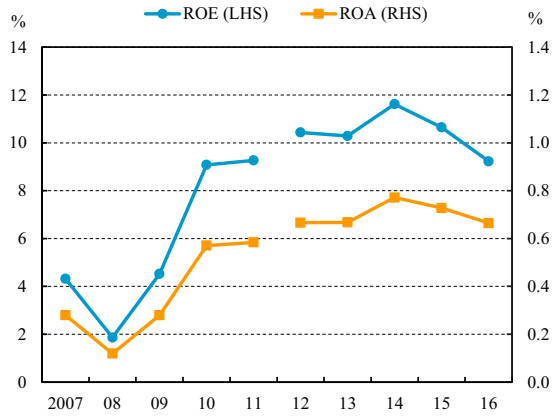
Source: CBC.

Chart 3.32 Net income before tax of domestic banks



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

Chart 3.33 ROE & ROA of domestic banks



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

assets, the average ROE and ROA fell year on year to 9.23% and 0.66% from 10.65% and 0.73%, respectively. This showed a weaker profitability of domestic banks in 2016 (Chart 3.33). Compared to selected neighboring Asia-Pacific economies, the ROEs of domestic banks ranked in the middle, higher than the US and South Korea. However, the ROAs still lagged behind their counterparts, only better than Australia and South Korea (Chart 3.34).

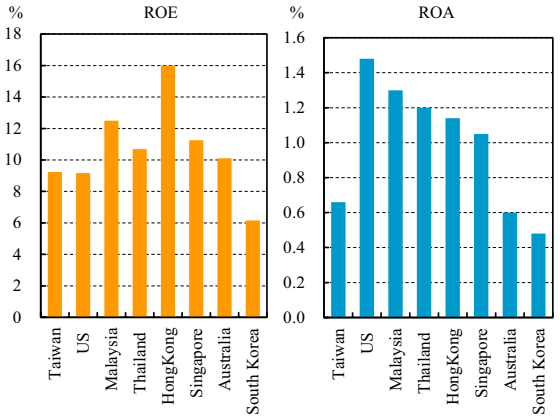
Analyzing domestic banks by segments, net income before tax of domestic banking units (DBUs) and offshore banking units (OBUs) dropped moderately by 3.82% and 3.56%, respectively, while that of overseas branches decreased significantly by 24.92% in 2016. As a result, the contributions of DBUs and OBUs to total profits improved, but the ratio for overseas branches trended down (Chart 3.35).

In 2016, only one bank achieved a profitable ROE of 15% or more, decreasing from two banks in 2015. The number of banks whose ROAs reached the international standard of 1% also saw a decrease from seven to four (Chart 3.36). Nevertheless, there still were nine banks with higher ROEs and 12 banks with higher ROAs compared to 2015.

Net operating income grew continually

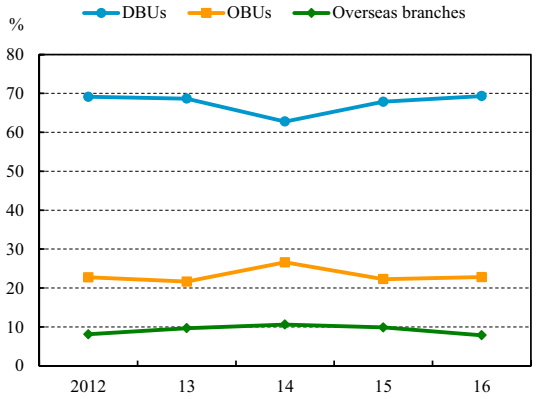
Total net operating income of domestic banks registered NT$746 billion in 2016, increasing by NT$11.5 billion or 1.56% year on year, mainly owing to growth in non-interest

Chart 3.34 Comparison of ROEs and ROAs of banks in selected economies



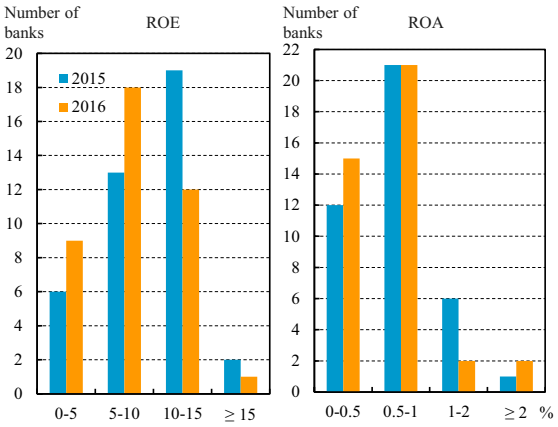
Note: Figures are as of the end of 2016.
Sources: CBC, FDIC, BNM, BOT, HKMA, APRA, FSS and IMF.

Chart 3.35 Profit contributions of domestic banks by segments



Note: Overseas branches include branches in Mainland China.
Source: CBC.

Chart 3.36 Distribution of ROEs and ROAs of domestic banks



Source: CBC.

income, such as net gains on financial instruments and fee income. Analyzed by income component, net gains on financial instruments significantly grew by NT$14.3 billion or 20.3% year on year, supported by a substantial increase in valuation and disposal gains of financial instruments at fair value. Net fee income also rose by NT$6.6 billion or 3.90% year on year, benefiting from growth in the sale of insurance products and credit card business (Chart 3.37).

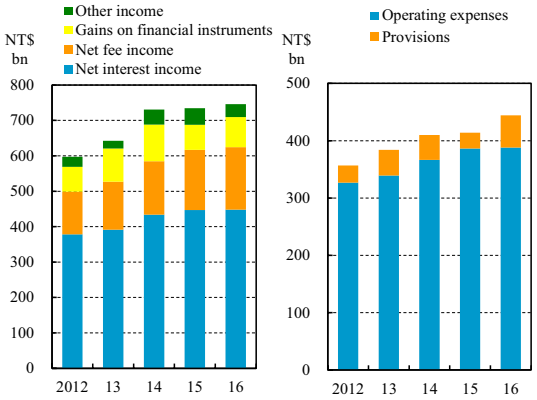
Total costs increased markedly due to a rise in provisions

The total costs of domestic banks registered NT$444.2 billion in 2016, rising by NT$30.2 billion or 7.3% compared to the previous year. Among them, operating expenses[63] slightly increased by NT$1.5 billion or 0.39%, but their share of total costs decreased to 87% from 93% in 2015. Meanwhile, provisions for loan losses and guarantee reserves remarkably increased by NT$28.7 billion or 104.57% year on year. The increase was mainly because domestic banks were required by the FSC to maintain a provision ratio of at least 1.5% against real-estate loans by the end of 2016, and also banks wanted to be prepared to address possible default losses related to TRF contracts (Chart 3.37).

Factors that might affect future profitability

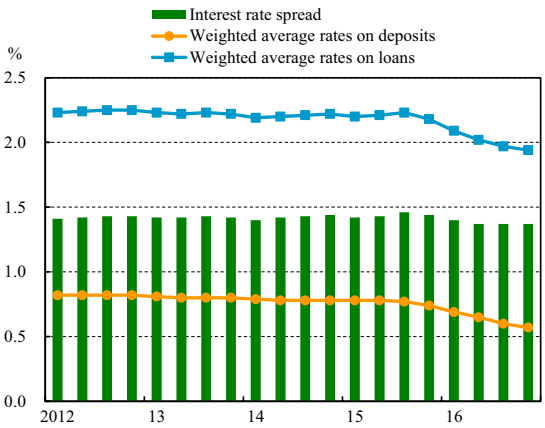
As a result of policy rate cuts by the CBC and increases in large-value loans to government and well-performing private enterprises at low lending rates, the interest rate spread between deposits and loans of domestic banks dropped by 0.07 percentage points from 2015 Q4 to hit a

Chart 3.37 Composition of income and costs of domestic banks



Source: CBC.

Chart 3.38 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.

[63] Operating expenses include employee benefits expenses, depreciation and amortization expenses, and other operating and management expenses.

five-year low at 1.37 percentage points in 2016 Q2 and remained the same in the second half of the year (Chart 3.38). The downtrend in the interest rate spread could undermine future profitability of domestic banks.

Furthermore, after Mega Bank was fined by the US authority for not strictly fulfilling the requirements set forth in the US AML regulations, the FSC has required domestic banks to reinforce their AML control mechanisms and regulatory compliance programs. This, coupled with more actions taken by banks in response to stricter international regulation and supervision of anti-money laundering (Box 1), means that compliance costs of domestic banks will increase and in turn affect their future profitability. Furthermore, the significant appreciation of the NT dollar against the US dollar in 2017 Q1 was also detrimental to those banks with high foreign incomes.

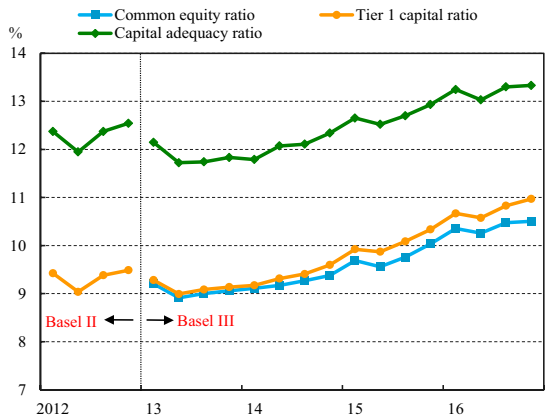
Capital adequacy

Capital ratios trended upward

In the second quarter of 2016, the average capital ratio of domestic banks declined slightly owing to seasonal factors such as cash dividends being declared and paid. Afterwards, as a result of capital injection and accumulated earnings as well as the issuance of Basel III-compliant capital instruments, the average common equity ratio, Tier 1 capital ratio, and capital adequacy ratio rose to 10.50%, 10.97%, and 13.33%, respectively, at the end of 2016 (Chart 3.39). However, compared to neighboring Asia-Pacific economies, domestic banks in Taiwan had relatively lower capital levels (Chart 3.40).

Further breaking down the components of regulatory capital, common equity Tier 1 capital, which features the best loss-bearing capacity, accounted for 78.80% of eligible capital, while non-common equity Tier 1 capital and Tier 2 capital registered significantly smaller shares of 3.49% and 17.71%, respectively, at the end of 2016. This showed that the capital quality of domestic

Chart 3.39 Capital ratios of domestic banks



Notes: 1. Figures from 2013 forward are based on Basel Ⅲ, while prior years are based on Basel Ⅱ
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

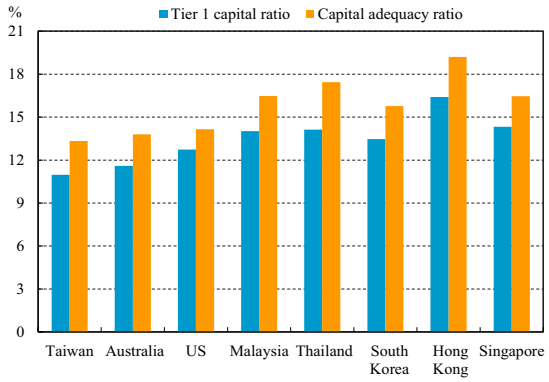
Source: CBC.

banks was satisfactory.

The capital levels of all domestic banks were higher than the 2016 statutory minimum

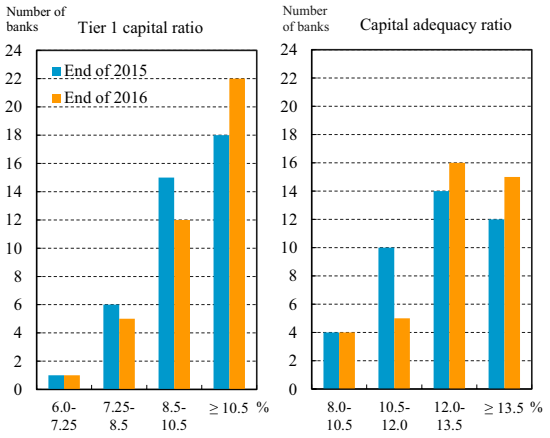
At the end of 2016, the common equity ratios, Tier 1 capital ratios, and capital adequacy ratios for all domestic banks remained above the statutory minimum requirements for 2016.[64] Compared to the end of the previous year, the number of banks with Tier 1 capital ratios higher than 10.5% and capital adequacy ratios higher than 12% significantly increased, indicating that most banks have been improving both their capital levels and quality (Chart 3.41).

Chart 3.40 Comparison of capital ratios in selected economies



Note: Figures are as of the end of 2016.
Sources: CBC, APRA, FDIC, BNM, BOT, FSS, HKMA, and IMF.

Chart 3.41 Number of domestic banks classified by capital ratios



Source: CBC.

A few banks still faced pressure to raise their capital levels

Even though the capital ratios of all banks met the minimum standards at the end of 2016, a few state-owned and private banks might not fulfill the escalating minimum capital requirements between 2017 and 2019 and thus face pressure to raise their capital levels. Such banks should actively improve their capital adequacy via issuing common stocks or qualified subordinated debts, accumulating earnings, or adjusting asset structures.

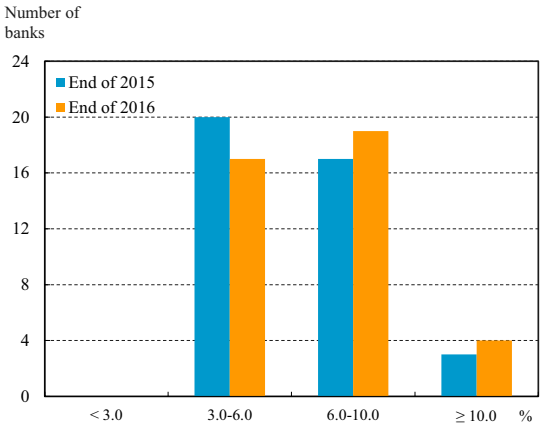
[64] The minimum capital requirements in the Basel Ⅲ transition periods are as follows:

Ratios	2016	2017	2018	2019 onwards
Common equity ratio (%)	5.125	5.75	6.375	7.0
Tier 1 capital ratio (%)	6.625	7.25	7.875	8.5
Capital adequacy ratio (%)	8.625	9.25	9.875	10.5

Leverage ratios higher than the international standard of 3%

The average leverage ratio[65] of domestic banks at the end of 2016 stood at 6.29%, higher than 5.9% a year before. The ratio was well above the international standard of 3%, showing sound leverage levels of domestic banks. By individual banks, no bank had a leverage ratio below 3%, while the number of banks with a leverage ratio higher than 6% came to 23, three more than the number of the previous year (Chart 3.42).

Chart 3.42 Leverage ratios of domestic banks



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

Credit ratings

Average credit rating level further enhanced

With respect to the overall risk assessments of Taiwan's banking system made by credit rating agencies, Standard & Poor's maintained Taiwan's Banking Industry Country Risk Assessment (BICRA)[66] unchanged at Group 4. Compared to other Asian economies, the risk of Taiwan's banking system was higher than those of Hong Kong, Singapore, Japan, and South Korea, about the same as that of Malaysia, but much lower than those of Mainland China, Thailand, Indonesia and the Philippines. The assessment of Taiwan's banking system by Fitch Ratings' Banking System Indicator/Macro-Prudential Indicator (BSI/MPI)[67] also remained

Table 3.2 Systemic risk indicators for the banking system

Banking System	Standard & Poor's		Fitch	
	BICRA		BSI/MPI	
	2016/2	2017/2	2016/2	2017/1
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	bbb/1	a/1
Taiwan	**4**	**4**	**bbb/1**	**bbb/1**
Malaysia	4	4	bbb/1	bbb/1
Mainland China	5	5	bb/3	bb/1
Thailand	6	6	bbb/1	bbb/1
Indonesia	7	7	bb/2	bb/1
Philippines	7	7	bb/1	bb/1

Sources: Standard & Poor's and Fitch Ratings.

[65] 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.

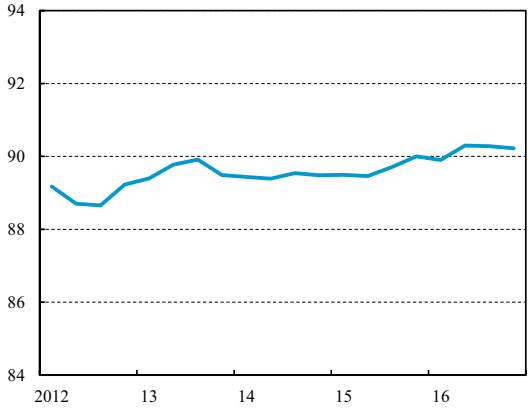
[66] The analytical dimensions of Standard & Poor's BICRA include economic risk and industry risk. The economic risk of a banking sector is determined by factors including economic resilience, economic imbalances, and credit risk in the economy, while industry risk is determined by institutional framework, competitive dynamics and system-wide funding. The overall assessments of those factors will lead to the classification of a country's banking system into BICRA groups, ranging from group 1 (lowest risk) to group 10 (highest risk), in order to indicate the relative country risk and banking sector credit quality.

[67] Fitch Ratings has devised two complementary measures, the BSI and MPI, to assess banking system vulnerability. The two indicators are brought together in a Systemic Risk Matrix that emphasizes the complementary nature of both indicators. The BSI represents banking system strength on a scale from aa (very strong) to ccc/cc/c (very weak). On the other hand, the MPI indicates the vulnerability to stress on above-trend levels of private sector credit, a bubble in real asset prices, and/or major currency appreciation, measuring the vulnerability of the macro environment on a scale from 1 (low) to 3 (high) in terms of banking system vulnerability.

unchanged at level bbb/1 (Table 3.2).

All domestic banks received ratings by credit rating agencies for 2016.[68] The credit rating index[69] of domestic banks went up[70] in 2016 (Chart 3.43), mainly because two banks were upgraded.

Chart 3.43 Credit rating indices of domestic banks

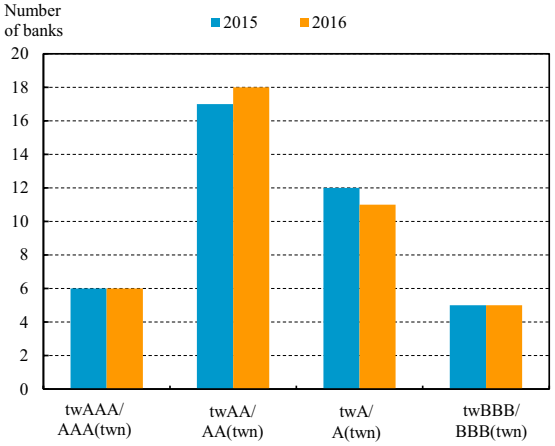


Note: End-of-period figures.
Sources: Taiwan Ratings Corporation, Fitch Ratings, and CBC.

Rating outlooks for most domestic banks remained stable or positive

Most domestic banks maintained credit ratings of twAA/twA (Taiwan Ratings) or AA(twn)/A(twn) (Fitch Ratings) at the end of 2016, and none had credit ratings lower than twBB/BB(twn) (Chart 3.44), similar to the previous year. Only three banks had negative rating outlooks in 2016,[71] while the other 37 banks remained stable or positive.

Chart 3.44 Number of domestic banks classified by credit ratings



Note: End-of-period figures.
Sources: Taiwan Ratings Corporation and Fitch Ratings.

3.2.2 Life insurance companies

In 2016, asset growth in life insurance companies accelerated, their average RBC ratio rose and overall credit rating remained stable at the end of the year. However, the profitability of life insurance companies weakened significantly and market risk stayed high owing to large open foreign exchange positions.

[68] As of the end of 2016, the majority of Taiwan's domestic banks received long-term issuer ratings from Taiwan Ratings, higher than the number of those with national long-term ratings from Fitch Ratings. Therefore, this section is based primarily on the Taiwan Ratings' ratings (tw~), and secondarily on Fitch Ratings' ratings (~twn).

[69] The credit rating index is an asset-weighted average rating score of rated domestic banks, measuring the overall creditworthiness of those banks on a scale from 1 (weakest) to 100 (strongest). The rating score for banks is determined according to their long-term issuer ratings from Taiwan Ratings or national long-term ratings from Fitch Ratings. The higher the index is, the better the bank's overall solvency.

[70] The credit rating index by the end of 2016 was slightly lower than that of the third quarter because of changes in total assets of some banks.

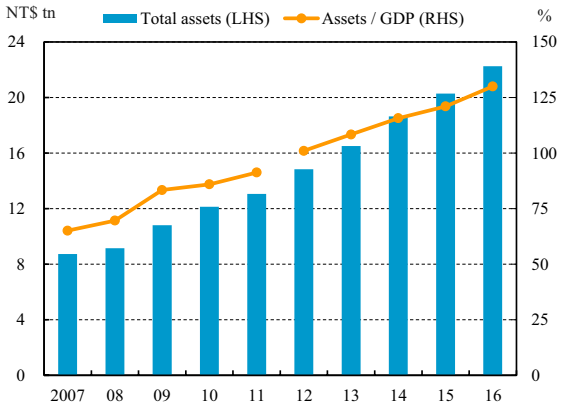
[71] Three banks with negative rating outlooks were ANZ Bank (Taiwan), Yuanta Bank and TC Bank. ANZ Bank (Taiwan) received a negative rating outlook in the third quarter of 2016, affected by its parent company. The rating outlooks of Yuanta Bank and TC Bank had turned stable in January 2017, as the capital level of their parent company, Yuanta Financial Holdings, stabilized when it adopted a more conservative growth strategy.

Asset growth accelerated

The total assets of life insurance companies grew continually and reached NT$22.25 trillion at the end of 2016, equivalent to 129.97% of annual GDP (Chart 3.45). The annual growth rate of total assets registered 9.74% at the same time, rising from 8.8% a year earlier.

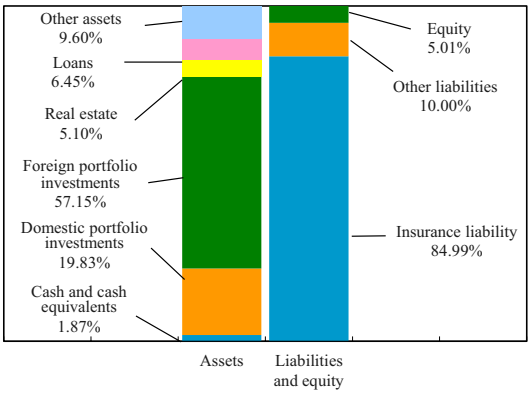
At the end of 2016, 20 domestic life insurance companies [72] held a 98.53% market share by assets, including four foreign affiliates with a 2.72% market share, while four foreign life insurance companies held the remaining 1.47% of total assets. The top three companies in terms of assets held a combined market share of 56.26%, a slight increase of 0.12 percentage points year on year. The market structure of the life insurance industry remained roughly unchanged in 2016.

Chart 3.45 Total assets of life insurance companies



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

Chart 3.46 Asset/liability structure of life insurance companies



Note: Figures are as of the end of 2016.
Source: FSC.

The share of foreign portfolio investments increased

In terms of the usage of funds, foreign portfolios and domestic securities accounted for the majority of the investments by life insurance companies as of the end of 2016. The share of foreign portfolio investments rose to 57.15%, owing to the fact that life insurance companies, with an expansion in usable funds, increased high-yield foreign bond investments and international bond investments that are not subject to the overseas investment ceiling. On the other hand, the share of domestic securities investments continued to drop to 19.83%.

The primary source of funds in life insurance companies was insurance liability. As policy reserves continually accumulated in line with an expansion in the policy underwriting

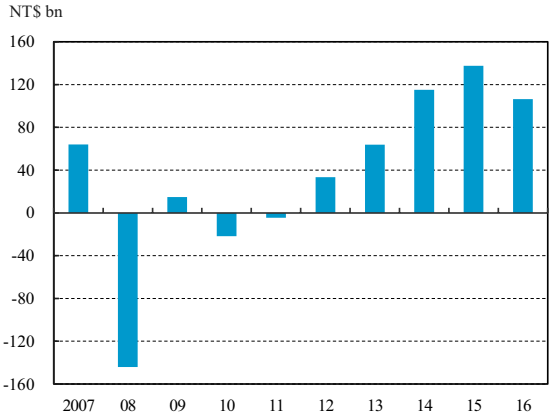
[72] Foreign affiliates included.

business, the share of insurance liability rose to 84.99%, while equity decreased slightly to a share of 5.01%. Overall financial leverage of life insurance companies increased marginally (Chart 3.46).

Profitability weakened significantly

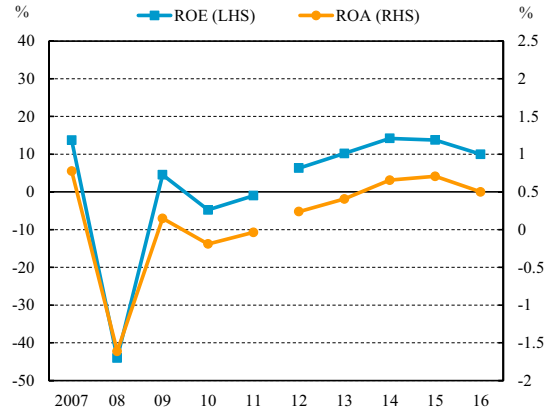
Life insurance companies reported net income before tax of NT$106.5 billion in 2016, a year-on-year decrease of NT$31.1 billion or 22.58% (Chart 3.47). This was chiefly driven by foreign exchange losses deriving from the appreciation of the NT dollar against the US dollar, as well as increases in commission expenses and policy provisions spurred by significant growth in first year premiums. Consequently, average ROE and ROA decreased to 9.98% and 0.5%, respectively, from 13.77% and 0.71% a year earlier (Chart 3.48), and the average rate of return on funds dropped to 4.11% from 4.22% the previous year. This posed challenges for insurance companies to alleviate interest rate spread losses. Among all 24 life insurance companies, ten companies posted better profits and achieved ROEs of 10% or more, equivalent to the number of a year earlier. However, there were eight companies that still suffered losses.

Chart 3.47 Net income before tax of life insurance companies



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

Chart 3.48 ROE & ROA of life insurance companies



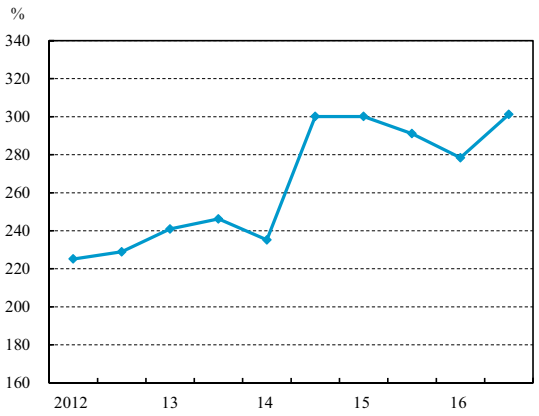
Notes: 1. Figures from 2012 forward are on the TIFRSs basis, while prior years are on the ROC GAAP basis.
2. ROE = net income before tax/average equity.
3. ROA = net income before tax/average assets.
Source: FSC.

Average RBC ratio rose

In 2016, life insurance companies strengthened capital levels through accumulation of operating profits and issuance of subordinated debt. As a result, the average RBC ratio rose to 301.25% at the end of 2016 from 291.08% a year before (Chart 3.49).

By individual company, there were 15 companies with RBC ratios over 300%, two less than the figure of the previous year. 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 1.58% of the total (Chart 3.50). Additionally, the negative equity Chaoyang Life Insurance was taken into receivership by the FSC on January 26, 2016 and was merged into Nan Shan Life Insurance on January 16, 2017.

Chart 3.49 RBC ratio of life insurance companies

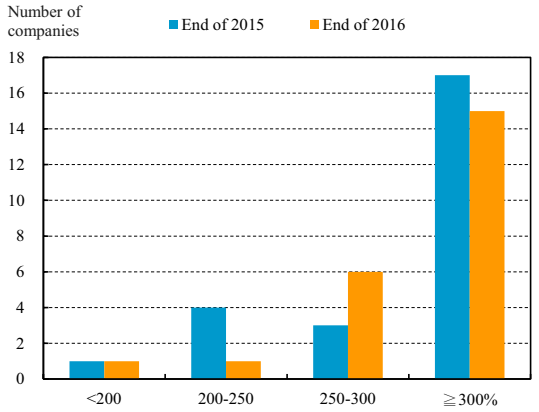


Notes: 1. RBC ratio = regulatory capital/risk-based capital.
2. Figures are exclusive of life insurance companies in receivership.
Source: FSC.

Overall credit ratings remained stable

Among 12 life insurance companies rated by Taiwan Ratings or Fitch Ratings, none received rating adjustments in 2016, except for Yuanta Life Insurance and Farglory Life Insurance receiving credit ratings of twA+ (Taiwan Ratings) for the first time, and credit rating of CTBC Life Insurance was withdrawn when it merged into Taiwan Life Insurance. As of the end of the year, all rated life insurance companies maintained credit ratings above twA or its equivalent, while the three biggest insurance companies by assets were all rated twAA+, showing strong capability to fulfill all financial commitments. Moreover, all companies received positive or stable credit outlooks except for Taiwan Life Insurance and China Life Insurance.

Chart 3.50 Number of life insurance companies classified by RBC ratios



Note: Figure for 2016 is exclusive of Chaoyang Life Insurance.
Source: FSC.

Life insurance companies faced higher market risk owing to large open foreign exchange positions

As their total assets grew continually in recent years, life insurance companies increased investments in international bond markets and other overseas investment targets owing to insufficient supply of domestic long-term financial instruments and relaxation of the

regulatory overseas investment ceiling. This led to great expansion in their foreign portfolio positions. However, in 2017 Q1, the NT dollar exchange rate hiked against the US dollar because of large international capital inflows. It resulted in great foreign exchange losses and rapid exhaustion of foreign exchange valuation reserves[73] in the life insurance industry. Although life insurance companies had actively deployed hedging strategies, they still faced higher foreign exchange risk because of large unhedged foreign exchange positions. Meanwhile, life insurance companies invested heavily in bonds reported at fair value. While the Fed might continue raising the federal funds rate and scale back QE in the near future, it will put upward pressure on bond yields. Life insurance companies should prudentially control interest rate risk of those positions.

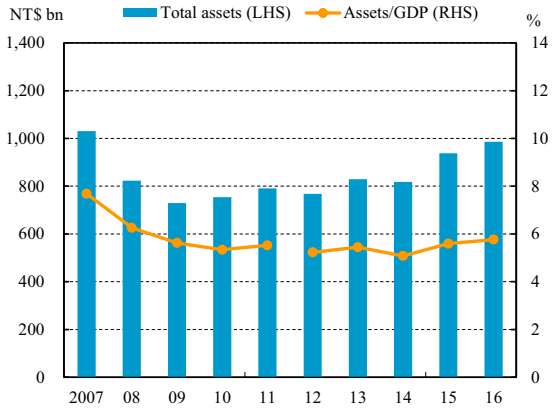
3.2.3 Bills finance companies

The total assets of bills finance companies continued expanding in 2016, while the guarantee business maintained an upward trend and credit asset quality remained sound. Net income before tax of bills finance companies slightly rose, whereas ROE & ROA somewhat descended. In addition, the average capital adequacy ratio of bills finance companies declined in 2016, and liquidity risk stayed high.

Total assets expanded and bond investment risks increased

The total assets of bills finance companies increased 5.22% in 2016 and stood at NT$986.5 billion at the end of the year, a figure equivalent to 5.76% of annual GDP. The asset expansion was mostly caused by more bill and bond holdings for the purpose of yielding revenues from the current market featuring low short-term interest rates (Chart 3.51). Among assets, bond investments amounted to NT$457.8 billion at the end of 2016, with an increase of NT$43.1 billion or 10.39% year on year. Foreign currency denominated bond investments in particular saw a significant increase of NT$44.5 billion

Chart 3.51 Total assets of bills finance companies



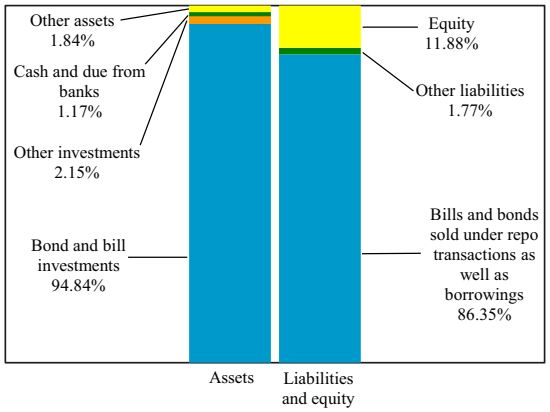
Note: Figures from 2012 onwards are on the TIFRSs basis, while prior years are on the ROC GAAP basis.
Sources: CBC and DGBAS.

[73] The foreign exchange valuation reserve was NT$18 billion as of the end of March 2017, decreasing by NT$25.4 billion or 58.50% from NT43.4 billion as of the end of 2016.

or 2.14 times. Considering the appreciation of the NT dollar against the US dollar in early 2017 and the expected hike of the Fed's policy rate, bond investments of bills finance companies might face increasing foreign exchange risk and interest rate risk.

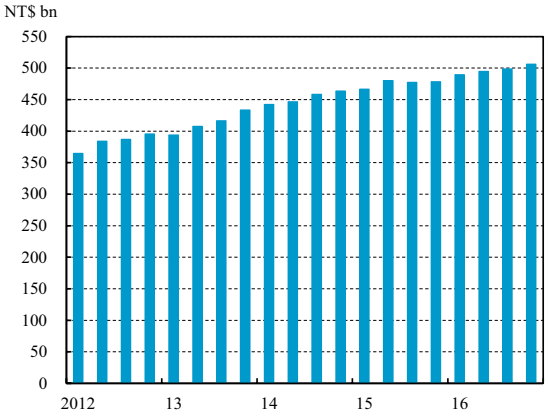
As for the asset and liability structure at the end of 2016, bond and bill investments constituted 94.84% of total assets, an increase of 0.81 percentage points year on year. On the liability side, bills and bonds sold under repo transactions as well as borrowings accounted for 86.35% of total assets, while equity only accounted for 11.88% (Chart 3.52).

Chart 3.52 Asset/liability structure of bills finance companies



Note: Figures are as of the end of 2016.
Sources: CBC and FSC.

Chart 3.53 Commercial paper guaranteed by bills finance companies



Source: CBC.

Credit risk

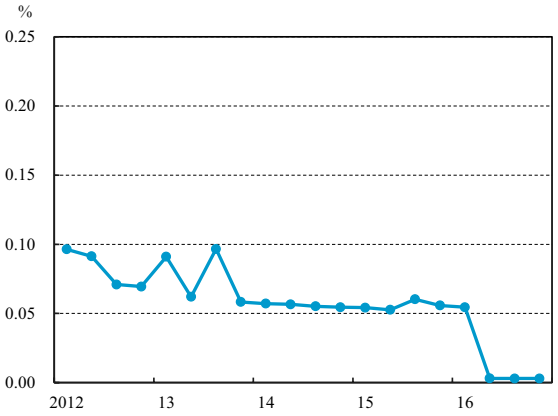
Guarantee liabilities grew continuously while the concentration of credit on real estate trended up

Owing to rising finance demands of corporates in money markets spurred by low short-term market rates, commercial paper guaranteed by bills finance companies saw an increase of NT$27.7 billion or 5.79% year on year and registered NT$506.3 billion at the end of 2016 (Chart 3.53). The average multiple of guarantee liabilities to equity of bills finance companies rose to 4.67 times at the end of 2016, compared to 4.62 times a year before. However, the multiple of each bills finance company still conformed to the regulatory ceiling of 5 or 5.5 times.[74]

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

At the end of 2016, guarantees granted to the real estate and construction industries and the credits secured by real estate accounted for 28.92% and 35.60%, respectively, of total credits of bills finance companies. Both ratios rose in 2016 and remained at high levels. While the outlook for the domestic housing market remains conservative, bills finance companies should closely monitor related credit risks. In response, the FSC continued to put a greater emphasis on real estate credit concentration and risk management for its on-site examinations of bills finance companies in 2017.[75]

Chart 3.54 Non-performing credit ratio of bills finance companies

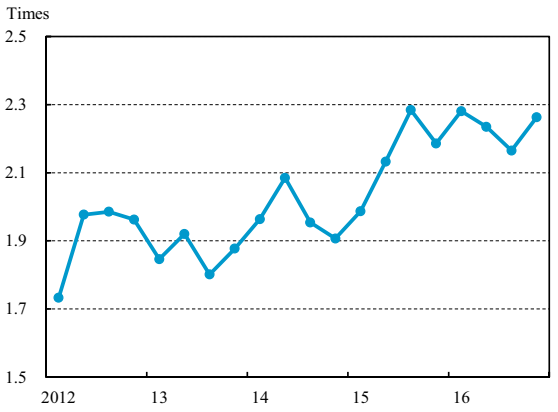


Note: Non-performing credit ratio = non-performing credit/(overdue guarantee advances + guarantees).
Source: CBC.

Credit quality remained sound

The credit quality of bills finance companies remained sound in 2016, as the non-performing credit ratio declined and stayed at a low level of 0.003% at the end of the year (Chart 3.54). Meanwhile, the credit loss reserves to non-performing credits ratio stood at 516.6 times, reflecting significantly sufficient reserves to cover potential credit losses.

Chart 3.55 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 46.40% of assets were long-term bonds and most liabilities were short-term interbank call loans and repo transactions. Moreover, the substantial increase of bond investments resulted in the 0-60 day maturity gap to equity increasing to 2.26 times, compared to 2.19 times a year before. Both indicated that the liquidity risk in bills finance companies remained high (Chart 3.55).

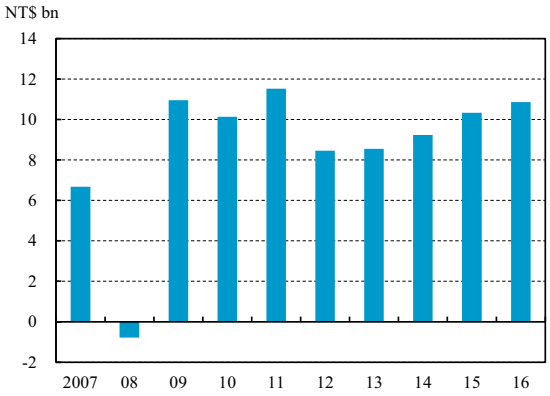
[75] According to the release of the Financial Examination Bureau of the FSC in December 2016.

Moreover, major liabilities[76] in bills finance companies grew by 6.05% in 2016, bringing the major liabilities to equity ratio to increase from 7.77 times a year before to 7.88 times at the end of 2016. However, the multiple of each bills finance company was still below the regulatory ceilings of ten or twelve times.[77]

Net income before tax slightly rose, whereas ROE & ROA decreased mildly

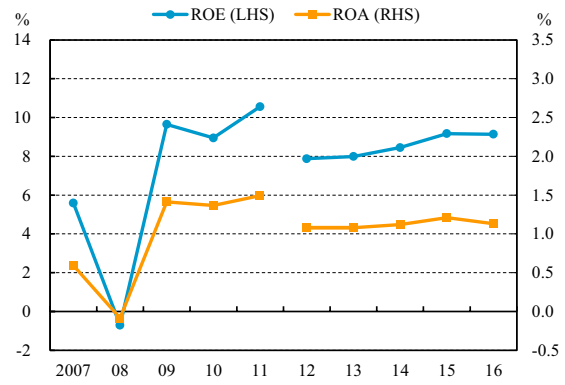
Bills finance companies posted a net income before tax of NT$10.9 billion in 2016, with an increase of NT$0.5 billion or 5.13% year on year (Chart 3.56). The rise was mainly driven by an increase in both commission fee income from commercial paper underwriting business and net interest income arising from higher interest income of bond investments and lower interest cost of call loans and RP transactions. However, owing to the faster growth of equities and assets, average ROE and ROA decreased mildly to 9.14% and 1.13%, respectively (Chart 3.57).

Chart 3.56 Net income before tax of bills finance companies



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

Chart 3.57 ROE & ROA of bills finance companies



Notes: 1. Figures from 2012 forward are on the TIFRSs basis, while 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.

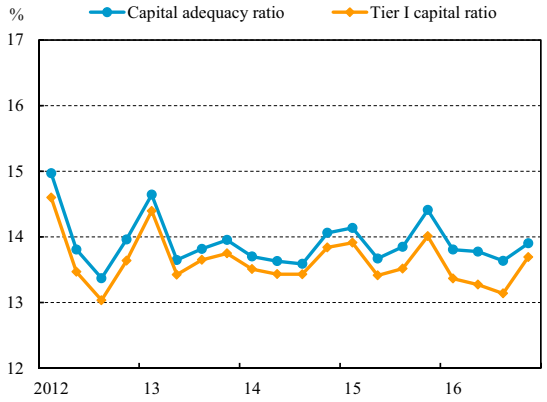
Average capital adequacy ratio descended

The average capital adequacy ratio of bills finance companies descended from 14.41% the previous year to 13.90% at the end of 2016, owing to higher risk-weighted assets spurred by more non-government bond holdings. The Tier 1 capital ratio also declined to 13.69% from 14.01% a year before. However, the capital

[76] Major liabilities include call loans, repo transactions as well as issuance of corporate bonds and commercial paper.
[77] According to the *Directions for Ceilings on the Total Amounts of the Major Liabilities and Reverse Repo Transactions Conducted by Bills Houses*, which aim to reduce the operating and liquidity risks of bills finance companies, the major liabilities of a bills finance company could not exceed six times, eight times or ten times its equity depending on the level of its capital adequacy ratio of below 10%, above 10% but below 12%, or above 12%. If a bills finance company is a subsidiary of a financial holding company or its bank shareholder meets safe and sound criteria, the ceiling will be raised by an additional two times its equity. As of the end of 2016, the capital adequacy ratio of each bills finance company was above 12%, so the ceilings were capped at ten times or twelve times for each company.

adequacy ratio for each bills finance company remained higher than 12%, well above the statutory minimum of 8% (Chart 3.58).

Chart 3.58 Capital adequacy ratios of bills finance companies



Source: CBC.

Box 1
International anti-money laundering trends

With highly liberalized international finance, booming development of financial products and internet technology, constantly changing and evolving money laundering channels and means, as well as the difficulty of tracing cross-border money flows, the task of anti-money laundering continues to face significant challenges. National regulators tend to strictly require financial institutions to implement anti-money laundering measures and stringently punish those institutions that violate or undershoot related requirements. Consequently, institutions may suffer a great deal of financial loss and have their reputations seriously damaged. Accordingly, anti-money laundering has become a topical issue around the world. This Box first discusses the major rules and standards of cross-border anti-money laundering and supervisory trends and then analyzes related measures adopted by Taiwan's regulators in response to the challenges ahead, before drawing the conclusions.

1. The major rules of international anti-money laundering

The major rules and standards of anti-money laundering prescribed by major international organizations and countries are as follows:

1.1 Financial Action Task Force (FATF)

The FATF *Recommendations* are recognized universally as the global anti-money laundering (AML)/countering the financing of terrorism (CFT) standards. The 2003 FATF *Forty Recommendations* were revised and combined with the *Nine Special Recommendations* into the new FATF *Recommendations* in 2012 (e.g., *Recommendation 7* was added to counter the threat of the financing of proliferation of weapons of mass destruction).[1] Under the 2013 FATF *Methodology for Assessing Technical Compliance* with the FATF *Recommendations* and the *Effectiveness of AML/CFT Systems*, the standards of assessment have become more rigorous. The key requirements of the FATF *Recommendations* related to financial institutions include:

(1) Deploying a risk-based approach (RBA) to assess risks.

(2) Undertaking the precautionary measures of customer due diligence (CDD), monitoring business relationships with customers, and maintaining all necessary records on transactions.

(3) Adopting appropriate risk control measures and enhanced due diligence (EDD), and

reporting suspicious transactions for specific customers and high-risk transactions.

(4) Verifying the identity of the customer and beneficial owner before or during the course of establishing a business relationship or conducting transactions for occasional customers, except when, for example, the money laundering and terrorist financing risks are effectively managed.

1.2 Asia/Pacific Group on Money Laundering (APG)

APG was founded in 1997 (Taiwan is among the founding members) and is an associate member of the FATF, which has obligations to implement the measures set out in the FATF standards. In order to enhance the capacity of AML/CFT, APG requires its members to be assessed through *Mutual Evaluation* processes according to the FATF *Methodology* (including the technical compliance assessment and effectiveness assessment).

1.3 USA

The USA has continually promulgated related laws and regulations of AML/CFT since 1970. The main requirements from 2000 onwards are as below:

(1) To deter and punish terrorism, the *USA PATRIOT Act* was passed by Congress in 2001.[2] The *Act* imposes radical obligations of AML and information declaration on financial institutions, as well as allowing expansion of executive discretion of law enforcement authorities. It not only strictly prohibits transactions from high-risk geographic locations but also requires the know-your-customer (KYC) process to be fully proceeded to carry out the verification of identification.

(2) In June 2016, the New York State Department of Financial Services (NYDFS) enacted a final regulation of *Part 504 – Banking Division Transaction Monitoring and Filtering Program Requirements & Certifications* to require that banks must stringently implement the process of transaction monitoring and filtering, including identifying all the sources of documents, and confirming the integrity, correctness and quality.[3] Each regulated institution shall submit the certifications duly executed by its certifying senior officer to the Department by April 15 of each year. A certifying senior officer who files an incorrect or false Annual Certification also may be subject to criminal penalties for such filing.[4]

2. Supervisory trends of international AML

2.1 Heavier penalties

In recent years, regulators have imposed heavy penalties on those financial institutions that violated or insufficiently enforced related AML regulations. For example, four of 15 banks penalized by the USA regulators from 2012 to 2015 owing to deficiencies in their AML regimes, including BNP (US$8.97 bn), HSBC (US$1.92 bn), UBS (US$1.49 bn) and Commerzbank (US$1.45 bn), were all fined more than one billion US dollars. This shows much heavier penalties for AML violations than before.

2.2 Enhancing review processes of high-risk customers and off-shore companies

Financial institutions should rigorously review the transactions conducted by international and local politically exposed persons, other high risk activities, correspondent banking, non-face-to-face clients, clients with high risk, etc. Because of the so-called Panama Papers leak which revealed that thousands of people worldwide owned shell companies, much more attention has been paid to the implementation of KYC and CDD for off-shore companies across countries. Moreover, it is now commonly recognized that financial institutions should take appropriate measures of identifying and verifying ultimate beneficial owners to contain money laundering and other illegal activities.

2.3 Expanding scope of application of the AML regulations

With the types of money laundering activities continually evolving, channels of money laundering are no longer limited to financial institutions; nowadays, even real estate transactions, insurance policies, lawsuits, etc., have been the conduits of money laundering. Therefore, lawyers, notaries, other independent law professionals and accountants proceeding specific transactions for or on behalf of clients should bear the responsibility of reviewing clients' identities, maimtaining transaction records, and reporting suspicious transactions.

3. Taiwan's efforts to address cross-border AML

To keep in line with international standards and in response to the *APG Mutual Evaluation* in 2018, Taiwan has actively adopted related response measures (please refer to Section 3.3 *Financial Infrastructure* for details).

3.1 Building a more comprehensive legal system

In light of the FATF *Recommendations*, Taiwan's *Money Laundering Control Act* was amended and *Terrorist Financing Prevention Act* was enacted to help further complete our AML/CFT system.

3.2 Establishing the Anti-Money Laundering Office

To be better prepared for the third round of the *APG Mutual Evaluation* in 2018, the Executive Yuan (Cabinet) established the Anti-Money Laundering Office in March 2017, gathering specialists from different government agencies to show Taiwan has the determination to carry out anti-money laundering tasks. The office is in charge of organizing national policies and the corresponding guidelines for AML, as well as monitoring the preparations for the forthcoming *Mutual Evaluation*.

3.3 Strengthening the AML/CFT mechanism of financial institutions

The FSC has enhanced the AML/CFT mechanism of financial institutions in many aspects including regulation and execution, mainly shown as below:

(1) Improving regulations: the three directions governing AML/CFT for banking, insurance, securities and futures sectors and the *Rules Governing Offshore Banking Branches* have been amended respectively. The related directions or orders in accordance with the *Money Laundering Control Act* and the *Terrorist Financing Prevention Act* have been published for financial institutions to comply with.

(2) Supervising the implementation by financial institutions: financial institutions have been required to complete the full assessment of money laundering and terrorist financing risks, and the FSC has put an emphasis on how effective this is implemented during its annual examinations.

(3) Helping financial institutions strengthen their ability of transaction monitoring: the FSC urges relevant financial associations to come up with a list of activities and products with high money-laundering risk for every sector and study the types of suspicious money-laundering transactions, in order to help financial institutions strengthen their ability of transaction monitoring.[5]

(4) Reinforcing training and awareness: financial institutions have been required to enhance employee training in AML/CFT and to have their board of directors, supervisors and senior management actively attend related seminars to help shape a stronger corporate culture against financial crimes.

The CBC has also amended the *Directions Governing Banking Enterprises for Operating Foreign Exchange Business* in accordance with the rules of wire transfer prescribed by FATF to require that banks should verify the identity of clients engaging in foreign exchange business. The CBC's relevant rules about declaration of cross-border transportation of NT dollar (including failure to declare, false declaration, or amount

exceeding the maximum allowed) have been also incorporated into the newly amended *Money Laundering Control Act*.

4. Conclusions

Enhancement of AML work has become an international trend. In addition to staying in line with international standards from a legal system perspective, rigorous implementation of the relevant regulations is needed. Having only regulations in place is not enough to move forward, government agencies have to actively step in, and the persistent effort from senior management of financial institutions is essential to success as well.

Financial institutions should change their profit-oriented business strategy in the past and put emphasis on the mechanism of internal control and compliance. Not only shall the personnel designated for this task shoulder the AML-related responsibilities, but the AML concept should also be firmly rooted in corporate culture to ensure effective implementation with the joint effort of all employees.

Financial institutions ought to keep abreast of international trends from those aspects of financial technology application, talent training, AML processes, etc., and establish comprehensive anti-money laundering mechanisms in a timely fashion to strengthen the capacity of effective responses.

Notes: 1. FATF (2012), *International Standards on Countering Money Laundering and the Financing of Terrorism & Proliferation*, February.

2. *Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism Act of 2001* is known as *USA PATRIOT Act*.
3. NYDFS (2016), *Superintendent's Regulations Part 504: Banking Division Transaction Monitoring and Filtering Program Requirements and Certifications,* June.
4. The finalized regulation of Part 504 has come into force from January 1, 2017; regulated entities should start to submit the Annual Certification in a regular manner from 2018.
5. The Bankers Association collected local and global cases to come up with the draft version of *Typologies of Suspected Money Laundering and Financing of Terrorism Transactions*, which offered dozens of typologies for banks' reference. For example, the total cash deposits into or withdrawals from the same account on the same business day or at the same counter cumulatively reaches above a certain amount; abrupt and large amounts of cash deposits into or withdrawals from a dormant account; immediately after the opening of a dummy account, there are large amounts deposited or remitted in and quickly transferred out, and which is apparently not commensurate with the client's identity and income background; each deposit or withdrawal is of similar amounts and being done in an intensive manner; frequently deposited/withdrawn large amounts into/out of a specific account for others or through different third parties.

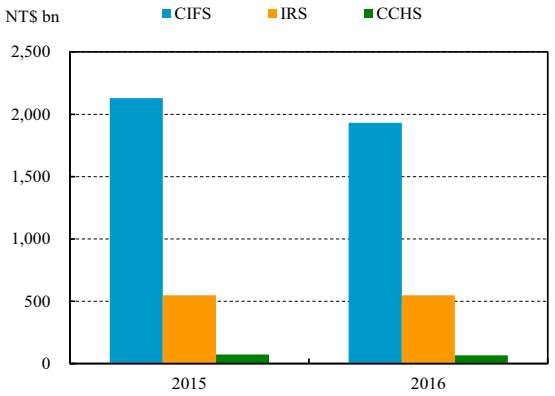
3.3 Financial infrastructure

3.3.1 Payment and settlement systems

Overview of three NTD systemically important payment systems (SIPSs) in 2016

The three SIPSs in Taiwan include the CBC Interbank Funds-Transfer System (CIFS), the Interbank Remittance System (IRS) and the Check Clearing House System (CCHS). In 2016, the daily average amount of funds transferred via the CIFS, the IRS and the CCHS were NT$1,931 billion, NT$548 billion and NT$65 billion, respectively. Compared to the previous year, the funds transferred via the CIFS and the CCHS declined, while those via the IRS largely remained the same (Chart 3.59). In particular, the amount of funds transferred via the CBC's CIFS saw a marked decrease of NT$198 billion in 2016. It was mainly because of lower issuance frequency of the CBC's certificates of deposit (CDs) which transfer funds through the CIFS.

Chart 3.59 Daily average amount of funds transferred via the three SIPSs

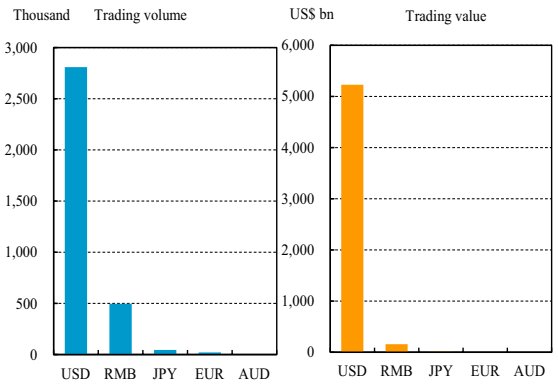


Source: CBC.

Overview of the foreign currency clearing platform

Since the foreign currency clearing platform was launched on March 1, 2013, it has successively provided US dollar, renminbi, Japanese yen, and euro remittance services, as well as PVP and DVP mechanisms for settlement services. In 2016, Australian dollar remittance was also integrated into this platform. By the end of 2016, the accumulated trading volume and value of funds transferred via this platform recorded

Chart 3.60 Trading volume and value in the foreign currency clearing platform



Note : Figures are from March 2013 to the end of 2016.
Source: CBC.

3.37 million and US$5.4 trillion, respectively. The main trading currency on this platform was the US dollar, the average daily transaction value of which registered at US$6.96 billion, while the renminbi was second to the US dollar with a transaction value of US$0.23 billion (Chart 3.60).

After domestic remittance could be settled directly through the foreign currency clearing platform rather than through foreign third parties, remittance fees paid by the public decreased by a great amount of NT$2.1 billion from the first day of platform operation to the end of 2016.

Measures in response to FinTech development

Concerns over the developments of distributed ledger technology

Blockchain, the distributed ledger technology behind Bitcoin, has gained public attention and become a popular issue in recent years. It provides a decentralized peer-to-peer (P2P) model that may change the current centralized structure of financial operation. Although the blockchain technology possesses advantages of high transparency and easy tracking, there still are some unsolved problems such as processing speed, transaction privacy, and compatibility with existing systems. Accordingly, large global financial institutions currently only carry out conceptual verification or small-scale experimentations in the areas of asset digitization, cross-border payments and trade finance. Broad application of the blockchain technology in finance will take time to achieve.

In view of this trend, the CBC established the Digital Finance Group in 2015 to actively explore the development of the blockchain technology, as well as to study other related issues such as electronic payment developments and virtual currencies (Box 2). Furthermore, to integrate financial industry resources on blockchain experimentations in Taiwan, the FISC, urged by the CBC, invited financial institutions to jointly establish the Financial Blockchain Research and Application Development Committee. This committee will carry out trial runs both in corporate and personal banking and report the trial run results at the end of 2017.

The CBC encourages the FISC to assist the financial industry to improve mobile payment services

In view of the increasing penetration rate of smart phones in Taiwan favoring mobile payment development, the CBC urged the FISC to actively assist financial institutions in

developing mobile payment services. As of the end of 2016, there were 24 financial institutions sharing a mobile payment platform built by the FISC to issue mobile credit cards and cash cards. Using mobile cards, consumers can make payments through 130 thousand domestic sensor-enabled card reading machines, using the near field communication (NFC)[78] functions of mobile devices.

Moreover, in response to the development of cloud technology, the FISC assisted financial institutions to start VISA and MasterCard HCE[79] mobile credit card businesses. By the end of 2016, there were 14 financial institutions operating these businesses. In addition, to meet retailers' needs of using mobile point of sale (mPOS) devices, the FISC provided the mPOS electronic signature and receipt switching service, which accepts payment tools such as credit cards, cash cards and UnionPay cards and helps member banks to expand their mobile card acquiring business.

3.3.2 Implementation of the net stable funding ratio in Taiwan

To reinforce banks' liquidity risk management, the Basel Committee on Banking Supervision (BCBS) published *Basel III International Framework for Liquidity Risk Measurement, Standards and Monitoring* in 2010, developing the liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR) as globally consistent liquidity indicators. With a view to strengthening the liquidity risk management of domestic banks and keeping in line with international standards, the FSC and the CBC collaboratively promote the implementation of the LCR and the NSFR standards. Among them, the LCR standards were implemented in 2015, while the NSFR regulations, the *Standards Implementing the Net Stable Funding Ratio of Banks,* was jointly promulgated by the FSC and the CBC in December 2016. Furthermore, the NSFR standards, which set the statutory minimum ratio of 100%, will be effective on January 1, 2018. The key NSFR standards in Taiwan are summarized as follows:

- The definition of NSFR: the NSFR is a quantitative indicator for long-term liquidity, calculated by dividing the amount of available stable funding (ASF) by the amount of required stable funding (RSF). ASF is the portion of capital and liabilities expected to be reliable over the time horizon (over one year). RSF refers to the amount of stable funding required, which is a function of the liquidity characteristics and residual maturities of various assets and off-balance sheet exposures held by domestic banks.

[78] NFC is a set of short-range wireless communication technologies that makes contactless and point-to-point data transfers between electronic devices. Based on different card emulation modes, NFC can be classified into three solutions: secure element (SE), host card emulation (HCE) and Tokenizations.

[79] With HCE, customers are allowed to store their card account details in the merchants' secure cloud servers. HCE enables mobile applications to conduct payments by providing virtual representation of account identities.

$$\text{NSFR} = \frac{\text{Available amount of stable funding (ASF)}}{\text{Required amount of stable funding (RSF)}} \times 100\%$$

- Statutory minimum standards: the NSFR of domestic banks should not be lower than 100%. However, in view of the financial conditions and regulatory considerations, the FSC may adjust the ratio after consulting the CBC.
- Reporting mechanism: domestic banks should calculate and report the NFSR on a quarterly basis, and inform the FSC and the CBC immediately when the ratio falls below the statutory minimum.
- Exemption: local branches of foreign banks and Mainland China's banks, as well as those banks which are taken over, ordered to suspend operations or liquidated by the FSC, are exempted from the application of the NSFR.

3.3.3 Promoting financial technology development in Taiwan

To promote Taiwan's financial technology (FinTech) development and provide a broader, safer and more predictable experimentation environment under the consideration of financial market order and consumer protection, the FSC amended related regulations and proposed to establish an innovative experimentation mechanism. These efforts aim to encourage Taiwan's financial services and related industries to take advantage of innovative technology to enhance the efficiency of financial services and to facilitate the development of innovative financial activities.

Amending regulations to allow banks to invest in information service and financial technology enterprises

According to Article 74 of the *Banking Act* and other related regulations, banks may not invest in more than one entity engaging in the same line of business. However, to encourage FinTech development in Taiwan, the FSC amended related regulations in December 2016, stipulating that a bank investing in information service enterprises and financial technology enterprises is not subject to the restrictions if the main business activities of these enterprises are different from the other entity in the same business line the bank has invested.

In addition, the FSC expanded the business scopes of financial technology enterprises invested by banks to include risk management, anti-money laundering, cyber security, transaction security, consumer protection, and P2P lending platforms, in response to the latest

FinTech developments and in order to encourage the financial industry to exploit FinTech to enhance their risk management and provide innovative financial services.

Establishing the FinTech innovative experimentation mechanism

To encourage Taiwan's financial services and related industries to take advantage of innovative technologies to enhance efficiency, quality and inclusion of financial services, the FSC planned to establish a FinTech innovative experimentation mechanism and drafted the *Financial Technology Innovative Experimentation Act* in December 2016. The draft bill stipulates the application, review, supervision, management and consumer protection procedures for innovation experimentation, as well as regulatory adjustments and liability exemption during the experimentation period (Box 3). The draft bill was approved by the Executive Yuan and was forwarded to the Legislative Yuan for review in May 2017.

3.3.4 Enhancing Taiwan's AML/CFT mechanism

To formulate a more comprehensive AML/CFT system and keep pace with the upcoming third round of the *APG Mutual Evaluation* process at the end of 2018, Taiwan has progressively adopted related response actions.

Enhancing the completeness of fundamental elements of the legal system

Enacting Terrorist Financing Prevention Act

To build a more comprehensive CFT system, and after consulting the international standard of FATF *Recommendations*, the *United Nations (UN) International Convention for the Suppression of the Financing of Terrorism*, and the *UN Security Council Resolutions* related to countering the proliferation of weapons of mass destruction and the financing of terrorism, Taiwan enacted the *Terrorist Financing Prevention Act* in July 2016. This *Act* stipulates that the Executive Yuan is the authority in charge of policy deliberations related to Taiwan's terrorism financing prevention policymaking and oversight. Furthermore, the Terrorism Financing Prevention Review Board has been established by the Ministry of Justice, which is the competent authority, to deliberate on the sanction list of terrorist groups and terrorists as well as related measures.[80]

[80] The Minister of Justice is the chair and an ex-officio member of the Terrorism Financing Prevention Review Board. The other members are the deputy heads of the National Security Bureau, the Ministry of the Interior, the Ministry of Foreign Affairs, the Ministry of National Defense, the Ministry of Economic Affairs, the Financial Supervisory Commission, and the Central Bank.

Amending the Money Laundering Control Act

To set up a sound AML system, ensure orderly money flows, and align with international standards, Taiwan overhauled the *Money Laundering Control Act* in December 2016 according to the FATF *Recommendations*.[81] The key amendments are as follows:

- To align Taiwan's definition of elements of a money laundering crime with international regulations, the *Act* now stipulates that allowing another person to use one's name or bank account to engage in money-laundering through a shell company or a real estate transaction is considered a crime.

- To lower the threshold for felony from crimes punishable by a minimum of not less than five years imprisonment to ones punishable by a minimum of not less than six months imprisonment.

- To increase transparency in money flows, financial institutions are obligated from all aspects to perform customer due diligence, to maintain records, and to report suspicious transactions. Financial lease businesses, as well as nonfinancial businesses and professions are also obligated to do the same.

- To better control borders and track the flow of money, the *Act* now additionally requires customs declarations for New Taiwan dollars and currencies issued by Hong Kong or Macau, gold over a certain value, and other objects that may potentially involve money laundering. Any untruthful declarations are subject to penalty or confiscation. In addition, items mailed or sent by express/cargo delivery must be declared to enhance the tracking and monitoring of cash flows as well.

Setting up an Anti-Money Laundering Office

The Anti-Money Laundering Office was established by the Executive Yuan in March 2017 to organize AML/CFT polices and execution strategies, to perform risk assessment, to monitor the preparations for the third round of the *APG Mutual Evaluation* in 2018, and to show Taiwan's determination in carrying out AML task.

[81] The amended *Money Laundering Control Act* came into force in June 2017, six months after promulgation.

Strengthening the regulations of the AML/CFT mechanism

The FSC has consulted the latest international standards and published related directions or orders in accordance with the newly amended *Money Laundering Control Act* and the *Terrorist Financing Prevention Act*. The three directions governing AML/CFT for banking, insurance, securities and futures sectors have been revised respectively. The key amendments for banking include:

- Enhancing board governance, the three-layers of defense for internal control, and training & education to foster a culture of AML/CFT compliance.
- Strengthening the management of overseas affiliates by bank headquarters through group-level AML/CFT programs and designated overseas personnel for AML/CFT.
- Enforcing the regulations of on-going account and transaction monitoring to help banks strengthen their ability to identify suspicious transactions.
- Requiring additional measures to be taken over people on the sanction list, politically exposed persons, and correspondent banking activities in order to reduce AML/CFT risks.

The CBC has also amended the *Directions Governing Banking Enterprises for Operating Foreign Exchange Business* in accordance with the rules of wire transfer prescribed by FATF, which requires banks to obtain the related information of remitter and beneficiary while operating inward and outward remittance activities of foreign exchange. The related transaction documents and records as well as all the information for verifying clients' identification should be kept for at least five years.

3.3.5 Synchronizing Taiwan's accounting standards with international norms by adopting IFRS 9 Financial Instruments

In response to the development of the International Financial Reporting Standards (IFRS), Taiwan will further synchronize its accounting standards with international norms by adopting IFRS 9 *Financial Instruments*, starting from January 1, 2018, as scheduled. General industries and financial industries such as financial holding, banking, insurance and securities sectors are required to apply this standard. IFRS 9 is significantly different from current accounting treatments of IAS 39 in the classification of financial assets and the recognition of expected credit losses, for example: (1) IAS 39 financial assets should be classified based on

the intention and ability of the entity,[82] whereas IFRS 9 bases the classification of financial assets on the contractual cash flow characteristics and the entity's business model for managing the financial assets;[83] and (2) IAS 39 adopts an incurred loss model to recognize credit losses, whereas IFRS 9 bases the new impairment requirement on an expected credit loss model.

With the adoption of IFRS 9, financial institutions should evaluate potential impacts and take preemptive actions as early as possible. To this end, the FSC has successively taken assisting measures, including: (1) setting up a joint taskforce on implementation of new IFRSs to tackle possible problems in practices arising from IFRS 9 adoption; (2) supporting the Bankers Association to develop the *Guidance on IFRS 9 Impairment Evaluation Methodology* and related evaluation examples and documents, as well as quarterly review of the implementation of insurance companies; and (3) helping insurance companies clarify the practical issues on the application of the overlay approach with the assistance of the joint taskforce on implementing new IFRSs.

In view of the possible greater effects of IFRS 9 adoption on the financial sector, financial institutions should make adequate preparation to address this impact, including a thorough understanding of the standards, evaluation of the accounting policy, investment policy and internal control systems to identify necessary adjustments, and enhancement of communication with those who are in charge of corporate governance. Financial institutions should make timely release of material information if the result of such evaluation indicates significant impacts on shareholders' rights.

3.3.6 Foreign exchange regulation amendments

Relaxing foreign exchange regulations of banks

In order to promote development of the financial services industry in the context of financial globalization and liberalization, the CBC continued to relax foreign exchange regulations of banks in 2016 as follows:

- To promote Taiwan's development into an offshore renminbi market and to carry out the internationalization and product diversification of the futures market, banks have been allowed to conduct declarations of foreign exchange settlement for transactions of

[82] An entity is required to classify its financial assets into one of the following categories: financial assets at fair value through profit or loss, available-for-sale financial assets and held-to-maturity investments.

[83] An entity is required to classify its financial assets into one of the following categories: financial assets at amortized cost, fair value through other comprehensive income, and fair value through profit or loss.

renminbi/USD options listed on the Taiwan Futures Exchange (TFE) and conducted by the TFE or futures firms since June 27, 2016.

- In September 2016, the CBC revised the *Directions for Issuance of Foreign Currency-Denominated Negotiable Certificates of Deposit by Banks* to encompass the issuance of NCDs denominated in Australian dollars.

Relaxing foreign exchange regulations related to insurance companies

To help insurance enterprises to expand their business and capture business opportunities, the CBC amended the *Regulations Governing Foreign Exchange Business of Insurance Enterprises* twice in March and December 2016, including: (1) relaxing the regulation on business scope related to the subject matter insured of non-life insurance products denominated in foreign currencies to be stipulated separately by competent authorities; (2) regulating the application procedures and administrative compliance of insurance companies which participate in foreign currency syndicated loans; (3) announcing the exceptions for NTD receipt and payment that may be used for foreign currency-denominated non-life insurance policies and the relevant settlement matters.

Accordingly, the relevant settlement and payment matters of non-life insurance policies denominated in foreign currency conducted by insurance enterprises will become more accurate and convenient. In addition, the simplification of application documents for foreign exchange business conducted by insurance enterprises will also help boost the innovation of insurance products.

Relaxing foreign exchange regulations related to securities firms

In order to strengthen the competiveness of securities firms, expand their business scope, and provide customers with additional services, the CBC continued to relax foreign exchange regulations of securities firms in 2016 as follows:

- The CBC revised the *Regulations Governing Foreign Exchange Business of Securities Enterprises* in March 2017, which allowed securities firms to conduct NTD spot foreign exchange transactions, expanded foreign exchange financial derivatives business, and simplified application procedures for several related businesses.

- In order to conform with the deregulation of NTD spot foreign exchange transactions, the CBC promulgated the *Directions for Domestic Security Firm Approved to Conduct*

Foreign Exchange Business while Assisting Customers to Declare Foreign Exchange Receipts and Disbursements or Transactions in March 2017. Accordingly, the operations for foreign exchange business by securities firms are expected to be more precisely regulated and effectively managed so as to facilitate compliance with the *Regulations Governing the Declaration of Foreign Exchange Receipts and Disbursements or Transactions*.

Given that securities firms are allowed to conduct the above-mentioned businesses, it will provide investors with more diversified financial services, help enhance the quality and quantity of securities businesses, and assist the long-term development of securities enterprises.

Box 2
Electronic payment developments in Taiwan and virtual currency issues

Taiwan has already established a comprehensive electronic payment and clearing system to ensure the security and efficiency of large-value payments. Moreover, in recent years, under the cooperation between government and private sectors and gradual change in consumer payment behavior, electronic retail payment services are experiencing a vigorous development with increasing diversity.

1. Electronic payment developments in Taiwan

Currently, Taiwan's diversified payment instruments under electronic payment and clearing systems can be divided into three categories, including: (1) electronic funds transferring through bank accounts; (2) credit cards and cash cards for retail consumption; and (3) electronic money with both top-up and consumption functions. In 2016, the total transactions by these three electronic payment instruments reached NT$615 trillion, 36 times the size of GDP.

1.1 Electronic funds transfers

The transaction amount of electronic funds transferring through bank accounts is enormous, occurring mainly through the CBC Interbank Funds Transfer System (CIFS) and the Interbank Remittance System (IRS) operated by the Financial Information Service Co., Ltd (FISC). In 2016, the total amounts settled through the CIFS and the IRS were NT$477 trillion and NT$135 trillion, respectively.

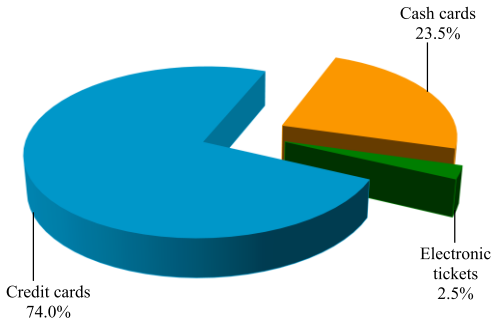
1.2 Credit cards and cash cards

With financial payment services gaining popularity in Taiwan, electronic payment instruments such as credit cards and cash cards are widely used. Total consumption via credit and cash cards in Taiwan was NT$3 trillion in 2016, with credit cards accounting for about 74% of it.

1.3 Electronic money

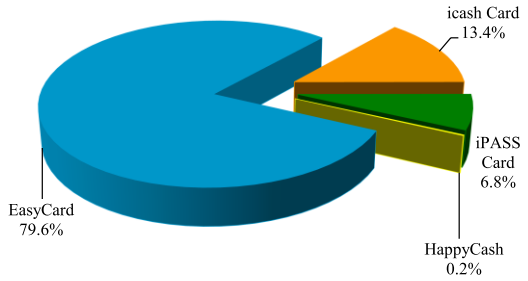
While the transaction amount of electronic funds transferred, credit cards, and cash cards have seen enormous growth, the value of consumption paid for by electronic money remains low (Chart B2.1). Electronic money includes electronic tickets such as EasyCard and stored-value accounts of electronic payment institutions (EPIs) approved by the FSC. Currently, the electronic tickets including EasyCard, icash Card, iPASS Card and HappyCash Card are mainly issued by non-banks.[1] In 2016, the total consumption

Chart B2.1 Consumption by electronic money in 2016



Sources: FSC and FISC.

Chart B2.2 Consumption by electronic tickets in 2016



Sources: FSC and FISC.

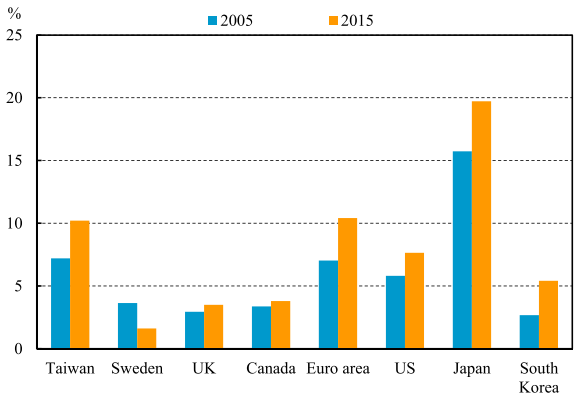
amount paid for by electronic tickets was NT$74.5 billion, with EasyCard contributing nearly 80% (Chart B2.2). Until recently, the FSC has approved five non-bank EPIs including O' Pay, GAMA Pay, Pay2go, Interpay and ezPay, yet their trading volumes remained small.

2. The CBC has continuously assisted the development of electronic payment

In recent years, the banknote issuance to GDP ratio has shown an upward trend in most countries, except for Sweden. Even in economies with well-developed electronic payment systems such as the US, South Korea, the euro area and Japan, the public is still using cash frequently. This shows that cash continues to be an important payment instrument for retail consumers (Chart B2.3).[2]

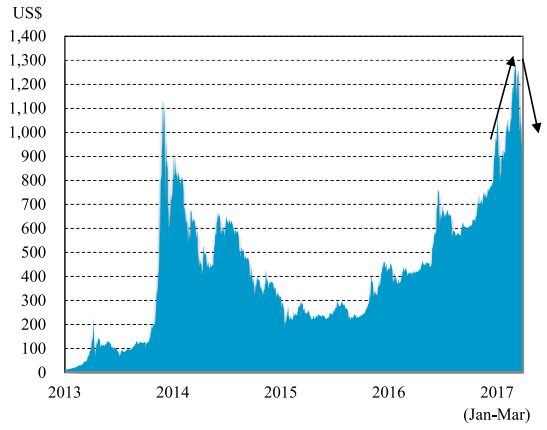
Taiwan has diversified and convenient electronic payment instruments. However, apart from credit cards, most of the public are used to paying by cash for daily purchases. In order to promote electronic payment, the CBC has urged the FISC to assist in the development of payment instruments such as cash cards payment and mobile payment. In particular, for mobile payment, the FISC will provide a full scope of payment services for bank account transferring,

Chart B2.3 Banknote issuance to GDP ratio in major countries



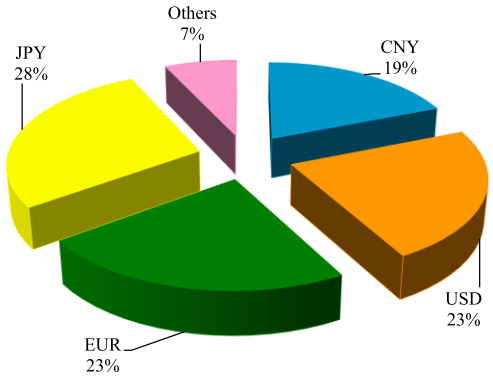
Sources: AREMOS database and CPMI (2016).

Chart B2.4 Bitcoin price



Source: bitcoin charts.

Chart B2.5 Bitcoin trading in different currencies



Note: Figures are for March 2017.
Source: bitcoin charts.

fee and tax payment, and shopping, and establish a secure and convenient identity authentication mechanism.

3. Virtual currency issues

From 2009 onwards, driven by the development of internet technology, many virtual currency systems have been created. One of the most notable examples is bitcoin, which applies the blockchain technology to build a decentralized P2P network.

3.1 Bitcoin price fluctuated significantly

According to CoinMarketCap, there are over 650 kinds of virtual currencies as of the end of March 2017, with total market value of about US$25 billion. Within them, bitcoin accounts for 67.1% of total market value. In March 2017, the bitcoin price is about US$1,100 per unit, with circulation of more than 16 million units. In the past, the renminbi was the main bitcoin trading currency, accounting for over 80% of the total. However, after Mainland China's government strengthened the supervision on bitcoin trading platforms to prevent the public from using bitcoin to circumvent capital control, the renminbi bitcoin trading market saw a significant decline in trading volume and extremely high price volatility (Chart B2.4). As a result, in March 2017, the Japanese yen became the largest trading currency in the bitcoin market, accounting for 28%, while the US dollar and the euro each accounted for 23%, and the renminbi only made up 19%[3] (Chart B2.5).

3.2 Virtual currencies are not currencies

From a legal and economic point of view, the IMF considers virtual currencies not yet satisfying the definition and characteristics[4] of a currency. In addition, according to an ECB survey, owing to low usage and very limited linkage with the real economy, bitcoin will not impact the operation of monetary policy and financial markets.[5] The ECB also considered bitcoin to be more like a value transfer instrument rather than a payment instrument.

Moreover, the US Securities and Exchange Commission (SEC) rejected the listing of a bitcoin exchange-traded fund (ETF) on the Bats exchange in March 2017, since it was considered inconsistent with the *Securities and Exchange Act* requirement that the rules of a national securities exchange should be designed to prevent fraudulent and manipulative acts, as well as to protect investors and promote public interest. Currently, the virtual currency regulations in the international arena are focusing on the supervision of its trading platforms. For example, the platforms should register or obtain a license to prevent from hiding users' identities through the network of virtual currencies and conducting illegal actions such as money laundering and terrorist financing.

3.3 The CBC reminded the public to pay attention to virtual currency investment risk and initiated research on digital currency issues

Considering that bitcoin has the characteristics of high price volatility, high speculation and significant investment risk, the CBC and the FSC jointly issued a press release on December 30, 2013, stating that virtual currencies such as bitcoin are highly speculative commodities and reminding investors of the related risk-taking issue. The FSC also issued a press release on January 6, 2014, requiring financial institutions not to receive or cash out bitcoin, as well as not to provide bitcoin-related services on ATMs. The Ministry of Justice is also paying attention to anti-money laundering issues relating to bitcoin.

With respect to the issue of applying new technologies to introduce digital currencies, the CBC has set up a Digital Finance Group to conduct related research. To date, no central bank has issued digital currency yet. Although some central banks, such as the Bank of England and the People's Bank of China, have initiated some research on digital currencies, technique, business model, security and privacy protection issues remain unsolved. In March 2017, Jerome H. Powell, a governor on the board of the US Federal Reserve System, publicly expressed his conservative attitude about central banks issuing digital currencies. His reason was mainly that bitcoin technology development in the

short run still cannot prevent global hacker attacks, and users' serious privacy concerns about digital currencies could arise if public transactional records were in the hands of a central bank or government.[6]

4. Conclusion

In addition to continuing to promote the development of domestic electronic payment, the CBC has set up a group to monitor the latest developments and study the emerging technologies including blockchain, to keep in step with evolving financial technology trends. Moreover, the CBC has planned to run proof of concept tests with the collaboration of the academia and related industries, in order to assess the feasibility of applying emerging technologies to financial services.

Notes: 1. The stored value balance in non-banks was NT$6.94 billion, while that in banks was NT$0.04 billion.

2. See CPMI (2016), *Statistics on Payment, Clearing and Settlement Systems in the CPMI Countries – Figures for 2015*, BIS, December.

3. Website data of CoinMarketCap and bitcoin charts, retrieved on February 18, 2017.

4. See IMF (2016), *Virtual Currencies and Beyond: Initial Considerations*, IMF Staff Discussion Notes, No.16/3.

5. See ECB (2015), *Virtual Currency Schemes - A Further Analysis*, ECB Publication, February.

6. See the speech by Jerome H. Powell, the governor of the Fed, on March 3, 2017, *At Blockchain: The Future of Financial and Capital Markets?*

Box 3
Establishment and development of FinTech innovative experimentation mechanism

In response to financial technology (FinTech) development, the British Financial Conduct Authority (FCA) published the Regulatory Sandbox report in 2015, providing an experimentation environment for FinTech innovative products, services or business models. Thereafter, Singapore, Hong Kong and Australia successively established similar experimentation mechanisms. By definition, a regulatory sandbox is a supervisory approach that provides a safe space where innovative products, services and business models can be tested practically under a specific, risk-controllable and risk-recognizable environment with legal exemptions during the experimentation period.

For the purpose of encouraging Taiwan's financial services and related industries to take advantage of innovative technologies, as well as enhancing efficiency and quality of financial services, the FSC promulgated the draft bill of the *Financial Technology Innovative Experimentation Act*, to build an experimentation mechanism similar to a financial regulatory sandbox. The aim is to promote Taiwan's FinTech innovation while ensuring financial market order and consumer protection at the same time. The following are the latest developments of financial regulatory sandboxes in major economies and its implementation progress in Taiwan.

1. The latest developments in major countries

Currently, most of the countries that have set up regulatory sandboxes have the legal systems of common law. Among them, the UK, Singapore and Australia have more concrete and detailed sandbox regulations, mainly because judges of common law systems are bound to the precedents, known as the doctrine of stare decisis. Therefore, the competent authorities could set up standards or plans based on their legal mandate without going through legislative procedures. By contrast, in countries with statutory legal systems such as Japan, South Korea and Taiwan, legislative authorization is necessary if such an experimentation mechanism is to be set up.

The UK was the first country to propose a regulatory sandbox, with the British FCA publishing the Regulatory Sandbox report in November 2015. Singapore, Hong Kong and Australia followed suit shortly after. Singapore essentially followed the UK's principles, while Australia provided start-ups a 12-month testing period after notifying the competent authority. In Hong Kong, the competent authority does not stipulate specific operational guidelines, but provides application review and assistance on a case

by case basis. The FinTech experimentation mechanisms in these countries are summarized in Table B3.1.

In addition to the aforementioned economies, other Asian countries also made some progress in establishing their own financial regulatory sandboxes. Thailand and Malaysia issued related guidelines or frameworks in 2016,[1] and Indonesia launched a FinTech office in charge of promoting FinTech development in November of the same year. South Korea's Financial Services Commission (FSC) established a FinTech Bridge with the British FCA to enhance bilateral cooperation. Japan enacted the *Industrial Competitiveness Enhancement Act* to encourage firms to develop experimental business and services in the fields where existing regulatory scope is unclear, and will revise relevant existing regulations according to the experimental results.

Table B3.1 Comparison of innovative experimentation mechanisms in major countries

Items	The UK	Singapore	Australia	Hong Kong
The competent authority	Financial Conduct Authority (FCA)	Monetary Authority of Singapore (MAS)	Australian Securities and Investments Commission (ASIC)	Hong Kong Monetary Authority (HKMA)
Titles of guidelines (Release date)	Regulatory Sandbox (2015.11)	FinTech Regulatory Sandbox Guidelines (2016.11)	Regulatory Guide 257 (2017.2)	FinTech Supervisory Sandbox (2016.9)
Applicable firms	Authorized and unauthorized financial firms	Financial institutions and non-financial institutions	Non-financial institutions	Authorized financial institutions
Review period	3 months	• 21 work days for document review • Qualified applications will step to an evaluation stage without a stipulated time period	Testing period commences 14 days after the ASIC is notified	Not stipulated
Testing period	3-6 months	6 months (extension possible)	12 months (no extension)	Case by case
Size of clients	Small scale (limited number of clients)	50 clients	• 100 retail clients • No limits for wholesale clients	Limited number of clients (not specified)
Application criteria	• Firms involved in FinTech • Genuine innovation • Beneficial to customers	• Proposing financial products or services that are unavailable currently	• The maximum exposure is AUD$5 million for all clients and AUD$10,000 for	• Clear definitions about the scope and phases of the trial

	• When experiment is needed • Providing related research reports	• Applying new technology to financial products and services	individual clients • Adequate compensation arrangements • Establishing mechanisms to solve consumer disputes • Conforming to requirements of information disclosure and business conduct	• Customer protection measures • Risk management mechanisms • Preparedness and follow-up monitoring

Sources: ASIC (2017), FCA (2015), HKMA (2016) and MAS (2016).

2. Implementation progress in Taiwan

To facilitate the development of FinTech innovation in Taiwan, a number of legislators put forward several drafts of law amendments related to regulatory sandbox establishment at the end of 2016. The Finance Committee of the Legislative Yuan also proposed to amend eight pieces of financial laws[2] such as the *Banking Act* and the *Insurance Act* to incorporate articles related to FinTech innovative experimentation mechanisms after a review meeting held in December 2016. However, to ensure the thoroughness of legislation, the FSC formulated a draft of the *Financial Technology Innovative Experimentation Act* after discussing with related agencies, with inputs from financial and technology industries as well. This draft has been approved by the Executive Yuan and was submitted to the Legislative Yuan for review in May 2017.

The aforementioned draft covered FinTech innovation experimentation application, review, participant protection, regulatory adjustments and exemption of legal liabilities during the experimentation period, as summarized in Table B3.2.

Table B3.2 Contents of the *Financial Technology Innovative Experimentation Act*

Items	Contents
Applicable clients	Natural person, sole proprietorship or partnership company and juristic person can apply for the permit of engaging in the experimentation.
Review mechanism	• The competent authorities should convene meetings to review the application and experimentation outcomes. The reviewers include experts, scholars and related agencies coming from finance, technology and other related areas. • When required documentation is submitted, the reviewing process should be completed within 60 days. The review criteria include innovations, financial service efficiency, complete risk assessment and participant protection.
Experimentation period	The experimentation period is six months and the applications can be

	extended for an additional six months. If the applicants need to adjust business qualification in accordance with the regulatory requirements, they may apply for another six months of experimentation.
• Participant protection	• Applicants should provide protective measures and opt-out mechanisms for participants and stipulate experimentation scope as well as rights and obligations in the contracts consented by participants. • Any civil dispute arising between applicants and participants will be mediated by the Financial Ombudsman Institution.
• Regulatory measures after experimentation	• Applicants should inform the competent authority to convene an appraisal meeting within one month after the experimentation is finished. The appraisal meeting should accomplish the evaluation process within 60 days. • Taking into account the experimentation process, the competent authority should review and revise financial regulations as necessary, as well as providing assistance to the applicants for their startup, strategic cooperation or referral to other consulting units.
• Exemption from applicable regulations and legal obligations	• The competent authority and other agencies could agree to grant exemption from applicable regulations and administrative directives. • The draft provides the exemption from criminal and administrative obligations in special licensed financial businesses within the scope of experiments authorized by the competent authority.

Source: Executive Yuan.

3. Conclusion

(1) As FinTech development has evolved rapidly in recent years, difficulties regarding financial law or regulation adoptions faced by some innovative business models might hinder the development of the innovative activities. Establishing innovative experimentation mechanisms is expected to provide innovative financial products and services in a safe experimentation environment by offering legal exemption, with the benefit of encouraging financial innovation.

(2) Currently, those countries that established innovative experimentation mechanisms have formulated related operational guidelines and started to accept applications. However, their effectiveness and impacts on banks still warrant close attention.

(3) Development of financial technology innovation could raise the accessibility, usage and quality of financial services and promote financial inclusion. However, when encouraging innovative experimentation, the competent authority should enhance consumer protection, maintain fair competition in the market and ensure they do not undermine financial stability.

Notes: 1. The Bank of Thailand issued the *FinTech Regulatory Sandbox Guidelines draft* in September 2016. Bank Negara Malaysia also issued *Financial Technology Regulatory Sandbox Framework* in October 2016.

2. The eight pieces of financial Laws include *Banking Act, Insurance Act, Securities and Exchange Act, Futures Trading Act, Trust Enterprise Act, Securities Investment Trust and Consulting Act,*

Act Governing Issuance of Electronic Stored Value Cards and *The Act Governing Electronic Payment Institutions.*

References: 1. The *Financial Technology Innovative Experimentation Act* draft, which was sent by the Executive Yuan to the Legislative Yuan for review on May 5, 2016.
2. Australian Securities and Investments Commission (2017), *Regulatory Guide 257*, February.
3. FCA (2015), *Regulatory Sandbox*, November.
4. Hong Kong Monetary Authority (2016), *FinTech Regulatory Sandbox*, Press Release, September.
5. Monetary Authority of Singapore (2016), *FinTech Regulatory Sandbox Guidelines*, November.

IV. Measures to maintain financial stability

In 2016, under the circumstance of modest domestic economic recovery and stable inflation, Taiwan's financial markets and financial infrastructure maintained smooth operations and sound development. Profitability and asset quality of financial institutions slightly declined but remained at an appropriate level, while capital levels continued improving. As a whole, Taiwan's financial system remained stable.

In spite of stable recovery in advanced economies and improving growth momentum in emerging economies, international financial markets are likely to fluctuate sharply owing to heightened uncertainties from economic policies and politics in the euro area and the US. Moreover, changes in global and domestic economic and financial conditions facing Taiwan are likely to have consequences for financial stability, especially the evolution of future policies in the US, the Fed's interest rate hike trajectory, the rise in trade protectionism, the Brexit negotiation process, the political and economic conditions of the euro area, and the spillovers from Mainland China's economic restructuring and financial risks. Therefore, the CBC will continue to closely monitor the influence of these issues on the domestic economy and financial system and adopt appropriate monetary, credit, and foreign exchange policies as warranted. Meanwhile, the FSC also continues to amend financial laws and regulations and undertakes measures to strengthen financial supervision, aiming at maintaining the soundness of financial institutions and improving financial stability.

4.1 Measures taken by the CBC to promote financial stability

In the first half of 2016, in view of lower-than-expected domestic growth yet mild inflation, the CBC cut policy rates twice, conducted open market operations, and continued adopting an accommodative monetary policy to boost economic growth. Given that financial institutions have kept strengthening credit risk management on real estate loans, the CBC removed most restrictions on the relevant targeted prudential measures in March 2016. The CBC continually followed a managed float regime, stabilized the NT dollar exchange rate, and examined foreign exchange regulations to reinforce anti-money laundering practices and risk management related to banks' foreign exchange business.

4.1.1 Adopting appropriate monetary policies to cope with domestic and global economic and financial conditions

The CBC lowered policy rates twice in the first half of 2016 and then kept them unchanged

In the first half of 2016, owing to a slowdown in global economic growth and an uncertain economic outlook, coupled with a subdued domestic economy and widened negative output gap, the CBC lowered policy rates twice by 12.5 bps each time against the backdrop of a moderate inflation projection. As a result, the discount rate, the rate on accommodations with collateral, and the rate on accommodations without collateral were cut to 1.375%, 1.75%, and 3.625%, respectively, so as to maintain a stable financial environment and boost economic growth. In the second half of 2016, considering modest international economic growth and a stable domestic economy, the policy rates remained unchanged.

Reserve money growth remained moderate

The CBC conducted open market operations to keep market liquidity at an appropriate level. In 2016, the excess reserves in all financial institutions remained at a higher level. The total loans and investments of all banks grew by 4.12%, while the monetary aggregate M2 grew by 4.51% year on year, both of which were higher than the GDP growth rate of 1.50%. This indicated 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 policy actions to maintain price and financial stability and, in turn, foster economic growth.

4.1.2 Unwinding most targeted prudential measures on real estate loans

Since the CBC has implemented targeted prudential measures for real estate loans in June 2010, financial institutions have continuously enhanced self-discipline on credit risk of real estate loans, and the government has successively carried out relevant taxation schemes to promote a sound housing market. As a result, speculative real estate demand tapered off;

however, the concentration in new high-value housing loans of financial institutions stayed at a high level. Therefore, the CBC repealed most regulations imposed on real estate loans in March 2016, except for high-value housing loans. In the future, the CBC will continue to monitor financial institutions' credit risk management on real estate loans and development of the real estate market so as to undertake appropriate policy actions in a timely manner to ensure financial stability.

4.1.3 Safeguarding stability of the NT dollar exchange rate

Adopting flexible foreign exchange rate policies

After the global financial crisis, the divergence of monetary policy stances in major advanced economies induced massive and frequent international short-term capital movements in emerging markets, sharp fluctuations in international financial markets, and an appreciation of the NT dollar exchange rate. In order to maintain dynamic stability of the NT dollar exchange rate, the CBC adopts a flexible managed float exchange rate regime, and 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 foreign exchange market order.

Maintaining an orderly foreign exchange market and promoting its sound development

In 2016, the CBC continued to undertake appropriate management measures to safeguard foreign exchange market order and promote its sound development. These measures mainly included:

1. Continuing to adopt management measures targeting international capital inflows and outflows, including (1) implementing a Real Time Reporting System for Large-Amount Foreign Exchange Transactions to monitor the latest transaction information in the foreign exchange market; (2) overseeing that funds of NTD demand deposit accounts of foreign investors are transferred in accordance with the purpose laid out in their declaration; (3) requiring foreign investors to use the US dollar as margins for securities lending; (4) requesting the amount of investment in bills and bonds by foreign investors not exceed 30% of net inward remittances.

2. Urging authorized foreign exchange banks to strengthen their foreign exchange risk management in order to mitigate the risk exposures of individual banks and systemic risks of the market as a whole.

3. Strengthening targeted examinations on foreign exchange businesses and forward transactions to ensure they are undertaken for real demand purposes in order to restrain foreign exchange speculation.

4. Requiring that, for each authorized foreign exchange bank, its combined position limit for NTD non-delivery forwards (NDFs) and foreign exchange options not exceed one-fifth of its total position limit.

4.1.4 Strengthening foreign exchange supervision of banks

Along with the reinforcement of money laundering prevention and the enhancement of supervision in complex high-risk FX derivatives, the CBC amended the following foreign exchange regulations in 2016:

1. The CBC revised the *Directions Governing Banking Enterprises for Operating Foreign Exchange Business*, stipulating that: (1) banks should ensure that know your customer (KYC) procedures are followed when conducting FX business; (2) the electronic messages for FX remittances should include the required information about the payers and the payees; and (3) supplementary measures should be taken when there is a lack of the above-mentioned information in electronic messages.

2. The CBC revised the *Regulations Governing Foreign Exchange Business of Banking Enterprises*, so that pre-approval is required for authorized banks when conducting new, complex, high-risk FX derivatives business for customers except for professional institutional investors and high-net-worth corporate investors.

4.2 Measures undertaken by the FSC to maintain financial stability

From 2016 onwards, in order to facilitate financial innovation, enhance financial competitiveness and shore up economic growth, the FSC has continued implementing several measures including promoting financial technology (FinTech) development, encouraging the financial industry to invest in the green energy industry and startups, as well as supporting industries to realize the 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 mechanisms

To maintain the reliability and security of Taiwan's financial system and to prepare Taiwan for the *Mutual Evaluation* by the Asia/Pacific Group on Money Laundering (APG) in November 2018, the FSC has continually announced amendments[84] to reinforce Taiwan's AML/CFT mechanisms since 2016. The amendments included incorporating the implementation of AML/CFT by financial institutions into the FSC's examination focus, and directing other financial industry associations to put forward information about businesses and products with high money laundering risk to serve as a reference (see Chapter 3.3.4). Moreover, the FSC also enhanced the customer due diligence requirement of OBUs.

4.2.2 Persistently enhancing banks' risk management and risk-bearing abilities

1. To reinforce banks' liquidity management and follow the Net Stable Funding Ratio as the globally consistent quantitative indicator of liquidity risk, the FSC and the CBC jointly promulgated the *Standards Implementing the Net Stable Funding Ratio of Banks* in December 2016. The Standards will be implemented on January 1, 2018. The aim is to urge domestic banks to have sufficient long-term stable funding sources in support of business expansion.

2. To improve banks' management of complex high-risk derivatives, the FSC further amended applicable regulations,[85] including: (1) requiring banks to submit application to competent authorities for approval or report the product by letter when offering products to customers that are not professional institutional investors or high-net-worth corporate investors; (2) requiring banks to submit the application for approval before planning to introduce a new complex high-risk derivative product that has not been deregulated or was deregulated within the most recent six months; (3) regulating that traders authorized by a juristic person customer to conduct transactions shall have sufficient professional

[84] The FSC has formulated regulations related to the *Money Laundering Control Act*. In addition, the FSC introduced amendments to the *Directions Governing Anti-Money Laundering and Countering Terrorism Financing of Securities and Futures Sector*, the *Directions Governing Anti-Money Laundering and Countering Terrorism Financing of Insurance Sector*, the *Directions Governing Anti-Money Laundering and Countering Terrorism Financing of Banking Sector*, and the *Rules Governing Offshore Banking Branches* to enhance OBUs' customer due diligence.

[85] The FSC successively amended the *Regulations Governing Internal Operating Systems and Procedures for Banks Conducting Financial Derivatives Business* in September 2016 and May 2017, and revised the *Directions for Offshore Banking Branches Conducting Financial Derivatives Business* in September 2016.

knowledge or trading experience in financial products.

3. To obtain an understanding of the effect on domestic banks when changes in the global economic situation and financial environment occur, the FSC asked domestic banks to carry out an overall position stress test in April 2016. The results of the overall stress test of 37 domestic banks revealed that in both mild and relatively serious scenarios, capital adequacy related ratios of domestic banks were all higher than the minimum capital requirement, showing that banks, to some extent, have the capability to bear risks.[86]

4. In October 2016, the FSC again required domestic banks to examine their exposure to investment in stocks and bonds in Mainland China because of increasing default risk of debt there. Moreover, banks shall enhance risk management to reduce the possible related losses (see Chapter 3.2).

5. In order to improve the effectiveness of internal audit and internal control, the FSC amended the *Implementation Rules of Internal Audit and Internal Control System of Financial Holding Companies and Banking Industries* twice in July 2016 and March 2017. The key amendments included the following: (1) adopting a risk-based internal audit system; (2) reinforcing the functions of the board of directors and audit committee; (3) enhancing internal guidelines to handle material contingencies and strengthen the anti-money laundering mechanisms; (4) introducing new requirements set for the report content of headquarters' compliance officers; and (5) establishing an internal reporting mechanism for monitoring the examination results by foreign competent authorities.

4.2.3 The takeover bid for Chaoyang Life Insurance Co., Ltd. has been made, and the FSC kept strengthening solvency and risk management for the insurance industry

1. In January 2016, according to an amendment of the *Insurance Act*, which allow the FSC to take prompt corrective actions, the FSC took over ailing Chaoyang Life Insurance Co., Ltd., and entrusted the Taiwan Insurance Guaranty Fund (TIGF) to hold a public auction. In January 2017, Nan Shan Life Insurance Co., Ltd. made the TIGF bailout bid in the second auction. By then, there was no local insurance company with negative net worth in Taiwan.

[86] All the data used in the stress tests are as of the end of 2015. The scenarios set in this test included declining domestic and international economic growth rates, increasing domestic unemployment, falling house prices, shrinking spread between deposit and loan interest rates, and rising market risk. The results of the overall stress test of 37 domestic banks showed that under a mild scenario, the average common equity ratio, Tier 1 capital ratio, capital adequacy ratio, and leverage ratio were 9.55%, 9.83%, 11.68%, and 5.63% respectively; under a relatively serious scenario, the figures were 8.50%, 8.78%, 10.58%, and 5.03%, respectively. All results were higher than the minimum capital requirement for 2016.

2. To continue improving solvency and risk management for the insurance industry, the FSC has implemented an external reviewing actuary system of insurance companies together with an Own Risk and Solvency Assessment (ORSA) mechanism for the insurance industry. Additionally, to reasonably reflect operating risks of the insurance industry, the FSC announced adjustments for the automatically adjusted actuarial formula, which was applied to determine the policy reserve interest rate for a new contract, as well as the calculation of the risk-based capital ratio in 2016.

4.2.4 Calling for stronger cyber security

Since several securities companies recently suffered distributed denial-of-service (DDoS) attacks, in which attackers overwhelmed the attacked websites and services with excessive traffic, the FSC has required the financial industry to implement stronger cyber security measures[87] and established a platform for reporting cyber-attacks. The FSC also planned to construct a Financial Information Sharing and Analysis Center (F-ISAC) for the purpose of offering financial institutions early-warning information. In addition, the Central Deposit Insurance Company has adopted cyber security as a rating indicator of its risk-based differential premium system.

4.2.5 Reinforcing the public tender offer system

As the settlement default of XPEC Entertainment stock's purchase revealed an institutional problem, the FSC introduced amendments to the related regulations[88] in November 2016. The key amendments were as follows: (1) requiring the offeror to provide a supporting document to prove their financial capacity for paying the purchase consideration of the tender offer; (2) requiring the board of directors and the review committee of the targeted company to take responsibility for the investigation and verification of their approvals; (3) stipulating that, in principle, the offeror may not change the time, manner, or place for payment of tender offer consideration; (4) modifying the extension of the public tender offer period to a maximum of 50 days; (5) introducing measures for protecting tenderer's rights and interests; and (6) increasing information disclosure requirements for public tender offers.

[87] The FSC required financial institutions to establish and implement a network-monitoring mechanism. When detecting a DDoS cyber-attack, financial institutions shall inform those telecommunications network operators to block the IP and clear the traffic.

[88] The FSC amended the *Regulations Governing Public Tender Offers for Securities of Public Companies* and the *Regulations Governing Information to be Published in Public Tender Offer Prospectuses* in November 2016.

Appendix: Financial soundness indicators

Table 1: Domestic Banks Unit: %

Items \ Year (end of year)	2011	2012	2013	2014	2015	2016
Earnings and profitability						
Return on assets (ROA)	0.58	0.67	0.67	0.77	0.73	0.66
Return on equity (ROE)	9.27	10.44	10.29	11.62	10.65	9.23
Net interest income to gross income	62.61	63.37	60.97	59.34	60.85	60.04
Non-interest expenses to gross income	55.44	54.71	52.81	50.15	52.62	52.01
Gains and losses on financial instruments to gross income	6.92	11.74	14.63	14.11	9.60	11.37
Employee benefits expenses to non-interest expenses	57.71	59.66	59.32	57.50	55.90	56.29
Spread between lending and deposit rates (basis points)	1.41	1.42	1.42	1.42	1.44	1.38
Asset quality						
Non-performing loans to total loans	0.43	0.41	0.39	0.25	0.24	0.27
Provision coverage ratio	250.08	269.07	311.65	502.87	547.66	503.45
Capital adequacy						
Regulatory capital to risk-weighted assets	12.06	12.54	11.83	12.34	12.93	13.33
Tier 1 capital to risk-weighted assets	9.08	9.49	9.14	9.60	10.34	10.97
Common equity Tier 1 capital to risk-weighted assets	-	-	9.06	9.38	10.03	10.50
Capital to total assets	6.29	6.59	6.60	6.85	7.12	7.37
Non-performing loans net of provisions to capital	-0.38	-0.82	-3.24	-3.86	-3.03	-2.49
Leverage ratio	-	-	-	-	5.90	6.29
Liquidity						
Customer deposits to total loans	128.66	129.06	130.06	130.89	136.21	137.25
Liquid assets to total assets	11.05	9.77	13.40	13.17	12.18	10.55
Liquid assets to short-term liabilities	15.67	14.00	18.42	18.32	16.85	14.98
Liquidity coverage ratio	-	-	-	-	125.13	125.81

Table 1: Domestic Banks (cont.)

Unit: %

Items \ Year (end of year)	2011	2012	2013	2014	2015	2016
Credit risk concentration						
Household loans to total loans	46.06	46.36	47.73	48.67	49.79	50.10
Corporate loans to total loans	44.91	44.82	44.65	44.32	43.74	43.79
Large exposures to capital	67.57	60.60	52.40	42.21	36.97	34.74
Gross asset positions in financial derivatives to capital	7.57	5.84	6.79	15.61	16.62	12.33
Gross liability positions in financial derivatives to capital	7.05	6.11	8.09	15.53	17.35	12.67
Sensitivity to market risk						
Net open position in foreign exchange to capital	2.71	2.91	3.04	2.69	R2.91	4.21
Foreign-currency-denominated loans to total loans	18.14	18.10	19.90	21.22	21.55	20.8
Net open position in equities to capital	24.25	22.13	22.71	24.33	22.52	21.73
Foreign-currency-denominated liabilities to total liabilities	21.65	21.84	27.01	29.01	30.58	29.49

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 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)	2011	2012	2013	2014	2015	2016
Total liabilities to equity						
TWSE-listed companies	104.22	110.61	105.35	101.77	94.29	98.33
OTC-listed companies	83.03	87.95	81.22	76.76	76.26	82.52
Return on equity						
TWSE-listed companies	10.99	10.45	14.06	14.78	13.73	14.38
OTC-listed companies	8.97	6.91	9.92	12.21	10.36	10.39
Net income before interest and tax / interest expenses (times)						
TWSE-listed companies	11.32	8.55	13.11	13.38	13.45	13.18
OTC-listed companies	10.59	6.75	11.12	14.50	12.75	12.59

Notes: 1. Data of TWSE-listed and OTC-listed companies are from TEJ.
2. Figures for listed companies are consolidated financial data; prior to 2011 are under ROC GAAP, while from 2012 are under TIFRSs.

Table 3: Household Sector

Unit: %

Items \ Year (end of year)	2011	2012	2013	2014	2015	2016
Household borrowing to GDP	79.38	80.09	82.46	R 82.66	R 82.98	83.65
Borrowing service and principal payments to gross disposable income	39.34	39.21	42.14	R 43.74	R 46.37	47.27

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 2016 is a CBC estimate.
3. Figures with "R" are revised data.

Table 4: Real Estate Market

Unit: index, %

Items \ Year (end of year)	2011	2012	2013	2014	2015	2016
Land price index	90.86	96.32	105.79	115.07	119.28	118.91
Residential real estate loans to total loans	28.64	28.21	27.91	28.04	28.96	29.35
Commercial real estate loans to total loans	13.70	14.14	14.26	14.70	15.87	16.60

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: %

Items \ Year (end of year)	2011	2012	2013	2014	2015	2016
The turnover ratio of trading value in stock market	119.87	97.33	82.64	84.63	77.54	64.60
The monthly average turnover ratio in bond market	19.73	12.26	8.59	8.64	7.67	6.62

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.

Explanatory notes: Compilation of financial soundness indicators

I. General notes

To facilitate international comparison, most items listed in "Appendix: Financial Soundness Indicators" are compiled in accordance with the "Financial Soundness Indicators: Compilation Guide" issued by the IMF. However, a few indicators are not used for analysis in this report due to insufficient time series data.

Unless otherwise stated, the data of all indicators are on a year-end (stock data) or year-to-date (flow data) basis.

Compilation of Domestic Banks' Indicators

1. The banks in this report as of the end of 2016 include Bank of Taiwan, Land Bank of Taiwan, Taiwan Cooperative Bank, First Commercial Bank, Hua Nan Commercial Bank, Chang Hwa Commercial Bank, The Shanghai Commercial & Savings Bank, Taipei Fubon Commercial Bank, Cathay United Bank, The Export-Import Bank of the Republic of China, Bank of Kaohsiung, Mega International Commercial Bank Co., Agricultural Bank of Taiwan, Citibank Taiwan, ANZ (Taiwan) Bank, China Development Industrial Bank, Industrial Bank of Taiwan, Taiwan Business Bank, Standard Chartered Bank (Taiwan), Taichung Commercial Bank, King's Town Bank, HSBC Bank (Taiwan), Bank of Taipei, Hwatai Bank, Shin Kong Commercial Bank, Sunny Bank, Bank of Panhsin, Cota Commercial Bank, Union Bank of Taiwan, Far Eastern International Bank, Yuanta Commercial Bank, Bank Sinopac, E. Sun Commercial Bank, KGI Bank, DBS Bank (Taiwan) Ltd., Taishin International Bank, Ta Chong Bank, Jih Sun International Bank, EnTie Commercial Bank, and CTBC Bank Co., Ltd., amounting to 40 banks.
2. The domestic banks' related indicators are calculated using unaudited data submitted regularly by domestic banks. The submitted data are different from the data posted on the banks' websites, which are audited and certified by certified public accountants or adjusted by the banks. The statistical basis for these two types of data is different.
3. Domestic banks' related indicators are calculated by aggregating the numerators and denominators of each ratio, and then dividing the total numerator by the total denominator to obtain the peer-group ratios. This methodology differs from the Winsorized mean on the quarterly "Condition and Performance of Domestic Banks" report compiled by the Department of Financial Inspection of the Central Bank of the Republic of China (Taiwan).

II. Explanatory notes on the indicators

1. Domestic banks' indicators

1.1 Earnings and profitability

1.1.1 Return on assets (ROA)

This indicator is used to analyze domestic banks' efficiency in using their assets.

- ROA = net income before income tax/average total assets
  - Net income: net income before income tax.
  - Average total assets: the average of total assets at the beginning and the end of the period before 2012, while the daily average of total assets is as of the end of reference date in current year since 2013.

1.1.2 Return on equity (ROE)

This indicator is used to analyze banks' efficiency in using their capital.

- ROE = net income before income tax/average equity
  - Net income: same as 1.1.1.
  - Average equity: the average of equity at the beginning and the end of the period before 2012, while the daily average of equity is as of the end of reference date in current year since 2013.

1.1.3 Net interest income to gross income

This indicator is a measure of the relative share of net interest earnings within gross income.

- Net interest income: interest income less interest expenses.
- Gross income: net interest income plus non-interest income.

1.1.4 Non-interest expenses to gross income

This indicator is a measure of the size of administrative expenses to gross income.

- Non-interest expenses include operating expenses other than interest expenses as follows:
  - Employee benefits expenses.
  - Other expenses related to operations.
    - Expenses for property and equipment, including: purchasing, ordinary and regular maintenance and repair, depreciation, and rental.
    - Other expenditure related to operations, including: purchases of goods and services (e.g. advertising costs, staff training service expenses, and royalties paid for the use of other produced or non-produced assets).
    - Taxes other than income taxes less any subsidies received from general government.
- Gross income: same as 1.1.3.

1.1.5 Gains and losses on financial instruments to gross income

This indicator is to analyze business revenues from financial market activities as a share of gross income.

- Gains and losses on financial instruments include the following items:

- Realized and unrealized gains and losses in the statement of comprehensive income arising on all financial assets and liabilities which are held at fair value through profit or loss, available for sale, and held to maturity.
- Gains and losses on financial assets or liabilities carried at cost.
- Gains and losses on debt instruments without active markets.
- Foreign exchange gains and losses.

- Gross income: same as 1.1.3.

1.1.6 Employee benefits expenses to non-interest expenses

This indicator is to analyze employee benefits expenses as a share of non-interest expenses.

- Employee benefits expenses, including: wages and salaries, profit sharing and bonuses, allowances, pensions, social insurance and medical insurance, etc.
- Non-interest expenses: same as 1.1.4.

1.1.7 Spread between lending and deposit rates

This indicator is to analyze the effect of the interest rate spread upon net interest revenues and profitability.

- Spread between lending and deposit rates: the weighted-average loan interest rate less the weighted-average deposit interest rate. The annual interest rate spread is the average of four quarters' spreads.

1.2 Asset quality

1.2.1 Non-performing loans to total loans

This indicator is to analyze asset quality in the loan portfolio.

- Non-performing loans:

  According to the *Regulations Governing the Procedures for Banking Institutions to Evaluate Assets and Deal with Non-performing/Non-accrual Loans*, non-performing loans include the following items:
  - Loans for which repayment of principal or interest has been overdue for three months or more.
  - Loans for which the bank has sought payment from primary/subordinate debtors or has disposed of collateral, although the repayment of principal or interest has not been overdue for more than three months.
- Total loans: Total loans include bills purchased, discounts, accrual and non-accrual loans, but excluding interbank loans.

1.2.2 Provision coverage ratio

This indicator is to analyze the provision policy for loan losses.

- Provision coverage ratio: loan loss provisions/non-performing loans

1.3 Capital adequacy

1.3.1 Regulatory capital to risk-weighted assets

This indicator is to analyze the capital adequacy of domestic banks. The minimum statutory ratio of regulatory capital to risk-weighted assets of a bank shall not be less than a certain ratio, based

on the *Regulations Governing the Capital Adequacy Ratio and Capital Category of Banks*.

- Regulatory capital: the aggregate amount of net Tier 1 Capital and net Tier 2 Capital.
- Risk-weighted assets: the aggregate amount of the risk-weighted assets for credit risk together with the capital requirements for market risk and operational risk multiplied by 12.5.

1.3.2 Tier 1 capital to risk-weighted assets

This indicator is to analyze the capital adequacy of domestic banks based on the core capital concept.

- Tier 1 capital: the aggregate amount of net Common Equity Tier 1 and net additional Tier 1 Capital.
- Risk-weighted assets: same as 1.3.1.

1.3.3 Common equity Tier 1 capital to risk-weighted assets

This indicator is to analyze the capital adequacy of domestic banks based on the high quality capital concept.

- Common equity Tier 1 capital: includes common stock and additional paid-in capital in excess of par value of common stock, capital collected in advance, capital reserves, statutory surplus reserves, special reserves, accumulated profit or loss, non-controlling interests and other items of interest, less supervisory deductions.
- Risk-weighted assets: same as 1.3.1.

1.3.4 Capital to total assets

This indicator is to analyze the degree of financial leverage on assets funded by other than banks' own funds.

- Capital: equity interest of owners in a bank (i.e. the difference between total assets and liabilities).
- Total assets: the sum of financial and non-financial assets.

1.3.5 Non-performing loans net of provisions to capital

This indicator is to analyze the potential impact on capital of non-performing loans.

- Non-performing loans net of provisions to capital = (non-performing loans - specific loan provisions)/capital
  - Non-performing loans: same as 1.2.1.
  - Specific loan provisions: the minimum provision that a bank should allocate in accordance with Article 5 of *Regulations Governing the Procedures for Banking Institutions to Evaluate Assets and Deal with Non-performing/Non-accrual Loans*.
  - Capital: same as 1.3.4.

1.3.6 Leverage ratio

This indicator is to analyze the capital adequacy of domestic banks based on the degree of core capital relative to total non-risk weighted exposure.

- Leverage ratio = tier 1 capital/total exposure
  - Tier 1 capital: same as 1.3.2.
  - Total exposure: the sum of on-balance sheet exposures, derivative exposures, securities

financing transaction exposures and off-balance sheet items exposures.

1.4 Liquidity

1.4.1 Customer deposits to total loans

This indicator is a measure of liquidity to indicate the degree of dependence on more stable sources of funds (customer deposits) to illiquid assets (loans).

- Customer deposits: including check deposits, demand deposits, time deposits, saving deposits, and money remittances.
- Total loans: same as 1.2.1.

1.4.2 Liquid assets to total assets

This indicator is to analyze the liquidity available to meet expected and unexpected demands for cash.

- Liquid assets: the core liquid assets comprising cash, checks for clearing, amounts due from the Central Bank, amounts due from banks, and assets with remaining maturity of no more than three months, can be converted into cash quickly and with minimal impact to the price received.
- Total assets: same as 1.3.4.

1.4.3 Liquid assets to short-term liabilities

This indicator is to analyze the liquidity mismatch of assets and liabilities, and provide an indication of the extent to which banks could meet the short-term withdrawal of funds without facing liquidity problems.

- Liquid assets: same as 1.4.2.
- Short-term liabilities: liabilities with remaining maturity of no more than one year, including deposits, borrowings, debt securities issued, and the net market value of financial derivatives positions (liabilities less assets).

1.4.4 Liquidity coverage ratio

This indicator is to analyze the resilience of short-term liquidity.

- Liquidity coverage ratio = stock of high quality liquidity assets/total net cash outflows over the next 30 calendar days.
  - High quality liquidity assets: assets with high liquidity under stressed scenarios, such as cash, central bank reserves, government bonds and qualified securities.
  - Net cash outflows over the next 30 calendar days: expected cash outflows minus expected cash inflows within subsequent 30 calendar days under specific stressed scenarios.

1.5 Credit risk concentration

1.5.1 Household borrowing to total loans

This indicator is to analyze the concentration of loans to the household sector by domestic banking units (DBUs) of domestic banks.

- Household borrowing: loans from DBUs of domestic banks to the household sector.
- Total loans: total loans (excluding export bills purchased and non-accrual loans) of DBUs

of domestic banks.

1.5.2 Corporate loans to total loans

This indicator is to analyze the concentration of loans to local public and private corporate borrowers by DBUs of domestic banks.

- Corporate loans: loans from DBUs of domestic banks to public and private non-financial corporate borrowers.
- Total loans: same as 1.5.1.

1.5.3 Large exposures to capital

This indicator is to analyze vulnerabilities at domestic banks arising from the concentration of credit risk on single individuals or corporate borrowers.

- Large exposures: refer to the total amount of credit to the first 20 private enterprises at domestic banks after integration.
- Capital: same as 1.3.4.

1.5.4 Gross asset positions in financial derivatives to capital

This indicator is to analyze the effect of price changes on gross asset positions in financial derivatives relative to capital.

- Gross asset positions in financial derivatives: total amounts of positive fair value in hedged and non-hedged financial derivatives such as swap, forward, and option contracts, excluding embedded derivatives inseparable from the underlying instruments.
- Capital: same as 1.3.4.

1.5.5 Gross liability positions in financial derivatives to capital

This indicator is to analyze the effect of price changes on gross liability positions in financial derivatives relative to capital.

- Gross liability positions in financial derivatives: total amounts of negative fair value in hedged and non-hedged financial derivatives such as swap, forward, and option contracts, excluding embedded derivatives inseparable from the underlying instruments.
- Capital: same as 1.3.4.

1.6 Sensitivity to market risk

1.6.1 Net open position in foreign exchange to capital

This indicator measures the mismatch of foreign currency asset and liability positions at domestic banks to assess the potential vulnerability of capital to exchange rate movements.

- Net open position in foreign exchange: the open foreign currency positions in balance sheet and financial derivatives, which are converted into NT dollars using the exchange rates as of the reporting date.
- Capital: same as 1.3.4.

1.6.2 Foreign-currency-denominated loans to total loans

This indicator is to analyze the share of foreign currency loans within gross loans.

- Foreign-currency-denominated loans: the loans to other financial institutions, corporate entities, and individuals that are payable in foreign currency, or in domestic currency but

with the amount to be paid linked to a foreign currency.

- Total loans: including loans to customers and other financial institutions, but excluding export bills purchased.

1.6.3 Net open position in equities to capital

This indicator is to analyze the effect of the fluctuation of banks' net positions in equities compared with own equity.

- Net open position in equities: the sum of on-balance-sheet holdings of equities and notional positions in equity derivatives.
- Capital: same as 1.3.4.

1.6.4 Foreign-currency-denominated liabilities to total liabilities

This indicator is to analyze the relative importance of foreign currency funding within total liabilities.

- Foreign-currency-denominated liabilities: the liabilities that are payable in foreign currency, or in domestic currency but with the amounts to be paid linked to a foreign currency.
- Total liabilities: the total amounts of current, non-contingent liabilities, and the liabilities positions in financial derivatives.

2. Non-financial corporate sector indicators

2.1 Total liabilities to equity

This indicator is a leverage ratio which is used to analyze the extent of activities that are financed through liabilities other than own funds.

- Total liabilities: including short-term and long-term liabilities.
- Equity: including funds contributed by owners, capital surpluses, retained earnings, and other items related to owners' equity.

2.2 Return on equity

This indicator is to analyze profitability of non-financial corporations in using their capital.

- Return on equity = net income before interest and tax/average equity (the "net income before interest and tax" is adopted according to the FSIs of the IMF).
    - Net income before interest and tax: net income before tax plus interest expenses from continuing operation units.
    - Average equity: the mean of the equity at the beginning and the end of current year.

2.3 Net income before interest and tax/interest expenses

This indicator is to analyze how well non-financial corporate income covers interest expenses.

- Net income before interest and tax: same as 2.2.
- Interest expenses: the interest expense payments on debt within the specified time period of the statement.

3. Household sector indicators

3.1 Household borrowing to GDP

This indicator is to analyze the level of household borrowing to gross domestic product (GDP).

- Household borrowing: household outstanding loans and credit card revolving balances from financial institutions. Financial institutions include depository institutions and other financial institutions (trust and investment companies, life insurance companies, securities finance companies, and securities firms).

3.2 Borrowing service and principal payments to gross disposable income

This indicator is to analyze the capacity of households to cover their debt payments.

- Borrowing service and principal payments: interest and principal payments made on outstanding loans and credit card revolving balances within the specified time period of the statement.
- Gross disposable income: the aggregate of the wages and salaries from employment, property and corporate income, and current transfers receipts less current taxes on income and wealth and other current transfers expenditures (net disposable income) plus expenses of interest and rent.

4. Real estate market indicators

4.1 Land price index

This indicator is to analyze the price movement of land prices in the Taiwan area.

- Land price index: the general index of land prices released by the Ministry of Interior each half year, and the reference dates are the end of March and September, respectively.

4.2 Residential real estate loans to total loans

This indicator analyzes the concentration of domestic banks' loans in residential real estate.

- Residential real estate loans: individual loans that are collateralized by residential real estate. Residential real estate includes houses, apartments, and associated land (including owner use and rental use).
- Total loans: same as 1.2.1.

4.3 Commercial real estate loans to total loans

This indicator analyzes the concentration of domestic banks' loans in commercial real estate.

- Commercial real estate loans including: loans to corporate entities and individuals that are collateralized by commercial real estate, loans to construction companies, and loans to companies involved in the development of real estate. Commercial real estate includes buildings and associated land used by enterprises for retail, wholesale, manufacturing, or other purposes.
- Total loans: same as 1.2.1.

5. Market liquidity

5.1 The turnover ratio of trading value in stock market

This indicator is to analyze the average turnover frequency in the stock market (i.e. stock market liquidity).

- The turnover ratio of accumulated trading value: the accumulated value of monthly turnover ratio in terms of trading value within current year of the statement.
- The monthly turnover ratio in terms of trading value in stock market = total trading value/market value
- Total trading value: total trading value of stock transactions in the month.
- Market value: total market value of listed stocks as of the end of the month.

5.2 The monthly average turnover ratio in bond market

This indicator is to analyze the average turnover frequency in the bond market (i.e. bond market liquidity).

- Monthly average turnover ratio in bond market = total amount of monthly turnover ratio in terms of trading value in bond market/12
    - Monthly turnover ratio in terms of trading value: trading value in the month/average bonds issued outstanding.
    - Trading value in the month: total bond trading value (excluding repo transactions).
    - Bonds issued outstanding: bonds that have been issued and are in the hands of the public.
    - Average bonds issued outstanding = (bonds issued outstanding at the month-end plus bonds issued outstanding at previous month-end)/2

Abbreviations

ABS	Australian Bureau of Statistics
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
ASF	Available stable funding
ASIC	Australian Securities and Investments Commission
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
BSP	Bangko Sentral ng Pilipinas
CBC	Central Bank of the Republic of China (Taiwan)
CCHS	Check Clearing House System
CDD	Customer due diligence
CDs	Certificates of deposit
CIFS	CBC Interbank Funds-Transfer System
CFT	Countering the financing of terrorism
CPI	Consumer price index
CPPCC	Chinese People's Political Consultative Conference
DBUs	Domestic banking units
DDoS	Distributed denial-of-service

DGBAS	Directorate-General of Budget, Accounting and Statistics of the Executive Yuan
DKOs	Discrete knock-outs
DVP	Delivery-versus-payment
ECB	European Central Bank
EDD	Enhanced due diligence
EPIs	Electronic payment institutions
ETF	Exchange-traded fund
EU	European Union
EUR	Euro
FAO	Food and Agriculture Organization of the United Nations
FATF	Financial Action Task Force
FCA	Financial Conduct Authority, United Kingdom
FDIC	Federal Deposit Insurance Corporation
Fed	Federal Reserve System
FISC	Financial Information Service Co., Ltd.
F-ISAC	Financial Information Sharing and Analysis Center
FSA	Financial Services Agency, Japan
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
HCE	Host Card Emulation
HIBOR	Hong Kong Interbank Offered Rate
HKMA	Hong Kong Monetary Authority
IAS	International Accounting Standards
IFRSs	International Financial Reporting Standards
IMF	International Monetary Fund
IRS	Interbank Remittance System
JCIC	Joint Credit Information Center

JPY	Japanese Yen
KRW	Korean Won
KYC	Know your customer
LCR	Liquidity coverage ratio
MAS	Monetary Authority of Singapore
MLF	Medium-term lending facility
MOF	Ministry of Finance
MOI	Ministry of Interior
MPA	Macro prudential assessment
MPI	Macro-prudential indicator
mPOS	Mobile point of sale
NCDs	Negotiable Certificates of Deposit
NDFs	Non-delivery forwards
NIRP	Negative Interest Rate Policy
NFC	Near field communication
NPC	National People's Congress
NPL	Non-performing loan
NSFR	Net stable funding ratio
NTD	New Taiwan dollar
NYSDFS	New York State Department of Financial Services
OBUs	Offshore banking units
OPEC	Organization of the Petroleum Exporting Countries
ORSA	Own Risk and Solvency Assessment
OTC	Over-the-counter
PBC	People's Bank of China
PP	Percentage Point
PPI	Producer price index
PSL	Pledged supplementary lending
PVP	Payment-versus-payment
QQE	Quantitative and qualitative monetary easing
RBA	Risk-based approach
RBC	Risk-based capital
RMB	Renminbi

ROA	Return on assets
ROE	Return on equity
RRR	Reserve requirement rate
RSF	Required stable funding
SDR	Special drawing right
SE	Secure element
SEC	US Securities and Exchange Commission
SGD	Singapore dollar
SHIBOR	Shanghai Interbank Offered Rate
SIPSs	Systemically important payment systems
SLF	Standing lending facility
SMEG	Small and Medium Enterprise Credit Guarantee Fund of Taiwan
SMEs	Small and medium-sized enterprises
SSE	Shanghai Stock Exchange
TAIEX	Taiwan Stock Exchange Weighted Index
TEJ	Taiwan Economic Journal Co., Ltd
TFE	Taiwan Futures Exchange
TIFRSs	Taiwan-IFRSs
TIGF	Taiwan Insurance Guaranty Fund
TLF	Temporary liquidity facilities
TPEx	Taipei Exchange Capitalization Weighted Stock Index
TRFs	Target redemption forwards
TWSE	Taiwan Stock Exchange
UN	United Nations
USD	US dollar
VaR	Value at risk
WPI	Wholesale price index

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