Central Bank Operations

III. Central Bank Operations

1. Overview

In 2018, the Bank observed that heightened uncertainties surrounding international economic and financial prospects could soften momentum for domestic economic expansion. Meanwhile, the output gap remained negative, and the inflation outlook was mild. Taiwan's interest rates still registered around the middle range among a host of economies. Against such a backdrop, the Bank kept policy rates on hold for the year 2018 to help foster price and financial stability and sustain economic growth.

To reinforce communication with the public about monetary policy, the Bank decided to live-stream the press conference following each Monetary Policy Meeting from June 2018 onwards. Furthermore, beginning from September 2018, the Monetary Policy Meeting would be held one hour earlier to allow sufficient time for the board directors to consider and discuss factors affecting economic and financial conditions and make appropriate monetary policy decisions.

In response to economic and financial conditions, the Bank continued to conduct open market operations by issuing certificates of deposit (CDs) to manage market liquidity, maintain reserve money at appropriate levels, and sustain steady growth in monetary aggregates.

In addition, to enhance financial institutions' flexibility in funding arrangements, the auction schedule of CDs would be announced on a quarterly basis instead of a monthly basis, starting from the third quarter of 2018. The outstanding amount of CDs issued by the Bank stood at NT$7,816.7 billion at the end of the year, down by NT$63.4 billion or 0.80% from the previous year end. In terms of money supply, the annual growth rate of reserve money averaged 5.61%, while M2 posted an annual growth rate of 3.52% for the year as a whole, within the Bank's target range of 2.5% to 6.5%.

With regard to macroprudential policy on the housing sector, as prices for high-value housing tend to be more volatile than ordinary housing, which raises banks' real estate-associated credit risks, the Bank decided to keep the regulations governing high-value housing loans in place over the year and continued to urge banks to strengthen risk management of real estate lending so as to sustain financial stability.

In respect of foreign exchange (FX) management, the Bank was dedicated to maintaining dynamic stability of the NT dollar throughout the year. The trading volumes of buying and selling currencies remained broadly balanced.

In addition, in order to promote authorized FX banks' competitiveness and quality of services, the Bank revised FX business related regulations, such as allowing authorized banks to accept customers' applications to open digital foreign currency deposit accounts online, and streamlining electronic FX services application procedures for banks.

In 2018, the Bank continued to improve financial market infrastructures to facilitate the development of financial inclusion. Meanwhile, the Bank stepped up efforts to closely monitor the latest trends in financial technology and assist financial institutions in developing innovative services and boosting the adoption of electronic payments. Related developments included suggesting the Financial Information Service Co., Ltd. to build a blockchain-based platform for financial audit verification, which commenced operation at the end of the year, and assisting financial institutions to promote the use of the mobile payment service "Taiwan Pay."

With the rapid development of electronic and mobile commerce, instant interbank clearing significantly increased year by year. To meet rising prefunding needs of financial institutions, the Bank raised the ceiling on the amount of financial institutions' end-of-day balances in the "Interbank Funds Transfer Guarantee Special Accounts" to be counted as part of the required reserves from 4% of the current month's required reserves to 8%, effective from January 4, 2019.

2. Monetary Management

Keeping Policy Rates Unchanged to Maintain Price and Financial Stability

While the global economy was clouded by many uncertainties in 2018, the domestic economy experienced a moderate recovery. The output gap remained negative, and inflation expectations were mild. Meanwhile, domestic nominal and real interest rates registered around the middle range among major economies. Against this backdrop, the Bank kept policy rates unchanged throughout the course of the year so as to maintain price and financial stability and achieve sustained economic growth.

At the end of 2018, the discount rate, the rate on accommodations with collateral, and the rate on accommodations without collateral were kept unchanged at their current levels of 1.375%, 1.75%, and 3.625%, respectively.

Conducting Open Market Operations to Sustain Steady Monetary Growth

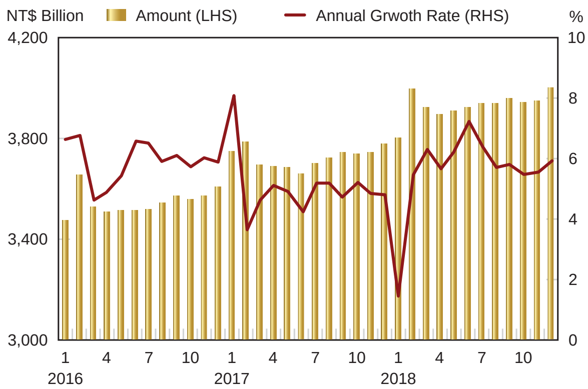
In 2018, the Bank managed market liquidity through open market operations by issuing certificates of deposit (CDs) in response to domestic economic conditions, which helped maintain reserve money, monetary aggregates and the overnight call loan rate at appropriate levels.

(1) Managing Market Liquidity

The Bank continued to conduct open market operations by issuing CDs. At the end of the year, the total outstanding amount of CDs issued by the Bank was NT$7,817 billion.

(2) Higher Growth in Reserve Money

Reserve Money (Averages of Daily Figures)

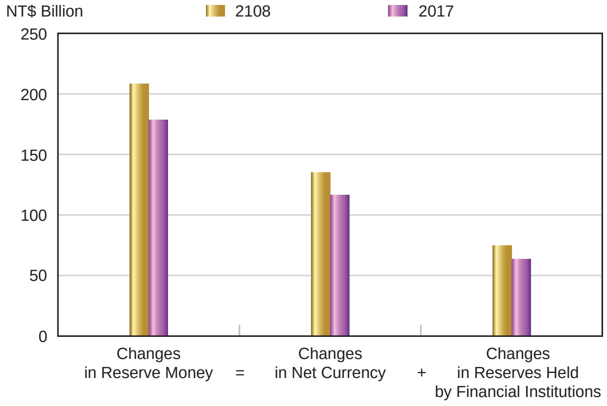


Source: *Financial Statistics Monthly*, CBC.

Reserve money grew at a moderate pace for the year of 2018, recording a growth rate of 5.61%, 0.57 percentage points higher than the previous year's figure. In terms of the monthly movements of reserve money, the annual growth rates of reserve money for January and February are often more volatile as the exact timing of the Lunar New Year holidays shifts on the Gregorian calendar each year. In 2018, reserve money posted an average annual growth rate of 3.50% during this period. Monthly figures of annual reserve money growth remained relatively stable from March onwards and reached a yearly high of 7.25% in June and a yearly low of 5.51% in October.

On the demand side, reserve money, measured on a daily average basis, increased by NT$209 billion over the previous year. Of the components, net currency increased by NT$135 billion and the annual growth rate slightly increased to 7.60% from 7.00% the previous year; reserves held by financial institutions expanded by NT$74 billion, with the annual growth rate increasing to 3.80% from 3.32% the previous year. Currency held by the non-bank public grew moderately because the low interest rates paid on bank deposits enhanced the willingness to hold currency in hand. Meanwhile, the overall growth rate of banks' reserves increased compared to the previous year as higher growth in transaction deposits raised banks' demand for reserves.

Changes in Reserve Money (Averages of Daily Figures)



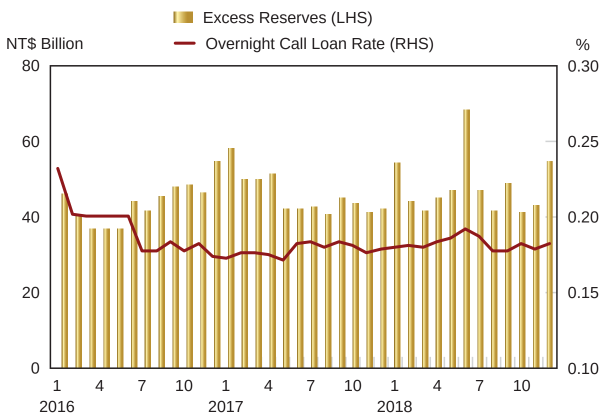
Source: *Financial Statistics Monthly*, CBC.

From the supply side perspective, reserve money increased by NT$278 billion at the end of the year. The balance sheet of the Bank revealed the sources of changes in reserve money. The increase was mostly attributable to the growth in foreign assets held by the Bank and in claims on financial institutions, as well as the decrease in the issuance of CDs.

(3) Overnight Call Loan Rate Broadly Stable

In 2018, the Bank continued to conduct open market operations to maintain excess reserves and the overnight call loan rate at appropriate levels. The annual average excess reserves of financial institutions reached NT$48 billion, slightly higher than the NT$46 billion of the previous year. The annual average overnight call loan rate remained broadly stable at around 0.180%.

Excess Reserves and Overnight Call Loan Rate



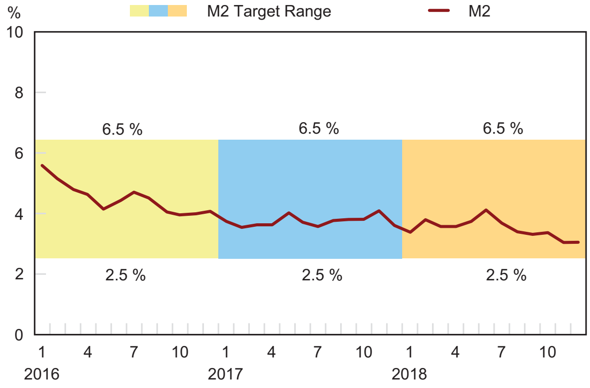
Source: *Financial Statistics Monthly*, CBC.

(4) M2 Growth Slower but Within Target Range

The M2 growth target range for 2018 was set at 2.5% to 6.5%, same as the previous year. M2 recorded an annual growth rate of 3.52%, down by 0.23 percentage points from the previous year. The annual growth rates of M2 in every month of the year remained within the Bank's target range.

With regard to the monthly movements in 2018, the M2 growth rate trended upward for the first quarter, reflecting continuous growth in bank loans and investments, and reached 3.60% in March. Afterwards, despite net foreign capital outflows, stronger expansion in bank loans and investments lifted the pace of monthly M2 growth to its yearly high of 4.10% in June.

Annual Growth Rate and Target Range of M2



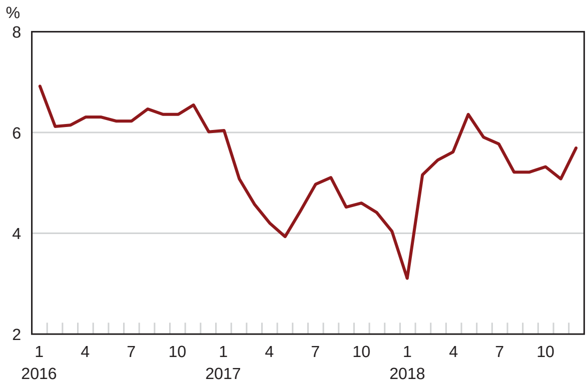
Source: *Financial Statistics Monthly*, CBC.

However, the M2 growth rate moved down to 3.68% in July, caused by slower growth in bank loans and investments and larger net foreign capital outflows. The M2 growth rate dropped further to 3.34% in September on account of softened growth in bank loans and investments and in foreign currency deposits. After slightly rising to 3.39% in October as growth in transaction deposits accelerated, the M2 growth rate declined in subsequent months and recorded an all-year low of 3.07% in December, dragged down by weaker growth in transaction deposits and net foreign capital outflows.

The monetary aggregate M1B rose at an annual rate of 5.32% in 2018 (on a daily average basis), 0.67 percentage points higher than the previous year's figure, primarily because of faster growth in transaction deposits.

As for the monthly movements of M1B, its annual growth rate reached a yearly low of 4.03% in January on account of diminished growth in bank loans and investments and a higher base effect with the Lunar New Year holidays falling in January in 2017. The M1B growth rate exhibited a steady uptrend from February to May owing to faster growth in transaction deposits and bank loans and investments and hit an all-year high of 6.35% in May.

Annual Growth Rate of M1B



Source: *Financial Statistics Monthly*, CBC.

From June onwards, the M1B growth rate moved downward as a result of softer growth in transaction deposits, slower expansion in bank loans and investments, and net foreign capital outflows. After ticking up in September and October, the M1B growth rate slid to 5.09% in November. Later, stronger growth in passbook savings deposits brought the M1B annual growth rate up to 5.69% in December.

Implementing the Net Stable Funding Ratio

To be in line with international standards and practices, the Financial Supervisory Commission (FSC) and the Bank jointly promulgated the net stable funding ratio (NSFR) regulations, effective from January 1, 2018. The introduction of the NSFR aims to strengthen the liquidity risk management of domestic banks. The NSFR is defined as the amount of available stable funding relative to the amount of required stable funding, and its statutory minimum standard is set at 100%. For the first three quarters of 2018, the NSFR of domestic banks averaged 133%, and all individual domestic banks' NSFRs met the minimum requirement during the period.

Continuing with Macroprudential Policy on High-Value Housing Loans

In 2018, housing prices fluctuated within a narrow range and home buyers remained cautious about the housing market outlook. However, given that largely volatile high-value housing prices could still raise banks' real estate-associated credit risks, the Bank kept the loan-to-value (LTV) ratio capped at 60% on high-value housing loans.

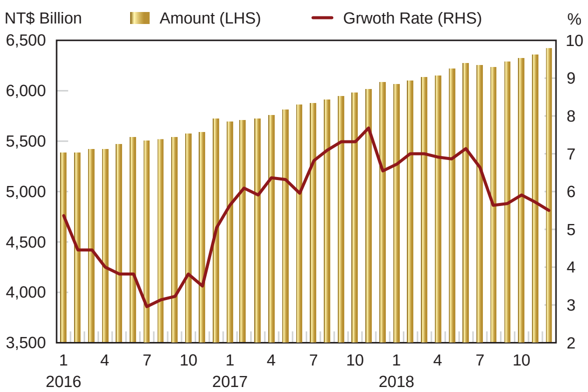
Looking ahead, the Bank will continue to keep a watchful eye on financial institutions' management of risks associated with real estate lending and developments in the housing market. Appropriate monetary policy actions will be adopted in a timely manner so as to ensure financial stability.

Facilitating SME Funding

To sufficiently meet SMEs' funding needs, the FSC continued to encourage lending to SMEs by domestic banks, while the Bank also urged commercial banks to increase lending to SMEs.

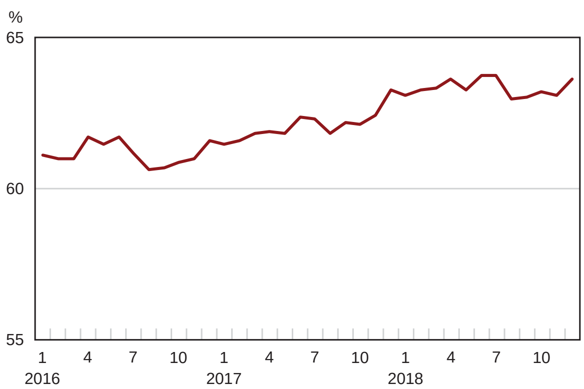
At the end of 2018, the outstanding loans extended to SMEs by domestic banks amounted to

Outstanding Loans Extended to SMEs



Source: FSC.

Ratio of Outstanding Loans Extended to SMEs to Those Extended to Private Entreprises



Source: FSC.

NT$6,438 billion, increasing by NT$336 billion from the end of the previous year and far exceeding the annual target of increased lending of NT$270 billion. Furthermore, the ratio of outstanding SME loans to those extended to private enterprises rose slightly from 63.28% at the end of 2017 to 63.63% at the end of 2018.

Accepting Redeposits from Financial Institutions

Accepting redeposits from Chunghwa Post, the Agricultural Bank of Taiwan and commercial banks is another instrument for the Bank to influence banks' reserve positions to promote financial stability. At the end of 2018, the outstanding redeposits of Chunghwa Post and the Agricultural Bank of Taiwan stayed broadly unchanged at NT$1,624 billion and NT$165 billion, respectively. Commercial banks' redeposits also remained unchanged at NT$364 billion.

3. Foreign Exchange Management

Taiwan is a small open economy which adopts a managed float exchange rate regime. Under the regime, the NT dollar exchange rate is in principle determined by market forces. In the event of excessive exchange rate volatility, the Bank would conduct "leaning against the wind" operations to stave off adverse implications for economic and financial stability. The Bank continues employing a flexible exchange rate policy and maintaining the dynamic stability of the NT dollar exchange rate. The Bank is also committed to facilitating the order and development of the foreign exchange (FX) market.

Promoting the Sound Development of the Foreign Exchange Market

In early 2018, global trade growth gathered momentum, and the stock markets of major Asian emerging economies, including Taiwan, were favored by international investors. However, in the second quarter, as the escalation of US-China trade friction and financial turmoil in some emerging markets drove up pressures to sell in the Taiwan stock market, the NT dollar exchange rate against the US dollar significantly fluctuated. Therefore, in line with its legal mandate, the Bank stepped in as necessary to maintain the dynamic stability of the NT dollar exchange rate.

In the third quarter of 2018, global financial markets generally stabilized, though this was followed by a broad correction in the fourth quarter. Nevertheless, the NT dollar exchange rate against the US dollar was relatively stable. For the year as a whole, the Bank's total purchase and sale in the foreign exchange market roughly balanced each other out.

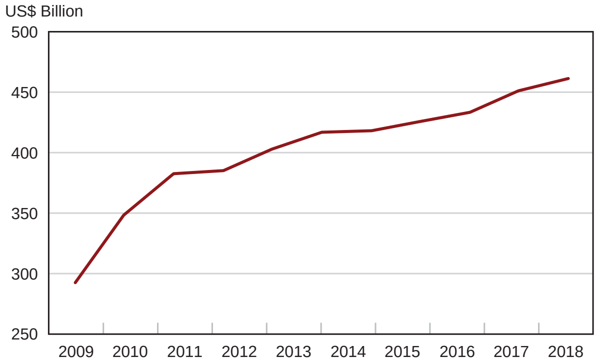
In 2018, the Bank continued to implement the Real-Time Reporting System for Large-Amount Foreign Exchange Transactions to maintain an orderly market. Moreover, reinforced examination efforts were made to ensure that forward transactions were based only on actual transactions. The Bank also urged authorized banks to enhance their exchange rate risk management in order to reduce FX market exposure of individual banks and to contain systemic risk. The Bank continued to strengthen targeted examinations on foreign exchange business in order to maintain the order of the FX market.

Foreign Currency Call Loan and Swap Market Management

In order to provide the financial system with sufficient foreign currency liquidity to meet funding needs, including those for corporations to venture into overseas markets, the Bank provided seed funds for the Taipei Foreign Currency Call Loan Market, including US$20 billion, €1 billion, and ¥80 billion.

Furthermore, to facilitate smooth corporate financing and provide sufficient foreign currency liquidity within the banking system, the Bank continued to conduct foreign currency swap transactions with banks and offered foreign currency call loans to banks.

Foreign Exchange Reserves



Source: Department of Foreign Exchange, CBC.

Foreign Exchange Reserve Management

The Bank manages its foreign exchange reserves based on the considerations of liquidity, safety, and profitability. The Bank keeps watch on the global economic and financial situation and adjusts the FX reserves as warranted.

Currently, US dollar assets make up a larger share in Taiwan's foreign exchange reserves than the COFER (Currency Composition of Official Foreign Exchange Reserves) average published by the IMF. As the US dollar strengthened and US interest rates rose during 2018, Taiwan's total FX reserves stood at US$461.8 billion at the end of the year, a US$10.3 billion or 2.3% increase from the end of 2017, mainly attributable to returns from FX reserve investments after valuation effects.

Capital Flow Management

The Bank's FX management mainly relies on the market mechanism and capital can, in principle, flow freely in and out of Taiwan. As of 2018, foreign currency capital not involving NT dollar conversion has been able to flow freely. Additionally, there are no restrictions on financial flows involving NT dollar conversion for goods and service trade, nor for direct and securities investments approved by the competent authorities. However, regulation exists for short-term remittances. Annual remittances for an individual resident within US$5 million and for a juridical person within US$50 million can be settled by banks directly, while annual remittances above the aforementioned amounts require the approval of the Bank. Each transaction for a nonresident within US$0.1 million can be settled by banks directly, whereas any transaction amount above that threshold requires the approval of the Bank.

Key measures with regard to the management of capital flows in 2018 included:

(1) Amending Corresponding FX Regulations

In line with the amendment to the *Company Act*, which abolished the foreign company approval system, the Bank amended the *Regulations Governing the Declaration of Foreign Exchange Receipts and Disbursements or Transactions* (hereinafter referred to as the *Regulations*), effective November 15.

Banking enterprises are now allowed to process settlements of foreign exchange sold by a representative office or a business office that does not have operating revenue in Taiwan to cover its office expenses, as defined in Article 3 of the *Regulations*.

In line with the relevant amendment of the *Regulations*, the Bank amended some contents in the *Directions for Banking Enterprises while Assisting Customers to Declare Foreign Exchange Receipts and Disbursements or Transactions*, and Table 1 of Direction 24 and Table 10 of Direction 26, effective November 15.

(2) Promoting the Internationalization of Taiwan's Capital Market

In 2018, the Bank approved fund-raising by domestic and foreign institutions through bond issuance, as shown in the following table.

CBC-Approved Fund-Raising by Domestic and Foreign Institutions

Institution	Method	Number	Amount
Foreign companies	NTD convertible bonds	15	NTD 7.7 billion
	IPO on TWSE & TPEx and registration on the Emerging Stock Board	19	NTD 8.5 billion
	International bonds	49 13 3	USD 27.8 billion RMB 20.3 billion ZAR 0.9 billion
Domestic companies	Overseas convertible bonds	2	USD 0.6 billion

Note: Taiwan Stock Exchange; Taipei Exchange.
Source: Department of Foreign Exchange, CBC.

In addition, on November 30, the Financial Supervisory Commission (FSC) gave the green light to the issuance of NTD-denominated foreign straight bonds domestically by foreign issuers, offered only to professional institutional investors. In the meantime, the Taipei Exchange promulgated the rules govering management of NTD-denominated international bonds.

(3) Approving Residents' Investments in Foreign Securities

In 2018, the Bank approved the following investments in foreign securities by residents:

Residents' investments in Foreign Securities Approved by the Bank

Institution	Method/Instrument	Amount
Securities investment trust enterprises (SITEs)	100 domestic SITE funds (including 52 NTD-foreign multiple currency SITE funds)	NTD 2,189.5 billion (including multiple currency funds: NTD 1,089.5 billion)
	4 SITE private funds	NTD 17.5 billion
	3 domestic futures trust funds for unspecified persons	NTD 60.0 billion
Life insurance companies	Non-discretionary money trusts managed by financial institutions	USD 0.7 billion
	Investment for their own accounts	USD 3.6 billion
	Lowering overseas investment hedge positions	USD 3.8 billion
Five major government pension funds and employment insurance fund	Investment for their own accounts	USD 2.3 billion

Source: Department of Foreign Exchange, CBC.

Management of FX Business of Financial Institutions

(1) Authorized FX Banks

Pursuant to the *Central Bank of the Republic of China (Taiwan) Act* and the *Foreign Exchange Regulation Act*, the Bank reviews, authorizes and supervises banks to conduct FX business accordingly. In 2018, the Bank continued to approve bank branches as authorized FX banks and loosened restrictions on FX derivative product business in order to facilitate authorized FX banks' competitiveness and service quality. Related developments in 2018 were as follows.

At the end of 2018, there were 3,444 authorized FX banks in total, which included 38 head offices and 3,368 branches of domestic banks, 35 branches of 29 foreign banks, three branches of Mainland Chinese banks, as well as 4,673 authorized money exchangers, post offices, and financial institutions authorized to engage in basic FX business.

On January 4, 2018, the Bank amended the *Regulations Governing Foreign Exchange Business of Banking Enterprises*, and the *Directions Governing Banking Enterprises for Operating Foreign Exchange Business*, and promulgated the *Directions Governing Authorized Banks for Operating Foreign Exchange Businesses Through Electronic or Communications Equipment*, in order to allow banking enterprises to open digital FX deposit accounts online for clients and simplify and upgrade the application for banks' FX business via electronic and communications equipment. The Bank also stipulated the procedures and rules for the authorized banks' various foreign currency trust businesses and foreign currency financial bonds issued abroad. The Bank urged banks to comply with the regulations on anti-money laundering/countering the financing of terrorism.

In accordance with the amendment of the *Company Act* and the recommendations of the Financial Action Task Force (FATF), on November 13, 2018, the Bank revised again the *Directions Governing Banking Enterprises for Operating Foreign Exchange Business*, amending the relevant regulations on grantors' remittances qualifications of non-discretionary money trust business and SWIFT messaging.

(2) Insurance Companies

Up to the end of 2018, the numbers of insurance companies allowed to engage in foreign currency insurance business for traditional and investment-linked foreign currency insurance products were 20 and 21, respectively. The 2018 foreign currency premium revenue was US$33.5 billion, an increase of US$1.8 billion or 5.55% over the previous year.

(3) Securities Firms

The approved cases granted by the Bank for securities firms to engage in FX business as of 2018 are shown in the following table.

Approved Cases for Securities Firms to Conduct FX Business in 2018

FX Business	Number
Agents for foreign bond trading	1
Proprietary foreign securities trading neither belonging to investment with their own funds nor for hedging needs	4
Foreign currency spot exchange transactions	1

Source: Department of Foreign Exchange, CBC.

(4) Investment Trust/Consulting Firms, and Futures Firms

The approved cases granted by the Bank for investment trust and investment consulting firms and futures firms to conduct FX business as of 2018 are shown in the following table.

Approved Cases for Investment Trust/Consulting Firms and Futures Firms to Conduct FX Business (as of the End of 2018)

Institution	FX Business	Number
Investment trust and investment consulting firms	Serving as mandated institution of private offshore funds	2
	Conducting public offer or private placement of foreign currency- denominated funds	7
Futures firms concurrently operating as leverage transaction merchants	Foreign currency margin trading	1

Source: Department of Foreign Exchange, CBC.

(5) Bills Finance Firms

In line with the opening of the foreign currency-denominated derivative business conducted by bills finance firms, on November 12, the Bank promulgated the rules for bills finance firms to, as business units, apply for operating the business of FX derivatives involving interest rates, as well as other matters for compliance.

(6) Offshore Banking Units (OBUs)

At the end of 2018, the number of OBUs was 60, and total OBU assets reached US$201.0 billion, which was US$2.0 billion or 1.0% less than the end of the previous year. The sum of OBU post-tax net profit was US$2.8 billion, an increase of US$0.1 billion or 5.2% from a year before.

(7) Offshore Securities Units (OSUs)

At the end of 2018, there were 19 OSUs, and total OSU assets reached US$4.4 billion, which was US$0.8 billion or 14.7% less than the previous year end. The total OSU profits turned into a net post-tax loss of US$20.1 million in 2018, a decrease of US$113.0 million from the net profits of US$92.9 million of 2017.

(8) Offshore Insurance Units (OIUs)

As of the end of 2018, there were 20 OIUs, with a total amount of assets of US$0.8 billion, which was US$0.3 billion or 70.7% more than the previous year end. A total OIU post-tax loss turned into a net post-tax profit of US$1.9 million in 2018, an increase of US$16.2 million from the net loss of US$14.3 million of 2017.

Foreign Currency Clearing Platform

Taiwan's foreign currency clearing platform, consigned by the Bank and established by the Financial Information Service Co., was inaugurated in 2013. The platform offers services for domestic and cross-border remittances (including cross-strait) of the US dollar, the renminbi, the Japanese yen and the euro, and domestic remittances of the Australian dollar. The platform adopts a payment-versus-payment (PVP) mechanism among banks, a liquidity-saving mechanism for foreign currency remittances, and a delivery-versus-payment (DVP) mechanism for foreign currency bonds and bills.

The Development of Domestic Foreign Currency Settlement Business

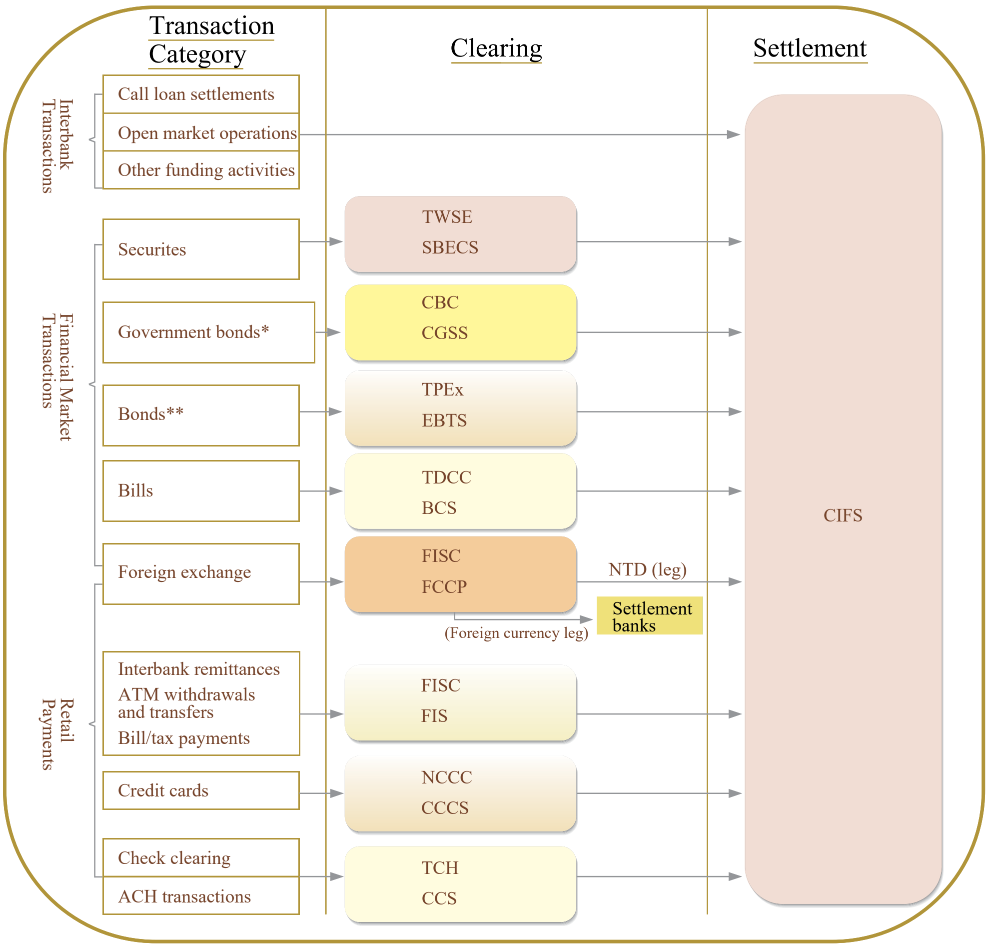
Currency	Domestic Participating Units	Settlements in 2018	
		Transactions	Amount
US dollar	69	1,247,693	USD 1,951.5 billion
Renminbi	61	2572,984	RMB 394.7 billion
Yen	41	32,082	JPY 1,231.2 billion
Euro	40	19,058	EUR 5.7 billion
Australian dollar	29	15,000	AUD 1.6 million

Source: Department of Foreign Exchange, CBC.

4. Payment and Settlement Systems

Serving as the hub of Taiwan's payment and settlement system, the Bank's CBC Interbank Funds Transfer System (CIFS) links the interbank clearing systems operated by the Financial Information Service Co., Ltd. (FISC), the Taiwan Clearing House (TCH), the National Credit Card Center of R.O.C. (NCCC), the Taiwan Depository and Clearing Corporation (TDCC), the Taipei Exchange (TPEx), and the Taiwan Stock Exchange Corporation (TWSE), as well as the Central Government Securities Settlement System (CGSS), together to construct a comprehensive system.

CIFS Settlement Services



Notes:* Including DVP settlements for interbank transactions of central government bonds and treasury bills.
** Including netting settlements for outright trades of government bonds, corporate bonds, and financial bonds.
Source: CBC.

In addition, the Bank monitors major payment systems based on the *Principles for Financial Market Infrastructures* released by the Bank for International Settlements (BIS) to ensure sound operation of these systems and to promote stability of the financial system.

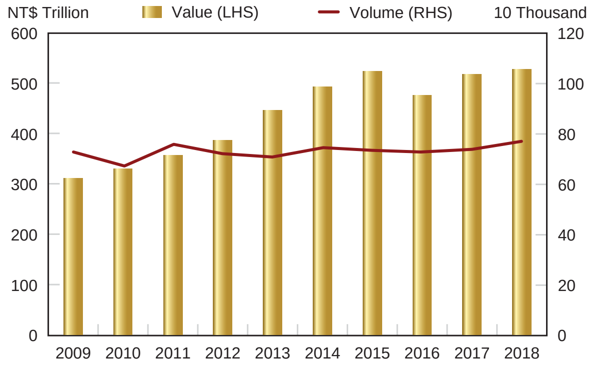
Operation of Payment and Settlement Systems

(1) Funds Transfers via the CIFS

The CIFS is a large-value electronic funds transfer system. In addition to dealing with interbank funding, open market operations, and funds settlements in financial markets, the CIFS also provides interbank final settlement services for each clearing institution.

At the end of 2018, participants of the CIFS included 67 banks, eight bills finance companies, and seven other institutions including Chunghwa Post, the FISC, the TCH, the TWSE, the TPEx, the TDCC, and the NCCC. In the year 2018, the number of transactions via the CIFS was 766,419, and the amount of funds transferred totaled NT$526 trillion. Meanwhile, the daily average number of transactions via the CIFS was 3,078 and the daily average amount of funds transferred was NT$2,113.7 billion, increasing by 3.87% and 1.30% over the previous year, respectively.

Transaction Value and Volume of the CIFS

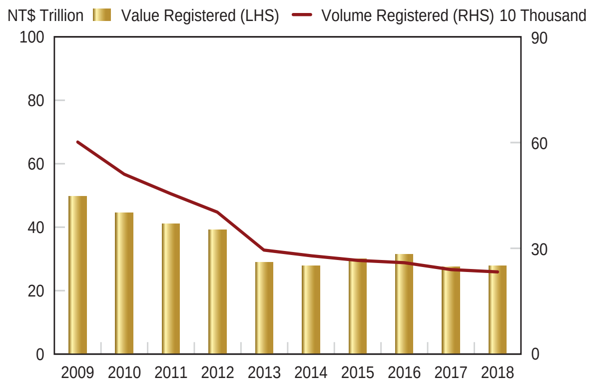


Source: Department of Banking, CBC.

(2) Transactions via the CGSS

The CGSS was established in September 1997. It is a system for issuance, transfer, redemption, and interest payment of book-entry central government securities. Since its inception, central government bonds have been issued in book-entry form. In October 2001, treasury bills were included in this system and have been issued in book-entry form ever since.

Transaction Value and Volume of the CGSS



Source: Department of Treasury, CBC.

The CGSS linked up with the CIFS in April 2008. Since then, fund settlements, principal redemptions, and interest payments have been handled through the CIFS using a delivery-versus-payment (DVP) mode. The DVP mode, promoted by the BIS, is an arrangement in a securities settlement system to ensure that securities delivery occurs at the same time as the funds transfer, effectively eliminating potential principal risk during the transaction process.

As of the end of 2018, there were 17 clearing banks with 1,694 branches that handled the registration of central government securities transfers. In 2018 there were 229,983 transfers with a total amount of NT$27.6 trillion were processed by this system.

Oversight of Payment and Settlement Systems

The Bank monitors the payment and settlement systems on a periodic basis to maintain their safety and efficiency. In 2018, the Bank's monitoring activities in this regard included the following:

(1) Continuing to monitor the operation of the payment and settlement systems. In 2018, 14 applications for the CIFS operation time extensions were filed by participating institutions owing to system malfunctions or other contingencies. The Bank required these institutions to submit improvement reports.

(2) Requiring payment system operators and payment instrument issuers to provide information about their operations and activities on a regular basis.

(3) Supervising clearing institutions to perform dry runs on remote backup operations to ensure business continuity in case of emergency. For year 2018, the FISC conducted its drill in July, while the TDCC held its drills in May and November.

(4) Inviting the Financial Supervisory Commission (FSC) and clearing institutions to jointly hold two conferences on "Promoting Sound Operation of the Payment Systems," through which the Bank urged clearing institutions to closely monitor the development of financial technology (fintech), strengthen information security, and put backup systems in place.
The conferences were convened separately by type of business. The meeting in May was held for securities clearing institutions such as the TDCC, the TPEx, and the TWSE, while the one in November was attended by payment clearing institutions including the FISC, the TCH, and the NCCC.

(5) Enacting and revising rules and regulations associated with the *Foundations Act*, which was promulgated on August 1, 2018, and would be effective from February 1, 2019. Relevant regulations and amendments made by the Bank aimed to reinforce the oversight of the TCH and would come into force on February 1, 2019, to be in line with the *Act*.

Improving Financial Market Infrastructures to Promote Financial Inclusion

To foster the development of financial inclusion, the Bank continued to strengthen financial market infrastructures and undertook the following actions:

(1) Raising the ceiling on the amount of financial institutions' end-of-day balances in the "Interbank Funds Transfer Guarantee Special Accounts" to be counted as part of the required reserves from 4% of the current month's required reserves to 8%, effective from January 4, 2019. This was to meet rising prefunding needs of financial institutions arising from significantly increased instant interbank funds transfers.

(2) Urging the FISC to reduce service fees charged to banks for its interbank information service after the FSC requested the FISC and related banks to collaboratively consider lowering processing fees for small-value ATM interbank funds transfers. The preferential processing fees for interbank transfers under NT$1,000, approved by the FSC, would go into effect on April 1, 2019.

(3) Keeping close watch on fintech trends and assisting financial institutions to develop innovative services. For example, the Bank suggested the FISC construct a blockchain-based platform for financial audit verification, which was officially launched at the end of 2018. Meanwhile, the Bank continued to assist financial institutions to promote the adoption of Taiwan Pay, a QR code based mobile payment service. In addition, the Bank instructed the TCH to carry out an outsourced research program with a focus on the applications of distributed ledger technology (DLT) in the CGSS.

5. Currency Issuance

As the sole agency with the authority to issue banknotes and coins, the Bank is committed to providing the public with a stable and reliable currency to facilitate economic activity and maintain public confidence in the currency.

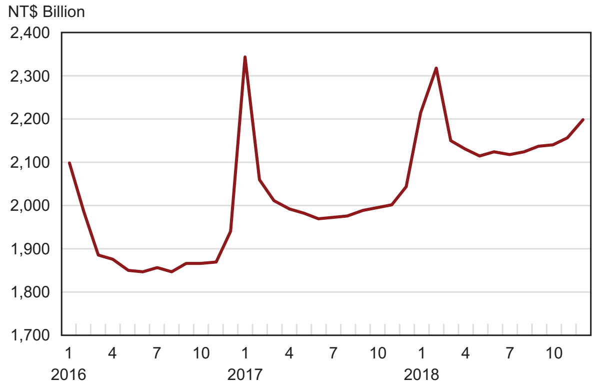
During 2018, the Bank ensured a stable currency supply in response to currency demand, which is dependent on domestic economic conditions, seasonal factors, and the development of non-cash payment instruments. The Bank also issued commemorative coin sets to mark national events. In addition, the Bank strove to promote public understanding regarding counterfeit deterrence and currency security.

Currency Issuance Increased to Meet Currency Demand

In 2018, the Bank provided an adequate amount of currency in response to currency demand. The currency issued peaked at NT$2,474.3 billion on February 14, the last business day before the Lunar New Year holidays, reflecting a temporary seasonal surge in cash demand. At the year end, the outstanding amount of currency issued was NT$2,197.3 billion, rising by NT$155.1 billion or 7.60% over the previous year end.

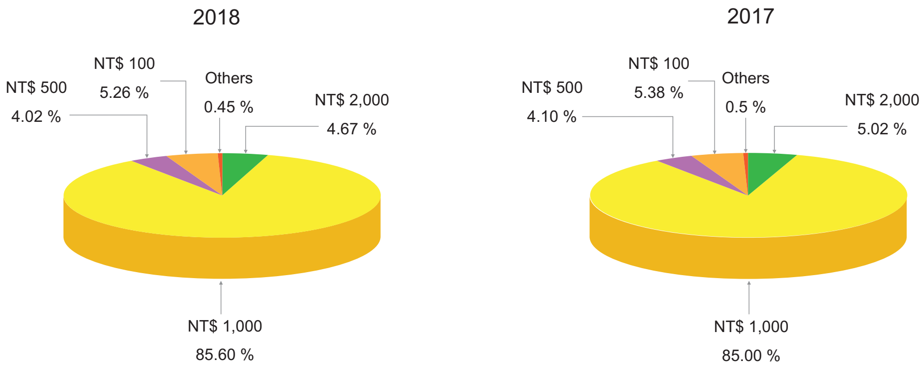
By currency denomination, the composition of NT dollar banknotes in circulation at the end

Currency Issued



Source: CBC.

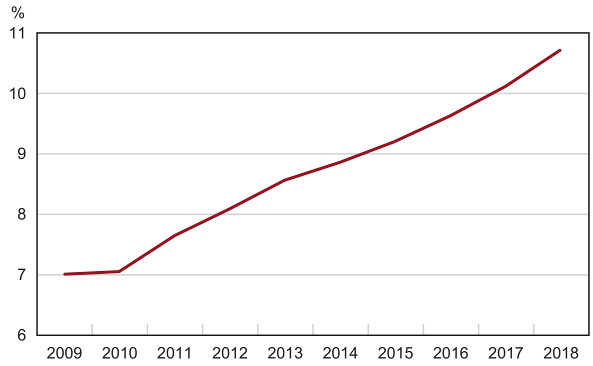
Composition of NT Dollar Banknotes Issued
(Year-End Figures)



Source: CBC.

of 2018 was similar to the end of 2017. The majority of circulating banknotes went for the NT$1,000 note with a share of 85.60%. The NT$100 and NT$2,000 notes came in second and third with shares of 5.26% and 4.67%, respectively.

The Ratio of Currency Held by the Public to GDP



Sources: 1. CBC.
2. DGBAS, Executive Yuan.

Currency in Circulation to GDP Moved Up

As domestic interest rates stayed at relatively low levels and cash was still frequently used for small-value transactions, the public's demand for currency remained high. The ratio of currency in circulation to GDP has continued to rise steadily since 2010 and reached 10.73% in 2018, 0.60 percentage points higher than the 10.13% of the previous year.

Two Commemorative Coin Sets Were Issued

The Bank may also issue gold and silver coins and commemorative notes and coins from time to time, such as for important ceremonies, national holidays, major international events or other significant national events. During 2018, the Bank issued a casting set of coins for the Chinese Zodiac Year of the Dog, and the seventh coin set of the National Parks of Taiwan series - Dongsha Atoll National Park.

Commemorative Coin Set for the Chinese Zodiac Year of the Dog

National Parks of Taiwan Series VII-Dongsha Atoll National Park

Source: CBC.

Efforts Were Made to Enhance Public Awareness of Counterfeit Currency

With the aim of protecting the rights of the public and the currency's credibility, the Bank continued its efforts on counterfeit prevention by raising awareness of counterfeit currency. In 2018, the Bank strengthened public education on the security features of NT dollar notes and coins to help individuals quickly identify counterfeits. Educational materials were provided through various channels such as the Bank's website, the Virtual Money Museum of the Bank, television, radio, and YouTube. Leaflets were also distributed to the public, financial institutions and government agencies.

Box The Role of Cash in Taiwan's Payment Systems

The rapid development of electronic payments in recent years has brought about the issue of whether to move toward a "cashless society." The statistical data of most major economies point to the fact that their currency issuance has grown in synchronization with electronic payments, and Taiwan is no exception. Therefore, the news reports claiming that cash would disappear anytime soon seem to be exaggerated. In line with government policy, the Bank has continued its efforts to promote the development of electronic payments in Taiwan. Meanwhile, cash remains an integral part of real economic activity, and the Bank ensures an adequate supply of cash to meet the public's demand so as to maintain the smooth functioning of the economy and the financial system.

1. Continuous Growth in Cash Demand in Most Economies

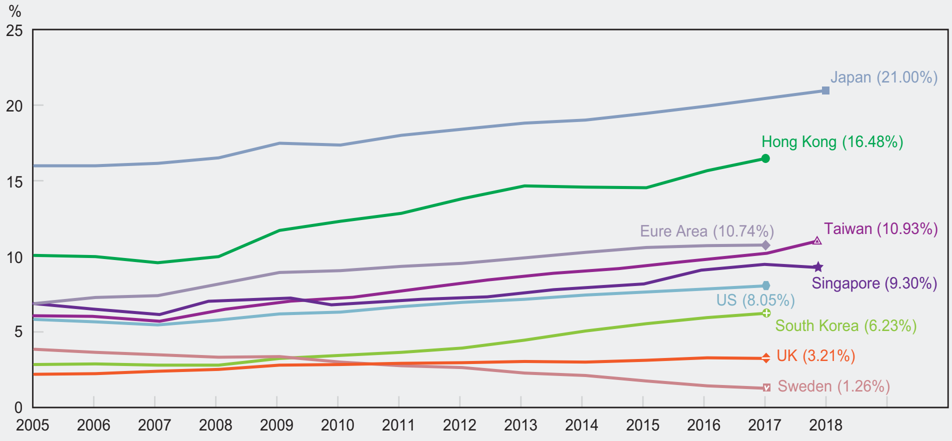
For more than a decade, the world has witnessed a broad trend of continuous expansion in currency issuance. The annual growth rates of currency issuance have been higher than those of nominal GDP, causing currency issuance to GDP ratios to display upward trends in most countries, including Taiwan. This demonstrates that cash is still an essential payment instrument despite the flourishing development of electronic payment services.

Among major economies, Sweden was the only one with a currency issuance to GDP ratio lower than 2% on average from 2005 to 2018 and declining, whereas such ratios in other countries broadly range from 5% to 20% for the same period and have shown steady uptrends. Taiwan has seen currency issuance as a percentage of GDP rise year by year from 6.04% in 2005 to 10.93% in 2018.

Demand for cash varies significantly across countries, mainly affected by a string of factors such as the usage habits of local consumers and retailers, the development of the payment market, and cultural differences. In Sweden, low population density adds to the difficulty in cash distribution, while a small number of banks dominate the market of electronic payment instruments, leading cash demand to decline year by year, which is quite different from Taiwan's case.[1]

[1] Department of Statistics, Ministry of Economic Affairs (2018), "Trade and Food Services Operations Surveys," Oct. According to the report, cash payments account for the largest share of retail payments in Taiwan. In supermarkets and convenience stores, nearly 80% of consumers pay in cash, indicating that cash remains a dominant means of payment in small-value retail transactions.

Ratios of Currency Issuance to Nominal GDP in Major Economies



Note: Data on currency issuance are year-end figures; GDP figures of 2018 for Japan, Taiwan, and Singapore are preliminary estimates.

Sources: Aremos; Thomson Reuters Datastream; Department of Issuing, CBC; DGBAS.

2. Unique Benefits and Necessity of Cash in Payment Systems

Sweden is considered a pioneer of the cashless society, yet the Riksbank, Sweden's central bank, pointed out several risks arising from a cashless economy. Moreover, an increasing number of central banks and relevant studies advocated the irreplaceable advantages of cash and the necessity of its existence.

2.1 Unique Benefits of Cash

For small retailers, benefits of cash payments include low transaction costs, real-time clearing, and a high prevalence. Furthermore, users do not need to afford additional service charges or install terminal devices. With its legal tender status,[2] cash is deemed the safest payment tool. An ECB study also found that cash has been a dominant payment instrument in small-value transactions.[3]

In addition, cash also serves as a store of value. As indicated in a study by the BIS,[4] cash demand has risen in most advanced economies since the global financial crisis. This resurgence appeared to be driven in part by a lower opportunity cost of holding cash (primarily referring to bank deposit rates) and by store-of-value motives of the public to increase cash holdings, reflecting their loss of confidence in the banking system.

2 This refers to the NT dollar as a legally defined means of payment valid for meeting debt obligations. If a creditor refuses payment when a debtor repays debt with legal tender, the creditor would be liable for the default, unless the creditor and the debtor have separate agreements.

3 Currency News (2017), "ECB Study: Cash Remains Dominant Throughout the Eurozone," Currency News, Volume 15, No.12, pp.6-7, Dec.; Esselink, Henk and Lola Hemandez (2017), "The Use of Cash by Households in the Euro Area," *European Central Bank Occasional Paper Series*, No. 201, Nov. The field work was carried out in three waves from October 2015 to July 2016 through online surveys, telephone interviews, and face-to-face interviews. Around 65,000 respondents from 17 member countries participated in the survey, reporting nearly 130,000 transactions in the euro area for analysis.

4 Bech, Morten, Umar Faruqui, Frederik Ougaard and Cristina Picillo (2018), "Payments are A-Changin' But Cash Still Rules," *BIS: Quarterly Review*, Mar.11.

2.2 Potential Risks of a Cashless Society Reflecting the Necessity of Cash

Going completely cashless may cause hardship for the disadvantaged such as the elderly and the visually impaired in making payments and would further widen differences among social classes.[5] In addition, if non-cash payment systems are concentrated in just a few private institutions, this would create potential risks of bankruptcy or monopoly, thereby leading users' rights to be exploited.

On top of that, the use of non-cash payment instruments must rely on electronic facilities. Once contingencies such as system malfunctions or power outages occur, the payment systems would be entirely paralyzed, thus compromising the smooth functioning of the real economy. It is also possible for electronic facilities to be invaded by hackers, which may cause unauthorized transactions or theft of users' assets.

3. Policy Stance of Major Central Banks and the Bank on Cash Payments

To deal with the issue of a cashless society, the Riksbank has urged the Swedish parliament to amend relevant regulations to ensure access to cash for the public. The People's Bank of China prohibits retailers or individuals from refusing cash payments to avoid undermining the legal tender status of the renminbi. Meanwhile, central banks in many countries share the view that cash remains needed as a well-functioning means of payment, and advocate to ensure the status of cash through agreements or legislation.[6]

In recent years, Taiwan has seen enhanced efforts in increasing the penetration rate of electronic payments. For example, the Financial Supervisory Commission has proposed a plan of boosting the ratio of electronic payments to private consumption to 52% by 2020. The Executive Yuan also announced a policy target of 90% mobile payment penetration by 2025. In the meantime, the Bank has instructed the Financial Information Service Co., Ltd. to take relevant measures in accordance with the policies above.

Moreover, the Bank raised the ceiling on the amount of financial institutions' end-of-day balances in the "Interbank Funds Transfer Guarantee Special Accounts" to be counted as part of the required reserves from 4% of the current month's required reserves to 8%, effective from January 4, 2019. This adjustment aimed to ensure that retail payment systems operate smoothly at all times.

Nevertheless, as a cashless economy may face a multitude of risks as mentioned before, cash remains an irreplaceable payment method in the short term. So long as the public still have needs for cash usage, the Bank would ensure an adequate supply of cash to maintain the smooth functioning of the economy and the financial system.

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5 McCart, Melissa (2018), "The Problem with Cashless Restaurants," *Eater*, Feb. 15.

6 Scholten, Bram (2017), "Decline Management: The Case of Cash," presented at Deutsche Bundesbank International Cash Conference in Mainau Island, Apr. 25-27.

6. Fiscal Agency Functions

The Bank, as the fiscal agent of the government, provides services for the national treasury, including handling the treasury deposit account (TDA), managing central government agency deposit accounts, and undertaking the issuance, transfer and registration, redemption, and interest payment of central government bonds and treasury bills.

Managing the Treasury Deposit Account

The Bank manages the TDA on behalf of the Ministry of Finance (MOF), processing receipts and disbursements of the central government. In order to offer convenient services for government agencies and the general public, the Bank delegates the handling of treasury business to 14 financial institutions and their 363 branches, including three overseas branches located in New York, Los Angeles, and Paris. In addition, there are another 4,731 national tax collection agencies set in financial institutions. In 2018, the Bank received a total of NT$3,251.1 billion in treasury deposits, increasing by NT$35.2 billion or 1.09% from 2017. Payments made on behalf of the national treasury were NT$3,251.4 billion, an increase of NT$27.9 billion or 0.87% over the previous year. At the end of 2018, the TDA balance was NT$19.5 billion, a decline of NT$0.3 billion or 1.52% from the end of 2017.

Handling Central Government Agency Deposits

Central government agencies are required to make their deposits with the Bank or other delegated banks. At the end of 2018, the balance of central government agencies' deposits with the Bank amounted to NT$170.9 billion, an increase of NT$14.1 billion or 8.99% over the previous year. Deposits with other delegated banks were NT$561.7 billion at the end of 2018, increasing by NT$27.0 billion or 5.05%.

Managing Central Government Bonds

As a fiscal agent, the Bank provides services related to the issuance, transfer and registration, redemption, and interest payment of central government bonds. The Bank also conducts the auctions of central government bonds. There are 56 domestic dealers qualified to directly participate in the auctions, including 23 banks, 19 securities companies, eight bills finance companies, five insurance companies, and Chunghwa Post.

In 2018, the Bank conducted 16 issues of central government bonds in book-entry form worth NT$347.3 billion. Of this amount, 10-year bonds accounted for the lion's share of 41.75%, with NT$145.0 billion, followed by 5-year bonds, 25.91% with an amount of NT$90.0 billion.

In addition, the Bank paid NT$383.5 billion in principal and NT$106.2 billion in interest for central government bonds. At the end of 2018, the outstanding amount of central government bonds was NT$5,558.6 billion, slightly decreasing by NT$36.2 billion or 0.65% from the end of 2017.

Managing Treasury Bills

The Bank also handles the auctions of treasury bills. Currently, direct bidders include banks, insurance companies, securities companies, bills finance companies, and Chunghwa Post.

In 2018, the Bank conducted five issues of book-entry treasury bills with a total amount of NT$160.0 billion. The majority of the issuance went for 182-day bills with NT$60.0 billion, or a share of 37.5%. At the end of 2018, the outstanding amount of treasury bills was NT$30.0 billion, an increase of NT$5.0 billion or 20% from the previous year end.

7. Financial Inspection

Pursuant to the objectives and duties stipulated in *The Central Bank of the Republic of China (Taiwan) Act*, the Bank conducts targeted examinations to ensure that monetary, credit, and foreign exchange policies are implemented effectively. The Bank has also established an off-site monitoring system and a financial stability assessment framework to systematically monitor and assess possible sources of potential risks. The Bank then adopts appropriate policies in a timely manner to achieve the operational goal of financial stability.

On-Site Examination

Targeted examinations in 2018 were conducted on interbank funds transfers and settlements business, disclosure of housing loan information by financial institutions, high-priced housing loans, mortgage grace periods, counterfeit money detection (either in terms of the NT dollar or foreign currency), foreign exchange remittances, foreign exchange transfer telegrams or messages, foreign currency loans and guarantees, accuracy of submission of financial statements and reports of offshore banking units as well as reports of term-to-maturity analysis of NT dollar assets/liabilities, etc.

Follow-up on Examination Findings

Based on the findings from the Bank's targeted examinations as well as the results of the Financial Supervisory Commission's financial examinations that are related to the central bank's operations or regulations, the Bank continued to track whether the financial institutions under inspection had improved their operations to ensure the effectiveness of the Bank's policies.

Strengthening Off-Site Monitoring

To respond to changing financial conditions and regulatory amendments and to keep good track of financial institutions' business operations, the Bank constantly reviews and revises all relevant reporting forms and contents of statistical data submitted by financial institutions. Developments related to off-site monitoring in 2018 included the following:

(1) In accordance with the new version of *International Financial Reporting Standard 9 (IFRS 9)*, ratio formulas and analytical categories of the report audit system, the format of quarterly reports on the *Condition and Performance of Domestic Banks*, and the declaration format and content of the one-stop declaration window were all modified.

(2) To meet the need for regulatory changes and financial supervision, several reporting requirements were modified. The Bank's newly required reporting of two forms, namely the *Concise Reporting*

Table of Financial Statements and Business Affairs of Overseas Branches of Domestic Banks, and the *Concise Reporting Table of Financial Statements and Business Affairs of Oversea Subsidiaries of Domestic Banks* was introduced. The Bank also modified the *Credit Services Reporting Table* for domestic banks and local branches of foreign and mainland banks, and the reporting formats and contents of the Term to Maturity analysis of NT Dollar Assets/Liabilities Reports by bills finance companies.

(3) To meet regulatory requirements of banks' capital adequacy ratios and liquidity coverage ratios, minimum requirements and grading standards of the Common Equity ratio, Tier 1 Capital Ratio, Capital Adequacy Ratio of domestic banks and minimum standards of Liquidity Coverage Ratio were all modified.

(4) To strengthen liquidity risks analysis and regulatory compliance of domestic banks, the grading criteria of the Net Stable Funding Ratio was added to the categories of liquidity and regulatory compliance analysis of financial supervision. The quarterly reports on *the Condition and Performance of Domestic Banks* would also need to include the Net Stable Funding Ratio item.

(5) To understand credit risks in the transactions of financial derivatives, the grading criteria of the Gross Positive Fair Value of Derivative Financial Instruments (GPFV) was added to the categories of business strategy and stability analysis of financial supervision.

(6) In line with relevant regulatory changes, the requirements concerning loan to equity ratios of local branches of foreign and mainland banks in the compliance analysis of financial surveillance were adjusted.

(7) To monitor operational risks of bills finance companies, new categories, namely operating and management strategy and liquidity analysis, as well as relevant ratios, were added.

Improving Information Transparency of Financial Institution Operations

The Bank regularly compiles and publishes financial institution statistics, such as *Condition and Performance of Domestic Banks (Quarterly), Business Overview of Financial Institutions (Yearly) and Major Business Statistics of Financial Institutions.* All related information is disclosed on the Bank's website to strengthen operational transparency of financial institutions and to reinforce self-discipline of the market.

Financial Stability Assessment

In addition to the financial soundness indicators and credit and market risks models, the Bank also developed a Graphical User Interface of Credit and Market Risks Models and continued to regularly publish the Financial Stability Report to help financial authorities, financial institutions, and the financial community understand current situations and sources of risks and to promote cross-border communication and information sharing.

International Cooperation in Financial Supervision

In 2018, the Bank continued to actively engage in international cooperation related to financial supervision, such as attending the 9th SEACEN Meeting of Deputy Governors in Charge of Financial Stability and Banking Supervision, the 20th SEACEN-FSI Conference of the Directors of Supervision of Asia-Pacific Economies, and the 31st Meeting of Directors of Supervision of SEACEN Members. The Bank also received high-level officials, who came to Taiwan to participate the Asia Financial Supervision Conference.

8. Participation in International Activities

The Bank continued its efforts in contributing to international activities during 2018. As a member, the Bank hosts conferences, provides training courses, and attends numerous forums, including the annual meetings organized by the Asian Development Bank (ADB), the Central American Bank for Economic Integration (CABEI), and the South East Asian Central Banks (SEACEN) group. In addition, the Bank also maintains close relationships with the Inter-American Development Bank (IDB), the European Bank for Reconstruction and Development (EBRD), the Bank for International Settlements (BIS), and the Asia/Pacific Group on Money Laundering (APG). Furthermore, the Bank strengthens its ties with other central banks and related institutions to share information and exchange opinions on macroeconomic and financial issues.

In 2018, the Bank attended the 54th annual conference of governors held by SEACEN in Colombo, Sri Lanka, from November 29 to December 2. At this conference, the Bank exchanged views with other member banks on a number of issues, including the implications of rapid technological changes for future currency issuance, monetary policy challenges arising from a persistently low inflation environment, and policy responses to external shocks such as volatile capital flows. Moreover, the Bank hosted the SEACEN Signature Course on Macroeconomic and Monetary Policy Management during July 22 to 27.

Meanwhile, the Bank participated in the meetings held by other international organizations, such as the IDB's annual meeting of the Board of Governors held in Mendoza, Argentina, from March 22 to 25, the CABEI's Ordinary Meeting of the Board of Governors in La Romana, the Dominican Republic, on April 26 and 27, the ADB's annual meeting in Manila, the Philippines, from May 3 to 6, the BIS' annual general meeting in Basel, Switzerland, on June 23 and 24, and the APG's annual meeting in Kathmandu, Nepal, from July 23 to 27. In addition, the Bank attended the third round of the APG Mutual Evaluation in Taiwan from November 5 to 16.


SEACEN Signature Course on Macroeconomic and Monetary Policy Management
Taipei, Taiwan, 22 – 27 July 2018
The SEACEN Centre
中央銀行