

附錄一：研討會專題報告

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**Country Paper on Macroeconomic and Monetary
Policy Management¹**

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¹ The views expressed here are those of the author and do not necessarily reflect those of the CBC.

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I. Assess Financial Sector Imbalance

1.1 Financial market surveillance

In order to promote the effectiveness of monetary policy and financial stability, it is important for central bank to adopt appropriate financial supervisory measures. The Central Bank of China (CBC), Taiwan's central bank, establishes an offsite review system and a financial stability evaluation framework to systematically monitor, analyze, and evaluate the potential sources of financial system risks so that CBC can adopt appropriate policies and measures in a timely manner.

In the offsite review system, the CBC establishes a report-auditing system, collecting information on financial institutions regarding capital adequacy ratios, asset quality, regulation compliance, strategies and stability, earnings, as well as liquidity(CARSEL indicators). By assessing CARSEL indicators, the CBC can monitor the operation, financial conditions and regulatory compliance of individual financial institution.

However, in the era of globalization, the adverse impact of financial crisis could easily spread from one market to neighboring countries or even the whole world in a very short period of time. Those crises often affect the financial market and real economy through macro-financial links. Moreover, financial deregulation and technological advancement have sped up the process of financial integration and innovation. The CARSEL indicators aren't enough to evaluate the potential sources of financial system risks; therefore, in 2006 the CBC set up the financial stability assessment section, which is actively engaged in the establishment of financial stability assessment framework and systemically analyzes and monitors the potential risks that may arise either within or outside the financial system. This section utilizes macro-prudential analytical methodologies to assess national macroeconomic and financial risks. The result of this analysis will be shown in a financial stability report issued in May every year.

1.2 Financial soundness indicators (FSI)

In accordance with compilation guides for financial soundness indicators issued by International Monetary Fund (IMF), the CBC compiles core set indicators quarterly and encouraged set indicators semiannually. Those indicators are released periodically in the financial stability report.

The CBC adopts those indicators as shown in table1 for surveillance. However the data in some FSIs such as those listed in the following are difficult to obtain in our country.

1. Deposit-takers:

- (1) sectoral distribution of loans to total loans
- (2) geographical distribution of loans to total loans
- (3) spread between highest and lowest interbank loans

2. Nonfinancial Corporations Sector:

- (1) earnings to interest and principal expenses
- (2) net foreign exchange exposure to equity
- (3) number of applications for protection from creditors

3. Other Financial Corporation

- (1) assets to total financial system assets
- (2) asset to GDP

4. Market Liquidity

- (1) average bid-ask spread in the securities market

Table1 、 Financial soundness indicators of CBC’s supervision

Core Set	
Deposit-takers	
Capital adequacy	<ul style="list-style-type: none"> ● Regulatory capital to risk-weighted assets ● Regulatory Tier I capital to risk-weighted assets ● Nonperforming loans net of provisions to capital
Asset quality	<ul style="list-style-type: none"> ● Nonperforming loans to total gross loans
Earnings and profitability	<ul style="list-style-type: none"> ● Return on assets ● Return on equity ● Interest margin to gross income ● Noninterest expenses to gross income
Liquidity	<ul style="list-style-type: none"> ● Liquid assets to total assets; Liquid asset ration ● Liquid assets to short-term liabilities
Sensitivity to market risk	<ul style="list-style-type: none"> ● Net open position in foreign exchange to capital
Encouraged Set	
Deposit-taker	<ul style="list-style-type: none"> ● Capital to asset

	<ul style="list-style-type: none"> ● Large exposures to capital ● Gross asset position in financial derivatives to capital ● Gross liability position in financial derivatives to capital ● Trading income to total income ● Personnel expenses to noninterest expenses ● Spread between reference lending and deposit rates ● Customer deposits to total (noninterbank) loans ● Foreign currency-denominated loans to total loans ● Foreign currency-denominated liabilities to total liabilities ● Net open position in equities to capital
Nonfinancial corporations sector	<ul style="list-style-type: none"> ● Total debt to equity ● Return on equity
Households	<ul style="list-style-type: none"> ● Household debt to GDP ● House debt service and principal payments to income
Market liquidity	<ul style="list-style-type: none"> ● Average daily turnover ratio in the securities market
Real estate markets	<ul style="list-style-type: none"> ● Real estate prices ● Residential real estate loans to total loans ● Commercial real estate loans to total loans

1.3 Financial stress index

The CBC hasn't compiled the financial stress index yet because there are still some difficulties to be overcome in constructing the stress test model, such as the consistency of historical data, the fitness of variables and the suitability of estimation method.

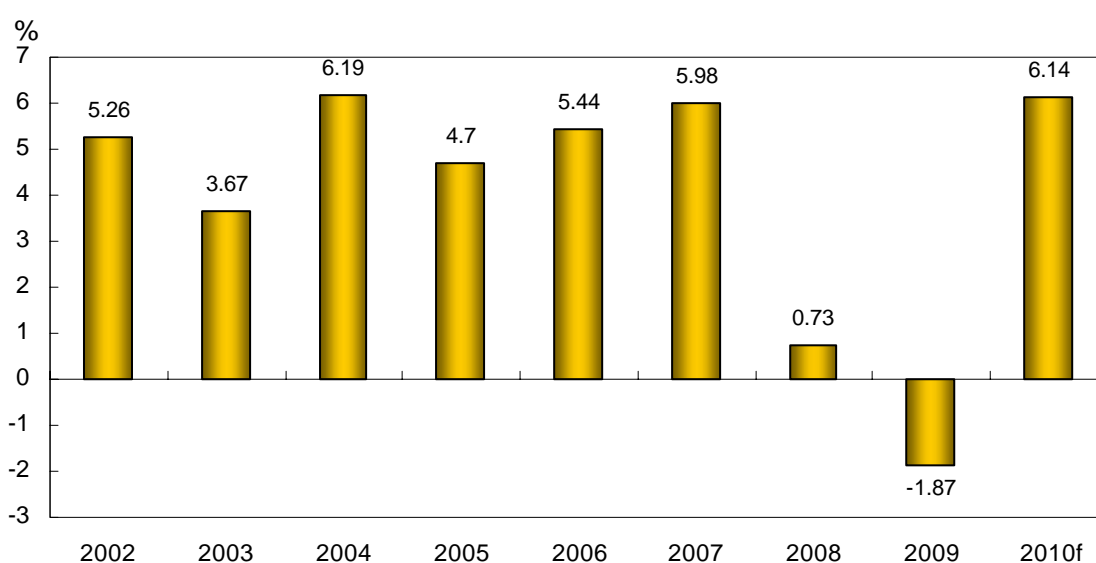
II. Macroeconomic Assessment and Forecasting

2.1 External environment scanning

After the collapse of Lehman Brothers in September 2008, the global financial crisis battered economies worldwide, including Taiwan. Taiwan's external trade declined, which in turn affected the economic activity and the labor market. Private consumption still weakened, and firms delayed investment though the government adopted an expansionary fiscal policy, including consumption vouchers and infrastructure construction, and the CBC pursued an easy monetary policy, cutting the

policy rates seven times. In 2009, the annual growth rate of real GDP is at negative 1.87% (Chart1), compared to 0.73 percent growth in the previous year. However, with the recovery of the global economy and also because the government's stimulus efforts bore fruit, Taiwan's economic activity gradually picked up. The economic growth rate reached to 9.2% in 2009 Q4 and is projected to increase to 6.14% in 2010. Taiwan has gradually gotten rid of the bad influence from the crisis.

Chart 1 Taiwan's Economic Growth Rate

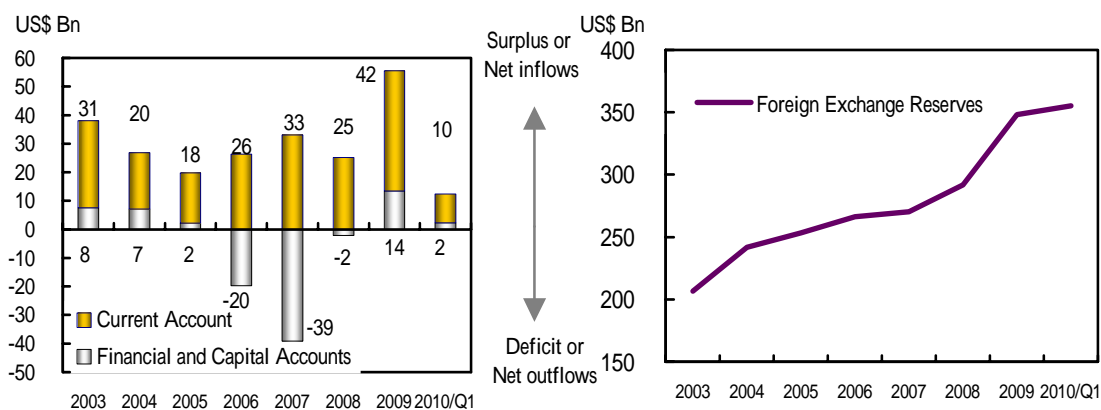


Source: News Release May 2010, the DGBAS, Executive Yuan

As for balance of payments, despite the fact that the global economic downturn continued to weaken foreign demand in 2009, a greater decrease in imports over exports resulted in the current account surplus of US\$42billion. For the year as a whole, the overall balance of payments registered a surplus of US\$56 billion, which reflected an increase in the foreign reserve assets held by the CBC. (Chart 2)

Taiwan is a small and highly open economy, and the major impetus of economic growth comes from external demand. The ratio of its export to GDP reached highly to 54% in 2009. Higher dependence on external trade will not only affect the exchange rates, but also impact our economy if a huge change in external demand takes place. Hence, the interest rate and exchange rate effects of domestic monetary policy need to be taken into account together.

Chart 2 Balance of Payments and Foreign Exchange Reserves



Source: Balance of Payment, Central Bank of Republic of China (Taiwan)

In order to maintain the stability of exchange rate, the CBC adopts a managed floating foreign exchange rate regime. When seasonal or irregular factors, such as huge “hot money” flows, disrupt the foreign exchange market, the CBC will take necessary measures to maintain an orderly foreign exchange market. If the measure causes violent volatilities of market funds, the CBC will adopt open market operation tools to ease the volatility, like adjusting the balance of CD/NCD and swaps. Therefore, the CBC arranges a coordination of both monetary and exchange rate management.

But the objectives of stable exchange rates, capital mobility, and monetary policy autonomy could not be achieved simultaneously by central banks. It is called the “Impossible Trinity”. As capital controls have been largely lifted, if the CBC pursues monetary policy autonomy, the resulting interest rate gap could easily lead to cross-border capital movement at the expense of exchange rate stability. This will affect domestic economic and financial stability for a small and highly open economy like Taiwan. Since Taiwan allows free capital movement, the CBC is facing the challenge of striking a balance between exchange rate stability and monetary policy autonomy.

2.2 Domestic economic conditions assessment

Effective macroeconomics supervision needs to persistently supervise the financial changes. It contains collecting related statistics, surveying the private sectors regularly, developing the indicators, analyzing the causes of changes, forecasting and

conducting stress tests, and assessing possible risks, such as vulnerability, persistency, competitiveness, and so on. Then response measures (monetary policy, fiscal policy and exchange rate policy) could be proposed.

The supervision was a broad range. It includes real, monetary, external, fiscal and financial sectors (table2), and contains short and mid-term macroeconomic and financial indicators, international guidelines and compliance with financial regulations, all of these provide the CBC with various and adequate information to monitor the financial changes. Besides, the CBC must also cooperate with domestic government departments (such as Ministry of Finance, Financial Supervision Commission and DGBAS, etc.) and other regional central banks tightly.

Table2 、 Major indicators of CBC’s supervision

Sectors	Major Indicators
Real	Price, Salary, Macro-demand and production, Potential output gap, Growth of production, Willingness to invest, Labor and Employment situation, and Unemployment rate.
Financial& Monetary	Reserve money, Money stock, Velocity of money circulation, Bank loan, Real interest rate, and Interest rate spread.
External	Growth of imports and exports, Terms of trade, Capital account, Financial account, External debt, International reserve assets, Real exchange rate, and Economic and Financial situations in the region.
Fiscal	Contents of government revenue and expenditure, Aggregate government debt, and Tax system.

2.3 Baseline Scenario

In order to more accurately estimate and forecast macroeconomic condition, the CBC has developed its own Keynesian-based Macroeconomic model, which contains

a variety of variables such as CPI, interest rate, bank loan, unemployment rate. etc. Additionally, the CBC collects lots of information and statistics from domestic (e.g. the DGBAS) and foreign institutions (e.g. IMF, Global Insight). The CBC takes both the model's outcome and major institutions' forecasts into consideration to build a baseline scenario.

The most challenge in building a baseline scenario is about setting future exogenous variables, as the financial and macroeconomic conditions have changed unexpectedly and dramatically in recent years and some institutional factors, such as tax cut or raise, external supply shock (eg. oil and raw material prices' volatilities), local and international political events, huge capital inflow/outflow, changes of the economic or industrial structure, or weather factors (eg. typhoons and heavy rainfall) challenge our forecast accuracy. Public expectation is also a difficult issue in macroeconomic forecasting in Taiwan. Therefore, the forecast performances were sometimes not satisfied.

Based on the baseline scenario, the CBC also refers to additional information, like some indicators released by international indicators from the international institutions (IMF, Global Insight), main database or real-time news company (Reuter, Bloomberg, Data stream). Sometimes, the CBC needs to know the more details of the information released by other local government departments. The CBC can always successfully access the information because it has established good relations with other government departments. The additional information usually could help the CBC strengthen its forecast ability effectively.

2.4 Forecasting key macroeconomic variables

The CBC uses econometric models to estimate some macroeconomic variables, such as potential output, monetary aggregates, and inflation. We adopt a wide range of financial and economic indicators which are highly related to these variables. However, some institutional factors, such as tax cut or raise, external supply shock (eg. oil and raw material prices' volatilities), changes of the economic or industrial structure, or weather factors, such as typhoons and heavy rainfall, challenge our forecast accuracy. Public expectation is also a difficult issue in macroeconomic forecasting in Taiwan. Because of some restrictions of the model, the CBC uses other ways (such as previous experience, the information we collect, etc.) to adjust our

estimation.

2.5 Forecast evaluation

The CBC staff undertakes forecast evaluations regularly (sometime irregularly). Every time after completing estimation and forecast, the CBC staff compares the latest outcome with the previous one. We find and analyze what the major differences and reasons are, and assess how accurate our previous forecast performances are. We also apply econometric quantitative statistics (such as MAE, MAPE, RMSPE, etc) to evaluate our out-of-sample forecast performance.

2.6 Assessment/Forecast frequency

There are different data frequencies for macroeconomic assessment/forecast in the CBC. For example, the CBC's M2 growth target zone assessment/forecast is yearly. Macroeconomic growth assessment/forecast is quarterly. Inflation and Interest rate assessment/forecast are monthly. The CBC often releases information by press conference or on its Website on a predetermined time. But not all of these assessments/forecasts are published. Some assessments/forecasts are merely for internal reference.

2.7 Future development in the CBC with regards to macro assessment and forecasting

In order to cope and adjust with more and more skittish economic environment, and to grasp and forecast future economic conditions effectively, the CBC will continue to develop economic and quantitative methods (e.g. DSGE model). In recent years, the CBC also focuses on financial stability assessment, for the sake of building an early warning mechanism.

III. Monetary Policy Framework and Operations

3.1 Monetary policy objectives & strategy and Institutional arrangement & governance

1. Monetary policy objectives & strategy

The CBC's monetary policy objectives include to promote financial stability, to guide sound banking operations, to maintain the stability of the internal and external value of the currency, and to foster economic development within the scope of the aforementioned objectives.

(1) To Promote Financial Stability

The promotion of financial stability contains two aspects: first, to prevent large fluctuations in financial asset prices, and second, to prevent systematic risk by providing necessary liquidity. To maintain financial stability, the CBC closely monitors international and domestic economic developments, and adopts response measures when necessary. In addition, as the lender of last resort, the CBC provides the necessary liquidity to prevent systematic risk.

(2) To Guide Sound Banking Operations

Another responsibility of the CBC is to promote the soundness of banking operations by monitoring the performance and operations of banks and, when necessary, undertaking financial reforms. In recent years, financial deregulation and technological advancement have sped up the process of financial integration and innovation. Therefore, the CBC's task to strengthen the soundness of banking operations has become increasingly challenging.

(3) To Maintain the Stability of the Internal and External Value of the Currency

Maintaining the internal stability of the currency refers to maintaining price stability at home. Stable prices reduce economic uncertainty and help economic agents to plan and carry out economic activities such as production, consumption, savings and investment.

The stability of the external value of the currency means the stability of the NT

dollar exchange rate. Because the Taiwan economy is highly open and its ratio of external trade to GDP is relatively high, large swings in the NT dollar exchange rate may adversely affect economic and financial conditions. Therefore, the CBC regards managing large swings in the NT dollar exchange rate as one of its operational objectives.

(4) To Foster Economic Development

In addition to achieving the three objectives mentioned above, the CBC may implement expansionary monetary policy to help stimulate economic growth during economic downturns. For instance, the CBC conducted an expansionary monetary policy in order to stimulate domestic demand as external demand turned sluggish during the Asian financial crisis, when the global IT bubble burst, and during the US sub-prime mortgage crisis.

2. Institutional arrangement & Governance

The executive body of the CBC consists of the Board of Directors, the Board of Supervisors, the Governor and Deputy Governors. Their respective functions are policy formulation, supervision and implementation. In practice, the Boards of Directors and Supervisors convene a joint meeting at the end of each quarter. The Board of Directors makes monetary policy decisions. Interim meetings and telephone consultations may take place when events of significant importance occur. After each meeting, the Governor hosts a press conference, and a press release will be available on the CBC's website.

3.2 Policy trade-off & monetary policy rule

The CBC pursues multiple operational objectives that may not be perfectly matched. Of these objectives, price and financial stability and sound banking operations are fundamental to sustaining long-term economic growth. Therefore, when formulating monetary policy, the CBC emphasizes these three objectives, and within their scope, strives to foster economic development.

The CBC adopts money growth rate rule and interest rate rule for its policy reference. For monetary growth rate rule, the CBC takes M2 growth target zone as its intermediate target. For interest rate rule, the CBC takes Taylor's rule as its interest

rate reference in open market operations. Because of financial innovation and liberation in recent years, the transmission channel of money policy from intermediate to final target sometimes becomes weak and hard to control. Therefore, in addition to these rules, the CBC sometimes has to take appropriate adjustments.

3.3 Current global crisis's impact on monetary policy

1. The CBC has gradually removed its quantitative easing policy

Facing the economic downturn caused by the global financial crisis, the CBC has pursued an easy monetary policy, cut the policy rates seven times by a total of 237.5 basis points and lowered required reserve ratios of deposits by 25 basis points since September 2008. With an efficient interest rate channel of monetary policy transmission, both long-term and short-term market interest rates have fallen. On the other hand, in order to supply liquidities to those banks which were adversely affected by the financial turmoil, the CBC expanded the scope of Repo facility operations in September 25, 2008. Eligible counterparties include banks, bills finance companies, Chunghwa Post, securities firms and insurance companies. Those policies have significantly reduced the burden of borrowers and enterprises and offered sufficient liquidity for the financial market.

With the gradual recovery of the global economy, Taiwan's economy has regained momentum since the fourth quarter of 2009. The CBC began to consider exit strategy to prevent asset bubble and recourse distortion in the low-rate circumstance. From the beginning of this year, excess reserves in the bank system have fallen to a normal level, and the overnight lending rate has gradually edged up. In June, the CBC decided to raise policy rate by 12.5 basis points.

2. Unorthodox monetary policy

The spread of the global financial crisis in the second half of 2008 simply resulted in relatively limited loss for domestic banks, due to less globalization and less investment in complicated new financial products. Furthermore, the efficient interest rate and credit pass-through make the financial system remain stable and run smoothly, compared to other advanced countries all over the world. Therefore, the CBC doesn't adopt unorthodox monetary policy.

3.4 The policy tool - reserve requirements

Financial institutions are subject to reserve requirements established by the CBC. This policy measure, however, is seldom adopted as a small change in required reserve ratios can have a great impact on the monetary aggregates and market interest rates. On several occasions when the CBC adjusted required reserve ratios, it also conducted open market operations to lessen the impacts.

In line with the changing financial environment, regulatory needs, and international practice, the CBC also continuously reforms the reserve requirement system. Major improvements of the system that have either been completed or are still underway include the following:

- a. Except July 2008, required reserve ratios have been lowered gradually on a timely basis. Table 3 displays the required reserve ratios on various types of bank liabilities between 2000 and 2008.
- b. The gap between the required reserve ratios on demand deposits and time deposits has been narrowed in order to remove distortion.
- c. Reserve liabilities have been broadened from bank deposits to all kinds of bank liabilities.
- d. In December 2000, the CBC began to impose reserve requirements on newly taken demand and time deposits denominated in foreign currencies. The purpose was to curb foreign exchange speculation by forcing banks to maintain an appropriate level of foreign currency liquidity at the CBC. The ratio was initially set at 5 percent, then reduced to 0.125 percent in June 2002. Because of a wide gap between the required reserve ratios on NT dollar deposits and foreign currency deposits, the CBC raised the required reserve ratio on foreign currency deposits to 5 percent in June 2007, lessening the impacts of reserve requirements in guiding the flow of funds. However, the CBC reduced the ratio to 0.125 percent again in April 2008 to lower banks' funding costs and narrow the interest rate spread between NT dollar deposits and foreign currency deposits.

Reserve requirements provide assurance over the liquidity of the financial system and safety of customers' deposits, so required reserve ratios are an important monetary policy instrument. In response to economic downturn caused by the global financial crisis, the CBC decided to reduce required reserve ratios on NT dollar

deposits to ensure sufficient market liquidity in September 2008.

Table 3 Reserve Ratios on Bank Liabilities

Unit : %

Types of Deposits Date (mm-dd-yyyy)	Checking Deposits	Demand Deposits	Savings Deposits		Time Deposits	Foreign Currency Deposits	Other Liabilities
			Demand	Time			
10.01.2000	13.5	13	6.5	5	6.25	0	0
12.08.2000	13.5	13	6.5	5	6.25	5	0
12.29.2000	13.5	13	6.5	5	6.25	10	0
10.04.2001	10.75	9.775	5.5	4	5	5	0
11.08.2001	10.75	9.775	5.5	4	5	205	0
06.28.2002	10.75	9.775	5.5	4	5	0.125	0
06.22.2007	10.75	9.775	5.5	4	5	5	0
04.01.2008	10.75	9.775	5.5	4	5	0.125	0
07.01.2008	12.00	11.025	6.75	4.75	5.75	0.125	0
09.18.2008	10.75	9.775	5.5	4	5	0.125	0

Source: Financial Statistics Monthly, Central Bank of the Republic of China (Taiwan).

3.5 Transmission channels of monetary policy

Over the past years, banks have played a very important role in Taiwan's financial system because they dominated the channel of funds between lenders and borrowers. In this environment, the credit channel was relatively important in the transmission mechanism of monetary policy. However, as direct finance in capital markets becomes more essential for borrowers and investors, the function of bank intermediation will be weaker than before. In other words, the significance of the interest rate channel is expected to further increase, while that of the credit channel will diminish in the future.

The structural changes of financial markets and the liberalization of interest rates in the 1980s created a greater role for interest rates to transmit the effects of monetary policy. The degree to how much the interest rate channel works depends on

the depth and width of financial markets. In addition, in order to make the interest rate channel work, the introduction of various financial instruments and the reform on financial system may be needed.

To enhance the interest rate channel, open market operations are used not only to manage liquidity, but also to maintain interest rate stability. In the past, while the discount rate was cut significantly, the lending rates of commercial banks, for a while, remained inflexible. To increase the transparency and flexibility of interest rate adjustments and make the monetary transmission mechanism more responsive to policy interest rate cuts, the CBC encouraged banks to introduce adjustable rate mortgages (ARMs) and adopt the new base rate lending system from June 2001 onwards. By 2005, all domestic banks and community financial institutions had adopted ARMs and the base rate system. The CBC required financial institutions to link prime rates to base rates from January 2006 onwards and, at the same time, conducted target examinations on banks' new pricing practice. In addition, from November 2008 onwards, the local banks agreed that clients could apply to reset their mortgage rates from quarterly to monthly adjustments in three months, improving the transmission mechanism of the CBC's rate cuts.

On the other hand, to increase the link between policy rates and market rates, the CBC issues the short-term CDs with maturities ranging from 30 days to 182 days on a non-competitive bidding basis to guide market rates towards the desired level.

From 2006, the CBC resumed to issue one-year CDs through an interest rate auction. The advantages of issuing longer-term bills and deposits are to reduce the need for larger turnover of shorter-term sterilizations on a daily basis and to enhance the effectiveness of monetary policy.

Under a more flexible exchange rate regime, there is a greater degree of control over the money supply, in particular when capital is mobile. In these circumstances, the exchange rate becomes an important channel for the transmission of monetary policy. A change in the money supply would lead to a change in interest rates through capital flows, which results in the appreciation/depreciation of the domestic currency. The interest rate and exchange rate effects of domestic monetary policy need to be taken more into account together. Coordination between monetary and exchange rate policies is essential. However, it is not easy to identify the exchange rate channel in Taiwan because its effects are often mixed with those of the interest rate channel.

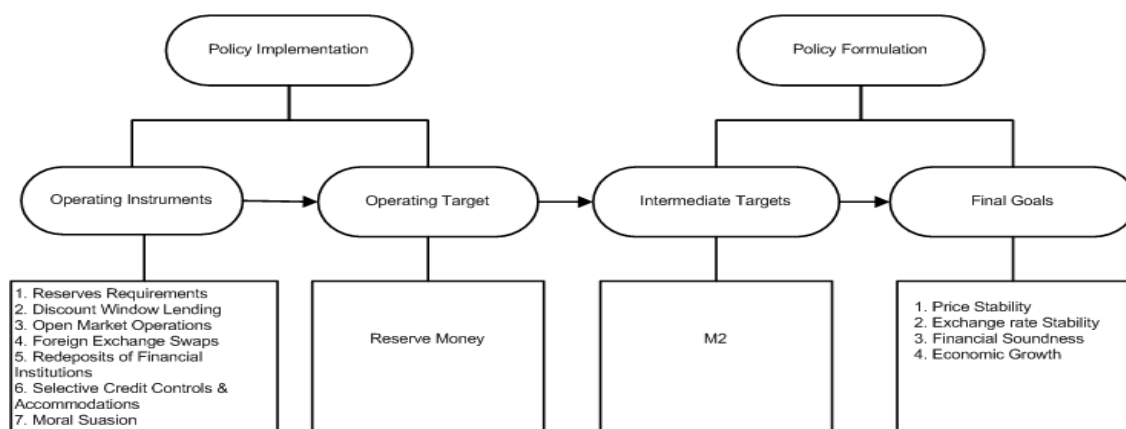
External trade and international capital flows may influence domestic interest rates and NT dollar exchange rates, and hence affect Taiwan's highly open economy. In the past, the high growth of Taiwan's economy could be partly attributed to our outstanding external trade performance. The depreciation of the NT dollar against the US dollar has a great impact on our external trade. On the other hand, because the appreciation of the NT dollar against the US dollar can alleviate the pressure of imported inflation in Taiwan, and to some extent, it also accomplishes the CBC's primary objective of price stability. Therefore, the exchange rate channel is still an important monetary transmission channel in Taiwan.

3.6 Monetary policy implementation and operations

1. Policy framework

Because changes in monetary policy affect the economy with considerable time lags, the CBC pays close attention to some intermediate targets such as monetary aggregates. In practice, the CBC adopts a monetary policy framework where it periodically checks whether operating targets have been achieved in the short run, and in turn measures intermediate targets to assess how effectively monetary policy is being transmitted to achieve its final goals (see Chart 3).

Chart 3 Basic Framework of the CBC's Monetary Policy



Since the mid-1980s, the CBC has adopted a framework of monetary targeting. The CBC chooses a broad monetary aggregate (M2) to be the intermediate target and reserve money to be the operating target. Since 1992, the CBC has been publishing intermediate targets on a yearly basis.

The CBC initially affects reserve money and inter-bank call loan rates with policy instruments, which in turn affect various monetary aggregates, interest rates and other financial and economic variables, and eventually achieves final goals of monetary policy.

(1) Intermediate Targets

Since 1992, the CBC has adopted the monetary targeting regime. For policy formulation, the CBC selects the M2 monetary aggregate as the intermediate target. The CBC estimates money demand function using econometric methods in December of each year to determine the target zone of M2 growth for the coming year. The projected growth rate of M2 demand from the money demand model will be used as the mid point of the M2 target range for the year.

The target zone serves as a guide for monetary policy operations throughout the year. Around the middle of the year, the CBC checks whether the growth of M2 has stayed within the target zone. If not, the CBC will analyze the causes and review whether the CBC should revise the target zone or adopt response measures to fine-tune, such as maintaining an appropriate growth of reserve money.

(2) Operating Target

For policy implementation, the CBC chooses reserve money as the operating target for its daily operations. This variable is directly managed through policy instruments and is closely related to the intermediate target, M2. At the beginning of each month, the CBC determines the monthly target for reserve money. Policy instruments are then used to keep reserve money within the target range.

Although an intermediate targeting strategy is adopted, the CBC does not only follow a simple rule of monetary targeting. It also relies on discretionary judgments to fine-tune its monetary management. To accommodate rapidly changing economic and financial conditions, the CBC also uses a wide range of financial and economic indicators in the formulation and implementation of monetary policy.

Financial indicators include short-, medium-, and long-term interest rates, exchange rates, excess reserves, bank deposits and credit, and the balance of payments. Macroeconomic indicators cover imports and exports, export orders, industrial production, the rates of economic growth, inflation, and the unemployment rate.

2. The CBC's Monetary Policy Instruments

The CBC uses various monetary policy instruments to achieve its operating target. These instruments include required reserve ratios on deposits, discount window facilities, open market operations (including repurchase agreements (RPs) in government securities or in negotiable certificates of deposit (NCDs) issued by the CBC), taking or releasing the redeposits of some financial institutions (mainly from the postal saving deposits of the Chunghwa Post Company), foreign exchange swaps, selective credit controls and moral suasion. Among these policy instruments, the discount rate, reserve requirements, and open market operations are relatively important.

The discount rate is the CBC's main policy rate. In practice, the CBC can affect the volume of discount loans in two ways. One is by setting the discount rate; the other is by affecting the quantity of the loans through its administration of the discount window. Both are important policy tools as the volume of discount loans affects reserve money and monetary aggregates.

In addition to its use as a tool for monetary control, discounting is also important in preventing financial panics. The CBC, like all other central banks worldwide, is the lender of last resort for banks. In other words, when banks have no one else to borrow from, they may come to the CBC for discount loans—loans that are particularly effective for providing liquidity to the banking system during a banking crisis because the reserves are immediately channeled to the banks that need them most.

3. Major issues and challenges in conducting and implementing monetary policy

Although monetary targeting has run smoothly for the past 17 years in Taiwan, there are increasing challenges. These include the emergence of new financial products and increasing cross-border capital flows. The former will blur the definition of money and affect the stability of money demand, while the latter will pose a challenge not only to monetary control, but also to exchange rate stability.

The rapid development of complicated financial derivatives also brings new challenges to financial stability and monetary policy transmission. What the Bank could do for this is to identify and evaluate the related risk exposures of financial institutions as well as the impact on the transmission channels to other sectors.

4. Communication and transparency in enhancing central bank's credibility

Proper communication and transparency could enhance central bank's credibility. The CBC holds press conference after "Monetary policy decisions of the board meeting" and "Monetary policy decisions of the executive directors meeting". In addition, updated information about policy and operations regarding foreign exchange, banking, issuing, treasury, economic research are also available on the CBC's website. If there is any misunderstanding about the CBC, we usually clarify instantly.

5. Liquidity management

In order to ensure sufficient sources of liquidity for financial institutions, the CBC manages liquidity through open market operations to prevent high volatility in the money market. Open market operation instruments include government securities, certificates of deposit (CD) and negotiable certificates of deposit (NCD) issued by the CBC. The CBC can directly influence the amount of reserves and the level of interbank call-loan market interest rates through such operations.

The issuance maturities of CD/NCDs are 30-, 91-, 192-, and 364-days. The CBC flexibly arranges maturities of CD/NCDs based on its outlook for fund conditions in the banking system. Since 1999, CD/NCDs have become the CBC's most frequently used and important open market operation instruments to reduce excess liquidity derived from continuous trade surplus and foreign capital inflows. In addition, with a substantial amount of foreign exchange assets, the CBC also uses foreign exchange swaps with banks as an operation tool to reduce excess liquidity of banks.

3.7 Macroeconomic policy coordination

1. Operational Arrangements for Coordination of Monetary Management and Fiscal Management

The CBC acts as the fiscal agent of the government. The fiscal and depository services it provides to the government are critical to treasury management and implementation of monetary policy. The central government could make its fiscal

management more accurately because it could effectively control the dynamics of budget implemented by each agency according to the latest information on treasury transactions provided by the CBC. As the transaction amount of the treasury funds is large, it has a significant influence on the level of reserve money of the CBC. Therefore, as a fiscal agent, the CBC could utilize the latest information on treasury transactions to implement its monetary policy more promptly and efficiently through open market operations.

Debt management is the responsibility of the Ministry of Finance (MOF). The CBC provides services related to the issuance, redemption, and servicing of central government bonds and treasury bills. However, the CBC is prohibited by law from financing the central government by purchasing central government bonds in the primary market and lending one year and above loans to the central government. On the other hand, the CBC may buy and sell securities through open market operations to keep financial markets stable. Because the CBC uses this measure as an important tool of implementing its monetary policy, not financing the government, it does not influence the independence of the CBC.

2. Operational Arrangements for Coordination of Monetary Management and Exchange Rate Management

The objectives of stable exchange rates, capital mobility, and monetary policy autonomy could not be achieved simultaneously by central banks. It is called the “Impossible Trinity”. As capital controls have been largely lifted, if the CBC pursues monetary policy autonomy, the resulting interest rate gap could easily lead to cross-border capital movement at the expense of exchange rate stability. This will affect domestic economic and financial stability for a small and highly open economy like Taiwan. Since Taiwan allows free capital movement, the CBC is facing the challenge of striking a balance between exchange rate stability and monetary policy autonomy.

Basically, Taiwan adopts a managed floating foreign exchange rate regime. However, when seasonal or irregular factors (such as hot money) disrupt the foreign exchange market, the CBC will step in to maintain an orderly foreign exchange market. If the measure causes violent fluctuation of market funds, the CBC will adopt some open market operation tools to ease the volatility, such as CD/NCDs and swaps.

Therefore, there is an operational arrangement for coordination of both monetary and exchange rate management.

In the 1st half of 2008, due to the continuous soaring prices of international primary materials, Taiwan has the inflationary pressure of import prices. For price stability, the CBC adopts some measures, such as fine-tuning the policy rates, and absorbing excess liquidity of banks, to prevent inflation risk and to maintain our economic growth. In the 2nd half of 2008 to 2009, On the Contrary, the CBC lowered interest rate rapidly and provided liquidity to market. However, achieving price stability needs coordination among government agencies. It relies not only on the CBC's monetary policy, but also on other policies such as sound fiscal policy, to control potential inflation risk. Our government has adopted some measures to stabilize prices in previous year, such as cutting tariffs and import taxes and raising export taxes on staple commodities, and providing fuel subsidies for the public transportation business. In response to financial crisis, our government has actively adopted an expansionary fiscal policy, while the CBC has consistently pursued an easy monetary policy. These coordinated policy efforts are helping to stimulate the economy.

Our government has been devoted to building a sound bond market, and has published the benchmark interest rates of medium- and long-term bonds for reference in an effort to guide a sound bond market. The soundness of the bond market will promote the effectiveness of the CBC's open market operations.