

ASIAN DEVELOPMENT BANK  
**CONCLUDING WORKSHOP ON**

RETA 5869: STRENGTHENING AND COLLECTION OF  
FINANCIAL AND MONETARY STATISTICS

16-18 MAY 2001  
ADB HEADQUARTERS  
MANILA, PHILIPPINES

Country Report  
**Taipei, China**

## **1. Introduction**

Like most central banks, the Central Bank of China (hereafter, the CBC) collects and compiles various statistics for the purpose of researching financial and economic conditions. The Economic Research Department of the Bank is generally responsible for the works of compilation, including monetary and banking statistics, flow of funds statistics and balance of payment statistics. In addition, in order to collect more detailed data about banks' operations, the Bank Examination Department conducts some data compilation, such as ROA, ROE, NPL, capital adequacy ratio, etc. The Foreign Exchange Department and the Banking Department also compile some financial market and foreign exchange transaction data aiming to monitor the development of short-term interest rates and the fluctuation of foreign exchange, so as to enhance the efficiency of the market.

With respect to follow-up activities of the Inception Workshop on RETA-5869, the CBC was required to compile commonly agreed ADB indicators and additional indicators developed by the CBC. After discussions with the concerned executives and officials, including the Central Bank of China, Taiwan Stock Exchange Corporation, Ministry of Finance, Council of Economic Planning and Development, Executive Yuan, Securities Investment Trust & Consulting Association of R.O.C., and Directorate-General of Budget, Accounting and Statistics, Executive Yuan, the CBC has selected 65 indicators and has compiled those indicators for the past five years. To understand the methodology for compiling the data and interpreting the results, we will firstly illustrate the definition of these indicators in detail in the next chapter of this report. Then we will examine the recent development of Taiwan's financial conditions by using these indicators. Finally, we will provide some issues related to macroprudential indicators (MPIs) as a conclusion. Apart from that, we include our finalized MPIs over the past five-year and related metadata in the appendices.

## **2. The definition of selected commonly agreed macroprudential indicators**

### **2.1 External Debt and Financial Flows**

#### **(1) Total Debt (% of GDP)**

The CBC currently publishes the aggregate external debt consisting central government's external debt only which remains throughout the long term. As for private sector external debt, it covers short-term and long-term obligations of financial institutions that are payable to non-residents only. This data is being reviewed by the CBC but has not been published yet. GDP is denoted by nominal GDP.

#### **(2) Long Term Debt (% of Total Debt)**

Long-term debt currently means public debt with a maturity of more than one year.

#### **(3) Foreign Direct Investment (% of GDP)**

Foreign direct investment means nonresident direct investment in Taiwan. The components of direct investment capital transactions are equity capital, reinvested earnings, and other capital associated with various inter-company debt transactions.

#### **(4) Portfolio Investment (% of GDP)**

The components of portfolio investment are equity securities and debt securities. Equity securities cover shares, stocks, and participation, or similar instruments - such as depositary receipts. Mutual funds and investment trusts are also included in equity securities. Debt securities are subdivided into bonds and notes, money market instruments, and financial derivatives. This item only refers to foreign portfolio investment in Taiwan.

### **2.2 Monetary Aggregates**

#### **(1) Money Base Growth (%)**

The base money comprises all reserves held by deposit money banks & the postal savings system and currency held by the public. All of which are the monetary liability of the Central Bank of China. Base money is also referred to as "high-powered money" or "reserve money", by which money is created. Changes in reserve money directly affect the amount of loanable funds of deposit money banks. Through the money-creating process, money supply and liquidity consequently expand or contract by a multiplier which is usually measured by the ratio of money supply to base money.

#### **(2) M1 Growth (%)**

Both M1A and M1B are described as narrow money. The definitions of M1A and M1B are as follows M1A = net currency + checking accounts and passbook deposits of enterprises and individuals (including non-profit organizations) in monetary institutions, M1B = M1A + passbook savings deposits of individuals (including non-profit organizations) in monetary institutions.

#### **(3) M2 Growth (%)**

The definitions of M2 are formulated M1B plus quasi-money. Quasi-money refers to time deposits (including general time deposits and negotiable certificates of deposit (NCDs)), time saving deposits, and foreign currency deposits of enterprises and individuals in monetary institutions. In addition, postal deposits are also included. As of January 1994 the data also include repurchase agreements and non-resident NT deposits.

(4) Money Multiplier (ratio)

Money multiplier refers to the ability of the commercial banks to create new bank deposits and hence increase the money supply. The money supply multiplier of M2, denoted by  $m_2$ , is derived from the formula  $m_2 = M_2 / \text{reserve money}$ .

(5) M2 (% of International Reserves)

The international reserves consist of foreign reserves and gold. The ratio of M2 over international reserves may rise as a result of a lack of foreign reserves. Therefore, This indicator is usually used to evaluate the sufficiency of foreign reserves.

(6) M2 (% of GDP)

Ratio of M2 to nominal GDP is also called Marshallian  $k$ . If the demand (supply) for money rises relative to GDP (that is, if  $k$  ratio rises), it may exhibit an over-expansion of bank credits.

## 2.3 Banking

(1) Total Assets (% of GDP)

This refers to the ratio of domestic banks' (including OBU) total assets to nominal GDP.

(2) Share of the 3 Largest Banks (as % of total assets)

This refers to the ratio of the assets of the 3 largest banks to total assets of domestic banks (including OBU).

(3) Net Profits (as % of Total assets)

This refers to the ratio of domestic bank's (including OBU) net profits to total assets.

(4) Loan-Loss Provision (as % of Non-Performing Loan)

This refers to the ratio of the loan-loss provision to non-performing loans from domestic banks (including OBU).

(5) Non-Performing Loan (% of Total Loan)

Non-performing loans are defined as follows (a) loans of which payment of principal have been overdue for more than three months and which have not been restructured, (b) installment repayments for medium to long-term loans overdue for more than six months and any loan (current or past-due) of which the borrower has been prosecuted for non-payment, or the underlying collateral has been disposed of, (c) loans of which the collateral has been disposed of by the court, but the proceeds have yet to be distributed, (d) any loan of which repayment of interest is overdue for more than 6 months. Also, NPL has been exempted from restructuring loans which meet the conditions prescribed by the regulations.

(6) Industrial Credit (% of Total Credit)

This refers to the ratio of manufacturing loans to total loans from domestic banks (excluding OBU).

(7) Real Estate Credit (% of Total Credit)

This refers to the ratio of real estate loans to total loans from domestic banks (excluding OBU).

(8) Total Credit (% of Total Deposits)

Total credit includes loans and investments (including securities and non-bank enterprises shares) in monetary institutions and the Postal Savings System.

(9) Central Bank Credit to Banking System

This refers to central bank's accommodations and RP loans to financial institutions

(10) Domestic Credit (% of GDP)

Domestic Credit consists of claims on government, claims on government enterprises, and claims on private enterprises and individuals in monetary institutions and the postal savings system.

(11) Capital Adequacy Ratio (%)

This refers to ratio of total capital to risk weighted assets (threshold value is 8% meaning that the ratio should not be less than this value). Ratio of tier 1 + tier 2 capital can include a range of other entities. These are undisclosed reserves that passed through profit and loss accounts, revaluation reserves, revaluation of equities held at historical cost, some hybrid instruments, general loan loss reserves (up to 1.25% of risk weighted assets) and subordinated term debt. The data of domestic banks' capital adequacy is filed every six months.

(12) Liquidity Ratio (%)

Ratio of deposit money bank's liquid assets denominated in local currency to reservable liabilities. Liquid assets include excess reserves, net dues from banks, Treasury bills, net holding of negotiable certificates of deposit, bankers' acceptances, commercial paper as well as bank debentures, government bonds, corporate bonds, and other liquid assets approved by the Central Bank of China.

## 2.4 Interest Rates

(1) Central Bank Lending Rate (e. o. p)

Discount rate of the Central Bank of China

(2) Money Market Rate/Inter-bank Rate (a. o. p)

Inter-bank call-loan rate refers to weighted averages of overnight interest rates

(3) Long-term (12 months) Time Deposit Rates

Averages of interest rates of one-year time deposit accounts held in the five leading banks.

(4) Real Deposit Rate (a. o. p)

Defined as the difference between the five leading banks' one year deposit rate and consumer price index.

(5) Real Lending Rate (a. o. p)

Defined as the difference between the five leading banks' new loan lending rate and consumer price index.

(6) Real Lending Rate/Real Deposit Rate

Ratio of lending rate of new loans to one-year time deposit rate by five leading banks.

(7) Bond/Treasury Bill Yield Long Term

Yield to maturity of government bonds (10- year)

## 2.5 Stock Markets

(1) Foreign Share in Trading (% of Total Volume of Trading)

Proportion of foreign share in trading to total volume of trading

(2) Share of 10 Top Stocks in Trading (% of Total Volume of Trading)

Proportion of top 10 stocks in trading to total volume of trading

(3) Composite Stock Price Index (Capital City;NCU)

- TSE stock price index
- (4) Composite Stock Price Index Growth (Capital City)  
Percent difference from the previous period of TSE stock price index
  - (5) Market Capitalization (as % of GDP)  
Ratio of market capitalization to nominal GDP. Market capitalization refers to the total market value of stocks or shares.
  - (6) Turnover in Stocks (as % of Market Capitalization)  
Turnover rate = trading value of shares/total market capitalization of listed shares
  - (7) Turnover in Mutual Funds (as % Market Capitalization)  
Turnover rate = trading value /total value of mutual funds
  - (8) Stock Price Earning Ratio  
P/E ratio = Total market value / Earnings

## **2.6 Trade, Exchange Rates and Reserves**

- (1) Export Growth (%)  
Export growth (fob, custom basis) percentage difference from the previous period.
- (2) Import Growth (%)  
Import growth (cif, custom basis) percentage difference from the previous period.
- (3) Trade Balance (Mn US\$)  
Difference between exports (fob,custom basis) and imports ( cif, custom basis)
- (4) Exchange Rate (end of period)  
Ratio of national currency unit to the US\$, e.o.p
- (5) International Reserve (Mn US\$)  
International reserves include foreign exchange reserves and gold in national valuation.
- (6) No. of Months of Import Cover (months)  
Quotient of international reserves over total imports for the year divided by 12.

## **2.7 Business Survey Data (Manufacturing, Construction, Trade, Services)**

- (1) Assessment of Current Business Situation  
Annual growth rate of industrial production index
- (2) Expectations on Business Situation in Next Six Months  
We use the diffusion index to evaluate the business conditions for the next 3 months. If D.I. is more than 50, the expectation improves. If D.I. is less than 50, the expectation deteriorates
- (3) Stocks of Finished Products (Present Situation)  
This refers to the ratio of manufacturing's inventory to manufacturing's sales
- (4) Assessment of Order Books  
This refers to manufacturing's new order's index the base year is 1976 / Jan.
- (5) Capacity Utilization (Present Situation)  
This refers to manufacturing's capacity utilization which is denoted by manufacturing actual output to its potential output.

### **3. Analyses on recent monetary and financial development in Taiwan by using MPis**

#### **3.1 Sufficient foreign exchange reserves and limited public external debt**

Before the Asian financial crisis, Taiwan foreign exchange reserves stood at US\$95.5 billion in June 1997 (see Figure 3.1). As of the end of September 2000, the level was up to US\$ 116.5 billion, this amount being sufficient to meet the demand for over nine months of imports (see Figure 3.2). On the other hand, public external debt exhibited only US\$ 0.1 billion at the end of 1997, This resulted in a negligible level of 0.04% for the public external debt ratio, representing payments in respect of amortization and interest on public external debt as a percentage of nominal GDP, over the same time (see Figure 3.3). After that, the ratio gradually declined to only 0.01% in the third quarter of 2000. Taiwan has traditionally depended on domestic savings to finance its local investments, Thus, private external debt, lacking of formal statistics for reference, should not be too large.

#### **3.2 Slowing growth in monetary aggregates**

In recent three years, the broadly defined monetary aggregates M2 grew 8.76% (1998), 8.33% (1999) and 7.04% (2000) respectively, within each year's target range (see Figure 3.4). The growth rates of the narrowly-defined monetary aggregates (see Figure 3.5) M1B and M1A exhibited an upward trend before the Asian financial crisis, due to the strong transactions demand for funds associated with the bullish stock market, but they were reversed as the Asian financial crisis affected the local stock market. In 1998 the growth rates of M1B and M1A decelerated to 2.52% and 0.39%, reflecting the weak demand for transaction balances. From then on, M1B and M1A were apparently increasing along with the bullish stock market. Since April of 2000, due to the bearish stock market, the annual growth rate of demand deposits trended down again. On the other hand, the growth of reserve money expanded at a moderate pace of 5.29%, 5.82%, and 5.17% in 1998, 1999 and 2000, respectively. With regard to money multiplier on M2, it was remaining as a mild upward trend in a range from 10 to 12 over the past five years.

#### **3.3 Slowing growth of loans and investments of domestic banks**

The growth of loans and investments with regard to domestic banks exhibited an obvious downward trend during the past five years (see Figure 3.6). From 1995 to 1997, the average annual growth rates of loans were 13.78%, 8.88%, and 6.80% respectively. The slowdown in the extension of bank credit was mainly attributable to the slow pace of economic recovery, as well as the increase in past-due loans. In addition, the increasing popularity among enterprises to issue bills and corporate bonds as a means of raising funds in the financial market as opposed to borrowing from banks also caused the growth of loans and investments to decline. In 1998, the growth rate increased to 9.02% mainly due to the significant increase in investments of commercial papers by banks because of the decline in money market interest rates. In 1999, the growth rate dropped down to 5.64% since the banks tended to deal with the problem of past-due loans aggressively and the enterprises demand for funds weakened. For the year 2000, the

average annual growth rate of loans and investments sharply decreased to 3.63%. The reasons included the following (1) banks actively dealt with non-performing loans and wrote off bad debts; (2) non-bank financial institutions, such as life insurance companies, used their ample funds to promote lending, taking over some market share of the lending business; (3) the construction and other traditional industries suffered shrinking business and trimmed expansion and investment plans due to dim prospects; (4) indirect finance was gradually substituted by direct finance; and (5) banks adopted a conservative attitude toward lending on concerns over the financial difficulties of some enterprises.

### **3.4 Increasing non-performing loans on domestic banks**

According to the definition of non-performing loan ratio as prescribed by the MOF, the impaired loans of which interest payments overdue for six months and principal overdue three months are classified as past due. From 1995 to 1997, the average non-performing loan ratio of domestic banks moved up from 2% to 4%. Since the second half of 1998 (see figure 3.7), the reported NPL ratio of domestic banks has worsened dramatically. By the end of the third quarter of 2000, the average non-performing-loan ratio for the domestic banks reached a record high of 5.36%. The causes of rising non-performing loans may be classified for the following reasons (1) poor risk management and poor loan performance, (2) inappropriate lending, (3) bust of real estate bubble, fall of collateral value and (4) restructuring difficulties in some traditional industries.

To improve quality and profitability of banks' asset, the CBC and the Ministry of Finance jointly introduced a series of financial reform in February 1999. For example, the CBC lowered required reserve ratios and raised the remunerative rate. The Ministry of Finance lowered the business tax rate for financial institutions from 5% to 2%. The extra income derived from these measures is to be exclusively used to write off bad loans. In addition, the rising problem loans also continually led the loan-loss provision to NPL of domestic banks to fall from 31.2% at the fourth quarter of 1997 to 23.91% at the third quarter of 2000 (see Figure 3.8).

### **3.5 Abundant liquidity in domestic banks**

From the end of August 1997 onwards, as the Asian financial crisis deepened, local stock market markedly declined. Consequently, falling stock prices have prompted depositors to return to the banks, while deteriorating asset quality have led the banks to reduce lending. Since 1998, domestic banks have been flushing with funds as a result of slower loan growth and increased deposits. The inter-bank overnight call-loan interest rate has fallen steadily from 6.98% in June 1998 to 4.80% in September 2000 (see Figure 3.9). In an effort to ease the shortage of sources of funds in the business sector, the CBC persuaded banks to make loans actively. However, much of the increased funding did not go to business sector, rather it went to the purchase of government bonds and other short-term assets. As a result, the liquidity ratio of deposit money banks rose from 16.30% in January 1998 to 20.99% in September 2000 (see Figure 3.10) and the average loan-to-deposit ratio for banks fell to 88.01% in September 2000 from 93.72% in September 1998 (see Figure 3.11).

### **3.6 Improving domestic bank's capital**

In recent five years the capital ratios of domestic banks in Taiwan virtually have been on a steady rise (see figure 3.12). The average capital-to-asset ratio for domestic banks rose from 6.29% at the first quarter of 1995 to 7.16% at the first quarter of 1998. During 1999-2000, many banks have undertaken substantial capital-raising exercises in an effort to shore up capital, in light of deteriorating asset quality. As a result, capital ratio rose upward to 8.14% at the third quarter of 2000. On the other hand, complying with more stringent capital adequacy rules, including the deduction of long-term investments from equity, the inclusion of market risk into risk assets, and the deduction of special reserves for bad debt from Tier 2 capital, devised by the Ministry of Finance at the end of 1998, the domestic banks capital adequacy ratio still upturned from 10% at mid-1998 sustaining to 10.67% at mid-2000 (see figure 3.13).

### **3.7 Slowing growth in profitability of domestic banks**

Due to rising problem loans, intense competition to over-banking, and slowing loan growth, profitability of domestic banks has shrunk in recent years. The average ratio of net profits to total assets (ROA) of domestic banks fell from 0.47% in 1999 to 0.30% in 2000 (see Figure 3.14). The return on equity (ROE) also showed a declining trend, from 6.95% to 4.6% for the same period.

### **3.8 Sluggish real estate market**

Following a speculative construction boom in 1980s, Taiwan has been left with an oversupply of housing units. Although the house price bubble burst in the early 1990s, this didn't remove the glut, since over 80% of Taiwanese families own their own houses.

Domestic banks are heavily exposed to the real estate market, since 23% to 27% of their banks' lending has been allocated directly to the property sector (see Figure 3.15), and much of the remainder is collateralized by real estate. The sluggishness of the housing market hampers the banks' ability to recover losses on these loans.

### **3.9 Declining bank interest rates**

From 1995 to 1997, Interest rates on deposits and loans granted by domestic banks generally exhibited a downward trend responding to the relaxing monetary policy and the weak demand for funds in the economy. During the first half of 1998, the funds in the banking system were relatively tight, affected by the outflow of foreign capital due to the Asian financial crisis, the interest rates on deposits and loans went upward and the spread in respect of the short-term and long-term deposit rates narrowed on account of the shortage of short-term funds. During the second half of 1998, the CBC adopted a moderately easy monetary policy to stimulate the economy, including reductions in required reserve ratios and the release of postal savings re-deposits to assist enterprises and to support a special residential mortgage program. In response to the measures, many banks followed suit by lowering interest rates on deposits and loans

further. Since 1999, as the CBC continued to maintain an easy monetary policy and as the demand for corporate funds remained weak, the monetary conditions in the banking sector were still loose and bank interest rates showed a mild downward trend.

Taking the five leading domestic banks as example (see Figure 3.16 and Figure 3.17), From 1995 to 1997, the average fixed rates on three-month time deposits were 5.97%, 5.54%, and 5.30%, respectively. The average fixed rates on one-year time deposits were 7.01%, 6.43%, and 5.96%, respectively. At the same period, the annually average new loans rates were 8.55%, 8.18%, and 8.13%, respectively. In the beginning of 1998, the three-month and one-year deposit rates moved up to 6.11% and 6.30%. The new loans rate also added to 8.29%. From the second half of 1998 onwards, the interest rates exhibited a downward trend. Until 2000 the five leading banks average deposit rate on one year time deposits was near 5% and their new loans rate was 6.74%, showing the spread between deposits rates and loans rates was less than two percentage points.

### **3.10 Contracting stock market**

Taiwan's stock market capitalization as percentage of GDP was 105.18% at the third quarter of 2000 and the trend of the ratio revealed downward trend (see Figure 3.18). This was associated with the slowdown in the domestic traditional industries and the bullish Nasdaq. The average P/E ratio exceeded 55 in June 1999 (see Figure 3.19), and fell to around 20 in September 2000, the lowest level since 1996 (see Figure 3.20).

## **4. Issues for discussion**

Since the Asian financial crisis, there has been widespread recognition of the importance of timely and reliable statistics on the financial conditions and risks to the system. The central banks across the countries not only reexamined the contents of financial statistics for improving their accuracy and timeliness, but also duly improved the frequency and accessibility by which the statistical data were collected. In addition, many institutions have initiated works on developing MPIs and enhancing their analysis capability.

To be a host of agencies in charge of financial data polling, the CBC has finished the compilation of Commonly Agreed ADB's Macprudential Indicators for the past five years in the end of last year. We believed that the indicators can be served as a blueprint with which a more comprehensive MPIs would be developed. Followings are some issues pertaining to establishment of MPI's statistical system which we perceived from the compilation of the ADB's MPIs

#### **4.1 To integrate various MPIs already in place in international and regional organizations**

With the aim to strengthen surveillance of financial sector, many central banks and international institutions have initiated programs on MPIs in recent years. In order to avoid overlap and duplication of works in compilation of MPIs for every country, it's necessary to integrate various MPIs already in place in international and regional organizations. The IMF has carried out a survey to national authorities and users of MPIs recently to know what types of MPIs they need. We believed that the result of the survey could contribute to the establishment of a more comprehensive MPIs and to ascertain the feasibility of constructing these indicators.

#### **4.2 To set an international standard for compilation of MPIs**

Although a monitoring of indicators over time (intertemporal comparison) can be more meaningful than comparison across countries, given the different structure and economic situation for each country and its financial system, the diverse national standards may impair the reliability as indicators. Little has been done to date to develop statistical formulas and definitions for most of MPIs. Therefore, if there is a manual which provides an international standard for compilation of MPIs, it could help to improve the quality of statistics and also be good for comparability across countries. The manual could include the definitions of indicators, classifications and treatment of financial instruments, etc.

#### **4.3 To enhance the analysis work of MPI**

A key determinant in making the statistical system work lies in how best the indicator figures can be analyzed and converted into useful information. We hope to see more studies on the implication for the movement of these indicators and the relationship between macroeconomic and prudential indicators. Only when we understand the meaning of these indicators, they can be used through an early warning system as references to decision makers.

Figure 3.1 International Reserve Levels and their Growth

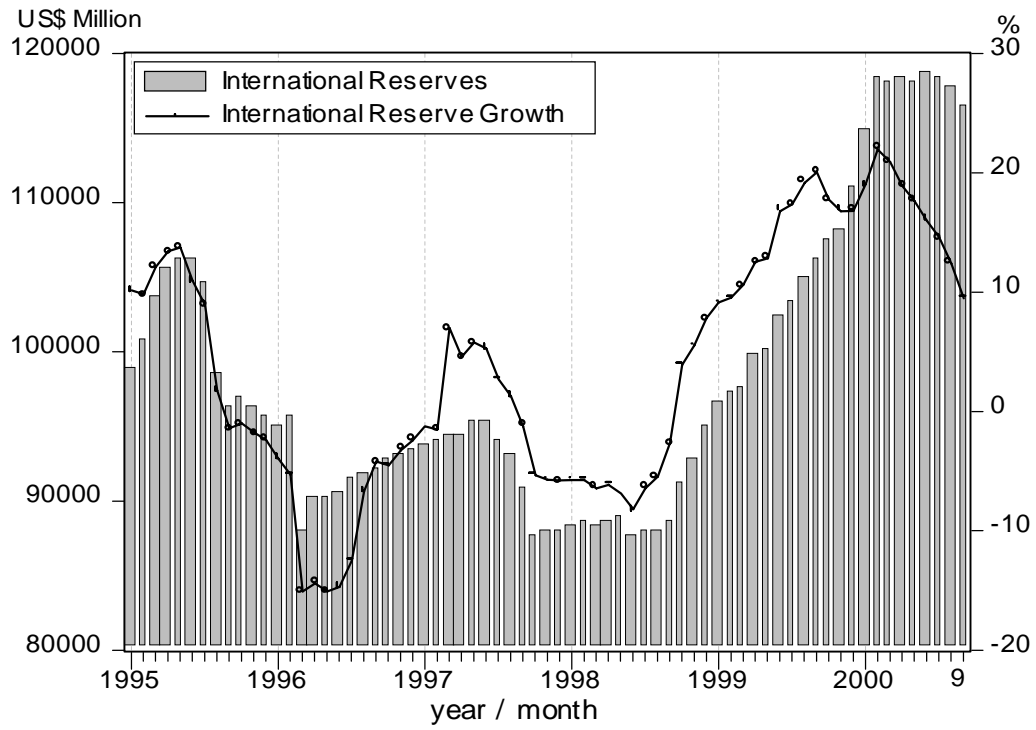


Figure 3.3 Public External Debt as % of GDP

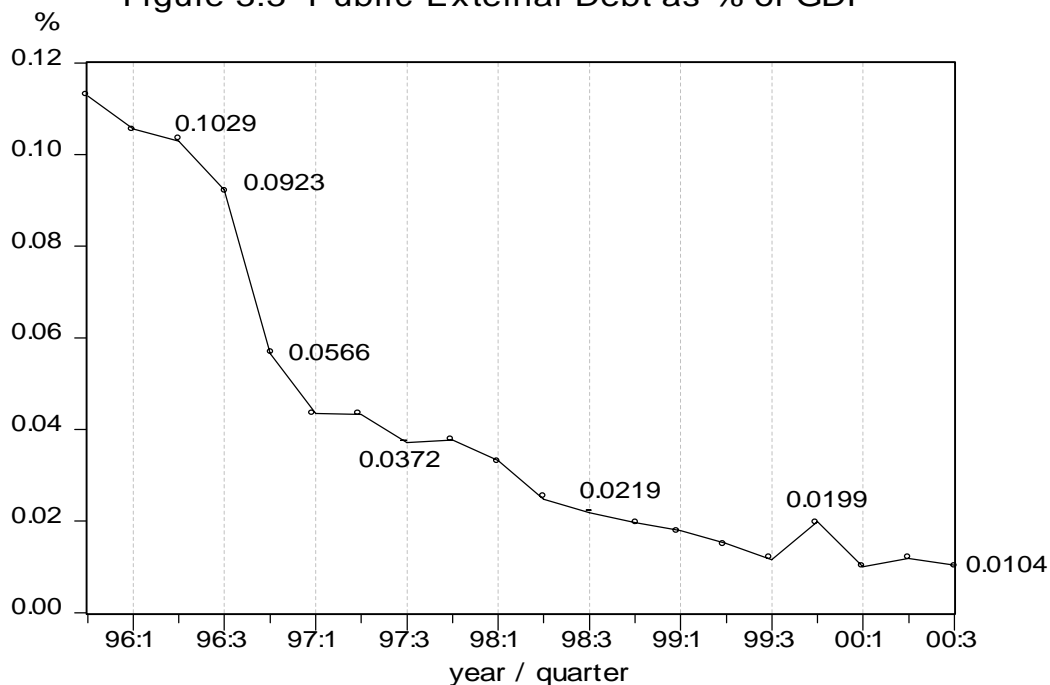


Figure 3.4 Annual Growth of M2 and its Target Range

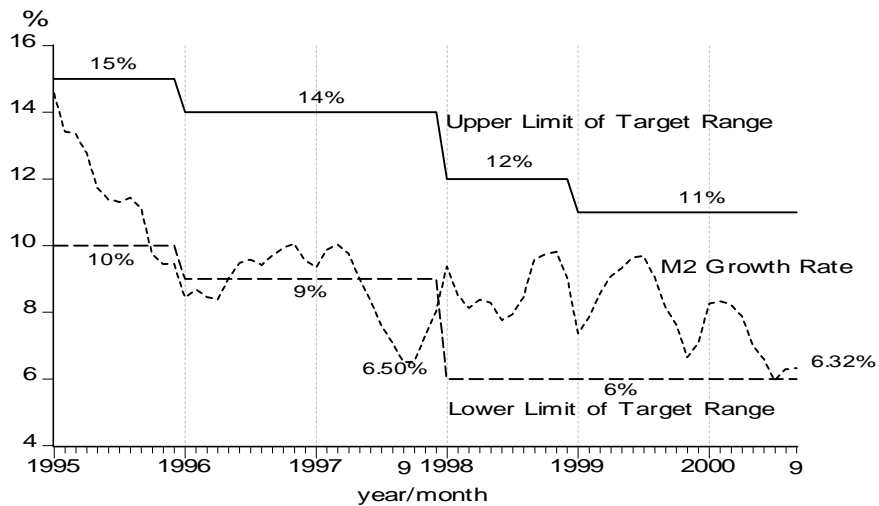


Figure 3.5 The Growth of M1A and M1B

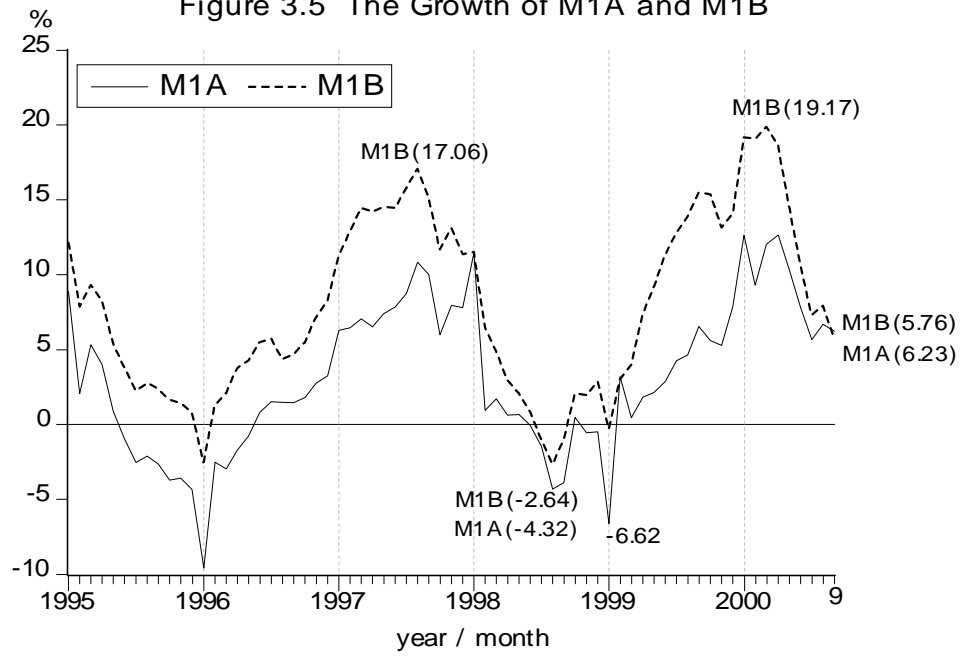


Figure 3.6 The Growth of loans and investments of domestic banks

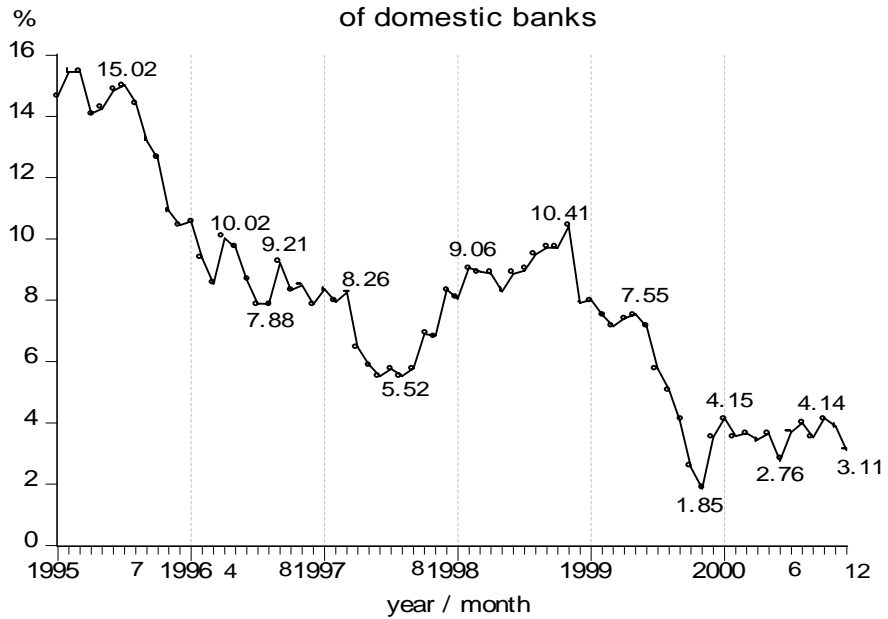


Figure 3.7 Non-performing loan ratio of domestic banks

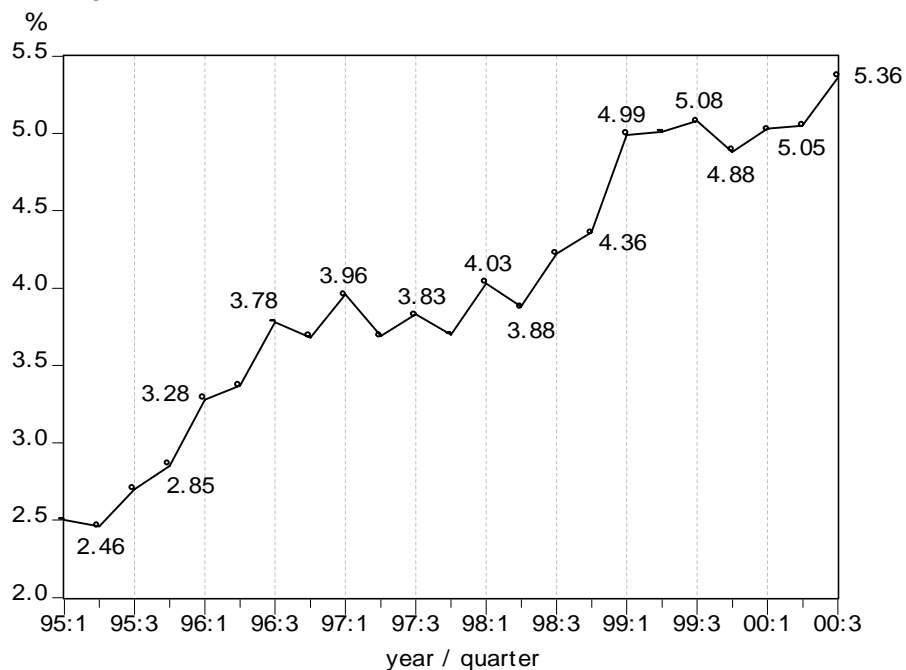


Figure 3.8 Loan-Loss Provision as % of NPL in domestic banks

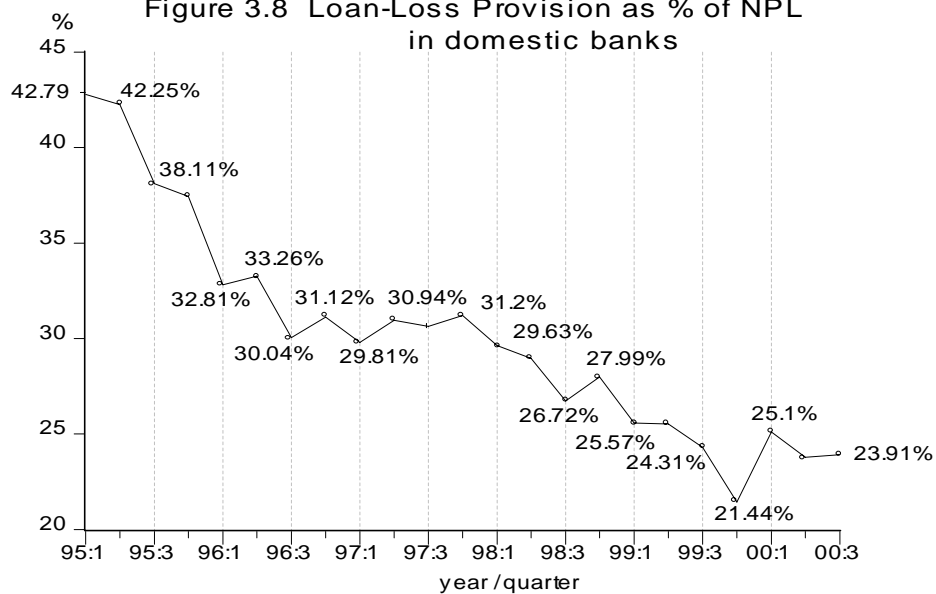


Figure 3.9 Interbank overnight of call-loan interest rate

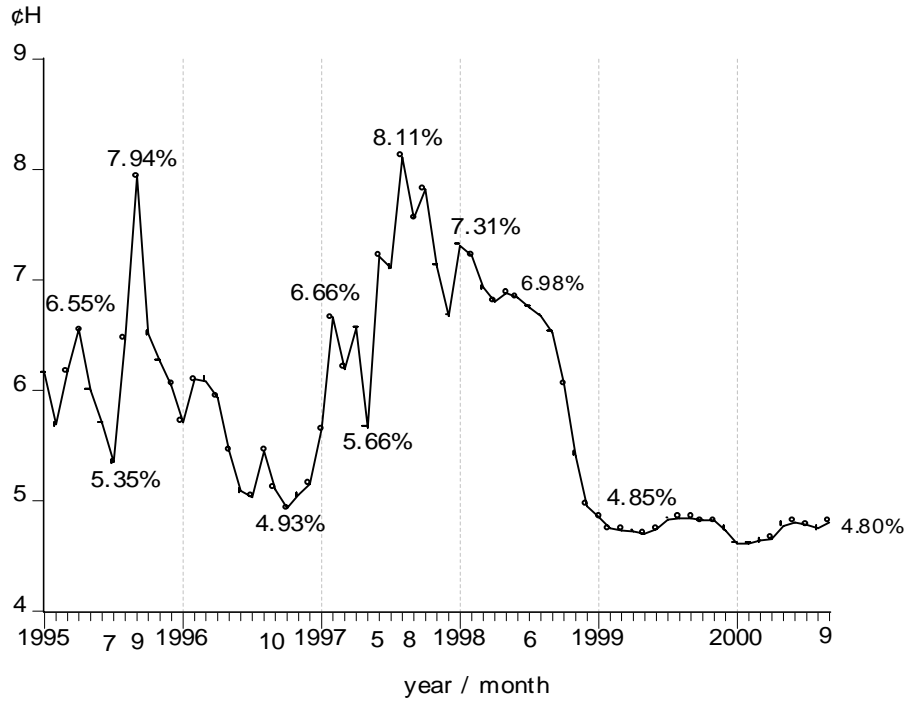


Figure 3.10 Liquidity ratio of deposit money banks

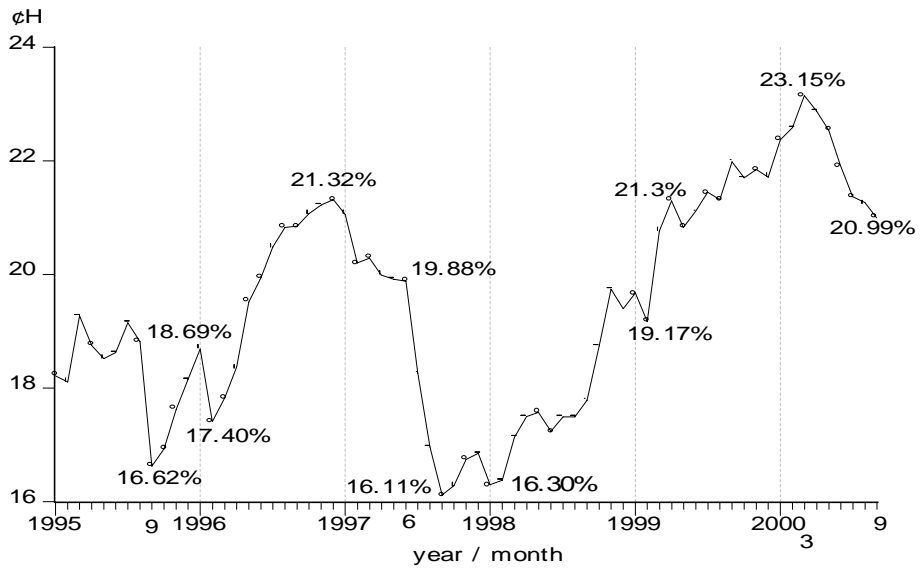


Figure 3.11 The average loan-to-deposit ratio of domestic banks

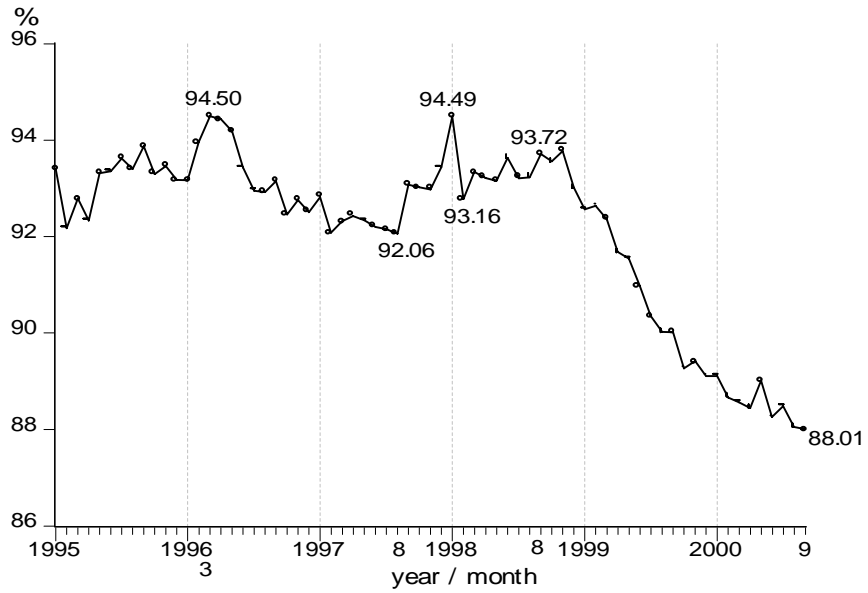


Figure 3.12 Bank capital as % of total assets in domestic banks

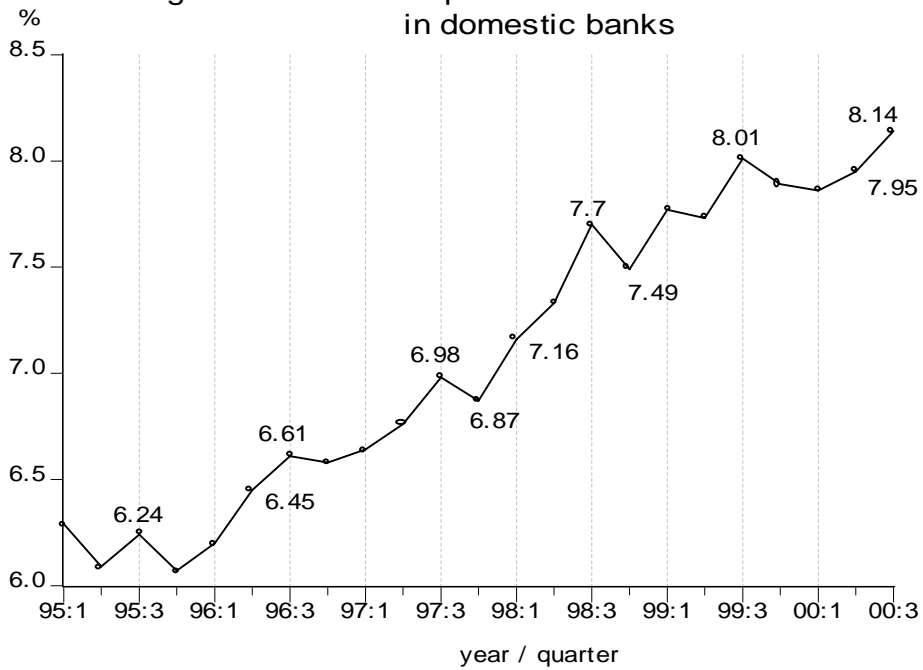


Figure 3.13 Capital Adequacy Ratio in domestic banks

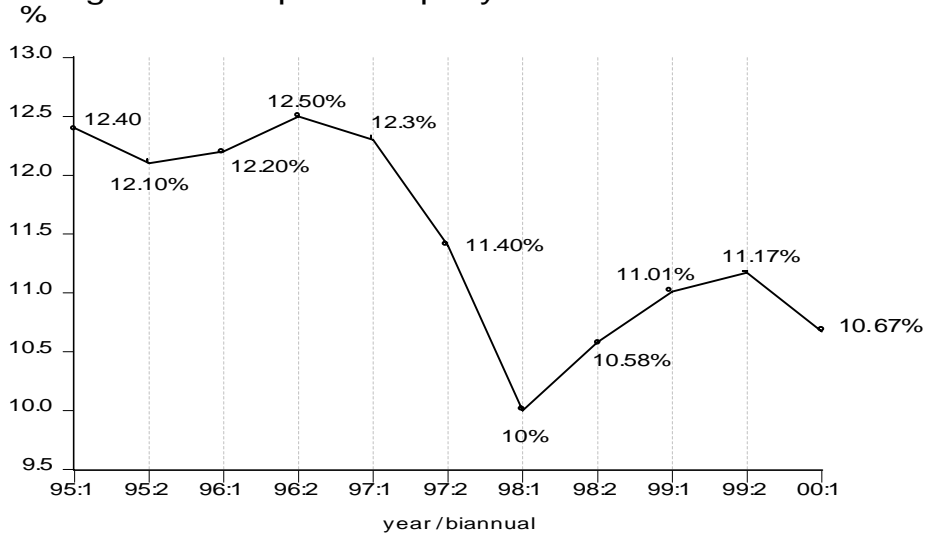


Figure 3.14 Average ratio of net profits to total assets of domestic banks

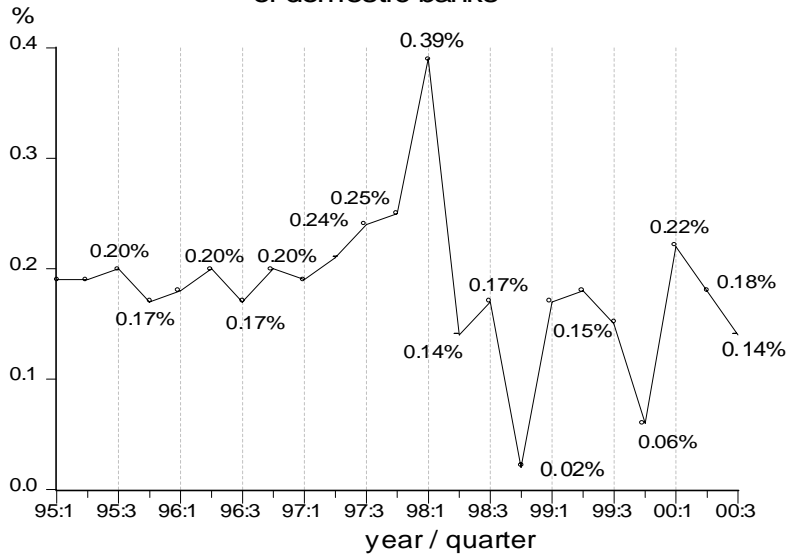


Figure 3.15 Real estate loans as % of total loans

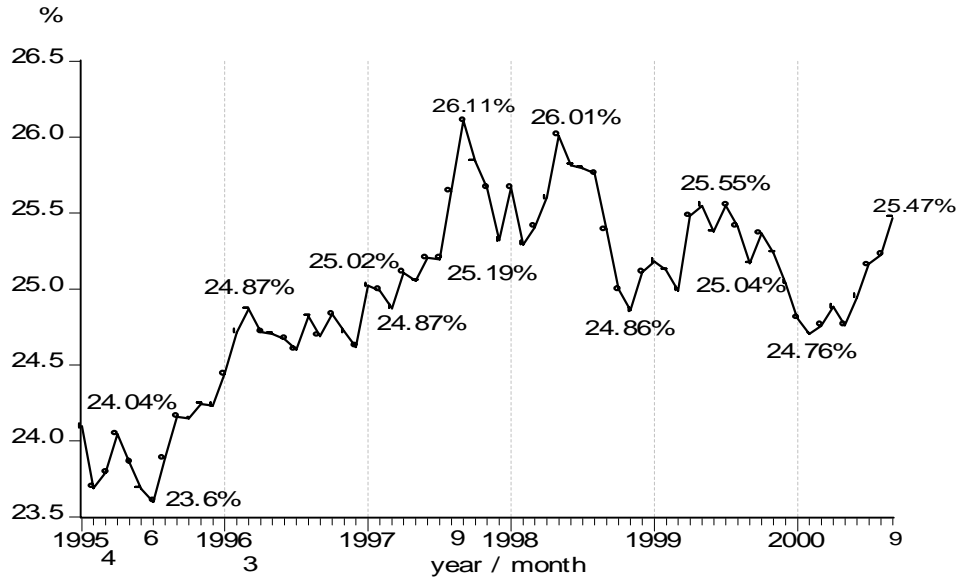


Figure 3.16 The Deposit Rates of the Five Leading Banks

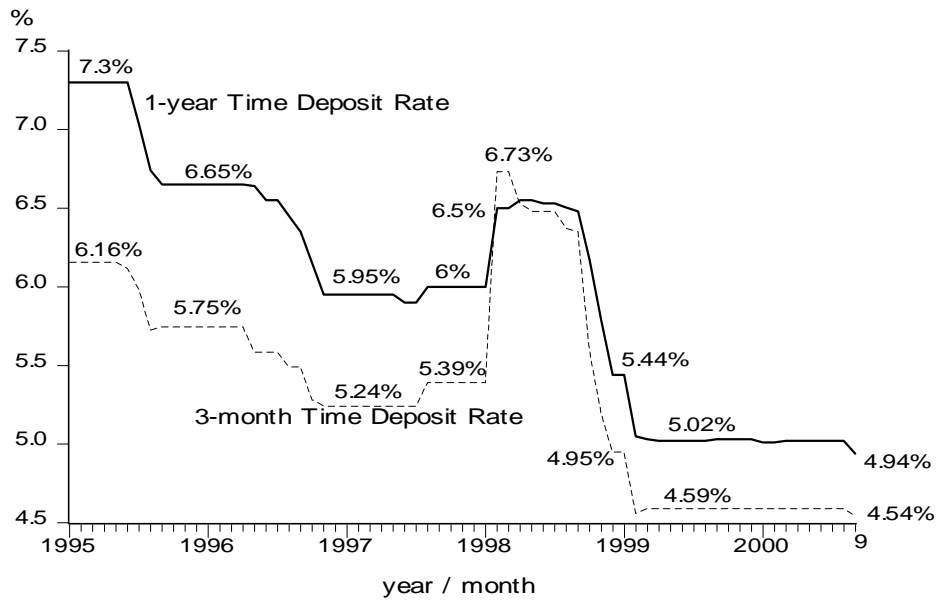


Figure 3.17 The prime rate and the rate on new loans of the five leading banks



Figure 3.18 Growth of Taiwan Stock Market

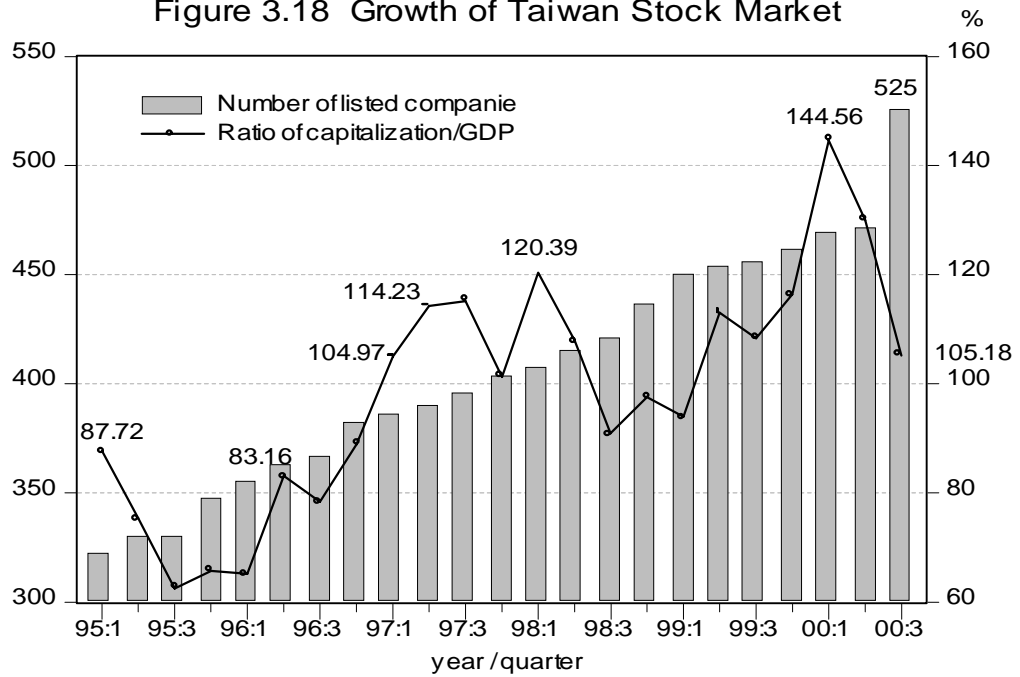


Figure 3.19 Stock Price Earning Ratio in Taiwan

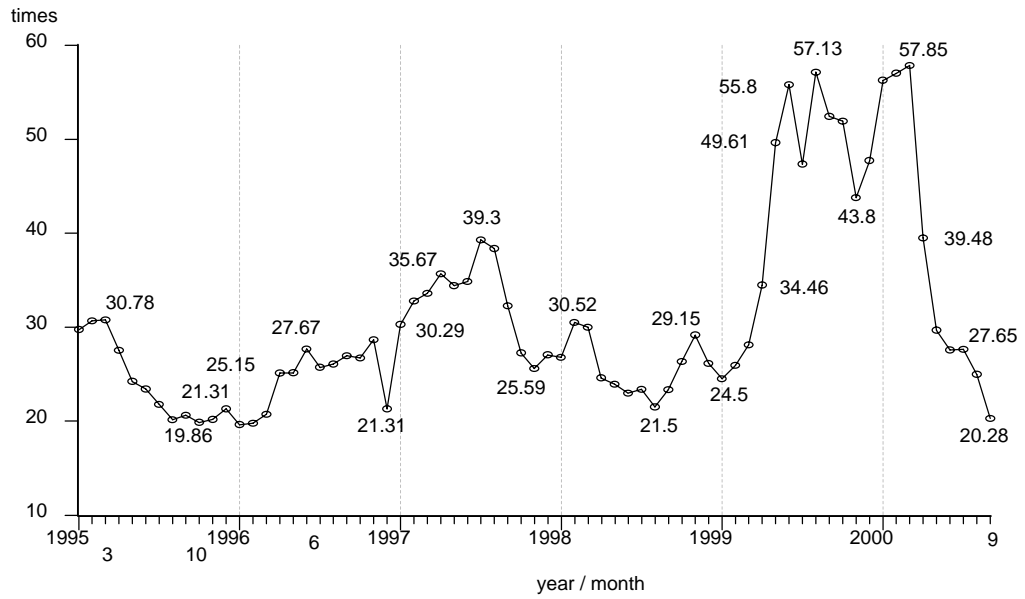


Figure 3.20 Taiwan Composite Stock Price Index and its growth

