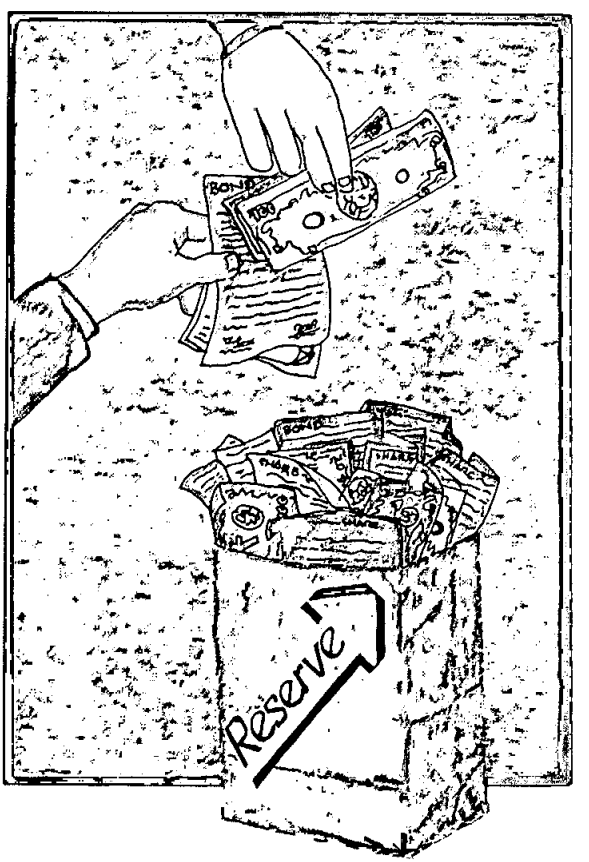
THE RESERVE REQUIREMENT AS A MONETARY INSTRUMENT IN THE SEACEN COUNTRIES

By
TUMNONG DASRI



The South East Asian Central Banks (SEACEN)
Research and Training Centre
Kuala Lumpur, Malaysia

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FOREWORD

Reserve requirement is one of the most well-known and commonly used monetary instruments in the world. Apart from its prudential role of ensuring the liquidity of financial institutions to meet withdrawals of depositors, it can also be used for other purposes such as credit and monetary control, regulation of domestic liquidity as well as selective credit policy. Under certain conditions, variation in reserve requirement is known to give the most powerful, immediate and direct impact to achieve the desired objective. Often, it is used to reinforce other monetary policy instruments such as discount rate for more effective results.

For the SEACEN countries, reserve requirement has long been imposed on the financial institutions, although its purpose varies across countries. In some countries, it is simply used for prudential regulation and as such, its ratio seldom changes. For other countries, on the other hand, reserve requirement is actively used as one of the chief monetary policy instruments to either restore domestic stability or promote growth as the situation requires. Thus, it would be very interesting and useful to find out what are the main reasons behind such a diverse choice among the SEACEN countries. In this respect, the main issue seems to be whether reserve requirement is an effective instrument for monetary control purposes and under what conditions.

In addition, despite its conceptual simplicity, in practice there are several facets of reserve requirement which are very different from country to country. For example, its form (variable versus uniform), composition of its liabilities base, computation and treatment of reserve deficiencies vary from one country to the next. In using this instrument, there are also many issues involved such as how reserve requirement which represents a cost to financial institutions influences the level of interest rates, particularly the lending rates; and whether the reserves in the form of cash deposited in the central bank should be paid interest or not. The availability of these information together with a comparative analysis across the SEACEN countries will certainly facilitate a better understanding of the instrument and consequently contribute to any policy decisions concerning its use.

The SEACEN Project on Reserve Requirement as a Monetary Instrument in the SEACEN Countries is designed to answer most of the questions listed in the foregoing two paragraphs. Although its coverage is somewhat hampered by data constraint, it attempts to assess quantitatively the impact of changes in reserve requirement

on the money supply through the money multiplier model. In its descriptive part, the study offers a comprehensive discussion on the various facets of reserve requirement for all the SEACEN countries.

This research project was undertaken by Mr. Tumnong Dasri, Research Economist from the Bank of Thailand, during his tenure at The SEACEN Centre in August 1987-August 1989. He was responsible for the overall methodological design and final report, while the quantitative part including its corresponding write-up was done by Mrs. Kanaengnid T. Quah, Economist at the Centre. Miss Seow Yun Yee, Senior Research Associate, assisted in the computer work of estimating the equations. Data for Tables in the Appendix were compiled by Miss Jami'ah Jaffar, Research Associate. The manuscript was edited by Mrs. Quah and Dr. G.M. Abayaratna, Assistant Director for Research, as well as by the undersigned. Miss Jayanthi Devi Appavoo typed the entire manuscript.

Although this is the first research project in which all the data and information were assembled from in-house sources, The SEACEN Centre is indebted to the research departments of its member central banks and monetary authorities for their continued support and cooperation. Their prompt assistance in giving extremely useful comments and suggestions on both the research proposal and the Draft Report is greatly appreciated. They are, however, not responsible for any errors that remain.

The views expressed in this volume, however, are those of the author and should not in any manner be ascribed to the institutions or individuals whose assistance is duly acknowledged herein.

Dr. Vicente B. Valdepẽnas, Jr.
Director
The SEACEN Centre

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Chapter 1

INTRODUCTION

1. Background

Varying the reserve requirement on deposit liabilities of financial institutions has long been recognized as one of the most important policy instruments available to the monetary authorities. From their original role of ensuring the liquidity of commercial banks to meet withdrawals by depositors, reserve requirements have become an effective tool for monetary control under certain conditions. In some countries, the reserve requirement is also used to regulate domestic liquidity and thereby influence interest rates. Alterations in the composition of reserve requirement have also served credit control purposes in many developing countries.

Unlike open-market operations and rediscounting or refinancing which operate indirectly through the market mechanism, the impact of reserve requirement is more direct and immediate as it places a constraint on commercial banks' lending portfolio. For instance, under a fractional reserve requirement arrangement, and through lending-investment activities of depository institutions, changing the legal reserve ratio affects total money supply through the money multiplier and monetary base. Its degree of effectiveness, however, will depend on prevailing conditions. These may include: (i) the monetary authorities' ability to control reserve or high-powered money; (ii) the degree of stability of the money multiplier and hence its components such as the cash-deposit ratio; and, (iii) the extent of the excess reserve position held by commercial banks at a particular point in time.

Although some of these conditions may not prevail in the developing countries, the reserve requirement is nonetheless one of the most important monetary policy instruments in many countries. Granting that the cash drain in these countries is large and the central bank may not have full control over the monetary base, the lack of depth and breadth in domestic financial markets reduces the potential effectiveness of open-market operations. Moreover, the central bank discount rate policy cannot be used effectively without support from open-market operations. As a consequence, apart from using the reserve requirement, central banks in the developing countries resort to other monetary instruments. Selective credit

control, for instance, is widely used as a direct monetary control to influence the direction of credit by controlling the terms and conditions on which credit is granted for specific purposes. It would, therefore, give rise to more market distortions than reserve requirement.

In most of the SEACEN countries, the reserve requirement is one of the most important monetary policy instruments used to achieve monetary objectives, in addition to the prudential function of meeting the withdrawals of the depositors and assisting in maintaining the financial soundness of the bank. In some countries such as Indonesia, Malaysia and Nepal, commercial banks have been obliged to comply with liquid assets requirement besides the "cash" or statutory reserve requirement. In addition, the form, composition and the base for computation of reserve requirement vary from one country to another. For example, bank reserve requirement have differed in Indonesia, depending on whether the deposits are in domestic or foreign currency or whether they are from domestic or foreign sources. In Indonesia and Sri Lanka, different reserve requirement ratios are imposed on demand deposits and time and savings deposits (Aghevli, et.al., 1979). The components of reserve requirement also vary from one country to another. For instance, the commercial banks in Thailand can hold certain proportions of the legal reserves in such forms as a deposit with the Bank of Thailand, government bonds, and cash in vault.

2. Objectives of the Study

The main objectives of this research project are:

i) To take a closer look into the various aspects of reserve requirement in the SEACEN countries. These include, among others, the form in respect to composition, computation and the treatment of reserve deficiencies.

ii) To examine conditions which could make the reserve requirement a very effective monetary policy instrument;

iii) To assess the impact of changing the reserve requirement on the money multiplier in selected SEACEN countries; and,

iv) To examine the constraints in the use of reserve requirement as a monetary instrument and its impact on cost of financial intermediation.

3. Scope and Organization of the Study

The study focussed on three main aspects: a descriptive analysis of the existing reserve requirement system in all the SEACEN countries, which included both the institutional set-up and policy-related issues such as interest rate paid on commercial banks' required reserves; an empirical investigation of the impact of changes in reserve requirement on money multiplier; and, some policy implications and recommendations drawn in the light of the empirical evidence and the existing institutional set-up.

The empirical investigation was done for the SEACEN countries for which the necessary data were available.

This report is organized into five chapters. Introductory remarks together with the objective and scope of study are described in Chapter 1.

The analysis made in Chapter 2 focusses on the conceptual framework of reserve requirement, such as the form of reserve requirement in respect of financial instruments and institutions, the composition, the computation and the treatment of reserve deficiencies. On the other hand, the limitations or constraints of using reserve requirement instrument is discussed while the possibility of using it as a substitute, supplement, or complement to other monetary policy instruments such as the discount rate policy and open market operations is analysed.

Chapter 3 examines the salient features of reserve requirement in the SEACEN countries, for example, the form of required reserve ratios, composition, computation and the treatment of reserve deficiencies. It also discusses the extent to which the reserve requirement adds to the financial intermediation cost of banks.

Chapter 4 reports the empirical findings of the study. It briefly presents the derivation of the money multiplier and discusses the impact of changes in reserve requirement on the money multiplier in selected SEACEN countries.

The fifth chapter concludes the study with a discussion on some policy implications drawn from previous chapters.

Chapter 2

CONCEPTUAL FRAMEWORK OF RESERVE REQUIREMENT

This chapter closely looks into the conceptual frame-work for the use of reserve requirement as a monetary instrument in terms of the theoretical aspects and the experience in some of the non-SEACEN countries. The first part describes the general features of reserve requirement, i.e., the definition, the composition, the computation and the treatment of reserve deficiencies. The second part discusses the arguments and implications of reserve requirement as a tool for monetary control. The third part reviews the argument on whether the reserve requirement could be used as a substitute, supplement or complement to other monetary policy instruments such as the discount rate and open market operations. The third part investigates the constraints and limitations of this instrument as a tool for monetary con- trol.

1. General Features of Reserve Requirement

The reserve requirement is one of the traditional instruments of monetary policy. It is normally conceived to affect money and credit mainly through its impact on the money multiplier. Nevertheless, some aspects of reserve requirement such as its form, composition and computation as well as the treatment of the reserve deficiencies also contribute to the effectiveness of using this instrument as a monetary tool. This part closely looks into some special facets of reserve requirement.

1.1 Some Aspects of Reserve Requirement

There are several definitions of reserve requirement that can be used as a policy instrument to achieve the monetary targets. Once decided, they are normally monitored closely to track movements in the money supply. The following definitions have received the most attention in the formulation of monetary policy in most countries:

(a) **Total Reserves:** This generally refers to the deposits of commercial banks or depository institutions with the central bank and the currency held in their vaults.

(b) **Required Reserves:** A fraction of deposits of other specified bank's assets that has to be kept in stipulated liquid asset form as required by law is called required reserves. Normally, the administration of the required reserves in terms of the form and level is under the jurisdiction of the central banks or monetary authorities which manage them in conjunction with certain monetary objectives. Going by the form of reserves, it is generally divided into primary reserves which consist of cash or deposits with the central banks and secondary reserves which comprise other eligible assets as prescribed by the central banks.

(c) **Excess Reserves:** The excess reserve is the difference between total reserves and required reserves. This is a rough indication of the ability of the banking system to expand the supply of money. The demand for excess reserves basically depends on such variables as the discount rate, inter-bank rates and other interest rates.

(d) **Borrowed Reserves:** Borrowed reserves are the amount of reserves that commercial banks have obtained by way of discounting or other form of borrowing from the central bank. To some extent, the level of borrowed reserves is an indicator of the desire of the commercial banks to gain additional reserves and increase their lending activities.

(e) **Non-borrowed Reserves:** Non-borrowed reserves are obtained by subtracting borrowed reserves from the total reserves.

(f) **Free Reserves:** Free reserves are the positive net excess reserves after deducting the borrowed reserves from excess reserves. However, if the borrowed reserves are greater than excess reserves, the result of the subtraction is called net borrowed reserves.

Any of the reserve definitions mentioned above could be used in a money multiplier framework, depending on the specific reserve measure used in a particular country. As most developing countries adopted the concept of required reserves, it follows that the emphasis of this study is on the required and excess re-serves.

1.2 Financial Institutions Subject to Reserve Requirement

According to banking laws in most countries, reserve requirement are most commonly applied to commercial banks. In some countries, non-bank financial institutions such as finance companies, merchant banks and other similar financial intermediaries are also required by law to maintain the minimum reserves. Some countries, moreover, also apply the reserve requirements to the banking department of the central bank. However, the savings and loan associations, or building societies, hire purchase companies, and specialized banks such as development banks, cooperative banks and agricultural banks are normally exempted from the reserve requirement.

Among the commercial banking group, variable reserve requirement ratios are sometimes prescribed according to the location and size of the banks. For instance, in the United States (before the Monetary Control Act 1980) the cash reserve ratios are applied to the member banks differently depending on whether such banks are in central reserve city (New York and Chicago), reserve city or in the country. In Sweden, the variable ratios are prescribed according to the size of the bank. Yet, in some countries, the small private banks are not subject to reserve requirement, largely for administrative convenience, since they normally account for a small percentage of the total assets of the banking system.

The purpose of the reserve requirement imposed on non-bank financial institutions (NBFIs) was mostly to ensure solvency rather than to affect general monetary policy. A few countries, however, have imposed such regulation on non-bank financial institutions for the purpose of controlling the allocation of their loans which consequently impact the total volume of credit. This is generally the case when such financial institutions compete directly with the commercial banks in the sense that their liabilities are close substitutes for bank deposits and their loans and instruments resemble those of banks. Moreover, NBFIs have increasingly played an important role in the economic activity. Changes in the volume of near-monies have implications on the spending decisions of economic units. Hence, NBFIs as well as commercial banks could contribute towards stability or instability of an economy.[1] Moreover, experience in the Union of South Africa, the United Kingdom, the United States of America,

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1. See Lombra, Raymond E, and others, *Money and the Financial System, Theory, Institutions and Policy,* McGraw Hill Book Company, 1980, p. 224.

and other countries in recent years indicate that shifts of deposits between banks and non-bank intermediarie and changes in relative rates of growth of deposits can complicate the effectiveness of a restrictive credit policy.

1.3 The Form and Composition of Reserve Requirement

Generally, there are three types of reserve requirements: cash reserve; reserve assets or liquid assets; and the combination of the two. Among these, the cash reserve requirement is commonly used by central banks and monetary authorities. The composition of reserve requirement, on the other hand, includes deposits with the central bank, cash in vault of commercial banks, and government securities. However, the composition could vary from one country to another. In some countries, foreign currency and foreign securities held by banks could be considered as part of the reserve requirement. For example, Sri Lanka allows foreign currency held by commercial banks to be part of the reserve requirement, while the Philippines permits eligible foreign securities for a similar purpose. In any case, the composition of reserve requirement will have implications on monetary goals.

To maximize profit, commercial banks prefer to hold reserve assets that would give them the highest possible returns. These assets include government securities and deposits with the central bank, if the central bank pays interest on that balance. The holding of non-earning assets such as non-interest deposits with the central bank and cash in bank vaults tended to be minimized at the level just enough to meet deposit withdrawals and other daily cash-flow requirements. Nevertheless, from a monetary control point of view, the deposits with the central bank are the most controllable item of the eligible reserve assets. Coats (1980) argues that while the central bank can control the quantity of currency, it cannot directly control that part of currency held by banks (i.e., bank reserves: vault cash plus bank deposits with the central bank), and the problem is much more serious, for government securities, on which he elaborated in the following manner:

> "When government securities or some class of government securities are allowed as a reserve asset, economic literature usually refers to liquidity requirements rather than reserve requirements. However, government securities might occasionally be an appropriate reserve asset if monetary authorities are able to adequately control the availability of government debt to the

banking system. Where government securities are also held in the private sector outside the banks, the ability of banks to bid for and attract securities, and therefore continue to expand credit by increasing 'reserves', is considerably greater than their ability to bid for and attract currency. From a banking system's point of view, currency must be attracted from the non bank public and this can only be achieved by increasing the attractiveness of bank deposits relative to currency in the eyes of the public". [1]

As for the cash in a bank's vault, it is more difficult for the central bank to monitor or verify its quantity than deposits with the central bank and government securities. Nevertheless, cash in a bank's vault is perfectly liquid for the bank to meet the demand for withdrawals by depositors. Including cash in a bank's vault in the reserve composition, therefore, allows the bank to manage its reserves more flexibly, if not for the effectiveness of monetary control.

1.4 The Computation of Reserve Requirement

In addition to the reserve assets used in the composition of reserve requirements, the regulation generally specifies the accounting period and the base used in calculating the magnitude of the requirement. The legal reserve ratios for computation could be uniformly applied against bank liabilities or all assets or variably prescribed against different reserve bases, different types of credit institutions or, other sizes and locations, depending on the financial structure and objectives of imposing reserve requirement of the authorities.

1.4.1 Accounting period

In general, there are two types of accounting systems in computing the reserve requirement, namely the lagged and contemporaneous accounting systems. In most countries, moreover, the required reserves need not be met daily. Rather, they could be averaged over a specified period of time.

The accounting period chosen for calculating required reserves will affect the liquidity of a bank or the entire banking system and the controllability of the money supply. Coats (1980) asserts that

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1. Coats, W.L., Jr., "The Use of Reserve Requirements in Developing Countries", *Money and Monetary Policy in Less Developed Countries: A Survey of Issues and Evidence*, edited by W.L. Coats, Jr. and D.R. Khatkhate, Pergamon Press, N.Y., 1989, p. 408.

longer accounting periods make required reserves more liquid, while shorter accounting periods potentially increase the precision of the central bank control over the money supply. The determination of the length of the accounting period will thus require balancing considerations of bank liquidity and money supply control.

In most countries, the lagged accounting system has been used for computing required reserves for two main reasons. Firstly, it is more convenient for the central bank to monitor the compliance of banks because in this way the bank's deposits or liabilities level is known. Secondly, the lagged accounting systems allow banks to adjust according to day-to-day business more easily.

1.4.2 Bases for computing reserve requirement

Generally, the required reserve ratio is calculated against either bank liabilities, assets or deposit turnover. The rationale of using each base can be briefly discussed as follows:

(a) **Bank liabilities:** The most common method of computing the reserve requirement is to relate the required reserve ratio to the deposits or similar liabilities of an individual bank. This method affords banks the greatest liquidity as adjustments in the level of reserves required in response to changes in the level of deposits takes place automatically (Goode and Thorn, 1959). The method is also favoured for its simplicity in computation and the ease with which it can be enforced. However, the major disadvantage is that the method does not distinguish among various types and maturities of deposits or their use. Reserve requirement against deposits, moreover, is less easily adaptable to the objective of selective credit control than that based on earning assets. Generally, the type of liabilities to include in the reserve base has more significant implications on monetary control and resource allocation than for bank liquidity.

(b) **Bank assets:** The other method of computing the legal reserve requirement is to relate it to bank assets. This has the same implications for money supply control as that of deposit liabilities, but with significant reduction in bank liquidity (Goode and Thorn, 1959 p. 31). The main advantage of this base is that it permits different reserve requirement to be imposed on different assets and thus facilitates selective credit control. If the interest return, the risk and

other relevant features are the same for two types of loans or investments, banks will prefer the one with lower reserve requirement. Credit will therefore tend to be diverted to it and consequently causes interest rate differentiation between the two types of loans. As such, banks may excessively expand total credit by concentrating on loans and investments subject to low reserve ratios. In addition, the task of the monetary authorities could be complicated as a change in reserve money is indeterminate when different reserve ratios apply to different kinds of loans and investments. Another problem could arise from the fact that this method, like all methods of selective credit allocation, may produce an end result which is quite different from the original plan. To date, very few countries use bank assets as the only base for their reserve requirement. In the SEACEN countries, Sri Lanka once included unused balance of commercial banks' overdraft as part of reserve base from December 1983 to May 1987.

(c) **Turnover of deposits:** This method relates reserve requirement to the turnover of deposits. It was formerly employed in Mexico. The purpose is to apply automatically a brake to an expansion of money demand associated with an increasing velocity of circulation of deposits during a period of boom and high interest rates; the brake is automatically eased as the turnover rate falls with a slowing down of business activity and a reduction of interest rates. The method has the further advan tage of preventing shifting of reserve base composition that commonly occurred under the variable reserve requirement system whereby required reserves could be minimized by shifting deposits from categories with high required ratios to categories with low ratios - - e.g., from demand deposits to time deposits or from deposits in large city banks to country banks - - without changing the real character of deposits (Goode and Thorn, 1959, p. 30).

In general, the choice of accounting periods, reserve assets, and bases for computing reserve requirements, depend on the stage of financial development, the ability of the monetary authorities to monitor and the objectives of the use of reserve requirement. All these methods have implications on bank liquidity, money supply control and credit allocation.

1.5 The Treatment of Reserve Deficiencies

In order for the reserve requirement to be effective as an instrument of monetary control, it is essential that the financial institutions subject to required reserves do not maintain their reserves below the required minimum. In its enforcement, the central bank has several options. It may impose penalty, or require that the reserve deficiency be made up by increasing reserve balances in subsequent periods. Normally, most central banks charge the reserve deficient banks certain interest rate on the amount and duration of the deficiency, and the rate is set somewhat higher than the prevailing discount rate. The difference is either stipulated by law or left to the discretion of the central bank. Frequently, the penalty rate of interest is progressive with the length of time that the deficiency persists. Persistent violators could be taken to courts. Some monetary authorities are empowered to take control of a bank if a reserve deficiency persists more than a specified period of time and may, in extreme cases, liquidate the offending bank and fine or imprison its officers.

The computation of reserve deficiencies is usually based on an average of deposit liabilities and reserve holdings over a period, but the determination is sometimes at a particular point in time. The method of averaging over a time interval may allow deficiencies to exist for a short period. When deficiencies are increasing rapidly, reserve statistics may be misleading, especially if reporting dates differ from one bank to another. All banks should report on the same day to prevent the shifting of reserves from bank to bank as a means of circumventing reserve requirement.

2. Constraints of Using Reserve Requirement as a Monetary Instrument

In many countries, the imposition of reserve requirement has been instituted in order to protect deposit holders as well as an instrument of monetary control. The minimum required reserve ratio, imposed for reasons of safety, is often fixed by law and can only be changed by a subsequent law. For it to be an effective instrument of monetary policy, the central bank must have the authority to vary the ratios which will in turn affect the banks' liquidity and consequently their credit policies. Nevertheless, since small changes in the reserve requirement may induce relatively large shifts in commercial banks' assets, one constraint of this instrument is that the central bank cannot change the required reserves ratio frequently

because the cost of reserve adjustments will be increased.

Moreover, the imposition of reserve requirement also raises the cost of intermediation because it diverts bank funds into assets that earn little or no interest. This cost may be borne by bank borrowers (in the form of higher interest), by depositors (in the form of lower interest), or by bank shareholders (in the form of lower profits). If this cost is too onerous, reserve requirement will discourage the growth of the banking system and will encourage the evolution of non bank financial institutions which are less amenable to control. Requiring banks to place deposit with the central bank without receiving interest is one form of taxes on the banks. To maximize profit, banks tend to diversify their reserve asset portfolio by reducing holding of non interest earnings assets reserve as much as possible. Thus, for the instrument to be effective, it must be applied equitably to all banks and is well defined and structured to include appropriate penalties for deficiencies. Further, there have been suggestions that interest be paid on required reserves. The requirement rates should also be uniformly imposed on all types of bank liabilities included in the money stock. The eligible reserve assets should also be the liabilities of the government and the central bank.

There is yet another compelling reason for paying interest on reserves. The development process is aided by encouraging the development and use of the financial sector. An important factor in such a development is the rate of return earned from holding financial assets, which practically speaking consists primarily of money in less developing countries. A reserve requirement 'tax' may lower the return banks can offer their depositors. On the other hand, the payment of interest on reserves may raise the return to banks which could be transferred to the depositors and shareholders.

The imposition of reserve requirement only on commercial banks and not the non bank financial institutions in some countries has caused some reluctance on the part of the authorities to place greater reliance on reserve requirement. For example, before using the Monetary Control Act 1980, the Federal Reserve Board in the U.S. had authority to apply reserve requirements only to members of the Federal Reserve System. Although all the large commercial banks are members, many smaller banks are not. Accordingly, the Board was reluctant to penalize the members in the System by raising reserve requirement so high that a competitive advantage is given to non members. In addition, banks that preferred not to have a part of their assets tied up in non interest earning reserves with the Federal Reserve would choose to leave the Federal Reserve

System, thereby weakening the effectiveness of monetary policy, particularly when interest rates were rising. To overcome this problem, the Monetary Control Act of 1980 has been enacted to require all depository institutions to maintain reserves with the Federal Reserve on their transactions accounts and non personal time deposits. Reserves are defined as funds deposited directly at the Federal Reserve; funds held at the Federal Reserve that are passed through a correspondent and vault cash. Requiring all depository institutions to maintain reserves was intended to improve the effectiveness of monetary policy.

3. Reserve Requirement as a Supplement or Substitute for Other Instruments

In most countries, the monetary policy instruments comprise of discount rate, interest rate, selective credit policy, credit ceiling, reserve requirement, open market operations, and moral suasion. Among these, the discount mechanism and interest rate policy tend to influence the costs of credit but not the availability of credit. Selective credit, on the other hand, affects the allocation of credit among various economic sectors but it does not influence the monetary aggregates. Only open market operations and reserve requirement have a direct impact on monetary aggregates, cost and availability of credit through changes in cash reserves of commercial banks. Nevertheless, changes in reserve requirement differ from open market operations in a number of respects. A major difference is the method of diffusion. However, changes in reserve requirement affects every bank directly and immediately with equal force, irrespective of differing individual bank situations; whereas the effects of open market operations are felt individually and gradually by the banks through the operation of market forces. Open market operations, moreover, like discount mechanism operate through market intervention. Nevertheless, changes in reserve requirement can be used to supplement other instruments of credit control in order to influence credit controls more quickly and to a greater extent than would otherwise be possible. For example, an increase in reserve requirement, like open market sales of securities by the central bank, may be employed as a means of making the central bank's rediscount policy more effective. In the absence of supplementary action, an increase in the rediscount rate may have little effect on the availability of credit or its cost. This may be the case if the commercial banks have excess reserves or are not accustomed to rediscounting at the central bank. Even where these conditions do not

exist, there may be considerable delay in transmitting such an effect due to the fact that commercial banks may acquire the funds from other sources rather than from the central bank. An increase in reserve requirement, however, can force the com mercial banks to borrow immediately in order to meet the high reserve requirement. A high rediscount rate can thus be made effective at once by raising interest rates and limiting the availability of credit. On the other hand, the easing of credit could be achieved with immediate impact when reduction in re quired reserves is used to complement the reduction in discount rate.

Since both changes in reserve requirement and engage ment in open market operations by the central bank affect the banks' reserves, changes in reserve requirement can also act as a supplement to open market operations. For instance, in the situation that the commercial banks that have large excess reserves, which may be the result of a balance of payments surplus, a capital flow, or a government deficit, the central bank may not have enough securities in its portfolio to conduct open market operations on the scale that would be required to eliminate excess liquidity. If the excess liquidity of the commercial banks is first substantially reduced by an increase in required reserves, open market sales of securities in modest amounts could bring about a prompt contraction of bank credit.

In countries where the traditional instruments are not available, variable reserve requirement may serve as a partial substitute for them. For example, in most developing countries where there are no active securities market in which the central bank can engage in buying and selling substantial amounts of securities in open market operations and where the commercial banks are traditionally reluctant to rediscount their approved financial assets at the central banks, variable reserve requirement may be the principal instrument available to the authorities by which they can affect bank liquidity entirely on their own initiative. In many such countries, however, the potential effectiveness of changes in reserve requirement is less than in the financially developed countries because the currency drain is large.

Chapter 3

THE SALIENT FEATURES OF RESERVE REQUIREMENT IN THE SEACEN COUNTRIES

This chapter will closely look at the salient features of the reserve requirement in the SEACEN countries. It is divided into four main parts. The first part will examine the form, composition and the computation of the reserve requirement. The second part describes the treatment of reserve deficiencies used in this region. The third part discusses the impact of the reserve requirement on the financial intermediation cost in the financial system. Finally, the fourth part briefly describes the use of the reserve requirement as a monetary instrument in the SEACEN region.

1. The Form, Composition and Computation of Reserve Requirement

Although, the form composition and computation of reserve requirement in the SEACEN countries are basically the same, the institutional setting, financial systems and different monetary objectives give rise to features which are unique in a country or group of countries. The details of which are discussed below:

1.1 The Form of Reserve Requirement

1.1.1. The Type of Reserve Requirement

The type of reserve requirement in the SEACEN countries can be generally classified into two categories, namely "cash" or statutory reserves and "liquid asset" requirements. The cash reserve requirement imposed by the central bank and monetary authorities are applied by all the SEACEN countries. In addition, commercial banks in Indonesia, Malaysia, Nepal and Singapore are also required to hold liquid asset reserve requirement. [1] Further, according to the new Banking Act, the commercial banks in Sri Lanka

1. Finance companies in Malaysia and Singapore and merchant banks in Malaysia are also subject to liquid asset reserve requirement.

were required to maintain a liquid asset ratio of 20 per cent. However, in case of Nepal, the 25 per cent liquid assets requirement was terminated effective May 29, 1989.

The definition of "liquid asset" is slightly different from one country to another and has been changed from time to time. For instance, the liquid assets in Singapore include notes and coins which are legal tender in Singapore, balances with Monetary Authority of Singapore (MAS) in excess of the minimum cash reserves, Singapore Government securities, trade bills and other assets approved by the Monetary Authority of Singapore. In the case of Malaysia, the liquid assets are divided into primary liquid assets and secondary liquid assets. The primary liquid assets include balances with Bank Negara Malaysia, cash in hand, money at call with discount houses in Malaysia, Treasury bills, Federal and State Government Securities of one year or less remaining to maturity and Cagamas Bonds [1] of one year or less remaining to maturity (in the case of finance companies). The secondary liquid assets, on the other hand, include bills discounted or purchased, bankers' acceptances in the case of finance companies, other Federal and State Government Securities and other Cagamas Bonds in the case of finance companies. "The apparent ease with which banks (and finance companies in Malaysia) have complied with the liquid asset requirements in Indonesia, Malaysia, and Singapore suggests that these requirements should be viewed as regulations to reallocate banks' assets rather as a tool to control the total amount of money and credit. Certainly, the infrequency with which these regulations has varied in Malaysia and Singapore indicates that they are considered as such by the authorities. Nevertheless, Nepal may perhaps be an exception in that, in 1975 when the liquid assets requirement was initially imposed to slow down the expansion of money and credit, the banks were initially unable to satisfy the regulation, although they subsequently did have substantial excess liquid assets." [2]

1.1.2 The Form of Reserve Requirement Ratios

In general, the reserve requirement ratios may be stated as a uniform or differentiated fraction of a wide variety of assets or liabili-

1. Cagamas Bonds are issued by the National Mortgage Corporation, Cagamas Berhad which was set up in 1986 to assist in the liquidity management of primary lenders and to enhance the development of a sophisticated financial market

2. Aghevli, B.G., and others, "Monetary Policy in Selected Asian Countries", IMF Staff Paper, Vol. 26, 1979, p. 801.

ties at a fixed or fluctuating levels. The purpose of uniform reserve requirement for all depositing liabilities and depository institutions was to increase the Central Bank control over the monetary system while the different reserve requirement aimed at affecting differently the cost of funds and the competition for the funds mobilized among different types of deposits.

In the SEACEN countries, the general direction is towards using a uniform ratio, regardless of the types of deposits or groups of financial institutions. In some countries, such as Malaysia, the Philippines and Sri Lanka, the differentiated fraction applied to different maturities of deposits and groups of institutions have now given way to a uniform rate, in line with the climate of financial liberalization which places emphasis on equitable competition. As will be discussed in detail later, the commercial banks, finance companies and merchant banks in Malaysia have had to observe a uniform ratio of 4.5 per cent since May 1989. For the Philippines, the reserve ratios which were used to be differently applied to deposits according to their maturities have been unified since November 1989. At present, the ratio against all the deposits and deposit substitutes at commercial banks is stipulated at 20 per cent. The required reserve ratios for all financial institutions and against all types of deposit maturities for the Philippines are shown in Table 3.1.

Similarly for Sri Lanka, before 1987, the required reserve ratios were different among the various types of deposits and unused balance of overdrafts. Even for the time deposits, the required reserve ratio of those maturing within 90 days was higher than those of longer maturity periods. Nevertheless, since August 1987, the Central Bank has imposed the uniform ratio to all types of deposit in order to increase the Central Bank control over the monetary system and to reduce the complexity of reserve administration.

1.2 The Composition of Cash Reserve Requirement

The cash reserves normally consist of deposits with the central banks and monetary authorities, cash in banks' vaults, and other eligible securities. The form of reserve assets that the banks are required to hold as a proportion to eligible liabilities have evolved from their original objective of protecting depositors to being an instrument of monetary policy. The eligible securities which are mostly consisting of the Government securities are included in the composition of reserve requirements because of their liquidity nature in that they can be encashed at any time with the central

Table 3.1

RESERVE REQUIREMENT RATIO AGAINST PESO DEPOSIT LIABILITIES OF FINANCIAL INSTITUTIONS IN THE PHILIPPINES (EFFECTIVE NOVEMBER 1986 TO JUNE 1989)

(% per annum)

Type of Financial Institutions	Type of deposits				
	Demand	Savings	Time		NOW
			730 days or less	more than 730 days	
Commercial Banks [1]	21	21	21	5	21
Thrift Banks	21	14	14	5	18
Rural Banks	21	14	14	5	-
Specialised Banks	21	21	21	5	-

1. The ratios for all types of deposits have been uniformly adjusted to 20 per cent from November 1989.

Source: Central Bank of the Philippines, *Philippine Financial Statistics*, Volume XVIII, No. 1, January - June 1987, p. 2.

bank. Meanwhile, the encouragement of banks to hold government securities helps the financing of government deficit at a lower cost.

1.2.1 Deposits with the Central Bank and Monetary Authorities

At present, the central banks and monetary authorities in the SEACEN countries that require the commercial banks (and finance companies and merchant banks in the Malaysia and finance companies in Singapore) to maintain the minimum required reserve totally in the forms of deposits with the central banks and monetary authorities are Myanmar, Indonesia, Malaysia and Singapore. As at end of January 1990, the ratios are 2 per cent against current liabilities in Indonesia, 6 per cent against liabilities base in Singapore and 6.5 per cent against eligible liabilities in Malaysia. For Myanmar, the recent information are not available but according to the Banking Law, the ratios for demand deposits shall not be less than 8 per cent and more than 40 per cent and for time deposits, not less than 3 per cent and not more than 15 per cent against deposit liabilities.

In Malaysia, moreover, according to the new arrangement which has become effective since January 1, 1989, each commercial bank is required to maintain two accounts with the Kuala Lumpur branch of Bank Negara Malaysia, namely, the "Statutory Reserve Account" and the "Clearing/Current Account". Under this arrangement, a bank which is "short" at the midnight clearing will first make-up the shortage by borrowing from the Day 1 Pool, and then if necessary, from its own statutory reserves up to the amount where the remaining statutory reserves reach the lower limit of 3 per cent of eligible liabilities. Any shortfall still remaining would have to be met from borrowings from Bank Negara Malaysia. On the other hand, a bank which is "long" at the midnight closing will first lend to the Pool. The surplus remaining in the Clearing Account will be automatically transferred to the bank's Statutory Reserve Account, until the reserves reach 4 per cent of eligible liabilities. Those borrowings and lendings would be effected automatically.

However, should a commercial bank decide not to borrow from its Statutory Reserve Account for the duration of the second week in any reserve period, the bank will have to instruct the Kuala Lumpur branch of Bank Negara Malaysia accordingly. Only one instruction can be given on or after the 8th day of any reserve period. Similarly, if a commercial bank, which is "long" at the midnight clearing, decide not to transfer any surplus funds into its Statutory Reserve

Account but retain the funds in its Clearing Account, the bank must instruct the Kuala Lumpur branch of Bank Negara Malaysia accordingly on or after the 8th day of any reserve period. The instruction to Kuala Lumpur will be made by telephone before 11.00 a.m. and will be followed by a written confirmation by 12 noon of the same day. The instructions would become effective until the end of that reserve period. Moreover, during normal business hours, a commercial bank would also be able to transfer funds between its Statutory Reserve Account and its Clearing Account, so long as the bank's statutory reserve requirement does not breach the lower limit of 3 per cent of eligible liabilities.

In Nepal, Thailand and the Philippines where the required reserves are allowed to be kept in the form of deposits with the Central Banks, cash on hand and Government securities, Tables 3.2 to 3.4 reveal the impact of interest paid on actual reserves kept by banks. In Nepal and Thailand, where no interest is paid on reserves, the combination of each form of reserves is more stable than in the Philippines which started paying interest on deposit with the Central Bank since January 1, 1978.

In Nepal, moreover, with effect from July 1981, the commercial banks are also required to hold a minimum reserve of 9 per cent against deposit liabilities, 5 per cent to be held as balances at Nepal Rastra Bank and 4 per cent as cash in vault, the latter being introduced first ever in order to allow flexibility in the liquidity management of commercial banks. The average percentage share of these two forms of reserve requirements are shown in Table 3.2.

In the case of Thailand, during 1970 to 1987, the minimum reserve requirement ratios against total deposits of commercial banks were changed only three times. This suggests that the Bank of Thailand has resorted to use other monetary policy instruments such as the interest rate policy as the latter is more flexible than the reserve requirement. Throughout the period, moreover, deposits with the Central Bank have been maintained at the level in excess of the minimum ratio required. (see Table 3.3).

In the Philippines, where interest has been paid on such deposits since January 1, 1978, [1] the increase in percentage share of the commercial banks' holding of reserves in the form of deposits with the Central Bank was evident since the first quarter of 1978. As shown in Table 3.4, the impact of the increase in such interest in the second quarter of 1984 could also be seen, from an average of 32 per

1. The rate was 3 per cent when it was first introduced. In June 1984, it was raised to 4 per cent.

Table 3.2
RESERVE COMPOSITION OF COMMERCIAL BANKS IN NEPAL

Mid-Month		Legal required reserve ratio [1]	% of Total Deposits Liabilities				% of Total Reserves			Total (8) = (5) + (6) + (7)
			Actual Total Res. (1) = (2) + (3) + (4)	Deposit with Rastra Bank (2)	Cash on hand in Rupee (3)	Cash on hand Foreign Curr. (4)	Deposit With Rastra Bank (5)	Cash on hand Rupee (6)	Cash on hand Foreign Curr. (7)	
1981	Mar	9.0	6.4	3.0	3.4	_	46.8	53.2	_	100
	June	9.0	10.1	6.3	3.8	_	62.3	37.7	_	100
	Sept	9.0	11.5	8.8	3.6	_	67.5	32.5	_	100
	Dec	9.0	11.8	8.2	3.6	_	69.3	30.7	_	100
1982	Mar [2]	9.0	9.8	5.9	3.8	_	61.1	38.9	_	100
	June	9.0	12.2	8.4	3.8	_	68.5	31.5	_	100
	Sept	9.0	16.4	11.4	3.6	1.5	69.2	21.7	9.1	100
	Dec	9.0	13.1	7.8	3.5	1.8	59.2	26.9	13.9	100
1983	Mar	9.0	10.5	4.9	3.7	1.9	46.6	35.4	17.9	100
	June	9.0	13.3	7.6	3.8	1.8	57.4	28.9	13.8	100
	Sept	9.0	10.1	5.1	3.7	1.4	50.2	36.1	13.7	100
	Dec	9.0	10.8	5.8	3.3	1.6	53.9	30.9	15.2	100
1984	Mar	9.0	11.9	6.6	3.7	1.5	55.8	31.6	12.6	100
	June	9.0	10.9	5.6	3.8	1.7	50.7	35.0	14.3	100
	Sept	9.0	10.4	4.9	4.1	1.7	46.0	39.0	15.1	100
	Dec	9.0	10.4	5.4	3.3	1.6	52.3	31.8	15.9	100
1985	Mar	9.0	12.9	7.7	3.6	1.6	59.6	27.7	12.6	100
	June	9.0	13.4	8.3	3.6	1.5	62.2	26.8	11.0	100
	Sept	9.0	9.6	4.7	3.7	1.2	49.0	38.2	12.8	100
	Dec	9.0	12.1	6.5	3.4	2.2	53.4	28.2	18.4	100

Table 3.2 (Continued)
RESERVE COMPOSITION OF COMMERCIAL BANKS IN NEPAL

Mid-Month		Legal required reserve ratio [1]	% of Total Deposits Liabilities				% of Total Reserves			Total (8) = (5) + (6) + (7)
			Actual Total Res. (1) = (2) + (3) + (4)	Deposit with Rastra Bank (2)	Cash on hand in Rupee (3)	Cash on hand Foreign Curr. (4)	Deposit With Rastra Bank (5)	Cash on hand Rupee (6)	Cash on hand Foreign Curr. (7)	
1986	Mar	9.0	16.8	11.0	3.9	1.9	65.7	23.0	11.3	100
	June	9.0	15.5	10.3	3.7	1.4	66.8	24.0	9.2	100
	Sept	9.0	11.2	6.1	3.7	1.4	54.7	32.9	12.4	100
	Dec	9.0	11.1	6.4	3.3	1.5	57.6	29.4	13.0	100
1987	Mar	9.0	8.5	3.2	3.5	1.8	37.3	41.8	20.9	100
	June	9.0	7.7	2.2	3.8	1.5	28.3	49.6	20.0	100
	Sept	9.0	8.0	3.2	3.4	1.4	40.1	42.8	17.1	100
	Dec	9.0	11.8	6.9	3.5	1.4	58.3	29.8	11.9	100

1. Since 1981, out of 9 per cent of required reserves against deposit liabilities, 5 per cent to be held in balance with Nepal Rastra Bank, and 5 per cent in cash on hand.
2. Since 1982 July, the foreign currency on hand has been included as part of cash reserve requirement.

Source: Nepal Rastra Bank, Annual Reports, various issues.

Table 3.3
RESERVE COMPOSITION OF ALL COMMERCIAL BANKS IN THAILAND

Average Daily Figures		Legal Required Reserves against Total Deposit				Actual Reserves		
		Total Required Reserve	Balance with BOT (not less than)	Cash on hand (not more than)	Govt. Securities (not more than)	Balances with BOT % of RD	Cash on hands % of RD	Government Securities %of RD
1970		7.0	3.5	3.5	–	62.8	–	37.4
1971		7.0	3.5	3.5	–	62.2	–	37.4
1972		7.0	3.5	3.5	–	60.3	–	39.6
1973		7.0	3.5	3.5	–	58.2	–	41.8
1974		8.0	4.0	4.0	–	59.9	–	40.1
1975		7.0	3.5	3.5	–	55.6	–	44.4
1976		7.0	3.0	4.0	–	51.3	–	48.7
1977		7.0	3.0	4.0	–	49.2	–	50.8
1978		7.0	3.0	4.0	–	48.8	–	51.6
1979		7.0	2.0	2.5	2.5	37.0	26.3	36.7
1980		7.0	2.0	2.5	2.5	34.8	25.5	39.7
1981	Mar	7.0	2.0	2.5	2.5	35.8	25.3	38.9
	June	7.0	2.0	2.5	2.5	32.9	24.3	47.8
	Sept	7.0	2.0	2.5	2.5	33.3	22.5	44.2
	Dec	7.0	2.0	2.5	2.5	38.2	24.6	37.2
1982	Mar	7.0	2.0	2.5	2.5	34.7	22.4	42.9
	June	7.0	2.0	2.5	2.5	32.0	21.9	46.1
	Sept	7.0	2.0	2.5	2.5	34.1	23.0	42.8
	Dec	7.0	2.0	2.5	2.5	34.9	23.4	41.7
1983	Mar	7.0	2.0	2.5	2.5	35.4	22.2	42.4
	June	7.0	2.0	2.5	2.5	32.8	21.4	45.8
	Sept	7.0	2.0	2.5	2.5	31.8	20.9	47.3
	Dec	7.0	2.0	2.5	2.5	32.1	21.6	46.3

Table 3.3 (continued)
RESERVE COMPOSITION OF ALL COMMERCIAL BANKS IN THAILAND

Average Daily Figures		Legal Required Reserves against Total Deposit				Actual Reserves		
		Total Required Reserve	Balance with BOT (not less than)	Cash on hand (not more than)	Govt. Securities (not more than)	Balances with BOT % of RD	Cash on hands % of RD	Government Securities %of RD
1984	Mar	7.0	2.0	2.5	2.5	31.5	20.5	48.0
	June	7.0	2.0	2.5	2.5	35.1	19.0	45.9
	Sept	7.0	2.0	2.5	2.5	31.1	18.9	50.1
	Dec	7.0	2.0	2.5	2.5	33.3	19.3	47.4
1985	Mar	7.0	2.0	2.5	2.5	32.6	19.0	48.4
	June	7.0	2.0	2.5	2.5	37.2	17.2	45.7
	Sept	7.0	2.0	2.5	2.5	31.2	16.3	52.5
	Dec	7.0	2.0	2.5	2.5	33.2	17.2	49.6
1986	Mar	7.0	2.0	2.5	2.5	31.9	17.5	50.6
	June	7.0	2.0	2.5	2.5	31.6	17.1	51.3
	Sept	7.0	2.0	2.5	2.5	32.3	15.5	52.2
	Dec	7.0	2.0	2.5	2.5	31.3	16.2	52.4
1987	Mar	7.0	2.0	2.5	2.5	32.1	15.8	52.1
	June	7.0	2.0	2.5	2.5	31.4	15.9	52.7
	Sept	7.0	2.0	2.5	2.5	30.7	15.1	54.2
	Dec	7.0	2.0	2.5	2.5	33.2	18.9	47.9

Note: RD = Total Reserves
Source: Bank of Thailand, Monthly and Quarterly Bulletins, various issues.

Table 3.4
RESERVE COMPOSITION OF COMMERCIAL BANKS IN THE PHILIPPINES*
(% of available reserves)

		Balance in the Central Bank	Cash on hand	Eligible Govt. securities	Eligible foreign securities	Available reserves (Total Reserves)
1976	Mar	31.5	18.3	50.2	–	100
	Jun	33.2	17.5	49.3	0.02	100
	Sept	33.5	18.2	48.2	0.03	100
	Dec	34.5	17.0	48.5	0.02	100
1977	Mar	25.8	19.2	54.9	0.08	100
	Jun	32.3	14.5	53.1	0.04	100
	Sept	32.0	13.8	54.1	0.04	100
	Dec	36.9	15.1	47.1	0.05	100
1978	Mar	48.9	12.7	38.8	0.05	100
	Jun	49.8	10.9	39.3	0.07	100
	Sept	48.0	12.8	39.1	0.05	100
	Dec	49.8	15.7	34.4	0.08	100
1979	Mar	52.3	13.3	34.4	0.08	100
	Jun	51.3	14.8	34.0	0.08	100
	Sept	57.1	16.2	26.6	0.08	100
	Dec	64.0	15.9	20.1	0.06	100
1980	Mar	51.6	11.8	36.6	0.04	100
	Jun	40.9	14.8	44.2	0.08	100
	Sept	43.0	14.1	42.9	0.04	100
	Dec	46.0	19.8	34.1	0.07	100
1981	Mar	42.0	17.2	40.6	0.20	100
	Jun	45.0	16.2	38.7	0.16	100
	Sept	40.2	14.7	44.9	0.18	100
	Dec	37.2	19.5	43.0	0.29	100

Table 3.4 (Continued)
RESERVE COMPOSITION OF COMMERCIAL BANKS IN THE PHILIPPINES*
(% of available reserves)

		Balance in the Central Bank	Cash on hand	Eligible Govt. securities	Eligible foreign securities	Available reserves (Total Reserves)
1982	Mar	38.3	15.6	45.8	0.30	100
	Jun	36.7	16.4	46.8	0.15	100
	Sept	33.6	16.1	50.2	0.14	100
	Dec	34.2	19.3	46.2	0.24	100
1983	Mar	36.0	13.3	50.5	0.14	100
	Jun	25.6	17.3	57.1	0.05	100
	Sept	29.8	14.8	55.2	0.16	100
	Dec	37.8	20.0	42.2	0.06	100
1984	Mar	25.8	7.9	63.4	_	100
	Jun	34.0	11.1	54.9	0.08	100
	Sept	39.6	14.2	46.1	0.09	100
	Dec	48.4	17.4	34.1	0.06	100
1985	Mar	55.0	10.9	34.1	0.04	100
	Jun	55.4	9.7	33.8	1.07	100
	Sept	65.3	10.6	23.9	0.19	100
	Dec	59.7	15.7	24.4	0.14	100
1986	Mar	23.3	18.9	2.7	0.12	100
	Jun	68.3	10.8	20.7	0.24	100
	Sept	74.3	7.2	18.3	0.21	100
	Dec	68.1	15.7	33.9	0.14	100
1987	Mar	78.9	11.0	9.8	0.19	100
	Jun	72.6	12.2	15.0	0.40	100

* The Monetary Board requires the commercial banks to maintain at least 25% of total reserves in the form of deposits with the Central Bank.

Source: Central Bank of Philippines, Annual Report, various issues.

cent for the period 1976 - 1977 to 43.3 per cent of total reserves in 1978 - 1983 and 58.7 per cent from 1984 to 1987. In addition, a breakdown of the composition of commercial banks' reserves in the Philippines during the twelve-year period 1976-1987 indicated that the minimum 25 per cent of reserves that has to be taken in the form of deposits with the Central Bank was more than complied with. Commercial banks' deposits with the Central Bank as a percentage of their total reserves accounted from as low as 26 per cent as of the first quarter of 1977, to as high as 79 per cent as of the first quarter of 1987. This reflected a drive to maximize profit by commercial banks in their reserves management.

1.2.2 Cash on Hand

In the SEACEN countries, every country has prescribed the minimum reserve requirement ratios in the form of cash on hand. For instance, in Thailand, the maximum reserves ratio in the form of cash on hand and Government securities is 2 per cent of the total deposits while at least 25 per cent of required reserves of banks must be held as deposits with the Central Bank of the Philipines and the remaining 75 per cent in the form of cash on hand and reserve-eligible government securities. In Nepal, this reserve in the form of cash on hand also includes the foreign currency held by the commercial banks since the reserves in the form of cash is non-earning asset, the ratios were generally stable at a minimum level. (see Tables 3.2, 3.3 and 3.4).

1.2.3 Government Securities

Unlike the deposits with the central bank and cash on hand, government securities are earning reserve assets. Under the principle of profit maximization, the banks tend to minimize the holding of such non-earning assets as deposits with the central bank and cash on hand and maximize the holding of the interest bearing government securities. However, the evidence derived from the quarterly data of commercial banks in the Philippines did not conclusively support this principle. Tison (1970) gave the reasons that commercial banks in the Philippines have various financial transactions (e.g. rediscount, repurchase, swap, etc) and the clearing among banks. In addition, the commercial banks also maintain cash in banks' vaults to meet depositors' withdrawals during the day-to-day banking business. [1]

1. Tison, Gerardo. S, "Government Securities as Reserve Against Deposit Liabilities", *Bondline*, Vol. XXVII, January 1983, p. 6.

In Thailand, Table 3.3 reveals that before the cash on hand could be taken as part of reserve requirement in 1979, the commercial banks tended to hold reserves in the form of deposits with the Central Bank more than that of Government securities. But since 1979, the trend was reversed. Commercial banks holding government securities have been higher in order to improve their income position by keeping smaller portion of reserves in non-earning assets.

In the Philippines, during the twelve-year period reviewed, commercial banks chose to maintain deposits with the Central Bank at ratios more than the government securities after the introduction of the interest paid on these deposits in 1978. Especially during 1986 and 1987, the percentage share of holding of deposits with the Central Bank were much higher than the Government securities. In contrast, the share of reserves in the form of Government securities declined from 14.4 per cent from the last quarter of 1985 to as low as 7.7 per cent in the first quarter of 1986. Apart from the positive earning from deposits with central banks, this was an outcome of a policy change to gradually phase out Government securities as eligible reserve requirements. [1]

1.3 Computation of Cash Reserve Requirement

In most countries, as mentioned earlier, the central banks are empowered to determine the reserve level, reserve assets, accounting period for computing the required reserves and the reserve requirement base. Through these elements, the central bank could also affect the bank liquidity, money supply, and financial resource allocation. For instance, to reduce money supply and bank liquidity, the reserve requirement would have to be increased. However, the choice of reserve averaging period may have opposite implications on monetary control and liquidity. For example, longer averaging periods enhance bank liquidity, but tend to diminish or weaken money suply control (Coats, 1980 p. 403). For the reserve base, the use of either liabilities or assets will also have different implications. Coats asserts that the precise determination of which bank liabilities to include in the reserve base has more significant implication for monetary control and resource allocation than for bank liquidity. The reserve requirement based on the bank assets, on the other hand, has tended to affect more on the allocation of credit.

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1. Central Bank of the Philippines, *Annual Report 1986*, p. 32.

In the SEACEN countries, the accounting period for computing reserve requirement ranges from daily calculation to weekly, bi-weekly (fortnightly) and one month. Only the Philippines requires banks to compute the reserve requirement daily while Myanmar, Sri Lanka and Thailand, the computation is based on a weekly basis. A fortnightly computing is applied in Malaysia.

In the Philippines, each bank or non-bank financial intermediary with quasi-banking functions has to calculate its reserve position daily on the basis of the amount of its reserves and its deposit or deposit substitute liabilities against which the said reserves are required to be maintained at the close of each business day. For this purpose, the principal office in the Philippines and all branches and agencies located therein are treated as a single unit. Included among deposits subject to reserve requirements are (1) proceeds from sales of DBP Bonds; (2) collection of premium contributions from the Social Security System, and (3) tax and loan accounts established in designated commercial banks in connection with the insurance and sale of Treasury Bills (Tax Anticipation Series) which are treated as demand deposits [1].

In Myanmar, the bank's reserve position is computed weekly at the close of business on Friday or the previous day if Friday is a holiday. Moreover, computation is on the basis of average of daily reserves actually held by bank against average of daily deposit liabilities. In Sri Lanka, the required reserves of the commercial banks are computed weekly every Friday on the basis of deposit liabilities as on the previous Wednesday. Figures so computed are applicable until next Thursday. The computation of the reserve position of commercial banks in Thailand is more or less the same as in Myanmar and Sri Lanka. Only the week day for computation starts on Friday and is computed at the close of business on Thursday rather than on Friday like Myanmar and Sri Lanka.

In Malaysia, with effect from January 1, 1989, the computation is based on the average amount of statutory reserves held during a fortnightly reserve period. There are two reserve periods in each month. The first reserve period is from the 1st to the 15th and the second period from the 16th to the end of the month. For the first reserve period, the eligible liability base will be the 15th day of the preceding month, while the eligible liability base for the second reserve period will be the last day of the preceding month. For example, the averaging of statutory reserves will be allowed beginning with the reserve period January 1 to 15, 1989. The statutory

1. Central Bank of the Philippines, Central Bank Circular No. 552, January 17, 1977.

reserve ratio (SRR) for the first reserve period will be calculated based on the eligible liabilities [1] on December 15, 1988. Moreover, the SRR of a commercial, at all times, may not fall below 3 per cent, that is, a daily deviation of 0.5 percentage point below the prescribed period SRR is allowed. In addition, for computing the period SRR, daily reserve holdings of only up to 4 per cent of eligible liabilities will be taken into account. In other words, excess reserve holdings of only up to 0.5 percentage point above the prescribed period SRR will be included in the computation. For Singapore, according to the 20 April 1987 Notice to Banking Act, CAP 19, a bank is required to maintain its minimum cash balance with MAS by means of an average weekly amount. Computation of liabilities base is done by averaging the bank's daily eligible liabilities [2] during a two-

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1. Eligible liabilities of commercial banks are:

Deposits (net of foreign deposits)
Demand Deposits
Fixed Deposits

Amount due to (including foreign borrowings) net of amount due from (including foreign lendings)
Other Banks in Malaysia
Finance Companies in Malaysia
Merchant Banks in Malaysia

Net NCDs Issued
Net Repurchase Agreements transacted
Special Deposit Accounts

2. They are:

Deposits
non-bank customers resident in Singapore (in all currencies)
non-bank customers resident outside Singapore (in Singapore dollar and in foreign currencies less the corresponding claims or net balances in foreign currencies outside Singapore)

Borrowings
from MAS (in all currencies)
from banks in Singapore (in all currencies and less any claims in all currencies on banks in Singapore)
from finance companies in Singapore (less any claims on finance companies in Singapore)

Certificates of Deposits in Singapore dollars issued in Singapore (less any holdings of such certificates)

Funds purchased by banks through repurchase agreement (repos)
in Singapore Government securities with customers other than banks and approved dealers or institutions.

Any other borrowings raised by means of bills of exchange, bonds, promisory notes or other commercial papers.

week period beginning on a Thursday and ending on a Wednesday (called the computation period). The required cash balance must be maintained with MAS for a corresponding fortnight (called the maintenance period) which begins on the third Thursday following the computation period. To allow some flexibility, the actual minimum cash balance held could vary within a band of 1 per cent above or below the required level on the day-to-day basis. In other words, on any day, balance with MAS should not drop below 5 per cent of the liabilities base and any balance in excess of 7 per cent will not be counted towards the weekly average. In addition, the weekly average is allowed to fall within a similar band of 1 per cent. The absolute (dollar) amount of any excess or deficiency in the required reserve balance for the week, that lies within the 1 per cent band, should be carried forward to the following week, wherein the shortfall has to be made good (in case of deficiency) or the surplus may be used (in case of surplus). If the bank's weekly average drops below 5 per cent, a penalty will be imposed. On the other hand, the absolute (dollar) amount greater than 7 per cent cannot be carried forward to the following week.

In Indonesia, the computation of reserve requirement is basically 2 per cent of the third party funds which consists of demand deposits, time and savings deposits, and other liabilities.

2. Treatment of Reserve Deficiency

As has been mentioned earlier the reserve requirement will be an effective instrument of monetary control so long as banks or other non-bank financial institutions that are subject to required reserves are reluctant to maintain their reserves below the required minimum. This could only happen when central bank could use some form of sanction or penalty on banks that fail to comply with the requirement. The most common means is to impose penalty in the form of interest charged on the amount and duration of the deficiency.

The interest charged on the reserve deficiency, however, varies across countries. In the SEACEN countries, five countries impose interest charged on a certain percentage of the amount of deficiency while the other two require banks to pay a fixed sum regardless of the amount of deficiency. According to the law, the banks in Myanmar, the Philippines and Sri Lanka, whose reserve positions are short of the required minimum level have to pay interest to the Central Bank not exceeding 1/10 of 1 per cent per day on the amount of deficiency. In the case of Sri Lanka, if a bank has a continuous

deficit, the Monetary Board may make an order to prohibit or restrict new loans or investments and prohibit the application of the whole or any part of the net profits for payment of dividend.

In the Philippines where incidences of reserve deficiencies occur more often than in other countries in this region, the treatment of reserve deficiencies is more complicated and closely monitored by the authorities. Whenever a reserve deficiency exists, the bank or non-bank financial intermediary with quasi-banking functions (NBQB) must pay the Central Bank 1/10 of 1 per cent per day on the amount of the deficiency, provided that the bank or NBQB is permitted to offset any reserve deficiency occurring on one or more days of the week with any excess reserve on other days of the same week and to pay the penalty on the average daily deficiency during the week. The privilege of offsetting may be denied by the Monetary Board, in case of "abuse". [1] For banks with "chronic reserve deficiency" [2] in deposit and/or deposit substitute liabilities, the bank would be denied the credit facilities from the Central Bank. In addition, the Monetary Board may limit or prohibit the making of new loans or investments by the institution or may require that all or part of the net profits of the bank of the institution be assigned to surplus. The Board of Directors of the said bank shall be notified of such chronic reserve deficiency and the penalties therefore, and be required to immediately correct the reserve position of the bank. Moreover, the Monetary Board may modify or set aside reserve deficiency penalties for part or the entire period of a strike or lockout affecting a bank or NBQB or of a national emergency affecting operations of banks or NBQBs.

In Indonesia, banks that fail to maintain the required minimum reserve balance at the Central Bank have to pay on actual reserve balance below the minimum required level. An interest penalty of 3 per cent monthly on the shortfall of the actual reserve balance below the minimum required level. An additional interest of 2 per cent is also charged on shortfalls hidden by false reports. Moreover, the banks failing to report on time also have to pay interest penalty determined by the Central Bank. For Nepal, the interest penalty rate is much higher than other countries. A bank with a reserve deficiency, according to the banking law, has to pay interest to the

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1. "Abuse" in the privilege of offsetting reserve deficiencies means having reserve deficiencies occurring three or more times during any given week for four weeks, whether or not resulting in net weekly deficiencies.
2. "Chronic reserve deficiency" means a bank is having a net reserve deficiency for four consecutive weeks.

Nepal Rastra Bank 5 per cent higher than its refinance rates on their own maximum lending rates.

For Thailand and to a certain extent Singapore, the penalty imposed on reserve deficiency is in fixed term. In Thailand, a bank that fails to maintain the minimum required reserves level shall be fined not exceeding Baht 100,000 and other sanctions, if necessary. In Singapore, the penalty charge for failing to maintain the required minimum cash balance is equivalent to the highest overnight interbank rate transacted during the week, subject to a minimum of Singapore dollar 100, or such larger amounts as MAS may determine for every day during which the deficiency continues. In addition, banks are advised not to circumvent the minimum reserve requirement by accepting Singapore dollar deposits from non-bank customers through either foreign exchange swaps or arranging for such deposits to be accepted by bank or their branches outside Singapore and treating these deposits as balances held for banks/ branches outside Singapore.

3. Reserve Requirement and Financial Intermediation Cost

Since the reserve requirement in the form of deposit with the central bank normally does not earn any interest (except in the case of the Philippines and Indonesia), it is considered as a cost of funds to the banks or non-bank financial intermediaries. This will in turn push up the lending rates. As pointed out by Thillainathan, factors which are taken into consideration when commercial banks are setting lending rates are: (1) cost of obtaining deposit; (2) the cost of maintaining statutory reserves and liquid assets; (3) the cost of administration or overheads; (4) the compensation for actual loan losses including actual uncollectable interest; (5) subsidy for the low yield on priority sector loans; and, (6) a reasonable return on shareholders' funds. [1]

To examine the relationship between the reserve requirements and their effect on the cost of funds, Thillainathan (1985 p. 28) introduced the formula for computing the cost of funds in the context of Malaysia as follows:

$$COF = A\left[r + \frac{r\text{-}y1}{DL} P1 + \frac{r\text{-}y2}{DL} P2 + \frac{r\text{-}y3}{DL} P3\right]^{2}$$

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1. Thillainathan, R., Are Malaysian Bank Lending Rates Too High?, ISIS Issue Paper, Institute of Strategies and International Studies (ISIS), Malaysia, 1985, p. 5.
2. See Thillainathan (1985), Ibid, pp. 28-29, for the derivation of this formula.

where COF is the cost of funds
A is the size of the loan
r is the lending rate of the commercial bank
y1 is the yield on statutory reserves
y2 is the yield on primary liquid assets
y3 is the yield on secondary liquid assets
P1 is the proportion of the deposit that must be maintained as statutory reserves with Bank Negara Malaysia
P2 is the proportion of the deposit that must be maintained as primary liquid assets
P3 is the proportion of the deposit that must be maintained as secondary liquid assets.
DL is loanable deposits (DL = 1-P1-P2-P3)

For example, if we assume that,

A = $1 million
r = 10%
y1 = 0%
y2 = 5%
y3 = 8%
P1 = 4%
P2 = 10%
P3 = 10%

Therefore, DL = 0.76,

Substitute the assumed figures of A, r, y1, y2, y3, P1, P2, and P3 in the above formula, we will get

COF = 11.3%

Based on the above assumptions with a statutory reserve ratio, i.e. P1 of 0.05 is obtained before April 15, 1985, COF will be 11.6%. This suggests that when the statutory reserve ratio was increased, other things remaining the same, there would be an add-on to the financial cost of the banks. If the commercial banks maintain the interest income, the lending rates charged to customers would increase accordingly.

To reduce the cost of funds, some central banks and monetary authorities in the SEACEN region allow the banks or non-bank financial institutions to hold required reserves partly in the form of earning assets, mostly in the form of government securities and pay interest on deposits with the central bank. Nevertheless, these earn-

ing assets give a lower yield compared to that derived from giving loans or other investment. Besides, the permission for banks to hold earning assets as reserve requirement will lessen the controllability power of this instrument.

However, in the cases of the Philippines and Indonesia (before June 1, 1983), interest is paid on deposits with the Central Bank in order to reduce the financial intermediation costs and hence reduce the pressure on lending rates. As mentioned earlier, the Central Bank of the Philippines pays 4 per cent on deposits with the Central Bank which form part of the reserves. In Indonesia, in order to lower the financial intermediation cost and to encourage banks to comply with maximum liquidity requirements, both in Rupiah and in foreign currency, Bank Indonesia decided to grant interest on both clearing accounts in Rupiah and on excess deposits of banks in foreign currency in account held with Bank Indonesia, according to the following formula: [1]

(1) Beginning July, 1974, Bank Indonesia would pay interest on Rupiah clearing accounts and on bank deposits in foreign exchange for all amounts in excess of the obligatory deposits held for these purposes, provided that the bank, during the month involved complied with regulations on the minimum liquidity position. Interest to be paid on the minimum daily balance of excess reserves held over the course of the month but only up to an amount equal to 100 per cent of the lowest daily required reserves balance.

(2) Initial interest rate on excess Rupiah clearing accounts and deposits in foreign exchange was set at 10 per cent per annum calculated monthly and paid once a year.

When Bank Indonesia reduced the reserve requirement from 30 per cent to 15 per cent against current liabilities in 1977, the interest rates on Rupiah and foreign exchange excess reserve deposited with Bank Indonesia were also adjusted. The payment of interest on these excess deposits up to 10 per cent of total current liabilities was introduced in 1974 to compensate banks experiencing excess liquidity as a consequence of the credit restrictions imposed. Under the new provisions, the maximum amount of those excess deposits subject to interest payment was increased to 15 per cent of current

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1. Bank Indonesia, Report for the Financial Year 1974/1975, p. 37.

liabilities and its rate reduced from 10 per cent to 6 per cent per annum. [1] This adjustment was one part of the policy package announced at the end of December 1977, reflecting an adaptation to current economic and monetary developments and was intended to reduce the cost of bank funds. Nevertheless, the interest paid on deposit with the Central Bank for either required or excess reserves has been terminated since the financial reforms, with effect from June 1, 1983 when the Central Bank decided to use open market operations as a major monetary policy tool.

4. A Survey of the Extent of Use of the Reserve Requirement as a Monetary Instrument in the SEACEN Countries

The reserve requirement has been imposed on commercial banks and financial intermediaries in most of the SEACEN countries since the commencement of operations of their respective central banks and monetary authorities although to a different degree and frequency depending on the specific environment and instruments available in each country. Only in Indonesia and Nepal was the imposition made after the inception of the Central Bank. Moreover, the reserve requirement has evolved from its prudential measure to maintain the minimum bank liquidity to its use as a monetary instrument to control the money supply and credit expansion. Nevertheless, at present there are only three countries, namely, Malaysia, the Philippines and Sri Lanka, that use this instrument more actively than other countries. This is reflected in the more frequent changes in the level of minimum required reserves. Changes in the required reserve ratio of each country in the SEACEN region, except Myanmar for which the data and information are unavailable, can be briefly discussed as follows.

4.1 Indonesia

In Indonesia, according to Wardhana (1962), [2] prior to May 1957, foreign exchange banks as well as other commercial banks maintained their own cash reserve ratio as they were not required to observe any ratio by the Bank Indonesia. Since then, in view of the continuous inflationary pressures, the Monetary Board felt that a regulation governing the restrictions of creits operated by private

1. Bank Indonesia, Report for the Financial Year 1974/1975, p.32.
2. Wardhana, A., *Monetary Problems of an Under-developed Economy: with Special Reference to Indonesia,* unpublished dissertation submitted to University of California, University Microfilms International, 1962, pp. 165-166.

credit banks [1] was necessary. That is, all private credit banks were required to observe a minimum ratio of 30 per cent between the amount of cash assets and the amount of time and demand deposits and bill payable. In addition to the 30 per cent reserve requirement, banks had to invest 10 per cent of their cash assets (plus balances with the Bank Indonesia) in Treasury notes and bills. These regulations did not apply to private credit banks with time and demand deposits and bills payable of less than Rp. 75 million.

This initial imposition of minimum required reserves was not forceful enough to curb the credit expansion. [2] This was because the banks were in the position of excess liquidity and the lack of total support from the government as Bank Indonesia's restrictive monetary policy by imposing the required reserves was counteracted by the granting of credit facilities by the Ministry of Finance to private enterprises (including national private banks). As such, in December 1958, the Monetary Board had to introduce two regulations to restrict the expansion of credit. First, a credit ceiling to the amount of loans outstanding as of November 30, 1957 was imposed on all banks. Second, all foreign exchange banks and private non-foreign exchange banks were required to deposit 50 per cent surplus cash in a "Special Account" with Bank Indonesia. These combined regulations, however, did not produce any significant results. In April 1959, the Monetary Board again raised the portion of the ready cash to be deposited on the banks' "Special Account" with the Bank Indonesia from 50 per cent to 75 per cent. The figures on banks loans and advance, however, did not seem to show the presence of the restrictive influence of the legal minimum reserve requirement and the "Special Account" regulation.

During 1959-1970, when the pressure on inflation and expansion of money supply eased due to the introduction of a balanced budget system, the reserve requirement was rarely used as the authorities relied mainly on credit ceiling and other policy instruments. The required reserve ratio was thus kept at 30 per cent of current liabilities.

However, in November 1971, in order to preserve monetary stability and after having observed the development of bank credit under inflationary pressures, Bank Indonesia revised the cash reserve requirement ratio in Rupiah currency. With respect to time

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1. Bank Indonesia, Decree of the Monetary Board, Number 28, May 28, 1957.
2. When obligatory reserve ratio was imposed the amount of total loans and advances declined from Rp. 4,963 million in March 1957 to Rp. 4,232 million in June 1957. The fall, however, was short-lived and bank credit continued to expand after that date. (Wardhana, *Op.cit.*, p. 166).

and savings deposits, the cash ratios were raised from 3 per cent to 5 per cent in the case of private commercial banks, private development banks, private savings banks and regional development banks; and raised from 3 per cent to 10 per cent in the case of state commercial banks, state development banks, state savings banks and foreign banks. These new provisions became effective from January 5, 1972. [1] In addition, to make sure that the provisions concerning cash ratio and required deposits with Bank Indonesia in Rupiah currency and the cash ratio in foreign exchange would produce the desired result, Bank Indonesia in October 1971 imposed a 3 per cent penalty rate per month on contraventions regardless of how many times such contraventions occurred within a given month. [2]

During the first oil shock in 1973, Bank Indonesia stipulated a new provision on minimum reserve requirements in foreign exchange for foreign exchange banks. The new provisions were intended to reduce the inflow of short-term funds from abroad as a result of the oil export boom, by the additional requirement of making liquid instrument in foreign exchange available by the exchange banks. The basic differences between the new and the former provisions were: [3]

(a) The component of 150 per cent of commitments on L/Cs which 10 per cent of the loans had been received was adjusted to 100 per cent import guarantee, 100 per cent time and savings deposits and 100 per cent loans received in the new provision;

(b) The component of liquid instruments in the new provision shall be cash, deposits with Bank Indonesia, current accounts with correspondent banks abroad and call deposits with correspondent banks abroad. Current accounts with foreign exchange banks (domestic) and 50 per cent of the balance of realizable bills of exchange shall not be cleared any more; and

(c) The foreign exchange banks which were formerly obliged to maintain minimum reserve to the extent of 50 per cent of the amount of current liabilities will under the new regulation maintain 30 per cent of such liabilities on which at least 1/3 of the amount has to be deposited in U.S. dollars with Bank Indonesia.

1. Bank Indonesia's Circular Letter No. 4/531/UPPB/PbB and No. 4/532/UPPB/PbB, ddo. November 23, 1971.
2. Bank Indonesia's Circular Letter No. 4/442/UPPB/PbB, ddo. October 7, 1971.
3. Bank Indonesia, *Report for the Financial Year 1973/74*, p. 28.

As the resurgence of the inflationary pressure became clear in 1974/1975 due to a rapid expansion in money supply, Bank Indonesia took steps to establish new requirements for minimum reserve level in Rupiah and in foreign exchange in order to combat the high inflation. Under the new regulations, current foreign exchange liabilities were defined to include foreign exchange obligations to non-residents, import guarantees based on Banker's L/Cs both in foreign exchange and in Rupiah, and foreign exchange deposits to back-up merchants' L/Cs. In addition, the foreign exchange reserve requirement ratios, originally set at 10 per cent on all current liabilities, were raised to 30 per cent. Of this amount, 30 per cent of total current liabilities to non-residents (both foreign exchange and Rupiah) and 10 per cent of the obligations in foreign exchange to residents must be held in the form of deposits with Bank Indonesia.

Moreover, in order to encourage banks to comply with minimum liquidity requirements, both in Rupiah and foreign currency, Bank Indonesia decided to grant interest on both clearing accounts in Rupiah and on excess deposits of banks in foreign currency in accounts held with it.

The use of reserve requirement to restrain expansion of credits and other assets of deposit money banks as mentioned above was continued to 1977/1978. In 1977, in spite of the improved economic and monetary situation, there were some indications that investment activities started to slacken. Therefore, the government introduced a set of important measures at the end of December 1977, to stimulate the expansion of investment and export activities. Among the measures introduced was the lowering of the minimum reserve requirement which happened for the first time. The details of this new reserve requirement measure could be enumerated as follows: [1]

(a) The minimum level of reserves legally required to be maintained by banks against their current liabilities, in Rupiah or foreign exchange liabilities, was decreased from 30 per cent to 15 per cent of the total current liabilities.

(b) In line with the reduction in the required reserve ratio, an adjustment was made in the portion of time and savings deposits which was subject to reserve requirement.

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1. Bank Indonesia, *Report for the Financial Year 1977/1978*, p. 31. It is a decision of Bank Indonesia Board of Directors No. 10/108/Kep/Dir/UPPB and No. 10/109/Kep/Dir UPPB and Bank Indonesia Circular Letter No. SE 10/12/UPPB and No. SE 10/13/ UPPB, all dated December 30, 1977.

(c) The minimum required deposit to be maintained with Bank Indonesia was decreased from 10 per cent to 5 per cent of total current liabilities.

(d) The amount of foreign exchange reserves required to be deposited with Bank Indonesia against current liabilities in foreign exchange was reduced from 10 per cent to 5 per cent of total current liabilities to residents and from 30 per cent to 15 per cent of total current liabilities to non- residents. Current liabilities to residents include all such liabilities in foreign exchange plus Rupiah import deposits, while current liabilities to non-residents include all such liabilities both in Rupiah and foreign exchange.

In line with the above changes in reserve requirement, Bank Indonesia also adjusted the interest rate on Rupiah or foreign exchange excess reserves deposited with Bank Indonesia.

The December 1977 measures had their intended effects as reflected in a more rapid expansion in bank credit albeit within the limits considered compatible with monetary stability (and a reduction of inflationary pressures). Until June 1, 1983, the monetary policy of the authorities still relied upon the direct control over money supply and interest rates. Money supply was controlled through credit ceiling policy and interest rates on savings and time deposits as well as lending rates for the state-owned banks were set by the monetary authorities. Moreover, the government channeled earnings from oil revenues into the banking system through low-interest liquidity credits to achieve a variety of development objectives. The liquidity credit system which was initially aimed at controlling the aggregate growth of credit was then intended to direct credit toward particular sectors. [1]

The pre-June 1983 financial policy, according to Sihotang (1988), weakened the incentives for greater resource mobilization by financial institutions and distorted signals for credit allocation. As the government savings fell due mainly to the decline in oil price, it became apparent that the existing system limited the expansion of credit, thereby curbing the growth of investment. To improve the financial system, on June 1, 1983, the government initiated a finan-

1. Sihotang, Kilian and others, *Monetary Policy and Developments in Indonesia since 1983*, background paper for the Eighth Pacific Basin Central Bank Conference on Economic Modelling; Kuala Lumpur, Malaysia; November 11 - 15, 1988, p. 1.

cial reform package whose main objectives were (a) to reduce the dependence of the banking system on Bank Indonesia liquidity credit, (b) to stimulate private financial savings, (c) to improve the allocation of financial resources, and (d) over the longer term, to improve bank performance through increased competition, and assist in meeting the needs of the economy for more sophisticated financial services. Consequently, state banks were allowed to set their own deposit and lending rates, credit ceilings were abolished, and the number of programs qualifying for Bank Indonesia liquidity credits was subsequently reduced.

Moreover, since June 1, 1983, the granting of bank credits was henceforth based on the ability of the banking system to mobilize funds from the public and bank credits were classified into high priority and non-priority credits. Liquid credit or refinancing facilities were made available only to high priority sector, of which the term and conditions were fixed by Bank Indonesia. For non-priority credits, commercial banks were free to determine their own terms and conditions. Nevertheless, in the case where banks faced a temporary shortage of funds, Bank Indonesia, as lender of last resort, would provide discount facilities.

The monetary package introduced in June 1983 succeeded in enhancing the capability of commercial banks to mobilize funds and encourage competitiveness among banks. It was also aimed at encouraging active role of monetary policy through the use of indirect monetary instruments, such as open market operations through the issuance of the central bank securities, discount facilities, reserve requirement and moral suasion rather than direct credit control.

In October 27, 1988, the Indonesian government introduced a new package of measures in financial, monetary and banking sectors so as to maintain the strength of the financial system and to increase economic growth at high rates as well as to enlarge employment opportunities. The package was aimed at raising the level of domestic fund mobilization, encouraging non-oil exports, increasing the effectiveness of monetary policy, and improving the capital market. Among the other measures, the new package also involved the reduction of the legal reserve requirement ratio from 15 per cent to 2 per cent of the third party funds which consist of demand deposits, time and savings deposits, and other liabilities. The reduction of the legal reserve requirement ratio was intended to free banks' idle funds in the form of required reserves held by the Central Bank, so that the banking system has an increased capacity to extend credits.

In summary, Bank Indonesia has used reserve requirement as a monetary instrument only sparingly. More often, the change oc-

curred in varying the fraction of time and savings deposit rather than the level of the reserve ratio and minimum bank reserve levels in Rupiah and in foreign exchange themselves. So far, the level of legal reserve was changed only twice from 30 per cent to 15 per cent in December 1977, and from 15 per cent to 2 per cent in October 1988. Open market operations, on the other hand, have been used as a monetary instrument actively.

4.2 Malaysia

The Central Bank of Malaysia or Bank Negara Malaysia, was founded in 1959. Its primary monetary objective is to regulate the nation's supply of money and credit. To meet these objectives, the general monetary instruments used include open market operations, discounting arrangements, variation in reserve and liquidity requirements, the foreign currency swap transactions, recycling of Government deposits held with the Central Bank to the banking system, and moral suasion. In addition, the Central Bank authorities also have at their disposal other instruments that influence the availability and cost of money and credit more directly, namely, changes in interest rates, credit ceilings and a range of direct measures which have more impact on money and credit.

In Malaysia, the Central Bank so far has relied mainly on variations in the statutory reserves and liquidity requirements and periodic changes in the interest rate prior to October 23, 1978, when interest rate was regulated by the Central Bank. These have been supplemented by discounting arrangements and whenever appropriate, credit control as well as selective credit guidelines and the use of moral suasion. The narrow scope of the domestic money and capital markets has so far precluded the effective use of open market operations. After the interest rate was liberalized in 1978, the Central Bank also employs swap transactions with the commercial banks as and when necessary to level the condition in the inter-bank market. In addition, there is selective credit measure to channel the availability and influence cost of credit to priority sector, to help achieve the Nation's twin economic goals of the eradication of poverty and the restructuring of society. [1]

With regard to variation in reserve requirement, in Malaysia like in other SEACEN countries such as Indonesia, Nepal and Singapore, commercial banks were required to comply with liquid

1. Bank Negara Malaysia, Annual Report 1986, pp. 129-130.

asset requirements in addition to cash reserve requirement. Cash reserves or statutory reserve requirement are to be held by each bank at the Central Bank against its sight, savings, time and other deposit liabilities as may be approved by the Ministry of Finance on the recommendation of the Board of Bank Negara Malaysia. The statutory reserve requirement have been applied to finance companies and merchant banks since 1972 and 1975, respectively. With respect to minimum liquidity requirements, each bank has to hold a minimum amount of liquid assets defined as a percentage of sight, savings, time and other deposits and such other liabilities as may be determined by the authorities, and such percentage may be altered. The development of statutory reserve requirement and minimum liquidity requirements in Malaysia can be highlighted as follows:

a. The Statutory Reserve Requirement

So far, the statutory reserve requirement which is defined as the ratio against bank's eligible liabilities has been uniformly applied to all the commercial banks within the banking industry. [1] Similarly, all finance companies maintain a uniform ratio, as do the merchant banks, against their respective eligible liabilities. Although the ratios required in all these three institutions were set differently originally, they have been unified since May 1989.

Historically, the maintenance of statutory reserves by the commercial banks, which is provided for in the Central Bank of Malaysia Ordinance, 1958, has been effective since January 1959, but the Central Bank resorted to using it only infrequently. [2] At that time, the ratio was fixed at 2.5 per cent of total deposit liabilities. It was subsequently raised to 4 per cent in December 1959. Since then, it had remained unchanged until February 1965, when it was lowered to 3.5 per cent to facilitate adoption by the banks, which were at various stages of development at that time, and to unify banking legislation throughout the country.

Statutory reserve requirement was first used as an instrument of monetary regulation on July 16, 1969, when it was increased from

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1. However, the Central Bank has the legal power to require different categories of banks to maintain varying ratios in accordance with the size or the location of banks or both. The objective is to facilitate selective credit control should the need arise. In addition, the Central Bank is also empowered to prescribe for a commercial bank, if necessary, separate and different reserve requirements on different types of deposit liabilities, including foreign currency deposits.

2 Bank Negara Malaysia, Money and Banking in Malaysia, Kuala Lumpur, 1984, p. 169. Prior to 1959, all the commercial banks operated without having to observe statutory reserves and minimum liquidity requirements.

3.5 per cent to 5 per cent to dampen the excess liquidity in the banking system due to the export boom. This increase in reserve ratio had the effect of reducing the liquidity of commercial banks by 43 million ringgit. [1] Nevertheless, the reserve ratio was kept under constant review in order to ensure that the supply of loanable funds would not be restricted in the event an increase in the demand for credit became necessary.

During 1971 and early 1972, commercial bank liquidity improved substantially and remained at a fairly high level, while domestic bank credit continued to expand at a relatively slower rate. In these circumstances, the Central Bank decided to leave unchanged the liquidity requirements in order to encourage the commercial banks to channel the increased liquidity into domestic credit operations. Therefore, the reserve requirement of 5 per cent remained unchanged. Similarly, the minimum liquidity ratio remained unchanged at 20 per cent while the minimum proportion of savings deposits which commercial banks were required to invest in Government securities and housing loans remained at 50 per cent. At the same time, the Central Bank decided to lower interest rates to stimulate demand for bank credit. [2] In addition, the Central Bank was particularly concerned to ensure that the ample excess liquidity be quickly channelled into productive investment and it was conveyed to the commercial banks that unless they utilized their funds effectively in this direction, increasing amounts of their excess liquidity would be frozen. To reinforce its policy directive, the Central Bank increased the statutory reserves from 5 per cent to 8.5 per cent against total deposits of commercial banks with effect from October 16, 1972.

The unorthodox move on October 16, 1972, which still left the banks with ample liquidity, was designed to stimulate loans demand and to maintain monetary stability. The rationale behind this is explained by Aghevli and others (1984, p. 801) that, "if more of the bank's excess liquidity assets were impounded in noninterest bearing cash reserves, the banks would try to maintain their profitability by lending out their remaining excess liquidity assets". As a result, by the the end of 1972, bank loans and advances had increased considerably and this pattern was maintained up to the early part of 1973. [3]

Since then, the Central Bank has used the statutory reserve as an

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1. Bank Negara Malaysia, *Annual Report 1969*, p. 14.
2. Bank Negara Malaysia, *Annual Report 1971*, p. 16.
3. Bank Negara Malaysia, *Annual Report 1973*, p. 36.

instrument of monetary regulation frequently. From the level of 8.5 per cent in October 1972, the ratio for the commercial banks was raised to 10 per cent in January 1974, and it had been reduced in four steps to 5 per cent by December 1978.

It was raised to 10 per cent in 1974 because of the emergence of inflationary pressure which was considered to be the most serious problem at that time. This measure combined with other monetary and fiscal measures resulted in the reduction in price level. However, by the last quarter of 1974, the country began to experience difficulty in its external sector as the recession in the industrial countries became increasingly severe. Accordingly, the objective of monetary policy was shifted back to an expansionary stance by increasing the availability of money and credit through a liberal provision of reserves to the banking system. Therefore, the statutory reserves was reduced to 8.5 per cent of total deposits, with effect from February 17, 1975. The policy was pursued until 1978 and the statutory reserves for banks in Malaysia were lowered three times to 7 per cent on May 18, 1975; to 6 per cent on February 16, 1976; and to 5 per cent in December 1978. This 5 per cent reserve ratio remained unchanged until April 1985, when the economy experienced tight liquidity situation. The ratio was then lowered to 4 per cent effective from April 15, 1985 in a move to improve liquidity in the financial system. As the tight liquidity persisted until mid-October 1986, the statutory reserve ratio was further reduced by one-half percentage point from 4 per cent to 3.5 per cent. The ratio was nevertheless increased to 4.5 per cent and 5.5 per cent on May 2 and October 16, 1989, respectively. The current ratio of 6.5 per cent is effective since January 16, 1990.

The statutory reserve ratio for finance companies and merchant banks were introduced much later than the commercial banks'. It was also set at lower level at the beginning. For finance companies, the ratio was first applied to them in October 1972 at 2.5 per cent, compared with 8.5 per cent for commercial banks at that time. In line with their later date of commencement of operations, merchant banks were first required to maintain a statutory reserve ratio of 1.5 per cent in February 1975. Since these introductions, the ratios for finance companies and merchant banks were adjusted many times in line with the revisions made for the commercial banks although at a lower level. The disparity in their ratios were, however, removed in stages. Since February 1986, the ratio for merchant banks was raised to be on par with finance companies at 3 per cent. On May 2, 1989 the ratio of these two institutions were adjusted to the same level as that of commercial banks at 4.5 per cent. Henceforth,

a uniform ratio has been prescribed to these three groups of financial institutions. This move is intended to promote more equitable competition among them.

b. Minimum Liquidity Requirements

Prior to 1969, the minimum liquidity requirement has been applied only to commercial banks. It has been imposed on finance companies since the coming into force of the Borrowing Companies Act in 1969. The liquidity requirements which the commercial banks and finance companies were required to maintain against their deposit liabilities were restructured in March 1979 on the basis of five basic principles, namely: equity, that is, the burden of meeting liquidity requirements set by the Central Bank will rest on the ultimate user of deposits; avoidance of double counting; uniformity of treatment of deposits; elimination of artificial markets; and, limits to be placed on the inclusion of certain types of liquidity assets to encourage the development of secondary markets in monetary instruments.

The minimum liquidity requirement in Malaysia has been essentially used as a prudential regulation to ensure that the banking institutions are able to meet demand for funds by their depositors at all time. In fact, its role in the monetary control purposes has been deemphasized in order to promote secondary market trading of Government securities. This is highlighted by the fact that long-term Government securities were designated as eligible for inclusion as liquid assets in the computation of the ratio.

Accordingly, variation in minimum liquidity requirement is infrequent compared to the statutory reserve requirement ratio. The ratio for commercial banks have been set at the level 17 per cent against eligible liabilities since May 2, 1989 while it has remained at 10.0 per cent for finance companies and 10/12.5 per cent for merchant banks since then. (The 12.5 per cent applies to the NCD-issuing merchant banks only).

Besides the minimum liquidity requirements, the commercial banks are obliged to invest at least 50 per cent of their savings deposits in the form of approved housing loans, Government securities (other than Treasury bills), and small loans under the Credit Guarantee Scheme of the Credit Guarantee Corporation.

4.3 Nepal

Like Malaysia, the commercial banks in Nepal have to maintain both minimum statutory reserves and liquidity ratios. However, the

first directive in imposing the reserve requirements on commercial banks by the Central Bank (Nepal Rastra Bank) was issued in September 1966 about 10 years after the commencement of Central Bank operations in April 26, 1956. Commercial banks were directed to maintain with the Nepal Rastra Bank a minimum cash reserve of 8 per cent of their total deposit liabilities. This measure was initiated to protect the interests of depositors as well as to limit credit expansion. Before the minimum cash reserve ratio became effective in September 1966, commercial bank credit, exclusive of investment in Government Securities, had risen from 59 per cent of deposits at mid-July 1963 to 130 per cent at mid-July 1966. It was found necessary to control the fast rate of credit expansion. Yet the banks had a cash reserve ratio of 11.4 per cent at mid-July 1966. For the subsequent five years, a steady improvement was recorded in the cash reserve of the banks. Only since 1971/72 did their reserve position show a declining trend. By mid-July 1974, the cash reserve ratio fell to 9.9 per cent owing particularly to a significant rise in credit to Government enterprises and private sector. The latter also caused a severe drop in the liquidity ratio of the bank to 31.1 per cent at mid-July 1974. Therefore, in October 1974 commercial banks were directed to maintain a minimum 32 per cent of total deposits in the form of liquid assets. Cash reserves to be maintained with the Central Bank which was reduced to 5 per cent of deposits was made part of liquid assets. [1]

Besides the 5 per cent statutory reserve ratio, the commercial banks were required to invest the remaining 27 per cent in two categories of assets: 5 per cent of deposit liabilities in the form of Government securities, and the remaining 22 per cent of deposit liabilities in the form of other liquid assets. These compulsory liquidity requirements which were introduced in October 1974 were revised on March 27, 1975, when unprecedented pressure for credit was felt from the public enterprises and the private sector. As it became apparent that these were demand pressures, the Central Bank felt it necessary to relax the liquidity requirements first by 5 per cent and subsequently by another 2 percentage points. Moreover, following the significant upward revision in the interest rate structure in April 1975, the Central Bank abrogated the minimum liquidity clause on February 12, 1977. Only the 5 per cent statutory reserve ratio remained in force.

In 1978, when there was inflationary pressure due to the rapid

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1. The SEACEN Centre, Monetary Policy in SEACEN Countries, Mimeograph, December 1979, p. 225.

domestic credit expansion as well as deterioration in the balance of payments position, Nepal Rastra Bank raised the statutory reserve ratio from 5 to 7 per cent against the total deposit liabilities of commercial banks with effect from March 14, 1978 in order to restrict the banks' lending capacity. Moreover, in order to secure total compliance of commercial banks with this provision, a special non-operating account was opened to receive such deposits. The owner of Special Deposits would receive interest on their holdings commensurate with the return they could have earned by placing their funds in a similar safe, interest bearing financial instruments.

However, although expansion of bank credit would, to a certain extent, be contained by the increase in the cash reserve ratio, it may not be a strong enough measure to bring down the inflationary pressure and correct the balance of payments problem. To that end, an additional step would have to be taken, such as the credit ceiling which Nepal Rastra Bank decided to set at RS. 2,366.2 million (except foreign bills purchased and discounted at year end). The Nepal Rastra bank has been taking such measures since the financial year 1975/76.

This statutory reserve ratio remained effective at 7 per cent of deposit liabilities until July 16, 1981, when it was increased to 9 per cent, 5 per cent to be held as balances at Nepal Rastra Bank and 4 per cent as cash in vault, the latter being introduced for the first time. This new ruling was found to be more beneficial to commercial banks as they could now utilize their reserves with Nepal Rastra Bank according to their needs.

Effective from the same date, 16 July 1981, Nepal Rastra Bank instructed the commercial banks to compulsorily maintain 25.0 per cent of their total deposit liabilities (including margin and cashier deposits) in the form of liquid assets. [1]

4.4 Philippines

In the Philippines, reserve requirements were imposed on banks from the start of operations of the Central Bank of the Philippines in 1949. At that time, banks were required to put up 18 per cent of demand deposits and 5 per cent of savings and time deposits as reserves in the form of government balances with the Central Bank. The reserve ratio was not altered for almost a decade. It was only in

1. Liquid assets comprise cash-in-hand, compulsory cash reserves with Nepal Rastra Bank, investment in Government Treasury Bills and Development Bonds and balances held abroad minus government securities pledged with Nepal Rastra Bank and overdraft from Nepal Rastra Bank.

1959 when the reserve ratio was increased at the rate of one percentage point every thirty days until it reached 21 per cent. [1] The stagewise increase in reserves was one of the stabilization measures instituted by the Central Bank in that year following its decision to phase out exchange control. During the period of 1949-1960, the thrust of policy was towards foreign exchange control to solve the problems of high imports, dwindling foreign exchange reserves and spiralling of prices.

In the 1960s, exchange control was partially lifted and the exchange rate was increased with the introduction of a multiple exchange rates system. Full liberalization of exchange rate became effective in 1962 and the exchange rate was allowed to seek its own level. The thrust of the stabilization policy was thus moved away from exchange rate to traditional monetary instruments, namely, rediscounting, reserve requirement and open market operations. As a result, the required reserve ratio was changed seven times during the period 1960-1969. The reserve requirement was reduced, together with the lowering of the discount rate, from 21 per cent to 18 per cent and subsequently to 16 per cent. In May 1961, reserve requirement was lowered further to 15 per cent. However, in 1962 when monetary restraint was needed, reserve requirement was raised to 19 per cent. In the following year, 1963, the reserve requirement against savings and time deposits was raised from 5 per cent to 6 per cent. The resultant low reserve position of banks was constrained in 1963 by allowing increased utilization of cash in vaults as part of available reserves from a proportion of 50 per cent to 100 per cent. The reserve ratios for each type of deposits remained at that level for two years until May 1965, when the differentiating system was changed to a uniform rate for all types of deposit liabilities and the ratios were changed to 10 per cent against total deposit liabilities in order to eliminate the tendency for banks to encourage depositors to shift from demand to savings and time deposits. The required reserves were raised again in 1969 and the following year to 20 per cent with at least 25 per cent of reserves to be kept in the form of cash in vault in order to reduce excess liquidity incurred mainly by the heavy public sector spending.

The reserve requirement remained at 20 per cent against all types of deposit liabilities of banks throughout the 1970s and the early 1980s. In the meantime, the Central Bank relied on open

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1. According to the Cental Bank Regulations "the Monetary Board may prescribe increases in reserve requirements provided these shall be made gradually and shall not exceed 4 percentage points in any 30-day period."

market operations and started to issue its own Certificate of Indebtedness for this purpose in 1970. In addition, it introduced the reserve requirement on deposit substitutes [1] in 1973, and foreign currency deposit in 1977. The Central Bank of the Philippines also started paying interest on banks' deposit balance with the Central Bank at an annual rate of 3 per cent in 1978.

The imposition of 5 per cent reserve requirement on deposit substitutes was an outcome of the rapid increase in this type of liabilities in the 1970s. [2] The move was made in light of the fact that deposit substitutes were not subject to the Usury Law ceiling on interest rates. It also helped to ensure that the non-bank financial institutions which were also the major issuers of deposit substitutes but had hitherto not come under the supervisory control of the Central Bank were subject to some control of the Central Bank. [3] This ratio remained at 5 per cent until January 1976 when the Central Bank issued Circular No. 496 subjecting deposit substitutes to further increase in reserve requirement from 5 per cent to 20 per cent, at a rate of 1/2 per cent per month. At the same time, interest rate ceilings on regular savings and time deposits were raised, to help compete with the growth of deposit substitutes.

Apart from imposing the reserve requirement against deposits of banks and non-bank financial institutions, in January 1972, the Central Bank imposed the required reserves against all foreign currency deposit liabilities not falling under the provisions of Circular No. 343 regardless of whether such deposits are demand, time or savings deposits. The rate was stipulated as 10 per cent of the total amount of such liabilities.

In 1983-1986, the effectiveness of changing reserve requirement was put to test when the country faced high domestic liquidity resulting in inflation rates as high as 50 per cent. In 1982, to prevent the build-up of excess liquidity, the programmed reduction in the reserve requirement scheduled for 1983 was suspended. Originally, the programmed reduction in reserve requirement against short-term deposits and deposit substitutes was intended primarily to lower the cost of holding reserves and thereby, serve as an incentive for banks to pass this benefit on to their clientele in terms of lower lending rates. However, as the problem of excess liquidity became

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1. Deposit substitutes are money market instruments.
2. Central Bank Circular No. 388, 13 November 1973, which required all banking institutions to maintain a 5 per cent reserves on their deposit substitutes.
3. Central Bank Circular No. 389, which imposed a 5 per cent reserve requirement on the deposit substitute liabilities of non-bank financial institutions.

more pressing, the programmed reduction had to be reverted to an increase. Meanwhile, the scheduled increase in reserve requirements on long-term deposits and deposit substitutes of universal banks, commercial banks, government specialized banks, and quasi-bank and non-bank financial intermediaries was continued as originally planned.

The imbalance in the external sector was also becoming a matter of great concern by the authorities in 1983. It was decided that the problem could be solved by tighter demand management measures, including reduced credit availability, higher reserve requirement and domestic interest rates, a major cut in government expenditure, and a higher level of taxation which inevitably affected output. Thus, in the fourth quarter of 1983, the reserve requirement on short-term liabilities of all banks was raised by a full 5 percentage points on a staggerred basis from September to December 1983. For short-term deposit liabilities, the reserve requirement increased to 23 per cent for commercial banks and 13 per cent for thrift banks. Moreover, marginal deposits on all types of imports were also subject to a 100 per cent reserve requirement starting November 1, 1983. The increase in reserve requirement limited the capacity of the banking sector to expand credit. However, to compensate banks for the opportunity cost of holding a higher level of reserves, a 3 per cent interest on bank reserves deposited with the Central Bank was reinstituted, to be paid on bank balances only up to the minimum cash reserves required for deposits with the Central Bank.

In early 1984, the economy still faced excess liquidity and inflationary pressure. Thus, in April 1984, the reserve requirement against traditional deposit substitute liabilities of all types of banks was raised by 1 percentage point, this brought required reserves for short-term deposit liabilities of commercial banks and thrift banks to 24 per cent and 14 per cent, respectively. These reserve ratios were the highest ever since the inception of the Central Bank in 1949. Such increases signalled the thrust of monetary policy towards greater restraint in credit and liquidity growth to achieve external stability and reduce inflationary pressure. Accordingly, in order to compensate banks for the resulting increase in the intermediation cost brought about by the upward adjustment in reserve requirement, the interest rate on deposit balances with the Central Bank that was reinstituted in 1983 was raised from 3 per cent to 4

per cent in June 1984. This move made the reserve position deposited with the Central Bank at par with the interest-bearing-reserve-eligible government securities. [1]

In 1985, the Philippine economy, like most other countries, faced a recession. Therefore, the monetary and credit policies during the year pursued the principle objectives of the Economic Recovery Program, namely, the reestablishment of a sound financial climate, the control of inflation, and the strengthening of the economic base for a sustainable and lasting growth. Among the various monetary measures, the reserve requirement against short-term liabilities of commercial and thrift banks, including the Land Bank of the Philippines and the Philippine Amanah Bank, was reduced from 24 to 23 per cent, effective 30 September 1985. While further easing credit by releasing additional funds for lending purposes, this measure also reduced the intermediation cost of banks which contributed to the further drop in lending rates of commercial banks.

For further support of efforts to stimulate investment, monetary policy measures in 1986 were eased by a further gradual reduction in the reserve requirement of banks' short-term deposit liabilities by 1 percentage point in May and another 2 percentage points in August 1986. In addition, the reserve requirement on long-term deposit instruments was likewise reduced from 6 per cent to 5 per cent on December 1, 1986. The reduction of the reserve requirement not only enhanced the availability of loanable funds but also reduced the intermediation cost of banks, which contributed to a further lowering of interest rates to help spur investment.

Most recently, the reserve ratio on long-term deposits was increased from 5 per cent to 20 per cent during June to November 1989. At the same time, the reserve ratio on short-term deposits was reduced by one percentage point in September and October to the present level of 20 per cent, thus unifying reserve requirement on all types of deposits of commercial banks.

4.5 Singapore

The Monetary Authority of Singapore was established by the Monetary Authority of Singapore Act in 1970 and commenced operations in January 1971. Like other central banks, MAS is empowered to impose the reserve requirement on commercial banks (and finance companies) in the form of minimum cash balances with the Author-

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1. Central Bank of the Philippines, Annual Report 1984, p. 49

ity and minimum liquid assets which could be described briefly as follows:

(a) Minimum Cash Balances: According to the Law and as at the end of 1989, all banks are required to hold a minimum cash balance with the Monetary Authority of Singapore of not less than 6 per cent of the liabilities base. In addition, MAS also prescribes the guidelines for the computation of liabilities base, the maintenance of minimum cash balance and the penalty for reserve deficiency.

(b) Liquid Assets: MAS prescribes in writing a minimum amount of liquid assets to be held by banks expressed as a percentage of their liabilities base. A grace period of a fortnight is allowed for compliance. Liquid assets include notes and coins which are legal tender in Singapore, balances with MAS in excess of the minimum cash balance, Singapore Government securities net of the repos operation, and bills of exchange maturing within 3 months which are accepted or endorsed by banks in Singapore.

At present, the minimum liquid assets for all banks remains at 18 per cent since the last adjustment in April 1987. It stood at 20 per cent during the period 1976 to April 1987. For finance companies, the ratio has been maintained at 10 per cent since 1976, although there were changes in the definition of liquid assets and in other minor regulations. The liquidity ratio has been used for purposes other than as an instrument of monetary policy. Apart from being essentially a prudential ratio, it is used to promote the development of a commercial bills market, as reflected in the increase from 3 per cent limit on commercial bills qualifying as liquid assets of banks to 4 per cent in April 1987.

However, there were occasions when the reserve requirement was used as a short-term measure to curb excessive liquidity arising from speculative capital inflows. In January 1973, a special deposit requirement on banks' net interbank foreign liabilities was imposed. Banks were required to place a percentage of their net interbank foreign borrowings as special deposits with MAS. Such percentage was raised when capital inflows continued to increase and was lowered when inflows declined. In March 1974, the requirement was lifted when the foreign capital inflows no longer posed a problem.

With regards to the cash reserve requirements, against the backdrop of high inflation period in 1973, the minimum cash reserve

requirement ratio for banks and finance companies were raised from 3-1/2 per cent in 1960 to 5 per cent on August 6, 1972, and to the peak of 9 per cent in March 1973. Concomittant with the increase in cash reserve ratio, MAS had introduced a special deposit ratio of 5 to 9 per cent for the net foreign fund in 1972-1973. [1] These measures helped to reduce the rapid rate of monetary expansion at that time, and hence ease the inflationary pressures.

After the initial thrust of anti-inflationary policies being actively pursued from mid-1972 through 1973, monetary expansion continued to be kept under a firm rein in early 1974. Meanwhile, while anti-inflationary, the overall economic policy was concerned with growth. Thus, to stimulate economic growth, emphasis was placed on channelling of the financial resources to productive sectors. Especially, as the rate of inflation slackened during the year, the tight monetary policy was gradually easing to help stimulate growth. From mid-1974, the new monetary measures included the release of more funds for credit expansion by the banking system. In July 1974, the minimum cash balance of banks and finance companies was reduced by 1 percentage point to 8 per cent.

Further relaxation of monetary policy took place towards the end of 1974. The minimum cash balance of banks and finance companies was further reduced from 8 per cent to 7 per cent. This ratio was further reduced to 6 per cent in July 1975 to stimulate investment, and remained unchanged until the present. Since 1981, the emphasis in the conduct of monetary policy has shifted away from targets for interest rates and money supply growth to the exchange rate. Underlying this shift is the view that the exchange rate is a relatively more effective anti-inflation instrument in the context of a small and open economy like Singapore's.

4.6 Sri Lanka

The reserve requirement in Sri Lanka has been imposed against the commercial banks' deposit liabilities since the inception of the Central Bank of Ceylon in 1950. In terms of the Monetary Law Act, such reserves shall be proportional to the volume of deposit liabilities and shall generally take the form of Rupee deposits with the Central Bank. The Monetary Board may, however, use its discretion to permit the maintenance of any part of the required reserves in the form of assets other than Rupee deposits with the Central Bank.

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1. This ratio was reduced to 3 per cent on December 20 1973. It was further reduced to zero with effect from March 5, 1974.

The Central Bank, moreover, has the power to prescribe and modify the reserve ratios against different types of deposit liabilities subject to a minimum of 5 per cent and a maximum of 20 per cent in the case of time and savings deposits and a minimum of 10 per cent and a maximum of 40 per cent in the case of demand deposits. While increases in the reserve ratios in respect of existing deposit liabilities should be made in a gradual manner, subject to a ceiling of 4 percentage points in any one month and, except in extraordinary circumstances, a 14 days notice to commercial banks, the reserve ratios in respect of increases in deposit liabilities from a given date can be made in any manner. In special circumstances, such as during critical inflationary periods, the reserve ratios can be increased up to 100 per cent of any increase in deposits after a specified date. However, where any commercial bank is required to maintain a minimum reserve against any class of deposit liabilities in excess of the statutory maximum for that class of deposit liabilities, the Central Bank shall pay to that bank interest on the amount in excess at a rate not higher than the Central Bank's lowest discount rate for the time being in operation. The effect of raising reserve ratios is to limit the volume of money created by the credit operations of the banking system.

At the time the Central Bank commenced business in August 1950, the reserve ratios were fixed at 10 per cent against demand deposits and 5 per cent against time and savings deposits. For the first time in January 1951 was the reserve requirement used as a monetary instrument by the Central Bank when it increased the required reserve ratio with respect of demand deposits from 10 per cent to 14 per cent in order to reduce excess liquidity in the economy resulting from balance of payments surplus during the Korean boom. However, when the Korean boom collapsed thereafter with the fall in commodity prices and the decrease in the balance of payments surplus and subsequently, a contraction in money supply that followed led to a sharp reduction in the liquidity of the banking system. With the view to easing this tight money situation, the major step taken by the Central Bank was to reduce the reserve requirement to the level existing before January 1951, that is, in September 1953, the required reserve ratio on demand deposits was reduced to 10 per cent. No changes were made in the ratios against savings and time deposits.

The reserve requirement was used by the Central Bank more intensively to restrict the credit operations of the banking system in 1960, which was the second occasion since the commencement of operations by the Central Bank. In August 1960, the reserve ratio

was raised from 10 per cent to 12 per cent of demand deposits while keeping the ratios against savings and time deposits the same. The increase in the reserve ratios was made in conjunction with several other monetary and fiscal measures which had to be taken to arrest the continuing decline in Sri Lanka's external reserves. The object of the Central Bank policy was to restrain bank credit and to preserve the foreign exchange reserves available as far as possible for essential purposes. [1]

In addition to the general reserve requirement of 12 per cent of demand deposits, on February 10, 1961, commercial banks were required to maintain a special reserve of 38 per cent against any increase in their demand deposits over the level of such deposits at the close of business on February 1, 1961. (No changes were made in the reserve requirement against time and savings deposits and the existing ratio remained unchanged at 5 per cent). This in effect, meant that for all new demand deposits, the required reserve ratio was 50 per cent. The purpose of such high increase in reserve ratios was to curb commercial bank liquidity. Such a policy, moreover, became necessary in view of the very heavy drain on the country's external assets which was accompanied by a steady increase in the domestic price level. However, in implementing the special reserve requirement, the Central Bank agreed to allow commercial banks to keep a part of these reserves in their own vaults rather than as deposits at the Central Bank. This facility referred to as the till cash concession was given as the Central Bank was of the view that, some banks, particularly, the indigenous ones, required a large volume of cash to meet the needs of their branch networks. If all the required cash was to be deposited with the Central Bank, commercial banks would often be seen short of cash for meeting their daily requirements, thus necessitating frequent transport of cash between branches at very short intervals. The special reserve requirement helped to reduce pressure on the balance of payments, particularly during the first half of the sixties.

The special reserve requirement was used until the Central Bank withdrew it on April 7, 1975. This removal meant a sharp reduction in the effective rate of reserves maintained by commercial banks and thereafter commercial banks were required to maintain as reserves only 12 per cent of demand deposits and 5 per cent of time and savings deposits. However, this reduction in the reserve requirement was combined with a progressive withdrawal of the till

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1. Karunatilake, H.N.S., The Variable Reserve Ratio as an Instrument of Central Bank Policy, the Colombo Apothecaries Co. Ltd., 1963, p. 224

cash concession enjoyed by these banks. Effective December 1974, the till cash concession was withdrawn in full and from that date onwards, the whole of the required reserves has to be maintained in the form of deposits with the Central Bank. This move was aimed at providing a more effective management of credit and monetary policy and to improve administration of the reserve requirement.

The reserve requirement ratios remained unchanged at 12 per cent of demand deposits and 5 per cent of time and savings deposits until June 19, 1981, when they were raised from 12 to 14 per cent against demand deposits and from 5 to 6 per cent against time and savings deposits with a view to siphoning off the excess liquidity in commercial banks provided by accrual of deposits, the objective of the Central Bank being to reduce the sharp expansion in credit which was aggravating the inflationary pressures in the economy. In order to further tighten the money market conditions and raise the cost of funds, effective on August 17, 1981, the Bank rate was raised from 12 per cent to 14 per cent and the penal rates on Central Bank accommodation to commercial banks were also raised from a range of 20 to 30 per cent to a range of 21 to 30 per cent per annum. The Bank rate and penal rate were later reduced to 13 per cent and 20 per cent per annum, respectively, in March 1983.

In August 1983, the growth rate of private sector credit reached the highest ever recorded level. The unprecedently high expansion in credit increased inflationary pressures in the economy and necessitated corrective action. Against this background, as a temporary measure, the Central Bank imposed a credit ceiling on commercial bank advances to the private sector with effect from November 1, 1983 with a view to containing the rapid increase in credit levels. However, the credit ceiling was withdrawn on November 30, 1983; and instead, more traditional types of policy instruments were introduced for the continuation of the restrictive credit policy. Accordingly, the statutory reserve requirement was raised from 14 to 16 per cent against demand deposits and from 6 to 8 per cent against time and savings deposits. In addition, for the first time, the Central Bank introduced a reserve ratio of 16 per cent on unutilized balances of overdraft with effect from December 16, 1983. Furthermore, effective November 14, 1983, the Central Bank reduced the availability of accommodation under the penal rate from 90 per cent of the value of collaterals submitted by banks to 50 per cent and further to 25 per cent on the November 22, 1983. Effective November 23, 1983, the grant advances at the penal rate were discontinued and commercial banks were required not to exceed the quotas allocated to them under the Bank rate for temporary liquidity require-

ments. Such monetary measures reduced the sharp increase in credit in the latter half of the year and helped to maintain the monetary expansion at a more manageable level of 22 per cent.

In 1984, apart from maintaining minimum reserve requirement against demand deposits, time and savings deposits and unused balances of overdraft, the commercial banks were also required to maintain special reserves under a reserve tranche system against increase in deposits over the level as at November 14, 1984. [1] This requirement was terminated with effect from February 28, 1986.

Since then, the reserve requirement had been changed twice, the first was the increase of the required reserve against demand deposits from 16 per cent to 18 per cent on August 9, 1985. This ratio has been reduced to 10 per cent and uniformly applied to all deposit liabilities since August 7, 1987.

4.7 Thailand

The Bank of Thailand was officially established by the Bank of Thailand Act 1942. As a central bank, it has the responsibility of maintaining the activities of the monetary sector in conformity with the desirable economic objectives of the country. The Bank of Thailand may use the monetary policy instruments to achieve the monetary objectives, derived from the statutory or administrative enactment as defined in the Bank of Thailand Act (1942) amended in 1979 and the Commercial Banking Act (1961) amended in 1979. These powers, among others, include: (i) vary the legal cash reserve requirement in relation to the volume of deposits; (ii) vary the ratio of risk assets to capital; (iii) prescribe the ratios of specified assets to capital; (iv) set maximum interest rates on various types of deposits; (v) regulate the proportion of loans to one borrower; and (vi) examine accounts of commercial banks.

Regarding the cash reserve requirement, the Law stipulates that a commercial bank shall maintain a cash reserve in proportion to its

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1. Required reserves in respect each tranche are as follows:
   - upto 3 per cent - nil and up to 6 per cent - 5 per cent of increase;
   - 6 per cent and upto 10 per cent - 10 per cent of increase; and
   - over 10 per cent - 15 per cent of increase.

2. Deposits and borrowings are specified as follows:
   a) total deposits;
   b) demand deposits;
   c) time deposits;
   d) total borrowings; and,
   e) each type of borrowings.

deposits and/or borrowings[2] at not less than the ratio prescribed by the Bank of Thailand with the approval of the Minister of Finance. The ratio prescribed shall not be less than 5 per cent or more than 50 per cent and may relate to one type or more of deposits and/or borrowings jointly or separately. Also, the Bank of Thailand may prescribe that Thai Government securities be included as part of such cash reserves. In addition, for the purpose of computation of deposits or borrowings, the Bank of Thailand with the approval of the Minister of Finance may prescribe that the total of unused balances of overdrafts be included as part of any one type of deposits or borrowings. In case it is necessary for the purpose of maintaining the stability of the domestic currency, the Ministry of Finance has the power to prescribe that commercial banks maintain a special cash reserve at the Bank of Thailand at not less than the ratio prescribed by the Minister, in addition to the maintenance of a cash reserve.

Nevertheless, since the introduction of cash reserve requirement, the Bank of Thailand has never imposed required reserve ratio on unused balances of overdrafts and a special cash reserve at the Bank of Thailand in addition to required reserves against total deposits. With respect to the cash reserve, it has only been prescribed against the total deposits of commercial banks, although the composition of reserves was changed as and when necessary. Moreover, though the Bank of Thailand is given the authority to change the reserve ratio to suit the prevailing economic situation within the limits of 5 to 50 per cent against the deposit liabilities, it has been seldomly used in the past. The unwillingness of the Bank of Thailand to exercise this vested power possibly lies in the uneven distribution of the excess reserves among individual banks. It is argued that small banks usually hold less excess reserves than the large ones and the action taken by the Central Bank concerning the variation in cash reserve requirement puts a severe strain on them. Similarly, the power to prescribe the ratios of specified assets to capital and to regulate the proportion of loans to one borrower was practically limited in application and hardly exercised. The area in which the Bank of Thailand is active, on the other hand, in the power to set maximum interest rates on various kinds of deposits and loans.

Since the commencement of the operations of the Bank of Thailand in 1942, the cash reserve ratio against total deposits of commercial banks was changed infrequently. The composition of the reserves, however, was changed relatively more frequently. The cash reserve ratio remained at 10 per cent from 1946 till 1962 when

there was a decrease to 6 per cent, and it remained at 6 per cent until early 1969.

In 1969, the balance of payments gap was substantially widened due to a decline in net receipts from services and transfers although the growth rate of export value was slightly higher than the growth of imports, that is, 9 per cent against 8 per cent. As a result, net foreign exchange reserves fell by 988 million Baht. Money supply increased at a low rate despite significant increases in government deficits and commercial bank credits to the private sector. The Bank of Thailand undertook two policy measures partly to counter the rising trend in imports by reducing aggregate demand and partly to adjust domestic money conditions in line with foreign money markets. These low measures include (i) raising the cash reserve ratios from 6 per cent to 7 per cent, and (ii) adjusting the Bank discount rate from 7 per cent to 8 per cent in January and 11 per cent in June 1969.

In 1970, since the growth rate in imports was modest, the policy objective was not directed at solving the balance of payments problem but rather to adjusting domestic money situation in line with developments abroad and to improve upon the existing structure of commercial banks. Measures undertaken included: (i) raising the ratio of capital funds to risk assets from 6 per cent to 7 1/2 per cent mainly to strengthen the position of commercial banks; (ii) lowering the bank discount rate from 11 per cent to 9 per cent per annum on March 1970 in line with developments in the overseas money markets; and (iii) lowering the rate of commercial bank loans and discounts extended to any person from 33 1/3 per cent of the capital funds to 30 per cent to reduce the degree of risks involved in commercial bank lendings.

In 1971, the overall economic situation was normal whilst in 1972, there was considerable crop damage, particularly to rice and maize, leading to a decline in agricultural output. The pressure on the balance of payments, on the other hand, was considerably relieved due to the increase in volume and prices of major export commodities. Therefore, the emphasis of the Bank of Thailand's policy was on alleviating the impact of the crop damage on investment expenditure by adopting moderately expansionary monetary policy. These included (i) reducing the Central Bank discount rate from 9 per cent to 8 per cent, and (ii) improving the terms and conditions of rediscounting facilities, particularly in connection with agricultural bills. With respect to the latter, the rate of rediscounting agricultural bills was reduced from 7 per cent to 5 per cent. These two measures were considered as a means to stimulate

private investment by reducing the cost of funds available to investors.

In 1973, in contrast to the economic conditions prevailing in 1972, the economy showed a remarkable recovery, registering 8.7 per cent growth rate in GDP. There was a notable increase in investment expenditure as well as production in the industrial sector. A large expansion in commercial bank credit to the private sector was observed and considered to be a cause of the sharp rise in money supply. Inflationary pressure exerted itself through an unprecedented increase in the general price level of 15.5 per cent as measured by the consumer price index and 22.8 per cent by the wholesale price index.

As a measure to slow down the expansion of credit, money supply, and to reduce the inflationary pressure, the Bank of Thailand had taken a remedial action by enforcing a more restrictive monetary policy. To this end, in August 1973, the Bank revised its discount rate from 8 to 10 per cent. Nevertheless, the expansion of domestic activities in 1973 was so strong that a moderate restrictive policy adopted in August 1973 proved insufficient. Therefore, in early 1974, a second round of relatively more restrictive monetary policy measures was adopted. These measures were: (i) an increase of cash reserve ratio from 7 per cent to 8 per cent, (ii) an increase of the Bank discount rate from 10 per cent to 11 per cent, and (iii) an increase of the interest rate chargeable by commercial banks for certain categories of lending by 1 per cent. As a result of these restrictive monetary measures, the economy began to show signs of entering a recessionary period.

As a consequence, in the second half of 1974, the Bank of Thailand reversed its original policy by easing the tight money situation, by increasing the amount of credit granted to commercial banks against Government bonds and reducing the legal cash reserve ratio from 8 per cent to 7 per cent.

The cash reserve ratio remained at 7 per cent till the present time, reflecting the fact that it was used as a prudential measure rather than as a monetary instrument. Nevertheless, since June 22, 1979, the commercial banks had been allowed to include cash-in-hand as part of cash reserves to the maximum of 2.5 per cent of total deposits in order that banks would have at their disposal more revolving funds to lend to the public. Previously, cash-in-hand was not regarded as a component of cash reserves which consisted of deposits at the Bank of Thailand and Government securities only. However, the ratio of cash reserves remained unchanged at 7 per cent of total commercial bank deposits, with the proportion of mini-

mum deposits at the Bank of Thailand reduced from the minimum of 3 to 2 per cent of total deposits and the rest being unobligated Government securities. The legal reserves at 7 per cent of total deposits and the forms of such reserves remained effective until the present.

Chapter 4

THE IMPACT OF CASH RESERVE REQUIREMENT ON MONEY MULTIPLIER

The focus of this chapter will be on the empirical evidence of the impact of cash reserve requirement on the money multiplier. Although it would be ideal to conduct such an investigation for all the SEACEN countries, our attempt in this direction is hampered by two major factors. The first and most important factor is the lack of variation in reserve requirement in certain SEACEN countries during the period under study. For Singapore, it has been common knowledge that the reserve requirement is used purely for prudential purposes and not as monetary policy instrument. For Thailand, although reserve requirement is used occasionally, it remained unchanged throughout our investigation period. Efforts to extend the study period to include the changes also failed due to changes in the definition of the key variables and the consequent non-availability of consistent data series. The second factor is the lack of monthly data for the key variable which is used in the model. Accordingly, we are left with Malaysia, the Philippines and Sri Lanka to illustrate our quantitative analysis.

This chapter comprises three main sections. It starts with a derivation of the money multiplier and its main components, using the concept of the money supply process. We then proceed to specify the general model in the context of each individual country. The Chapter concludes with a discussion on empirical results which sheds some light on the relative importance of required reserves vis-a-vis other determinants on the money multiplier.

1. The General Model

1.1 Derivation of the Money Multiplier

The money multiplier is derived from the monetary base and money supply identities.

$$B = CP + RD \quad \ldots (1)$$

$$M1 = CP + DD \quad \ldots (2)$$

where B denotes monetary base or high-powered money [1].

CP is currency held by the non-bank public

RD is commercial banks' total cash reserves

M1 is money supply in the narrow sense

DD is demand deposits at commercial banks

Total deposits (TP) are defined as the sum of demand deposits (DD), savings deposits (SD) and time deposits (TD).

$$TP = DD + SD + TD \qquad ...(3)$$

Commercial banks' total cash reserves comprise required reserves (RQ) and excess reserves (RE).

$$RD = RQ + RE \qquad ...(4)$$

Since commercial banks are required to maintain part of their deposit liabilities in the form of reserves, the reserve ratio (r) can be written as,

$$r = \frac{RD}{TP} \qquad ...(5)$$

Alternatively, in terms of required reserve ratio (rq) and excess reserve ratio (re)

$$r = \frac{RQ}{TP} + \frac{RE}{TP}$$

$$= rq + re$$

We also define the currency ratio (c) as

$$c = \frac{CP}{M1}^{2} \qquad ...(6)$$

---

1. The monetary base or reserve money is also referred to as high powered money because any dollar of the monetary base can support several dollars of transaction deposits and, hence, the money supply (Cargill, Thomas F., 1983, p. 141)

2. Preliminary results show that "c" defined as currency over money supply performs much better than that originally defined in the research proposal as currency over demand deposit ratio.

To allow for shifts among various forms of commercial banks' deposits (which are mainly caused by differences in the corresponding interest rates), a shift coefficient (d) is defined as

$$d = \frac{TP}{DD} \qquad ...(7)$$

Substitute (2), (5), (6) and (7) into (1)

$$\begin{aligned} B &= c.M1 + r.TP \\ &= c.M1 + r.d.DD \\ &= c.M1 + r.d.(M1-CP) \\ &= c.M1 + r.d.(M1-c.M1) \\ &= M1\ (c + r.d.(1-c)) \end{aligned}$$

$$M1 = \frac{1}{c + r.d - r.d.c}\ B \qquad ... (8)$$

or $M1 = m1.B$

where m1 is a money multiplier. From equation (8) we can write the formula of the money multiplier (m1) as

$$m1 = \frac{1}{c + (rq+re).d - (rq+re).d.c} \qquad ... (9)$$

It is shown from equations (8) and (9) that changes in required reserves (rq) influence the money supply through the money multiplier (m1). It is recognized, however, that this impact may be cancelled or reinforced by changes in monetary base (B). This implies that the degree of control that the authorities have over the monetary base is also a crucial factor in the effective implementation of the reserve requirement. However, the issue of controllability of the monetary base requires by itself an in-depth analysis and therefore will not be dealt with in this study. In other words, the monetary base will be treated as an exogenous variable in this analysis.

Turning to the money multiplier (m1), it is shown that the currency-M1 ratio (c), required reserve ratio (rq), excess reserve ratio

(re) and the proportion of total deposits to demand deposits (d) are factors determining the change in m1. It should be noted that while changes in rq are within the control of the monetary authorities, c, re and d depend on the behaviour of the commercial banks and the non-bank public. The ability to decompose the impact of each of these parameters is therefore crucial in the assessment of the role of reserve requirement as a monetary control instrument. The method for the decomposition proposed in this study follows that used by Siri Ganjarerndee and Suchada Kirakul (1980). To evaluate the impact of c, rq, re and d, a multiple regression analysis is performed on the log-linear relationship of

$$\ln m1 = a + b_1 \ln c + b_2 \ln rq + b_3 \ln re + b_4 \ln d + \varepsilon \qquad \ldots (10)$$

or alternatively

$$\frac{\Delta m1}{m1} = b_1 \cdot \frac{\Delta c}{c} + b_2 \cdot \frac{\Delta rq}{rq} + b_3 \cdot \frac{\Delta re}{re} + b_4 \cdot \frac{\Delta d}{d}$$

Each component on the right hand side gives an approximation of the impact on money multiplier (m1) attributed by c, rq, re and d.

A priori signs of c, r and d are derived from the theoretical relationship (9) as follows:

$$\frac{\partial m1}{\partial c} = \frac{-(1 - r.d)}{(c + r.d - r.d.c)^2}$$

$$\text{since } r.d = \frac{RD}{TP} \cdot \frac{TP}{DD}$$

$$= \frac{RD}{DD}$$

$$= \frac{(B - CP)}{(M1 - CP)}$$

$$= \frac{(B/M1 - CP/M1)}{(M1/M1 - CP/M1)}$$

$$= \frac{\left(\frac{1}{m1} - c\right)}{(1 - c)}$$

$$= \frac{(1 - c.m1)}{m1.(1 - c)}$$

Substitute r.d in $\frac{\partial m1}{\partial c}$, we will get

$$\frac{\partial m1}{\partial c} = \frac{-\left[1 - \frac{1 - c.m1}{m1.(1 - c)}\right]}{(c + r.d - r.d.c)^2}$$

$$= \frac{-(m1 - 1)}{m1.(1 - c).(c + r.d - r.d.c)^2} < 0 \text{ for } m1 > 1 \text{ and } 1 > c > 0$$

$$\frac{\partial m1}{\partial r} = \frac{-(d - d.c)}{(c + r.d - r.d.c)^2}$$

$$= \frac{-d.(1 - c)}{(c + r.d - r.d.c)^2} < 0 \text{ for } d > 0 \text{ and } 1 > c > 0$$

$$\frac{\partial m1}{\partial d} = \frac{-(r - r.c)}{(c + r.d - r.d.c)^2}$$

$$= \frac{-r.(1 - c)}{(c + r.d - r.d.c)^2} < 0 \text{ for } r > 0 \text{ and } 1 > c > 0$$

This implies that changes in the currency-M1 ratio (c), cash reserves ratio (r) or ratio of total deposits to demand deposits (d), will lead to changes in the money multiplier in the opposite direction.

2. Specification and Application of the Estimation Equation to the Selected SEACEN Countries

2.1 Malaysia

In Malaysia, coverage of the banking institutions, when defined as those which come under the purview of supervision of its Central Bank, extends beyond the commercial banks. In fact, finance companies and merchant banks have emerged as significant members of the banking system in terms of both assets and liabilities. Especially for the finance companies, they have established themselves as serious competitors of the commercial banks. What they lose in financial services such as acceptance of demand deposit, they compensate for by offering relatively higher interest rates.

Accordingly, we have to modify our model to reflect the reality of the situation. Such modification will take into account the fact that (i) different required reserve ratios are applied to commercial banks, finance companies and merchant banks; [1] (ii) the three financial institutions may have different responses to adjustments in required reserve ratios; and (iii) depositors will transfer their deposits from commercial banks to finance companies when the interest rate differential is high enough. Thus, our equation for Malaysia is expressed as follows:

$$\ln MUL1 = a_1 + a_2 \ln MCM1 + a_3 \ln MRQR + a_4 \ln MRERB + a_5 \ln MRERO + a_6 \ln MELBD + a_7 \ln MELFB + a_8 \ln MELMB + M_\varepsilon \quad \ldots (11)$$

where,

MUL1 = money multiplier for M1

MCM1 = currency-M1 ratio

MRQR = statutory reserve ratio for the banking institutions which could be decomposed into the statutory reserve ratio of the finance companies (MRQRF), the

1. Since our empirical study covers the period January 1981 to December 1987, the latest change (effective May 1989) in which statutory reserve ratios of the three institutions have been made equal could not be incorporated in the model. However, this will not affect the general implications of the results since the multicollinearity problem ultimately forced us to include only one reserve requirement (of commercial banks) in the model.

merchant banks (MRQRM) and the commercial banks (MRQRB).

MRERB = excess reserve ratio of commercial banks. As the actual data for commercial banks' excess reserves are not available, balances with the Central Bank is used as a proxy.

MRERO = excess reserve ratio of finance companies, merchant banks and other non-bank financial institutions. Proxies for excess reserves of each of these institutions are: cash in vault for finance companies; cash and balances with commercial banks for merchant banks and other deposits with Bank Negara Malaysia for other non-bank financial institutions.

MELBD = ratio of total eligible liabilities [1] of commercial banks to their demand deposits.

MELFB = ratio of total eligible liabilities [1] of finance companies to commercial banks' total eligible liabilities.

MELMB = ratio of total eligible liabilities [1] of merchant banks to commercial banks' total eligible liabilities.

The determinant variables of the money multiplier shown on the right-hand side of equation (11) can be divided into two main groups. The first group, the required reserve ratio variables (MRQRB, MRQRF, MRQRM), are the policy variables which could be controlled by the Central Bank to influence the demand for reserve money of the banking system. The second group are the market behavioural variables which the Central Bank cannot directly control. They are MCM1, MRERB, MRERO, MELBD, MELFB and MELMB. Since all of these variables affected the money multiplier in the same direction, they will accelerate changes in the money multiplier if they move along the same trend. However, the changes will be decelerated if some of these variables go against the trends of the others. As can be seen from Chart 1 in Appendix 1, the money multiplier (MUL1) during the period 1985 -

1. Total liabilities is used in place of total deposits to reflect the fact that, according to the Central Bank's regulation, the reserve ratio in Malaysia is computed on the basis of total liabilities.

1987 would have fluctuated more rapidly had the shifting variables MELBD and MELFB not moved in the opposite directions.

Results of the preliminary estimation confirm our a priori expectation of the serious multicollinearity problem due to the inclusion of all the three reserve requirement with respect to commercial banks, finance companies and merchant banks. As these statutory reserve ratios more or less move in the same direction and with the absence of evidence suggesting that the reserve requirement has been used exclusively for credit control purpose, only statutory reserve ratio of commercial banks is used in the equation for empirical study to represent the policy variable.

2.2 Philippines

In the Philippines, reserve requirement is applied to all types of banks which are classified as deposit money bank, namely the commercial banks, thrift banks, rural banks and specialized government banks. However, on the basis of deposit liabilities which are essential in the creation of supply of money, commercial banks as a group is the single most important component of all the deposit money banks. Its share in total deposit liabilities nearly reached 85 per cent in September 1987. This together with the fact that our study focusses on the impact of the narrow-money-supply multiplier seems to justify our choice of confining the equation to commercial banks only. It is also obvious that the spotlight on commercial banks alone will help us see the impact better and without any distortions that could arise from the aggregation process. Thus, the model for the Philippines is modified as follows:

$$PMUL1 = b_1 + b_2\, PCM1 + b_3\, PRQRB + b_4\, PRERB + b_5\, PBD1 + P_\varepsilon \quad \ldots (13)$$

where,

PMUL1 = money multiplier for M1

PCM1 = currency-M1 ratio

PRQRB = required reserve ratio for commercial banks, which is the ratio between the total required reserves to total deposits of the commercial banks

PBD1 = ratio of commercial banks' total deposits to demand deposits

PRERB = excess reserve ratio of commercial banks computed from ratio between the excess reserve (available reserves minus required reserves) and their total deposits.

2.3 Sri Lanka

In Sri Lanka, the reserve requirement has been imposed on the commercial banks against both the deposit liabilities and the unused balance of overdrafts. In addition, prior to August 1987, different minimum reserve ratios have been imposed on each class of deposits (demand, savings and time deposits and tranches of deposits). To reflect the intention of the authorities, therefore, the derivation of required reserve ratio to be used in the model is done by averaging all these different required reserve ratios of both deposit liabilities and unused balances of overdrafts. For the excess reserves, it is computed by adding the balance till cash to the excess reserves of the banking system, to acknowledge the fact that banks could create money out of the excess reserves of balance till cash.

Thus, the equation for Sri Lanka could be expressed as:

$$\ln SLMUL\ 1 = e_1 + e_2\ \ln SLCM1 + e_3\ \ln SLRQR + e_4\ \ln SLRER + e_5\ \ln SLD1 + SL_\varepsilon \quad \ldots (14)$$

where,

SLMUL1 = money multiplier for M1

SLCM1 = currency-M1 ratio

SLRQR = required reserve ratio of commercial banks, which is the ratio between total required reserves and the total deposit liabilities of commercial banks

SLRER = ratio of excess reserves (including balance till cash of commercial banks) to total deposits

SLD1 = ratio of commercial banks' total deposit to demand deposits

3. Empirical Results

Ordinary Least Square (OLS) technique is used to estimate the equations as specified in the foregoing section. All the equations

appear to perform well for the period under study (1980 - 1987). The explanatory variables are significant and have the "correct" signs. However, as can be expected from a study involving time series data, the evidences from the estimated equations suggest strong autoregressive problem. The correction is made using the Cochrane-Orcutt technique which is available in the MicroTSP software program.

In all the countries, the currency to money supply (M1) ratio, the required reserve ratio and the deposit shift between demand and savings and time deposits have the strongest impact over the money multiplier. The other variables, though significant, have relatively less effect on the money multiplier. Details of the estimated results by country are reported in the following section.

3.1 Malaysia

For Malaysia, the regression is estimated over the period January 1981 to December 1987. The results of the estimation is shown below :

$$\begin{aligned}\ln(MUL1) = &- \underset{(2.31)}{0.3844} - \underset{(5.55)}{0.5168}\ \ln(MCM1) - \underset{(3.70)}{0.1198}\ \ln(MRQRB) \\ &- \underset{(8.28)}{0.0958}\ \ln(MRERB) - \underset{(1.71)}{0.0106}\ \ln(MRERO) \\ &- \underset{(7.62)}{0.3283}\ \ln(MELBD) - \underset{(1.89)}{0.0593}\ \ln(MELFB)\end{aligned}$$

R2 = 0.9047 S.E. of regression = 0.0158
D.W. = 2.06 No. of observations = 84
Figures in parentheses refer to t-statistics.

Alternatively, the equation above can be written as :

$$\frac{\Delta MUL1}{MUL1} = - 0.5168 \frac{\Delta MCM1}{MCM1} - 0.1198 \frac{\Delta MRQRB}{MRQRB} - 0.0958 \frac{\Delta MRERB}{MRERB}$$

$$- 0.0106 \frac{\Delta MRERO}{MRERO} - 0.3283 \frac{\Delta MELBD}{MELBD} - 0.0593 \frac{\Delta MELFB}{MELFB}$$

One important point of our findings is that the shift in deposits between the demand deposits and time and savings deposits within the commercial banking system has strong bearing on the change in the money multiplier. Its elasticity over our sample period is .3283 and ranks second in terms of the size of all the other factors. In fact, the importance of this factor confirms an earlier finding of the study done by Merris and Chang [1] in 1986. Using annual data covering the period 1973-1985, they found that the movements of the money multiplier are influenced by this shift factor. They postulated that as interest rate peaks over the credit cycle, there are strong incentives to economize holdings of M1, or more specifically the demand deposits, in favor of interest-earning deposits. This leads to a persistent deposit shift which remains long after the high rate subsides.

Another finding that lends support to that of the study done by Merris and Chang is that the shift of deposits between commercial banks and finance companies also plays an important role in determining the money multiplier. Since the deregulation of interest rates of both finance companies in 1973 and commercial banks in 1978, the competition for deposit mobilization between these two major financial institutions has been intense. As such, their deposit shifts have significant influence over the size and composition of the monetary aggregates. In our study, the elasticity of the money multiplier with respect to this shift factor (MELFB) stands at .0593. Although its size is relatively much less than that of the shift between non-and-interest bearing deposits, one should note that the money multiplier in our study is based on the narrow money supply.

In terms of overall importance as measured by the size of the estimated coefficient values, currency to money supply ratio (MCM1) appears to have the strongest impact on the money multiplier. While it may be true that the currency ratio is declining over time due to the increased monetization and technological advancement in the banking sector, our finding suggests that it remains one of the key factors which could determine the degree of success in the conduct of monetary policy. In order to gauge the impact of the change in reserve requirement on money multiplier, one has to be able to accurately predict whether such a move will affect the currency ratio and by how much. In this respect, knowledge on the important factors explaining the currency ratio would provide a useful input to this prediction.

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1. Merris, Randall C. and Cheng Yoke Chang, "The Money Supply Process" *Bank Negara Malaysia Quarterly Bulletin,* Vol. 1 No. 2, September 1986. pp. 81-90.

As mentioned earlier, the factors listed in the foregoing paragraphs are outside the control of the monetary authorities. Of all the factors accounting for the change in money multiplier in our model, only the required reserve ratio could be determined solely by the Central Bank. Our results show that it is the third most important factor with the elasticity of .1198. Although its size is rather modest as compared to the currency ratio and the shift factor (MELBD), its contribution is significantly higher than the excess reserve ratio, the deposit shift between commercial banks and finance companies and the excess reserve ratio of non-bank financial institutions.

3.2 Philippines

With the presence of negative excess reserves of commercial banks during the study period, the equation for the Philippines is estimated in the level form. Thus, the computation of the elasticities of the variables on the right hand side of the equation are based on the conventional definition of point elasticity. [1]

The estimated equation reported below is based on the monthly data for the period 1980-1987.

$$\underset{}{\text{PMUL1}} = \underset{(38.57)}{2.7376} - \underset{(11.80)}{1.9548}\ \text{PCM1} - \underset{(4.13)}{1.6087}\ \text{PRQRB} - \underset{(8.23)}{3.5283}\ \text{PRERB} - \underset{(4.46)}{0.0317}\ \text{PBD1}$$

$R^2 = 0.9682$ S.E. of regression = 0.0472
D.W. = 2.16 No. of observations = 94
Figures in parentheses refer to t-staistics.

Alternatively, in terms of elasticity values, the above equation can be expressed as:

$$\frac{\Delta \text{PMUL1}}{\text{PMUL1}} = -0.9771\ \frac{\Delta \text{PM1}}{\text{PM1}} - 0.2482\ \frac{\Delta \text{PRQRB}}{\text{PRQRB}} - 0.0361\ \frac{\Delta \text{PRERB}}{\text{PRERB}} - 0.1894\ \frac{\Delta \text{PBD1}}{\text{PBD1}}$$

1. Point elasticity is defined as (dy/dx).(x/y). The figures for dy/dx are taken from the estimated coefficient values for the respective independent variables. For x/y, the mean values for each of the variables are used.

Again, the most important contributor to variations in the money multiplier is the currency to money supply ratio (PM1). For the period 1980-1987, its elasticity of .9771 is considered very high, especially when compared with elasticities of the other variables. If we assume a unitary change in all the variables on the right hand side of the equation, the contribution of the currency ratio to the money multiplier will be as high as 67 per cent. The result implies that the currency ratio could be the most important factor in explaining the variations in the money multiplier during the period under study.

Of all the rest of the other variables, the required reserve ratio of the commercial banks has the strongest role to play in explaining the changes in money multiplier during our study period. Its elasticity is 0.2482 and its total contribution will be 17 per cent if we assume a unitary change in the other variables. The next factors in order of importance are the shift factor, PBD1, and the excess reserve ratio, PRERB.

Going by our findings, it should be noted that while reserve requirement is important, the significance of other behavioural factors which lie beyond the control of the monetary authority cannot be discounted. As also found in the case of Malaysia, the stability of the currency ratio and the deposit shifting factor could either reinforce or counteract the desired impact of change in reserve requirement. In the light of the monetary authority effort to increase monetization of the economy and the rapid trend of technological advancement in the banking sector, the currency ratio itself can be expected to undergo a period of structural change. This will, in turn, have great impact on the process of money supply creation and may be detrimental to the success of the implementation of monetary policy.

3.3 Sri Lanka

The equation for Sri Lanka is estimated by using the monthly data for the period 1980-1987. The results are reported below :

$$\ln(SLMUL1) = \underset{}{-\ 0.9389} - \underset{(7.52)}{0.5720}\ \ln(SLCM1) - \underset{(10.66)}{0.3170}\ \ln(SLRQR)$$
$$(7.53)$$

$$- \underset{(5.70)}{0.0940}\ \ln(SLRER) - \underset{(4.84)}{0.2217}\ \ln(SLD1)$$

$R^2 = 0.9498$ S.E. of regression = 0.0227
D.W. = 1.4873 No. of observations = 94

Figures in parentheses refer to t-statistics.

Alternatively, the equation can be written as :

$$\frac{\Delta SLMUL1}{SLMUL1} = -0.5720 \frac{\Delta SLCM1}{SLCM1} - 0.3170 \frac{\Delta SLRQR}{SLRQR}$$

$$- 0.0940 \frac{\Delta SLRER}{SLRER} - 0.2217 \frac{\Delta SLD1}{SLD1}$$

The required reserve ratio in the equation refers to that imposed on the commercial banks. For the excess reserve ratio, it also includes till cash of commercial banks.

The overall results for Sri Lanka are somewhat similar to those of the Philippines. The currency to money supply ratio is the single most important contributory factor to the stability of the money multiplier. However, in terms of the actual size of the elasticity value, it is much lower than the Philippines. Again, if we assume a unitary change in all the right-hand-side variables, the contribution of the currency ratio to change in the money multiplier is 47 per cent. The contribution of other variables under the same assumption are 26 per cent, 18 per cent and 8 per cent respectively for the required reserve ratio, the shift factor between demand and time and savings deposits and the excess reserve ratio.

The empirical results of these three countries are slightly different from the findings for Thailand in the study done by Ganjarerndee and Kirakul in 1980 [1]. Using the monthly data for the period January 1970 to December 1978, they found that the elasticities of the shift factor (total deposit over demand deposit) is the highest, followed by the required reserve ratio, currency to demand deposit ratio and excess reserve ratio. However, when the actual changes in each of the variables are taken into account, the contribution of required reserve ratio to total change in the money multiplier is the highest (36.6 per cent). The currency to demand deposit ratio ranks third in the total contribution, at 15.1 per cent.

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1. Ganjarerndee, Siri and Suchada Kirakul, *Empirical Investigation into the Relationships between Monetary Base and Monetary Aggregates*, DP/80/35 (TH). (in Thai).

Chapter 5

SUMMARY AND POLICY IMPLICATIONS

Although the monetary authorities in all the SEACEN countries are given the power to impose and vary the reserve requirement, they have been using it only sparingly. This is evident in Thailand, Singapore and Nepal, where the levels of required reserve ratios have never been changed since September 1974, July 1975 and July 1981, respectively. Rather, the change in Thailand since 1974 was on the components or forms of the reserves. In Indonesia, the required reserve ratio has been changed only twice since the legal imposition was instituted in 1953, one in 1977 and the other as late as October 1988. For the Philippines, Malaysia and Sri Lanka, on the other hand, the changes in the required reserve ratios have been comparatively more frequent. It is for this reason that in this study these three countries have been selected in the quantitative investigation of the impact of changes in cash reserve requirement on the money multiplier.

In line with developments in most countries all over the world, one of the main aims of financial reforms in the SEACEN countries is to promote a healthy competition among the financial institutions. It is hoped that such a move would bring down the spread between deposit and lending rates and enhance efficiency of the financial system. Accordingly, the SEACEN countries have recently moved towards unifying the reserve requirement ratio. Countries which used to have differentiated reserve requirement according to types of financial institutions or maturities of deposits have dismantled such a practice in favour of a uniform ratio. In Malaysia, for example, the statutory reserve ratios for commercial banks, finance companies and merchant banks have been adjusted to the same level since May 1989. The latest ratio for all the three institutions effective from January 1990 is set at 6.5 per cent. In the Philippines, the ratio for all maturities of deposits including the NOW account at commercial banks have been unified since the end of 1989. With respect to the sizes and locations of financial institutions, all the SEACEN countries have instituted a uniform required reserve ratio for ease of administration.

The empirical results in Chapter 4 show that the changes in

required reserve ratios and other determinant variables (currency ratio, bank's excess reserve ratios and deposit shifting ratios) are significant factors which influence movements of money multipliers. They also illustrate the extent to which each of these factors contributes towards the change in money multiplier. Among these factors, the results in the period under review show that the currency ratio is the most influential factor in the changes in money multiplier for M1 thus representing a major constraint in using reserve requirement. [1] In addition, the extent to which the supply of money could be influenced by changing the required reserve ratios also depends on stability and degree of predictability of the other behaviourial variables which are beyond the control of the monetary authorities. However, the central bank has not normally been using the reserve requirement as a monetary instrument alone, but rather as a supplementary tool to reinforce other monetary policy instruments such as open market operations and the discount rate policy.

In summary, we can conclude that even though there are some weaknesses in the use of reserve requirement as a monetary policy instrument, there is no doubt that the reserve requirement is one of the important instruments for monetary control in the developing countries. A successful use of this instrument depends on various factors such as the ability of the authorities to influence and predict such behavioural factors as the public's demand for currency balances, the commercial banks' demand for excess reserves, and the shifting of deposits among the various maturities or among the types of financial institutions. Also, the central bank must be able to control the monetary base precisely. Even when all these conditions are met, the authorities have to keep in mind that the reserve requirement is too powerful, inflexible, and too blunt an instrument to employ on a continued basis. It is a form of direct control.

Moreover, an increase in required reserves that causes hardship on some banks may have little effect on other banks that are in a more liquid position when the increase is announced. A higher mimimum required reserve ratio may also result in the channelling of more credit to the government sector as holding of government securities could be used as part of the legal reserves composition. In addition, a higher reserve requirement, combined with an already low or zero yield on reserve assets, is in fact a form of tax on the banks. This limits their ability to compete with other non-bank financial institutions which are not subject to similar reserve re-

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1.The results should be interpreted with care, in light of the fact that the analysis is based on an assumption that the central bank is able to control high-powered money.

quirement. Consequently, there will be more and more financial flows. In addition, commercial banks are in a position to transfer this "tax" to their customers, through higher interest rates on loans, or lower interest rates on deposits. As a result, the desired economic goals could eventually be adversely affected.

Areas for Further Research

In the present study, it is aimed at analyzing appropriateness, impact and constraints in using reserve requirement as a monetary instrument in the SEACEN countries. By the very nature of problem, it is necessary to assume that the required reserve ratio is an exogenous policy variable. It must be noted, however, that the success of the instrument also depends critically upon a number of uncontrollable factors; such as currency flows, the commercial banks' demand for excess reserves and shifts in the composition of bank deposits or switches among various types of financial institutions; which tend to weaken the impact of reserve requirement as a monetary control instrument. Therefore, the impact of the disturbances caused by these uncontrollable factors on the level and structure of reserve requirement, which are not evaluated in the present study, should be studied further.

APPENDICES

Appendix 1

Trends of Money Multipliers
and Their Determinants in the
Selected SEACEN Countries

Chart 1

Malaysia : Multiplier for M1

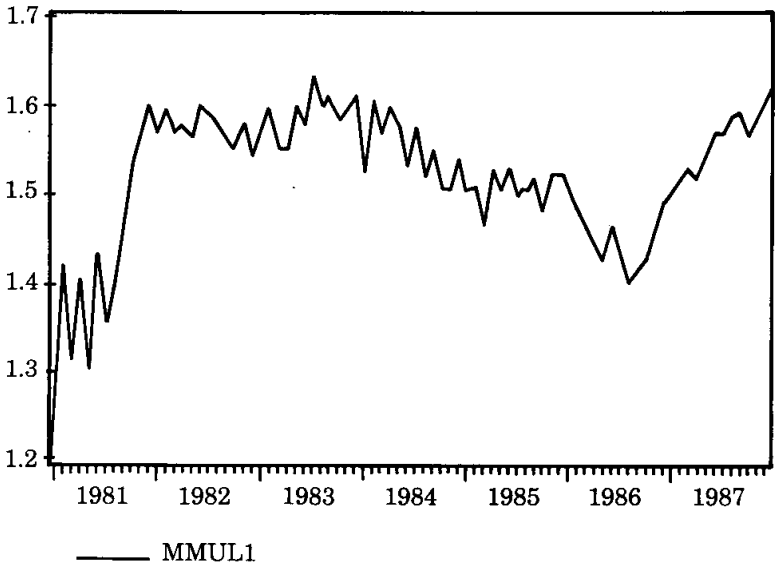


Chart 2

Malaysia : Currency to Money Supply Ratio

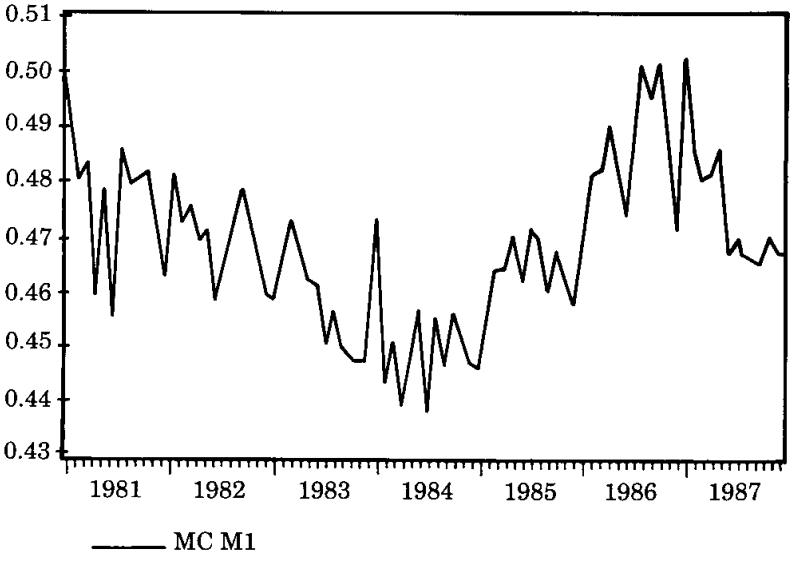


Chart 3

Malaysia : Required Reserve Ratio of Commercial Banks

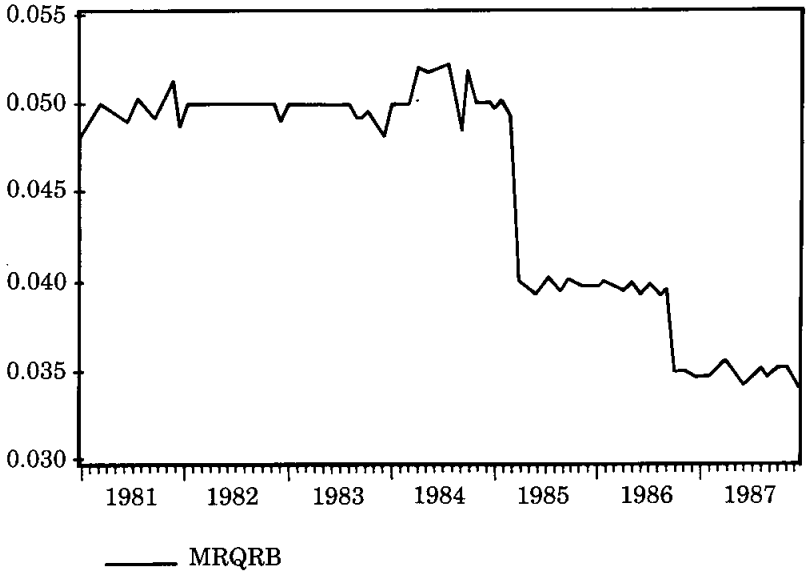


Chart 4

Malaysia : Excess Reserve Ratio of Commercial Banks

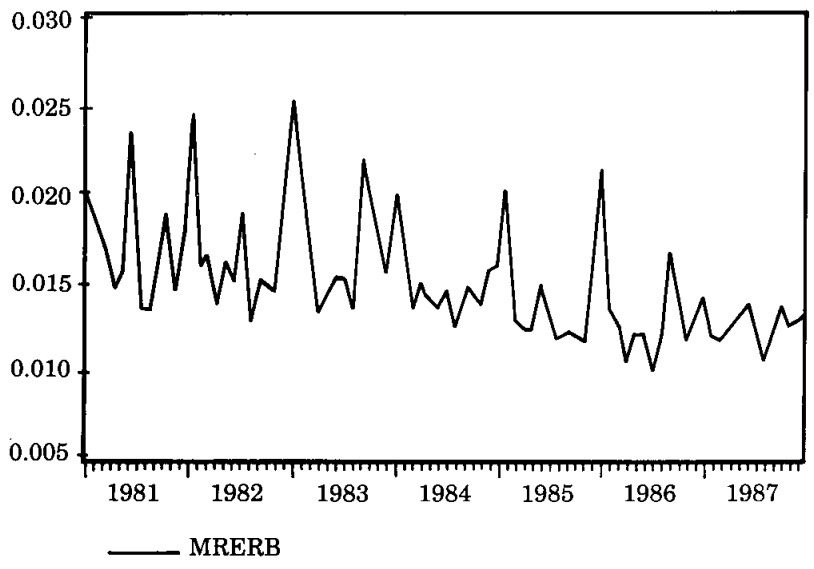


Chart 5

Malaysia :
Excess Reserve Ratio of Non-Commercial Bank Institutions

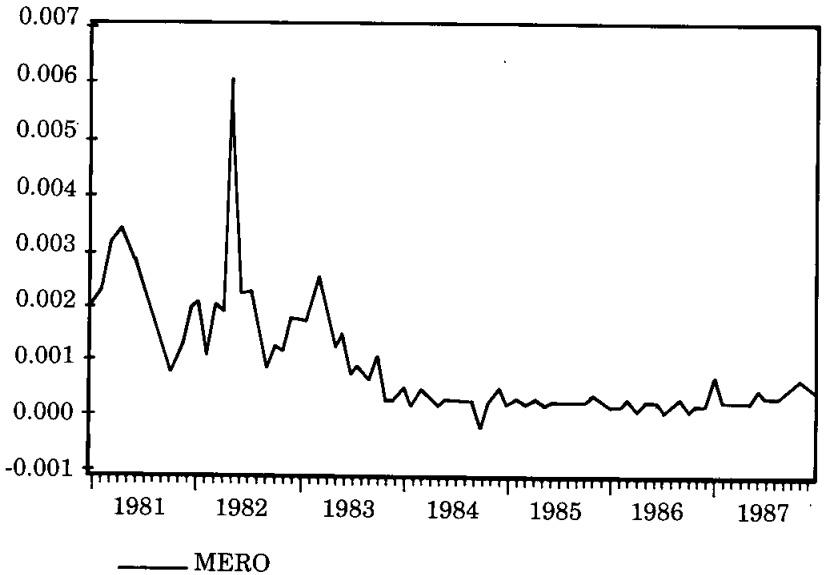


Chart 6

Malaysia : Ratio of Total Deposits to
Demand Deposits of Commercial Banks

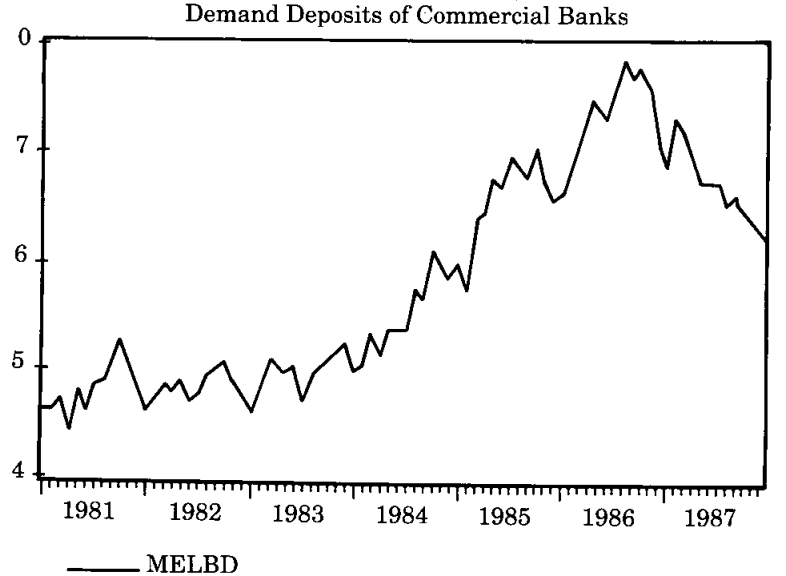


Chart 7

Malaysia: Total Eligible Liabilities of Commercial Banks to Total Eligible Liabilities of Finance Companies

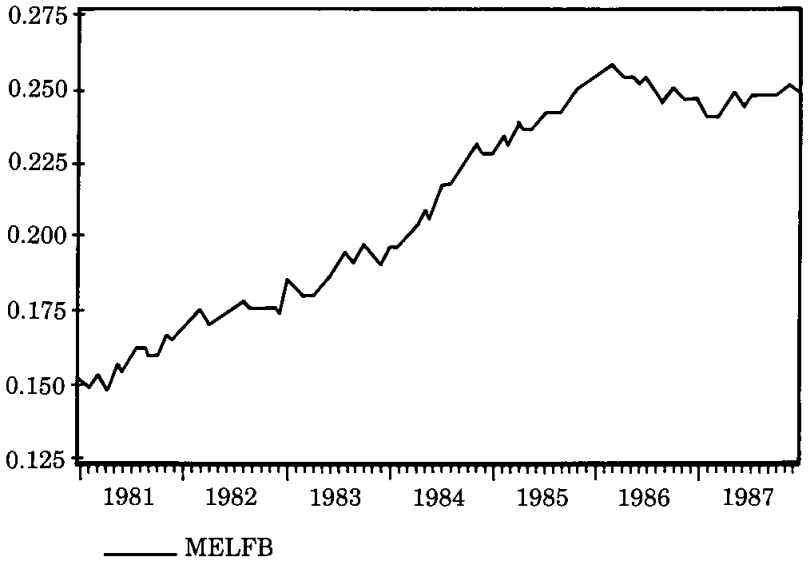


Chart 8

Philippines : Multiplier for M1

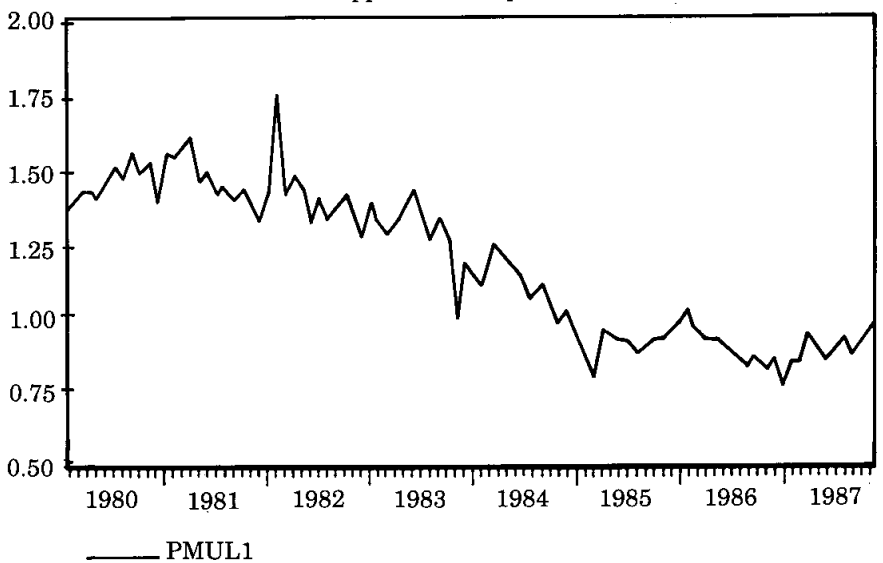


Chart 9

Philippines: Currency to Money Supply Ratio

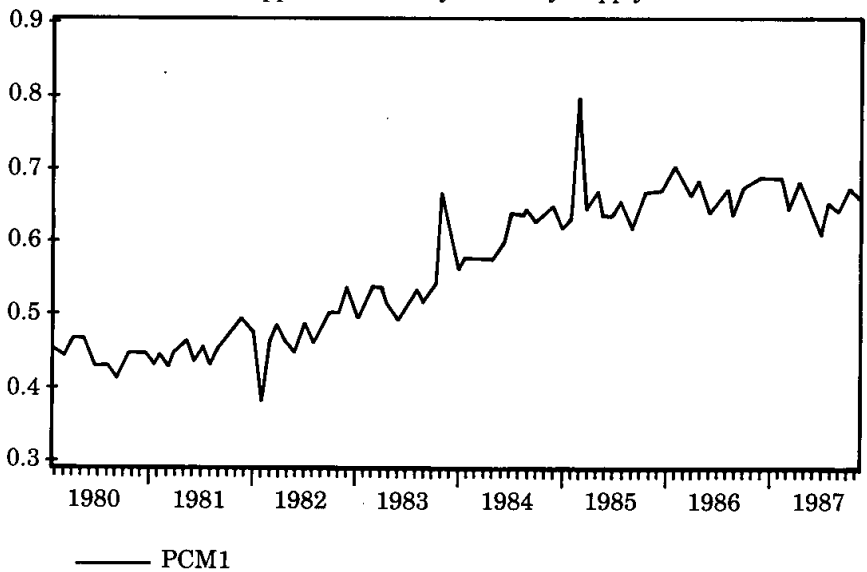


Chart 10

Philippines: Required Reserve Ratio of Commercial Banks

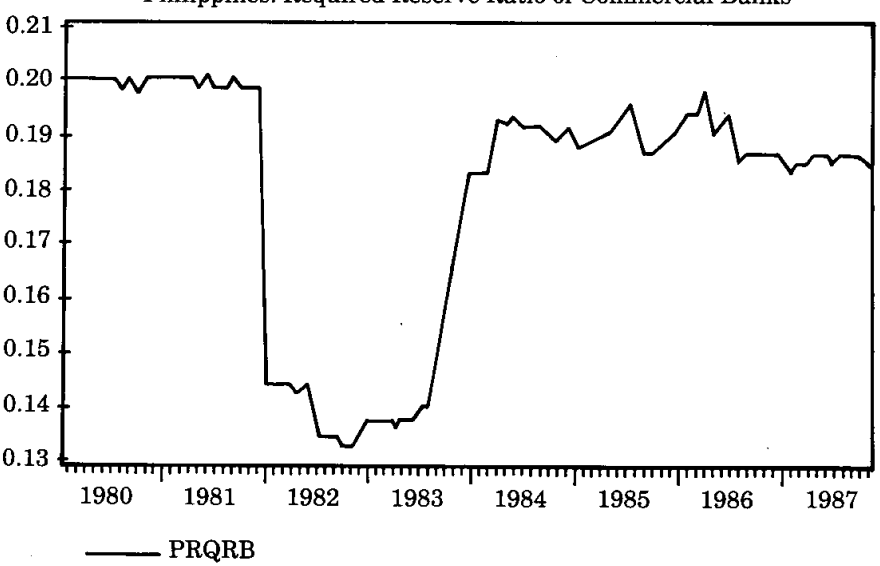


Chart 11

Philippines: Excess Reserve Ratio of Commercial Banks

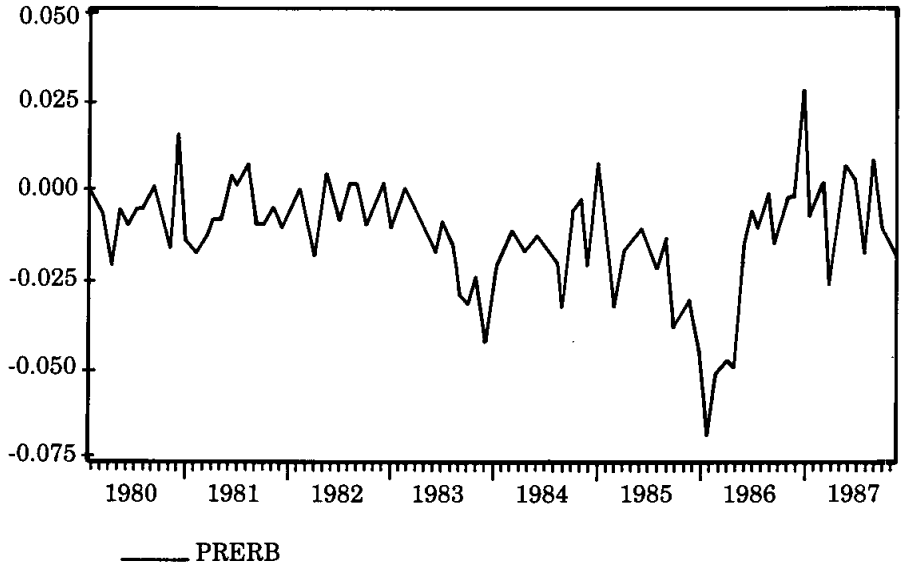


Chart 12

Philippines: Ratio of Total Deposits to
Demand Deposits of Commercial Banks

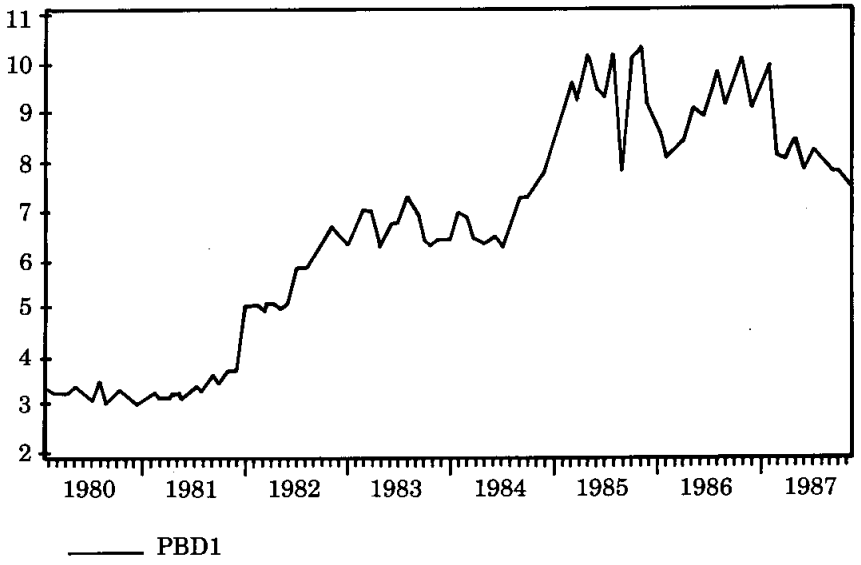


Chart 13

Sri Lanka: Multiplier for M1

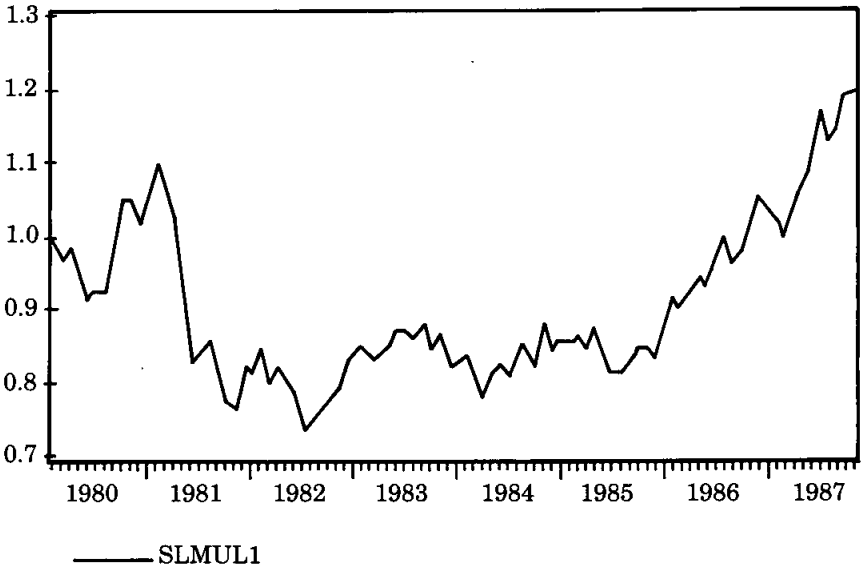


Chart 14

Sri Lanka: Currency to Money Supply Ratio

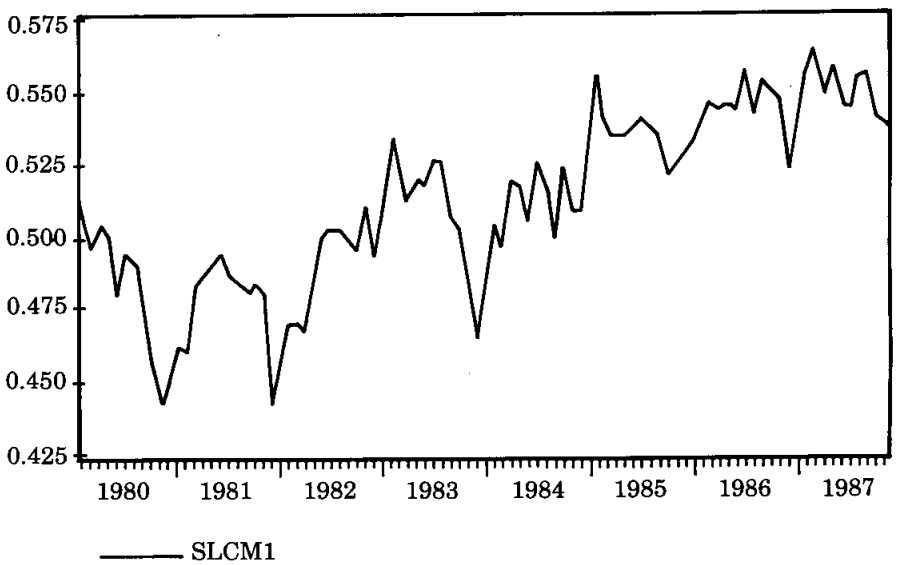


Chart 15

Sri Lanka: Required Reserve Ratio of Commercial Banks

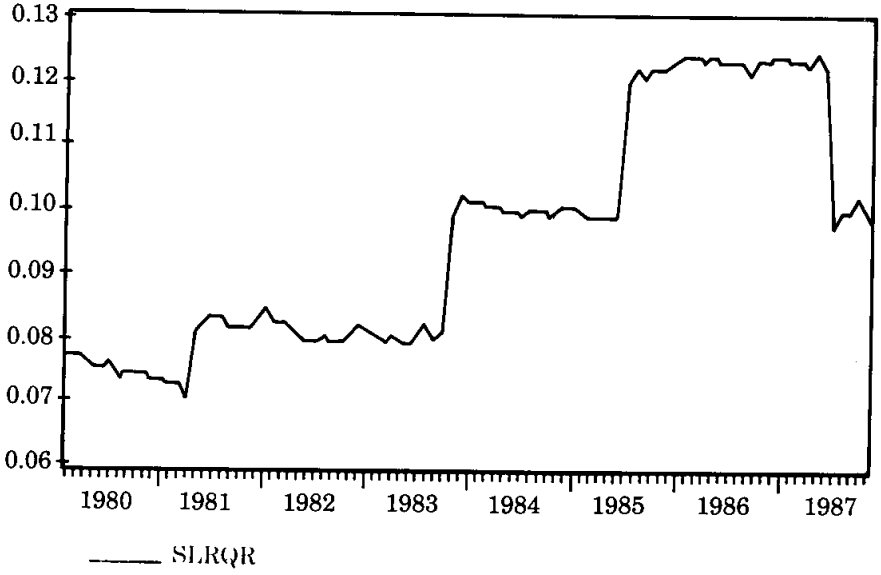


Chart 16

Sri Lanka: Excess Reserve Ratio of Commercial Banks

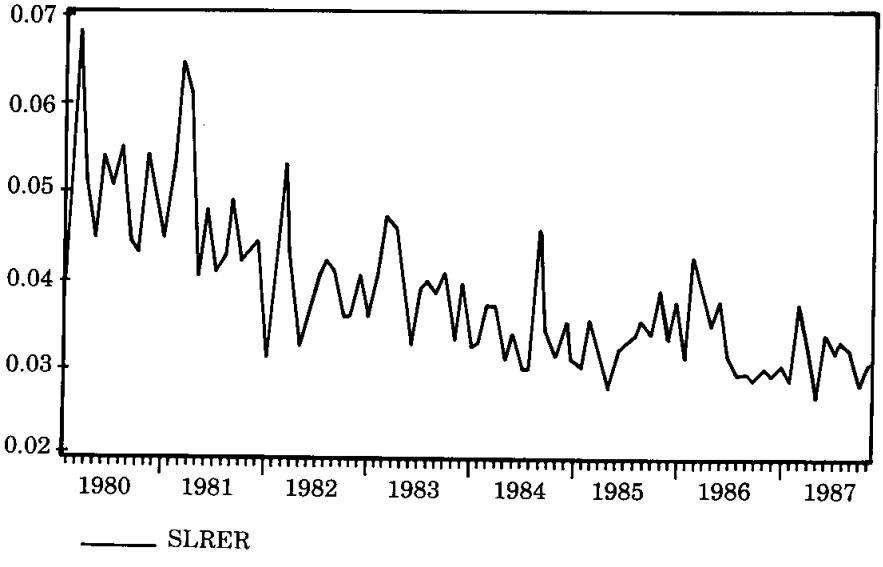
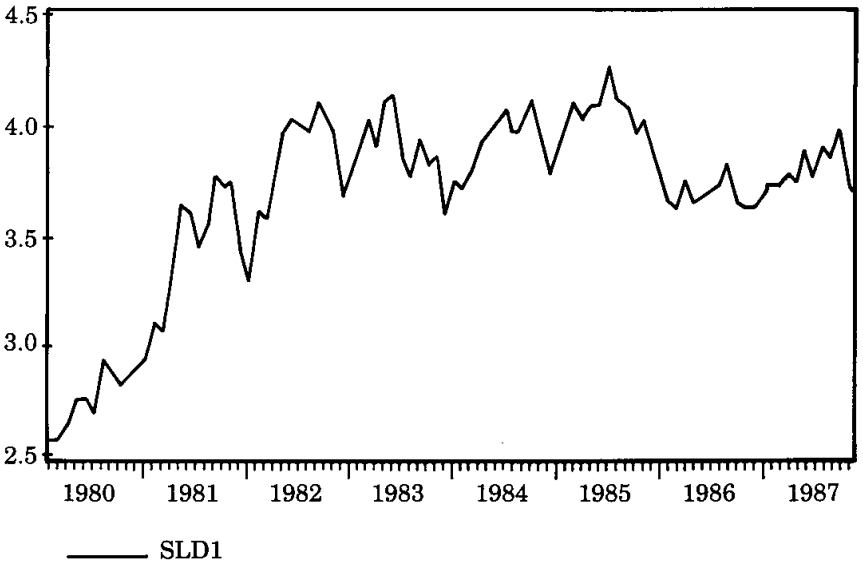


Chart 17

Sri Lanka: Ratio of Total Deposits to
Demand Deposits of Commercial Banks



INDONESIA: SELECTED MONETARY INDICATORS

	1971-82	1983	1984	1985	1986	1987	1983-87
			(Billions of Rupiahs, End of Period)				
Currency	1178.3	3333	3712	4440	5338	5782	4521
Demand Deposits	1464.2	4236	4869	5664	6339	6903	5602
Narrow Money	2642.5	7569	8581	10104	11677	12685	10123
Time & Savings Deposits	1517.6	7093	9356	13054	15984	21200	13337.4
Broad Money	4160.1	14662	17937	23158	27661	33885	23461
Reserve Money	1781.9	5138	5701	6721	8170	9032	6952.4
Private Credit	3936.2	10934	14737	18104	22864	29710	19269.8
Net Foreign Asset	1982.0	8419	11942	14106	15919	18332	13743.6
			(Annual Percentage Growth Rate)				
Currency	28.1	13.6	11.4	19.6	20.2	8.3	14.6
Demand Deposits	29.0	1.2	14.9	16.3	11.9	8.9	10.6
Narrow Money	24.8	6.31	3.4	17.7	15.6	8.5	12.3
Time & Savings Deposits	40.4	79.4	31.9	39.5	22.4	32.6	41.2
Broad Money	26.5	32.4	22.3	29.1	19.4	22.5	25.1
Reserve Money	29.5	25.1	11.0	17.9	21.6	10.6	17.2
Private Credit	35.2	28.4	34.8	22.8	26.3	29.9	28.4
Net Foreign Asset	49.1	50.0	41.8	18.1	12.9	15.2	27.6
			(Percentage of Nominal GDP)				
Currency	5.1	4.5	4.3	4.7	5.6	5.0	4.8
Demand Deposits	5.3	5.67	5.6	6.0	6.6	6.0	6.0
Narrow Money	10.4	10.3	9.9	10.7	12.2	11.1	10.8
Time & Savings Deposits	5.9	9.6	10.7	13.7	16.7	18.5	13.9
Broad Money	16.3	19.9	20.6	24.4	28.9	29.2	24.6
Reserve Money	7.7	7.0	6.5	7.1	8.5	7.9	7.2
Private Credit	16.9	14.8	16.9	19.1	23.9	25.9	20.1
Net Foreign Asset	5.4	11.4	13.7	14.9	16.6	16.0	14.5
Memorandum Items							
Real GDP Growth (%)	7.2	4.2	6.0	2.5	4.0	3.6	18.0
Inflation (%) (1980=100)	16.8	11.8	10.4	4.7	5.9	9.3	8.4

Sources: Bank Indonesia, Indonesia Financial Statistics, various issues
International Monetary Fund, International Financial Statistics, various issues
International Monetary Fund, Supplement on Price Statistics, 1986, no. 12

MYANMAR: SELECTED MONETARY INDICATORS

	1971-82	1983	1984	1985	1986	1983-86
			(Millions of Kyats, End of Period)			
Currency	7020.2 [a]	n.a	11768	10505	15218	12497 [b]
Demand Deposits	2403.3 [a]	n.a	5246	5967	6540	5917.6 [b]
Narrow Money	6540.7	11067	17014	16472	21758	16577.8
Time & Savings Deposits	1300.8	4603	5659	6558	7447	6066.8
Broad Money	7841.5	15670	22673	23030	29205	22644.5
Reserve Money	7184.6 [c]	10823	12360	11034	15627	12461
Private Credit	1491.9	2628	2396	2762	3009	2698.8
Net Foreign Asset	214.2	-627	-625	-1317	-818	-846.8
			(Annual Percentage Growth Rate)			
Currency	12.0 [d]	n.a.	n.a.	-10.7	44.9	17.1 [e]
Demand Deposits	20.2 [d]	n.a.	n.a.	13.7	9.56	11.7 [e]
Narrow Money	17.2	-12.9	53.7	-3.2	32.1	17.4
Time & Savings Deposits	18.4	22.7	22.9	15.9	13.6	18.8
Broad Money	17.1	-4.8	44.7	1.6	26.8	17.1
Reserve Money	6.3 [f]	11.0	14.2	-10.7	41.6	14.0
Private Credit	17.4	6.4	-8.8	15.3	8.9	5.5
Net Foreign Asset	-100.9	98.4	-0.3	110.7	-37.9	42.7
			(Percentage of Nominal GDP)			
Currency	18.6 [a]	n.a.	21.8	18.7	26.0	22.2 [b]
Demand Deposits	6.3 [a]	n.a.	9.8	10.6	11.2	10.5 [b]
Narrow Money	23.9	22.2	31.7	29.4	37.2	30.1
Time & Savings Deposits	4.7	9.2	10.6	11.7	12.7	11.1
Broad Money	28.5	31.5	42.3	41.1	50.0	41.2
Reserve Money	29.8 [c]	21.7	23.1	19.7	26.7	22.8
Private Credit	5.5	5.3	4.5	4.9	5.1	5.0
Net Foreign Asset	0.8	-1.3	-1.2	-2.3	-1.4	-1.6

	1971-82	1983	1984	1985	1986	1987	1983-87
Memorandum Items							
Real GDP Growth (%)	4.7	4.3	5.6	4.3	3.7	n.a.	4.5 [g]
Inflation (%) (1980-100)	9.9	5.7	4.8	6.8	-12.6	23.3	5.6

a. This figure is an average of the period 1977-1982
b. This figure is an average of the period 1984-1986
c. This figure is an average of the period 1974-1982
d. This figure is an average of the period 1978-1982
e. This figure is an average of the period 1985-1986
f. This figure is an average of the period 1975-1982
g. This figure is an average of the period 1983-1986

Sources: International Monetary Fund, Supplement on Price Statistics, 1986, no. 12.
International Monetary Fund, International Financial Statistics, various issues
Ministry of Planning and Finance, Selected Monthly Economics indicators, various issues

MALAYSIA: SELECTED MONETARY INDICATORS

	1971-82	1983	1984	1985	1986	1987	1983-87
			(Millions of Ringgit, End of Period)				
Currency	3109.5	6026.3	5974.4	6220.2	6580.5	7358.4	6431.8
Demand Deposits	3335.7	7407.0	7382.3	7358.7	7376.5	8409.8	7586.9
Narrow Money	96445.2	13432.3	13356.7	13578.9	13957.0	15768.2	14018.6
Time & Savings Deposits	10304.7	27760.7	32531.6	34817.6	39810	40690.8	35122.1
Broad Money	16749.8	41193.0	45888.3	48396.5	53767.0	56459.0	49140.8
Reserve Money	4325.3	8718.0	9038.0	9729.0	10134.0	10664.0	9656.6
Private Credit	11786.9	36417.4	42973.6	48808.7	52378.9	52363.2	46588.4
Net Foreign Asset	5807.6	7926.0	6120.2	9111.1	14243.8	19457.1	11371.6
			(Annual Percentage Growth Rate)				
Currency	15.9	5.2	-0.8	4.1	5.8	11.8	5.2
Demand Deposits	16.3	9.7	-0.3	-0.3	0.2	14.0	4.7
Narrow Money	15.6	7.7	-0.6	1.7	2.8	13.0	4.9
Time & Savings Deposits	21.6	10.3	17.2	7.0	14.3	2.2	10.2
Broad Money	20.4	9.4	11.4	5.5	11.1	5.0	8.5
Reserve Money	16.8	4.3	3.8	7.6	4.2	5.2	5.0
Private Credit	24.5	21.7	18.0	13.6	7.3	-0.02	12.1
Net Foreign Asset	13.6	-4.5	-22.7	48.9	56.3	36.6	22.9
			(Percentage of Nominal GDP)				
Currency	9.7	8.56	7.5	8.0	9.2	9.1	8.5
Demand Deposits	10.3	10.6	9.3	9.5	10.4	10.4	10.0
Narrow Money	20.0	19.2	16.8	17.5	19.6	19.5	18.5
Time & Savings Deposits	28.7	39.7	40.9	44.9	56.0	50.4	46.4
Broad Money	48.8	58.9	57.7	62.4	75.6	69.9	64.9
Reserve Money	13.6	12.5	11.4	12.5	14.2	13.2	12.8
Private Credit	32.1	52.1	54.0	62.9	73.6	64.9	61.5
Net Foreign Asset	18.6	11.3	7.7	11.7	20.0	24.1	15.0
Memorandum items							
Real GDP Growth (%)	7.5	5.9	7.3	-1.0	1.2	5.2	3.7
Inflation (%) (1980=100)	6.3	3.7	3.9	0.3	0.7	0.6	1.8

Sources: Bank Negara Malaysia, Quarterly Bulletin, various issues.
International Monetary Fund, International Financial Statistics, various issues
International Monetary Fund, Supplement on Price Statistics, 1986, no. 12.

NEPAL: SELECTED MONETARY INDICATORS

	1971-82	1983	1984	1985	1986	1987	1983-87
			(Million Rupees, End of Period)				
Currency	1269.8	2782.9	3301.6	3796.7	4787.1	5826.5	4099.0
Demand Deposits	682.9	1583.0	1640.7	1819.2	2164.4	2855.0	2012.5
Narrow Money	1952.6	4365.9	4942.3	5615.9	6951.5	8681.5	6111.4
Time & Savings Deposits	1650.2	5228.4	5898.8	7398.2	8591.9	10342.6	7491.9
Broad Money	3602.9	9594.3	10841.1	13014.1	15543.4	19024.1	13603.4
Reserve Money	1703.9	3927.4	4554.7	5151.9	6548.7	7745.0	5585.5
Private Credit	1140.7	2733.2	3343.1	4589.9	5896.6	6674.7	4647.5
Net Foreign Asset	1919.1	2724.4	2118.8	2037.7	2235.8	4065.9	2636.5
			(Annual Percentage Growth Rate)				
Currency	13.7	15.6	18.6	15.0	26.1	21.7	19.4
Demand Deposits	18.9	22.1	3.6	10.9	19.0	31.9	17.5
Narrow Money	15.0	17.8	13.2	13.6	23.8	24.9	18.7
Time & Savings Deposits	28.8	22.1	12.8	25.4	16.1	20.4	19.4
Broad Money	19.8	20.1	13.0	20.0	19.4	22.4	19.0
Reserve Money	15.2	15.7	16.0	13.1	27.1	18.3	18.0
Private Credit	22.7	2.2	22.3	37.3	28.5	13.2	20.7
Net Foreign Asset	10.1	-3.4	-22.2	3.8	9.7	81.9	12.4
			(Percentage of Nominal GDP)				
Currency	6.8	8.2	8.4	8.6	9.2	9.9	8.9
Demand Deposits	3.6	4.7	4.2	4.1	4.2	4.9	4.4
Narrow Money	10.4	12.9	12.6	12.7	13.4	14.8	13.3
Time & Savings Deposits	8.0	15.5	15.0	16.7	16.6	17.7	16.3
Broad Money	18.4	28.4	27.6	29.4	30.0	32.5	29.6
Reserve Money	9.2	11.6	11.6	11.6	12.7	13.2	12.1
Private Credit	5.7	8.1	8.5	10.4	11.4	11.4	10.0
Net Foreign Asset	10.4	8.1	5.4	4.6	4.3	6.9	5.9
Memorandum Items							
Real GDP Growth (%)	3.0	-1.4	9.7	7.9	3.9	2.4	4.5
Inflation (%) (1980 = 100)	8.4	12.4	2.8	8.1	19.0	10.7	10.6

Sources: International Monetary Fund, International Financial Statistics, various issues.
International Monetary Fund, Supplement on Price Statistics, 1986, no. 12.
Nepal Rastra Bank, Quarterly Economic Bulletin, various issues.

PHILIPPINES: SELECTED MONETARY INDICATORS

	1971-82	1983	1984	1985	1986	1987	1983-87
				(Million Pesos, End of Period)			
Currency	6907.4	19607.3	21797.9	24066.0	29311.0	35454.0	26047.2
Demand Deposits	7295.5	12882.0	11835.5	11760.0	13346.0	16932.0	13351.1
Narrow Money	14202.9	32489.3	33633.4	35826.0	42657.0	52386.0	39398.4
Time & Savings Deposits	20179.9	63366.5	76397.8	88447.0	93608.0	103536.0	85071.1
Broad Money	34382.8	95858.8	110031.2	124273.0	136265.0	155922.0	124470
Reserve Money	10602.3	29130	34990	39930	52290	59530	43174
Private Credit	46393.4	139900	139360	115340	892100	109770	118716
Net Foreign Asset	-5057.0	-74494.4	-99937	-121664.0	-112514	-108213	-103364.5
				(Annual Percentage Growth Rate)			
Currency	15.1	54.3	11.2	10.4	21.0	21.0	23.7
Demand Deposits	14.4	19.1	-8.1	-0.6	13.5	26.9	10.2
Narrow Money	14.6	38.1	3.5	6.5	19.1	22.8	18.0
Time & Savings Deposits	23.4	14.8	20.6	15.8	5.8	10.6	13.5
Broad Money	19.6	21.7	14.8	12.9	9.6	14.4	14.7
Reserve Money	16.4	47.6	20.1	14.1	31.0	13.8	25.3
Private Credit	23.7	27.1	-0.4	-17.2	-22.7	23.0	2.0
Net Foreign Asset	98.5	82.3	34.2	21.7	-7.5	-3.8	25.3
				(Percentage of Nominal GDP)			
Currency	4.4	5.1	4.0	3.9	4.7	5.0	4.5
Demand Deposits	4.7	3.4	2.2	1.9	2.1	2.4	2.4
Narrow Money	9.1	8.5	6.2	5.8	6.8	7.4	6.9
Time & Savings Deposits	11.0	16.5	14.1	14.4	15.0	14.7	14.9
Broad Money	20.1	25.0	20.4	20.3	21.8	22.1	21.9
Reserve Money	6.6	7.6	6.5	6.5	8.4	8.4	7.5
Private Credit	25.8	36.4	25.8	18.8	14.3	15.6	22.2
Net Foreign Asset	-1.4	-19.4	-18.5	-19.9	-18.0	-15.3	-18.2
Memorandum Items							
Real GDP Growth (%)	5.7	1.1	-5.8	-4.0	0.4	4.6	-0.7
Inflation (%) (1980=100)	14.4	10.0	50.4	23.1	0.7	3.8	17.6

Sources: Central Bank of The Philippines, Annual Report, various issues.
Central Bank of the Philippines, Philippines Financial Statistics, various issues
Central Bank of the Philippines, Statistical Bulletin, 1981
International Monetary Fund, International Financial Statistics, various issues
International Monetary Fund, Supplement on Price Statistics, 1986, no. 12.
National Economic and Developments Authority, Philippines Statistical Year Book, various issues

SINGAPORE: SELECTED MONETARY INDICATORS

	1971-82	1983	1984	1985	1986	1987	1983-87
			(Millions of S$, End of Period)				
Currency	2181.8	4335.3	4619.2	4739.0	5033.4	5439.8	4833.3
Demand Deposits	2299.0	4272.4	4247.1	4046.0	4787.9	5590.7	4588.8
Narrow Money	4480.8	8607.8	8866.3	8785.0	9821.3	11030.5	9422.6
Time & Savings Deposits	6525.3	16918.0	18254.5	19362.7	21133.6	26058.7	20345.5
Broad Money	11006.1	25525.7	27120.8	28147.7	30954.9	37089.2	29767.7
Reserve Money	2974.8	6220.0	6656.0	6944.0	7319.0	7910.0	7009.8
Private Credit	11429	32581.0	35608.0	35798.0	34493.0	36702.0	35036.4
Net Foreign Asset	7733.3	13439.0	14833.0	19930.0	25002.0	29137.0	20468.2
			(Annual Percentage Growth Rate)				
Currency	15.4	8.5	6.5	2.6	6.2	8.1	6.4
Demand Deposits	13.9	2.7	-0.6	-4.7	18.3	16.8	6.5
Narrow Money	14.5	5.5	3.0	-0.9	11.8	12.3	6.3
Time & Savings Deposits	17.4	15.5	7.89	6.1	9.1	23.3	12.4
Broad Money	16.1	11.9	6.2	3.8	10.0	19.8	10.3
Reserve Money	17.0	9.3	7.0	4.3	5.4	8.1	6.8
Private Credit	22.5	19.7	9.3	0.5	-3.6	6.4	6.5
Net Foreign Asset	30.7	-6.9	10.4	34.4	25.4	16.5	16.0
			(Percentage of Nominal GDP)				
Currency	13.0	11.8	11.5	12.2	13.2	13.0	12.3
Demand Deposits	14.1	11.6	10.6	10.4	12.5	13.3	11.7
Narrow Money	27.2	23.4	22.1	22.6	25.7	26.3	24.0
Time & Savings Deposits	37.6	46.1	45.6	49.7	55.4	62.2	51.8
Broad Money	64.8	69.5	67.7	72.3	81.1	88.3	75.8
Reserve Money	17.6	16.9	16.6	17.8	19.2	18.9	17.9
Private Credit	62.7	88.7	88.9	92.0	90.4	87.6	89.5
Net Foreign Asset	42.9	36.6	37.0	51.2	65.5	69.5	52.0
Memorandum Items							
Real GDP Growth (%)	8.9	7.9	8.3	-1.6	1.7	8.8	5.0
Inflation (%) (1980=100)	6.6	1.2	2.6	0.4	-1.4	0.5	0.7

Sources: The Monetary Authority of Singapore, Monthly Statistical Bulletin, various issues
International Monetary Fund, International Financial Statistics, various issues
International Monetary Fund, Supplement on Price Statistics, 1986, no. 12.

SRI LANKA: SELECTED MONETARY INDICATORS

	1971-82	1983	1984	1985	1986	1987	1983-87
			(Million Rupees, End of Period)				
Currency	2796.34	7200.1	8560.9	9815.5	11569.9	13495.3	10128.3
Demand Deposits	2852.9	7547.8	8262.9	8945.5	9609.3	11588.0	9190.7
Narrow Money	5649.3	14747.9	16823.8	18761.0	21179.2	25083.3	19319.0
Time & Savings Deposits	5741.8	22509.0	26603.6	29647.9	29681.1	33251.7	28338.7
Broad Money	12226.1	37256.9	43427.4	48408.9	50860.3	58335.0	47657.7
Reserve Money	4242	12240	14300	18084	18695	20626	16788.2
Private Credit	8886.4	31759.9	35371.8	38878.5	41562.7	48517.6	39218.1
Net Foreign Asset	1996.8	3186.8	9964.1	9272.7	8859.1	8416.1	7939.8
			(Annual Percentage Growth Rate)				
Currency	17.1	20.2	18.9	14.7	17.9	16.6	17.7
Demand Deposits	16.3	30.8	9.5	8.3	7.4	20.6	15.3
Narrow Money	16.5	25.4	14.1	11.5	12.9	18.4	16.5
Time & Savings Deposits	31.2	20.0	18.2	11.4	0.1	12.0	12.3
Broad Money	22.7	22.1	16.6	11.5	5.1	14.7	14.0
Reserve Money	18.6	26.5	16.8	26.5	3.4	10.3	16.7
Private Credit	26.9	25.8	11.4	9.9	6.9	16.7	14.1
Net Foreign Asset	216.4	34.4	212.7	-6.9	-4.5	-5.0	46.1
			(Percentage of Nominal GDP)				
Currency	7.3	5.9	5.6	6.0	6.4	6.9	6.2
Demand Deposits	7.2	6.2	5.4	5.5	5.4	5.9	5.7
Narrow Money	14.5	12.1	10.9	11.6	11.8	12.8	11.8
Time & Savings Deposits	12.5	18.5	17.3	18.3	16.5	16.9	17.5
Broad Money	26.9	30.6	28.2	29.8	28.3	29.7	29.3
Reserve Money	10.4	10.1	9.3	11.1	10.4	10.5	10.3
Private Credit	18.4	26.1	23.0	23.9	23.2	24.7	24.2
Net Foreign Asset	3.4	2.6	6.5	5.7	4.9	4.3	4.8
Memorandum Items							
Real GDP Growth (%)	5.1	5.1	5.1	5.0	4.3	1.5	4.2
Inflation (%) (1980=100)	9.8	14.0	16.6	1.4	8.0	7.7	9.5

Source: Central Bank of Sri Lanka Monthly Statistical Bulletin, various issues
International Monetary Fund, International Financial Statistics, various issues
International Monetary Fund, Supplement on Price Statistics, 1986, no. 12.

THAILAND: SELECTED MONETARY INDICATORS

	1971-82	1983	1984	1985	1986	1987	1983-87
			(Billion Bahts, End of Period)				
Currency	31.5	59.6	63.5	64.0	72.1	86.7	69.2
Demand Deposits	17.0	23.4	25.2	21.9	31.4	45.7	29.5
Narrow Money	47.5	83.0	88.8	85.9	103.4	132.4	98.7
Time & Savings Deposits	124.5	367.5	449.1	507.6	569.3	676.1	514.0
Broad Money	172.0	450.5	537.9	593.5	672.8	808.6	612.6
Reserve Money	38.9	75.6	79.8	86.5	95.3	116.7	90.8
Private Credit	136.6	414.4	489.5	540.9	567.3	695.7	541.6
Net Foreign Asset	24.6	16.5	28.3	37.9	80.9	107.5	54.2
			(Annual Percentage Growth Rate)				
Currency	13.6	10.5	6.5	0.7	12.6	20.3	10.1
Demand Deposits	10.9	-6.4	7.9	-13.3	43.5	45.8	15.5
Narrow Money	12.5	5.2	6.9	-3.3	20.5	28.0	11.5
Time & Savings Deposits	22.0	29.0	22.2	13.0	12.2	18.8	19.0
Broad Money	18.9	23.8	19.4	10.3	13.4	20.2	17.4
Reserve Money	13.3	10.5	5.6	8.5	10.2	22.4	11.4
Private Credit	22.7	32.4	18.1	10.5	4.9	22.6	17.7
Net Foreign Asset	14.1	-57.1	71.1	33.9	113.6	33.0	38.9
			(Percentage of Nominal GDP)				
Currency	7.7	6.4	6.4	6.1	6.6	7.1	6.5
Demand Deposits	4.5	2.5	2.6	2.1	2.9	3.8	2.8
Narrow Money	12.1	9.0	9.0	8.2	9.4	10.9	9.3
Time & Savings Deposits	28.0	39.7	45.4	48.7	51.8	55.8	48.3
Broad Money	40.1	48.7	54.4	57.0	61.3	66.7	57.6
Reserve Money	9.9	8.2	8.1	8.3	8.7	9.6	8.6
Private Credit	29.5	44.8	49.5	51.9	51.6	57.4	51.0
Net Foreign Asset	7.3	1.8	2.9	3.6	7.4	8.9	4.9
Memorandum Items							
Real GDP Growth (%)	6.8	7.3	7.1	3.5	4.5	7.1	5.9
Inflation (%) (1980=100)	10.3	3.7	0.9	2.4	1.8	2.5	2.3

Sources: Bank of Thailand, Monthly Bulletin, various issues
Bank of Thailand, Quarterly Bulletin, various issues
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