OPERATIONAL FRAMEWORK OF MONETARY POLICY IN THE SEACEN COUNTRIES

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Kuala Lumpur, Malaysia

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Foreword

The SEACEN countries have embarked on various financial structural reforms, especially since the Asian crisis in 1997. As a result of such unprecedented reforms, monetary policy has undergone radical changes. In many cases, traditional monetary tools such as required reserves and direct controls have been increasingly replaced by market-based, as well as newer and more innovative instruments. Furthermore, several SEACEN countries have also adopted inflation targeting. Major forces for changes have been the rapid development and deepening of a variety of financial markets and instruments, the diversification of financial institutions and the globalization of intermediaries. In addition, new challenges have emerged for monetary authorities in light of the global low interest rates.

This paper, thus, provides an overview of the operational framework of monetary policy in the SEACEN countries. The paper builds upon the SEACEN research study on *Efficacy of Monetary Transmission Mechanism: Experiences in the SEACEN Countries*. Further, it will include an in-depth survey as well as an analytical report on the operational frameworks of monetary policy of the SEACEN countries to enable cross-country comparisons. The paper is mainly based on the responses of SEACEN members to the survey. It also reviews the general aspects of monetary operational framework, and looks into the main components of operational framework in detail. It also considers various indicators for monetary policy, which involves empirical work to estimate some measures of ex-ante real interest rate together with expected inflation.

This project was undertaken by Dr. Sangdai Ryoo, Senior Economist of the SEACEN Centre seconded from The Bank of Korea. The author is grateful to SEACEN member banks/monetary authorities for responding to the survey and providing useful data. He would also like to acknowledge useful comments and suggestions of Dr. Jahyeong Koo, Economist of FRB of Dallas; and fellow SEACEN colleagues, Dr. Bambang S. Wahyudi, Director for Research, Mr. Vincent Lim Choon Seng, Senior Economist, and Ms Seow Yun Tee, Economist. The views expressed in this paper, however, are those of the author and do not necessarily reflect those of the SEACEN Centre, or SEACEN member banks/ monetary authorities.

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Abstract

Based on the survey of 12 SEACEN members, a number of common and general trends can be detected in relation to the operational framework of monetary policy in the SEACEN countries. Firstly, it was found that price stability is the most important objective of monetary policy and many central banks focus more on interest rates rather than bank reserves, due to the increased importance and flexibility of the price mechanism. Many central banks are increasingly concentrating more on the short-term interest rate, through which central banks can now have greater impact, given payment and settlement arrangements. Secondly, SEACEN countries have increased the market orientation of their instruments. In most cases, a higher proportion of reserves are now supplied through operations in open markets, with the use of standing facilities limited to providing marginal accommodation or serving as an emergency finance. Consequently, the use of reserve requirements and standing facilities are now rather limited in many SEACEN countries. Thirdly, domestic repos are used in a major way for day-to-day management of liquidity, and the diversity and variety of instruments used in many SEACEN countries have grown tremendously.

The structural VAR with the Fisher relation can provide timely estimates of expected inflation and the corresponding ex-ante real rates for the SEACEN countries, and can also give a proper measure of monetary policy stance. The estimates were done for the purpose of a comparative analysis. However, it should also be noted that applying this approach to each country needs further prior studies and investigation such as a time-series analysis on the interest rate movement to find out whether actual nominal interest rate is closely consistent with the Fisher relation. The practical use of the measures may also be determined on country basis by the monetary policy framework, and other indicators of information set currently used.

1. Introduction

The financial world has become increasingly globalised and thus the interaction between macroeconomic policies has also become increasingly intertwined. Since the Asian crisis in 1997, the SEACEN countries have embarked on various financial structural reforms. As a result of such unprecedented reforms, monetary policy in particular has itself undergone radical changes since the last decade. In many cases, traditional monetary tools such as required reserves and direct controls have been increasingly replaced by market-based, as well as newer and more innovative instruments. Furthermore, several SEACEN countries such as Indonesia, Korea, the Philippines and Thailand have also adopted inflation targeting. Major forces for changes have been the rapid development and deepening of a variety of financial markets and instruments, the diversification of financial institutions and the globalisation of intermediaries. In addition, the global low interest rates are bringing about new challenges to monetary authorities.

As such, this paper provides an overview of operational framework of monetary policy in the SEACEN countries. In most countries where the financial sector was relatively closed and dominated by commercial banks, monetary control is exercised by the setting of only two parameters: reserve requirements against some deposits at commercial banks and the discount rate on bank borrowing from the central bank. Adjustments in either parameter would induce banks to change the terms of their loans and deposits, leading to change in the economy-wide stock of money and in turn aggregate spending. Even more rudimentary techniques based on quantity controls rather than on price signals proved effective as long as financial markets remained underdeveloped and insulated from foreign influences. Once new financial markets developed and market integration progressed, bank intermediation became less dominant. Households placed part of their saving outside the banking sector, enterprises started tapping non-bank sources of funding and banks, too, had to gain a foothold in the new markets, on both the supply and the demand side. In this environment, the setting of bank interest rates came to depend on conditions in financial markets. Moreover, aggregate spending became sensitive to more than just bank-determined interest rates. In order to control the new channels of financial transmission, new procedures had to be developed, focused on influencing the behavior of all market participants and price formation in a variety of short-term money and inter-bank markets.

Although the experiences and the choices made in individual countries vary widely, a number of common and general trends can be detected in the modernisation of operating procedures. First, the deepening of financial markets

and the growth of non-bank intermediation have induced, if not forced, central banks to increase the market orientation of their instruments. In most cases, a higher proportion of reserves are now supplied through operations in open markets, with the use of standing facilities limited to providing marginal accommodation or serving as an emergency finance. This, however, does not imply an erosion of the power of standing facilities in affecting liquidity conditions: indeed, it is often marginal changes in bank liquidity which have the greatest impact on interest rates. Secondly, the increased importance and flexibility of the price mechanism is the new market environment that have induced many central banks to focus more on interest rates rather than bank reserves in trying to influence liquidity. A third trend is that, reduced market segmentation, and thus the greater ease and speed with which interest rate changes are transmitted across the entire spectrum of yields, has enabled central banks to concentrate on the very short end of the yield curve. By focusing on the short-term interest rate, central banks can now have a greater impact, given payment and settlement arrangements. The move to real time gross settlement systems in some countries may increase the short-term focus of policy implementation even further. Fourthly, the greater market orientation of the central bank's instruments has been associated with a preference for flexible instruments. In the highly volatile financial environment marking several of the emerging market economies, flexibility in the design of the policy instruments may be particularly important. Much of this greater flexibility has come from the growing use of repurchase operations. Finally, awareness has increased markedly. This has implications for the degree of transparency which central banks need to influence interest rates, their reliance on market information in formulating polices and their own tactics in signaling policy changes to the markets.

The paper will build on the 2003/04 SEACEN research study on *Efficacy of Monetary Transmission Mechanism: Experiences in the SEACEN Countries.* Further to this, it will include an in-depth survey[1] as well as an analytical report on the operational framework of monetary policy of the SEACEN countries to enable cross-country comparisons. The following two sections of the paper are mainly based on the responses of SEACEN members to the survey.

1. The survey was quite general on the monetary policy framework, and 12 of 14 SEACEN members responded. These are Fiji, Indonesia, Korea, Malaysia, Mongolia, Myanmar, Nepal, Philippines, Singapore, Sri Lanka, Taiwan and Thailand. However, the information for Myanmar is not sufficient for this purpose and therefore the cases of the remaining 11 country cases are mostly analyzed. Actual comparative analyses, of course, were quite limited mainly because of a diversity of economic development stages and financial structures of member countries. As for the comparison with broader range of cases, some other sources such as BIS (1999) are also referred.

Those sections begin by reviewing general aspects of monetary operational framework, and looking into main components of operational framework in more detail. The next section is on some indicators for monetary policy, which involves empirical work to estimate some measures of ex-ante real interest rate together with expected inflation. New challenges for monetary policy are also discussed in the appendix after a concluding remark.

2. General aspects of Operational Framework

2.1 Strategic Choices of Monetary Policy

2.1.1 Institutional Setting

The ultimate objective of monetary policy should first be considered in relation to the institutional settings. In SEACEN countries, price stability is the most important objective of the monetary policy and central banks. As can be seen in Table 1, all the countries single out the prices stability as or at least one of, the main policy goals[2]. Of course, other objectives are also explicitly pursued in some countries. The ultimate objective of monetary policy in Malaysia is to promote the highest sustainable rate of output growth that is consistent with price stability. In working toward this objective, the central banks of Malaysia seeks to maintain monetary stability by ensuring that monetary conditions are appropriate to support real growth in the economy without causing inflationary pressures. In a similar way, Myanmar sets as the main objective a full employment without excess inflation. In Nepal, Singapore, and Taiwan, other objectives such as a surplus in BOP, management of exchange, financial stability and economic development are also important goals together with price stability.

The ultimate objectives or policy goals normally tend not to change much. So, once the objectives of monetary policy are set, the consideration is then on how best to achieve those objectives. The central bank has to make a number of choices with respect to the strategy to be followed and specific tactics have to be adopted in executing the policy. The institutional setting may have a bearing

2. According to Bank of England survey of 94 central banks (Mahadeva and Sterne, 2000), the following are the statutory objectives of central banks: Monetary stability and other non-conflicting (57%), Only monetary stability (25%), Monetary stability and other conflicting (13%), No statutory goals (3%), and Only non-monetary stability (1%).

on strategies and tactics. Many SEACEN countries have similar policy decision bodies, whose legal status and function are slightly different with many of them known as monetary policy committee (or council) or board of directors. However, some differences seem to exist in the frequency with which the primary decision-making body meets. In most countries, the meeting is held once a month. The Board of Governors in Indonesia and the Board of Directors in Taiwan meet on a quarterly basis. On the contrary, the Board of Directors in Mongolia meets once a week, while the decision bodies in Korea and Singapore meet bi-weekly.

Whatever the institutional set-up, a number of strategic issues will need to be faced by the policy markers, especially in relation to the selection of intermediate and operational objectives of monetary policy. An intermediate target is normally referred to as the monetary regime and includes the exchange rate target, monetary target, inflation target and discretion[3]. As for an operating target, the most important issues include the choice of key or target operating interest rate; and the degree of volatility of key interest rates to be allowed, since interest rate is now more important for the central banks.

3. Through time, exchange rate target was the first popular regime before early 1970s. It is favorably known to provide external price anchor and less uncertainty for external sector. However, the exchange rate target is argued against now in that domestic monetary autonomy is lost and the risk of speculative attack is higher.

   Monetary targeting was very popular in the 1970s which was characterised as a high inflation era. Its popularity declined in the 1980s. Monetary targeting was based on the quantity theory of money, and it mainly involved the choice between broad money and narrow money, the robustness of the quantity theory, and the way to be explained explicitly to public.

   Inflation targeting became popular in 1990s after disillusionment with money and exchange rate targeting. Inflation targeting, characterised by institutionally commitment to the attainment of a numerical inflation target announced publicly, is believed to increase transparency and accountability of monetary policy. Inflation targeting has proven to bring inflation down, although inflation has declined over the world including the countries adopting the other regimes. However, some emerging market countries still have difficulty meeting targets, and some criticisms stem mainly from the strong focus on goods price inflation.

   Discretion is when there is no explicit single target for policy anchor. However, it does not mean that there is no target at all. Also known as the "just-do-it" approach, it has the advantage of flexibility although lacking transparency and discipline.

Table 1
Institutional Aspects

	Policy Decision Body	Frequency of Meeting	Policy Goal
Fiji	RBF Board	Monthly	Price stability
Indonesia	Board of Governors	Quarterly	Price stability
Korea	Monetary Policy Committee	Bi-weekly	Price stability
Malaysia	Monetary Policy Committee	Monthly	Highest sustainable growth consistent with price stability
Mongolia	Board of Directors	Weekly	Stability of national currency
Myanmar	—	—	Full employment without excess inflation
Nepal	Board of Directors	Monthly	Prices stability and reasonable level of surplus in BOP
Philippines	Monetary Board	Monthly	Price stability, monetary stability and convertibility of the Peso
Singapore	Several relevant depts.	Bi-weekly	Price stability and management of exchange rate
Sri Lanka	Monetary Policy Committee	Monthly	Price stability
Taiwan	Board of Directors	Quarterly	Financial stability, sound banking operations, stability of the currency value, and economic development
Thailand	Monetary Policy Committee	Every six week	Price stability

2.1.2 Intermediate Target

In most SEACEN countries, financial liberalisation and development have eroded the once important role of explicit intermediate targets in monetary policy implementations[4]. After the Asian crisis, many SEACEN countries including Indonesia (July 2005), Korea (April 1998), Philippines (Jan. 2002) and Thailand (May 2000) introduced inflation targeting, where central banks have directly geared policy to an explicit forecast of inflation. Malaysia adopts the interest rate framework with overnight interbank rate as its operating target in April 2004 while Fiji makes the nominal exchange rate the dominant policy indicator.

Singapore, taking the exchange rate target[5] as the monetary regime, has the exchange rate target band as the intermediate target. In the other countries such as Mongolia, Nepal, Sri Lanka, and Taiwan, intermediate targets for specific monetary aggregates continue to be specified. The shift from explicit money target appears to be somewhat less pronounced. Even though money targets are seen as the most effective way of constraining government finances, many countries using money targets do so only in an indicative way, supplementing them with other variables such as interest rates, exchange rates, and expected inflation.

2.1.3 Operating Target

The daily implementation of monetary policy is guided by operating targets. In many SEACEN countries, the shift towards interest rate targeting has recently been almost as pronounced as in industrial countries[6]. This is because Fiji, Malaysia and Taiwan have adopted interest rate as the operating target, as well as the countries which adopted inflation targeting.

The interest rate used as an actual operating target is short-term interest rates, usually the overnight rate, which is mainly determined in the interbank

4. In the industrial world, most central banks have chosen either to make the exchange rate the dominant policy indicator or to have their policies guided by a sometimes wide range of indicators of development in the financial markets and the real economy

5. The exchange rate target that Singapore takes is the unilateral arrangement consisting of basket, band and crawl.

6. An interesting explanation of the growing operational significance of the interest rate is that growing central bank independence has made it possible to substitute the operational efficiency of targeting an interest rate for the politically expedient practice of choosing a quantitative monetary target.

market for settlement balances[7]. This is the case in many of SEACEN countries including Korea, Malaysia, Philippines and Taiwan. The reason for this preference may be practical - the overnight rate is usually the rate which the central bank can control most easily. Being the monopolist supplier of bank reserves (settlement balances) and being able to affect the demand for them through a system of required reserves and/or by determining the terms of inter-bank clearing and settlement, the central bank can in theory control the overnight rate with a high degree of precision. Indeed, its greatest influence is almost invariably exerted in the overnight market[8]. Thailand uses the 14-day RP rate as its policy rate. Money market rates with longer than overnight maturities may be more relevant for the pricing of loans and deposits or as benchmarks for longer-term financing[9].

In some countries, the choice of operating variables may also be related to the design of the central bank's instruments. If the central bank supplies most bank liquidity through operations of a specific maturity, it is likely to have a large and direct influence on rates at the corresponding maturities and may choose to adopt these rates as its operating objective. Fiji and Indonesia are the examples. Fiji adopts the 91-day RBF note rate and Indonesia uses the 30-day SBI rate, respectively. Focusing on longer-term rates, however, has its costs. First, control will be significantly less than in the market for bank reserves, given that the central bank is not likely to exert a dominant influence on either the supply or the demand side. Secondly, the central bank may wish to leave the information in these longer-term markets free because it wants to use the information from interest rates in these markets to monitor private sector views and expectations.

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7. In industrial countries, the choice of operating target has almost universally been narrowed down to a short-term interest rate.

8. Yet central banks may be hesitant to focus policy exclusively on the overnight rate. First, the overnight rate can be prone to sudden changes that reflect technical adjustment. (e.g. related to the details of the system of reserve requirements, seasonal factors, errors in projecting the autonomous sources of liquidity) which the central bank may not want to counteract. Central banks may be concerned that their tolerance of swings will be misinterpreted as changes in the stance of monetary policy. Secondly, the structure and characteristics of the financial system may be such that the overnight rate plays a relatively modest role in the monetary policy transmission mechanism. In those cases where interest rate changes are not transmitted smoothly or predictable from the overnight market to the other segments of the money market, central bank control of the overnight rate may not have the desired effects over the entire yield spectrum.

9. If control of the overnight rate comes at the cost of greater volatility of rates, at the more relevant maturities, overall monetary control could be compromised. In the emerging market economies, similar contrasts can be observed and this may well have implications for the tactical choices made by individual central banks.

Finally, concentrating on longer-term markets may greatly increase volatility of the overnight rate. For instance, where the need for end-of-day settlement balances is the binding variable in banks' demand for reserves, the attempt to meet operating objectives at longer than overnight maturities may imply accepting or encouraging potentially large movements in the overnight rate.

In the countries such as Mongolia, Nepal, Sri Lanka, and Taiwan, bank reserves or somewhat broader concept of the monetary base continue to serve as the operational focus of monetary policy implementation. The central bank may then prefer to achieve a quantitative target rather than a price target. Often, too, disinflation episodes are supported by IMF programs in which targets tend to be defined in terms of critical items of the central bank's balance sheet – partly because these elements are more directly under central bank control.

However, many central banks have found that movements in the monetary base have been volatile and not always closely related to economic or broader monetary conditions. In addition, financial deregulation and liberalisation have enhanced the role of the interest rate in the monetary transmission mechanism. For these reasons, almost all of the central banks have chosen to assign to a short-term money market interest rate at least an important subsidiary role in their day-to-day policy implementation. Singapore is again an exception since it has an exchange rate as the most important nominal anchor.

Table 2
Intermediate and Operating Targets

	Intermediate target	Operating target
Fiji	Nominal exchange rate	91-day RBF Note rate
Indonesia	(Inflation Targeting)	BI rate
Korea	(Inflation Targeting)	Overnight call rate
Malaysia	(Interest rate framework)	Overnight interbank rate
Mongolia	Broad M2	Reserve money
Nepal	Money cum credit	Excess liquidity of commercial bank
Philippines	(Inflation Targeting)	Overnight RRP/borrowing rate
Singapore	Exchange rate target band	Exchange rate
Sri Lanka	Money supply	Reserve money
Taiwan	M2	Reserve money and overnight interbank call rate
Thailand	(Inflation Targeting)	14-day repurchase rate

2.2 Public Sector and Monetary Policy

Policies of the public sector and the monetary authorities may not be consistent. In the end, there are many potential areas of conflict that could impinge on the operational efficiency of the central bank[10]. Here, we just focus on the areas in which the relationship between the public sector and the central bank may lead to specific operational problems. Issues discussed here often arise as a result of state-owned financial institutions, the central bank's role as banker of the public sector and public debt management.

2.2.1 State Owned Financial Institutions

In many SEACEN countries, large state-owned banks and/or a government-run postal system continue to play an important role in the banking system. In some countries, local or regional banks have been established by powerful local governments. Such banks could complicate the implementation of monetary policy in two important respects. First, explicit or implicit deposit guarantees or bailouts promises may make these institutions less responsive to interest rate adjustments or to the policy signaling of the central bank. Monetary policy implementation may thus be constrained, be less predictable, or require the use of direct controls in the central bank's dealings with state-owned institutions. A second impediment to efficient policy implementation is that these institutions may be prone to conditions of either excess liquidity or liquidity shortage[11].

However, many SEACEN countries point out that such problems with state financial agencies or state-controlled financial institutions seemed to have declined most recently, especially since the structural reform and deregulation following the 1997 Asian crisis. First, the state ownership of financial institutions is on a declining trend in some countries. A more important thing is that the behaviour

10. They include the public airing by the Treasury or Ministry of Finance of views that are contrary to those held by the central banks, the imposition of exchange rate regimes that complicate monetary policy and the stance of fiscal policy in general.

11. In some cases, their main function is to collect the public sector's tax receipts, or to manage the accounts on which salaries of public sector employees are paid. At particular periods they may consequently hold large amounts of liquidity. Moreover, state guarantees may attract many depositors to these institutions, further aggravating the problem. Other state-owned banks may have a tendency to over-invest in longer-term government paper, causing them to face a quasi-permanent state of low liquidity. The structural liquidity imbalances experienced by different types of state-owned financial institution are likely to complicate the efficient distribution of bank liquidity in the inter-bank market and to cause sharp fluctuations in the overnight rate when the imbalances are particularly marked.

of state owned financial institutions is now becoming more comparable with those of private commercial banks in many countries.

2.2.2 Banking Relationship with Government

The other problem is the relationship with the government and central bank[12]. In general, however, how far deposits and withdrawals by the public sector complicate liquidity management depends on the extent to which these transactions take place through changes in the balances of the government accounts held at the central bank, as well as on their predictability. Government access to credit from the central bank is a further complication.

In all the SEACEN countries, the central banks work as banker for the government and most of the government holds some deposits at the central bank. However, the extent to which the central bank acts as government banker varies widely. In Korea, all central government transactions lead to changes in the deposit liabilities of the central bank; but in a number of countries like Malaysia and Thailand, special government bodies, state governments and/or public enterprises are allowed to maintain accounts at the central bank.

The quasi-universality of the central bank as banker for the government sector is rather surprising given that government revenues and expenditures can display erratic and variable patterns and as a result can give rise to major problems in managing bank liquidity. Swings in the government's financing position have frequently disrupted the central bank's management of liquidity.[13]

To alleviate problems of liquidity management, some countries have take steps to improve the predictability of swings in government deposits at the central bank through formal or practical managements. In Indonesia and Singapore,

12. The banking relationship between the central bank and the public sector can be an important component of bank liquidity changes. The transfer of public funds to and from the central bank could act to disturb the level of bank reserves. Public sector operations could complicate liquidity management if they give rise to pronounced liquidity imbalances among commercial banks and in turn to frictions in the inter-bank market. Moreover, active financial management by the Treasury of its own funds using commercial financial institutions could interfere with the management of short-term interest rates by the central bank.

13. One solution is to prevent the government placing balances, or surplus balances that exceed projected levels, with the central bank or in the overnight market. Another solution is to penalise the government by paying a lower interest rate on excess balances.

arrangements for the collection or transfer to the central bank of tax receipts are designed to smooth movements in the government's account. In Korea, the introduction of a new government scheme in early 1997 involving the use of surplus funds held at the central bank for lending to financial institutions was associated with the creation of a mechanism for consultation with respect to the timing and the scale of these funds transfers. In Thailand, large deposits and withdrawals usually occur on a regular schedule.

At certain times, cooperation between the central bank and the Treasury with regard to the depositing of government funds could be useful tool of monetary management. Some central banks have the authority to shift at their own discretion, the Treasury's deposits between their books and the commercial banks[14]. The transfer of government deposits has been applied in Malaysia where the transfers of government deposits between the central bank and the commercial bank have been used as a more active instrument of monetary policy.

In all the SEACEN countries, central banks credit to government has now become more limited, and in some countries, even prohibited to avoid a potential loss of monetary control. Lending to the central government or even to local government and public enterprises, as in Indonesia, was widespread. However, open-ended access to credit facilities at the central bank no longer exists. Therefore, credit to the public sector in SEACEN countries would not appear to be as important a constraint on monetary discipline as in the past. Moreover, as recourse to central bank credit diminishes, experience in industrial countries has shown that governments become more eager to manage the bulk of their liquidity outside the central bank. This limits the impact on bank liquidity of flows in and out of the Treasury's account at the central bank.

2.2.3 Public Debt Management

Public debt management can also have implications for monetary policy implementations. The timing and size of public sector debt operations which are most advantageous from the perspective of the public sector may conflict with the central bank's strategies of bank liquidity management. The conflict could be most acute in countries with high inflation and substantial government borrowing requirements. Often, pressure is put on the central bank to stabilise yields at

14. This can be a very useful weapon of monetary management especially in those circumstances where the timing and expected short duration of disturbances in bank reserves make it difficult to offset them through operations in securities markets. Moreover, transfers of government deposits can affect bank reserves and thus have a direct impact on short-term interest rates.

relatively low levels. Another problem can arise when the central bank is heavily relied upon to develop securities markets for government financing.

To defuse potential conflict in debt management, many countries have set up mechanisms of coordination and consultation between the central bank and the Treasury; less often, the management of public debt is fully delegated to the central bank. The central bank acts in an advisory capacity or participate in debt management committees in Malaysia, Philippines and Thailand. In Korea, the central bank administers the public sector's debt programme, although the main responsibility for deciding on the terms and timing of new issues rests with the Treasury. In Nepal and Sri Lanka, central banks are partly in charge of the management of public debts.

3. Main Components of Operational Framework

3.1 Liquidity Forecast

To have a successful implementation of monetary policy, the first task for the central bank is to forecast the liquidity, especially autonomous factors of liquidity. Reliance on market-based operations, especially, creates a need for forecasts of the liquidity which the central bank will have to provide in order to equilibrate the market for bank reserves. Many other exogenous factors that can cause such changes are net foreign assets, currency in circulation and special items, such as valuation changes. Bank reserves are influenced by both the autonomous factors and the policy variables[15]. This conceptual framework often underlies the forecasting exercises which many central banks conduct on a regular basis and with planning horizons ranging from one day to several months. The length of the maintenance period for required reserves sometimes conditions in a major way, the choice of a particular planning horizon[16].

15. These sources of liquidity creation/withdrawal, largely beyond the control of the central bank, are often grouped under the heading "net autonomous position". By contrast, those balance sheet items that are closely under the central bank's control, mainly lending to banks and operations in open markets, are usually classified as the "net policy position".

16. For most of the early 1990s many emerging market economies are likely to have experienced structural surplus of bank liquidity. In the light of rapid international reserve growth, a very large autonomous source of liquidity inflows was net foreign assets. Net lending to the government is likely to have given rise to autonomous bank liquidity outflows in many Asian countries. Currency circulation often has been an important factor absorbing bank liquidity. Especially in those economies recovering from a past history of high or suppressed inflation, the public's acceptance of bank notes has made currency one of the more dominant exogenous causes of changing bank liquidity.

Table 3
Liquidity Forecasting Features

	Horizon /Update	Most Unpredictable Items	Notes
Fiji	2 weeks /twice a week	Foreign reserves	Liaise with MOF for government related transactions
Indonesia	Week/daily	Net foreign assets	ARIMA forecast, news and anecdotal information, etc.
Korea	2 weeks/daily	Government and foreign asset	No formal institutional arrangement, but frequent phone calls to many relevant institutions
Malaysia	Daily -/fortnightly, -/monthly	Government and transfer between conventional and Islamic sector	
Mongolia	- /weekly	Government and foreign assets	Many attempts, but internally not satisfactory forecasts
Nepal	- /weekly	Foreign asset	
Philippines	Month/monthly		The indicative monthly and annual levels of RM serve as guides in the liquidity management
Singapore	Daily	Government	
Sri Lanka	Daily	Bank reserves and currency	Contacting major banks every morning
Taiwan	Month/daily	Currency	
Thailand	Month/daily	Government	Work closely with government

In general liquidity forecasts range between one day and two months in both industrial and emerging market economies. All the SEACEN members are now conducting liquidity forecasting on a regular basis[17]. Planning horizon and frequency of updating differ much over countries. For example, Singapore and Sri Lanka have a 1 day horizon; Indonesia and Nepal, 1 week; Fiji and Korea, 2 weeks, and Philippines, Taiwan and Thailand have 1 month. Malaysia is now conducting liquidity forecasts more frequently, compared to the other countries.

In an actual liquidity forecasting, net foreign asset and government sector are large and the most unpredictable items in most of countries as a whole. In Sri Lanka and Taiwan, currency in circulation is the most difficult item to be predicted instead. In some countries, like Fiji, Sri Lanka and Thailand, central banks have better, sometimes official, relationship with government and some leading banks in forecasting liquidity, which provides reliable sources for central banks' forecast of liquidity. Other countries rely more on informal contacts both with external parties and internal parties, and sometimes, engage some kind of time-series methods.

3.2. Reserve Requirement

All the countries impose reserve requirements on deposit liabilities like demand, savings and time deposits. In many cases, differential ratios are applied to serve particular objectives. For instance, some countries have higher ratios for short-term deposits so as to lengthen the maturity of deposits. Higher ratios are sometimes imposed on foreign currency deposits compared with domestic currency deposits in some countries. Several countries apply marginal reserve requirements to the increase in a balance-sheet item, not its level.

Reserve requirements are normally to serve five functions; as interest rate buffer, liquidity management, monetary control, seignorage, and settlement.[18] For

17. Mongolia has attempted to forecast liquidity in many ways, but it has concluded that there is no one optimal way to forecast liquidity.

18. Reserve can help to stabilize the overnight interest rate in the face of changes in liquidity conditions that are sometimes purely technical in nature (the buffer function). Since reserve requirements often represent the major determinant of the demand for central bank reserves, they can be adjusted to offset the supply of liquidity generated through autonomous factors (the liquidity management function). They can be used actively (i.e. not just in response to liquidity developments) as a means of changing the stance of monetary policy (monetary control function). If not-remunerated, or remunerated at below-market rates, reserve requirements can be regarded as a source of revenue for the central bank (seigniorage). Reserve requirements can also help the function of settlement.

the SEACEN countries, reserve requirements are mainly for the liquidity management function or monetary control function. Liquidity management is in fact, the most important function for all the countries. Other functions are also explicitly regarded as important to some countries. For example, in Korea and Malaysia, reserve requirements for interest rate buffer are important while in Nepal and Sri Lanka, the emphasis is on the smoothing function of settlement. Seinorage income is also considered to be an important function in Singapore and Thailand.

From the perspective of the interest rate buffer function, there are two features of the reserve requirement system that are similar in emerging market and industrialized economies. First, banks need to meet the reserve requirement only on average during the maintenance period.[19] Secondly, the buffer function is more effective if the maintenance period lags the calculation period so that both the banks and the central bank know with precision the amount that must be held as reserve requirement.[20] In all the SEACEN countries, reserve requirement is to be met on average during the maintenance period, and moreover the maintenance period lags the calculation period with some carry-over of previous balances, for interest rate buffer function. However, the maintenance period is not so long, only 1 or 2 weeks, in most of the countries, which may impair the interest rate buffer function. This is especially for Indonesia, Philippines and Sri Lanka where the maintenance period is just for one week. The exceptions are Fiji and Taiwan which have a leeway of one month which may be long enough for banks to benefit fully from the averaging feature.

19. Higher required reserve balances tend to make the banks' demand for reserve more stable, as they would increase the day-to-day flexibility within the maintenance period. By contrast, low reserve requirement complicate reserve management by banks as they increase the risk of an overdraft, or the need to find funds in a thin market, resulting from an unexpected reserve outflow late in the day and make it more difficult to work off a large excess on a particular day over the course of the remainder of the maintenance period. However, several central banks, like Indonesia and Malaysia limit the degree to which banks' daily reserve holding can deviate from the average required level.

20. Carry-over provisions, allowing errors in one maintenance period to be offset in the subsequent one, are used in industrial counties with semi-lagged or simultaneous reserve accounting. However, two other features could impair the interest rate buffer function in emerging market economies when compared with industrialized countries. The first concerns the maintenance period, which has to be long enough for banks to benefit from the averaging feature of the reserve requirement and effectively arbitrage over the period. The maintenance period is shorter in many of emerging market economies.

Table 4
Functions of Reserve Requirements

	Interest Rate Buffer	Liquidity Manage-ment	Monetary Control	Seignorage Income	Settle-ment
Fiji		O	O		
Indonesia		O	O		
Korea	O	O			
Malaysia	O	O	O		
Mongolia		O			
Nepal		O	O		O
Philippines		O			
Singapore		O		O	
Sri Lanka		O			O
Taiwan		O			
Thailand			O	O	

The second feature concerns the inclusion among reservable assets of items other than deposits at the central bank which can compromise the interest rate buffer function. The most common of such asset is vault cash, which is included in the required holdings of all the SEACEN countries and these can compromise the interest rate buffer function. In the Philippines and Taiwan, some liquid assets such as government securities, are also taken as reservable assets.

Fiji, Mongolia, Philippines and Taiwan remunerate their reserve requirements but in many countries, reserve requirements are not remunerated at market rate, possibly granting some seinorage to the central banks.

In many SEACEN countries, reserve requirement is still one of the most important components of monetary policy framework[21]. First, higher required reserve ratio helps to automatically sterilise a part of large inflows of foreign

21. Central banks in emerging market countries tend to use reserve requirement variations to offset autonomous influences on bank liquidity more frequently than in industrialized countries. Furthermore, in some cases, the management of reserve requirement ratio is also directed to control monetary policy. The phasing-out of direct controls on ban credit has often involved the imposition of high reserve requirements as a transitional measure to control liquidity.

exchange in the SEACEN region. In Sri Lanka, Mongolia, and Philippines, the ratio is relatively high at 10%, 14%, and 21% respectively.

There are substantial differences across the countries in the frequency of changes in reserve requirement ratios. Some countries have frequently adjusted their ratios for purposes both of offsetting autonomous liquidity developments and of controlling the growth of broader monetary aggregates. In Malaysia, Philippines, Sri Lanka and Taiwan changes were more frequent (much more than 10 times since 1995) to control excessive liquidity.

Even though reserve requirements are still used as one of the most important tools of monetary policy, there are clear signs of convergence to lower levels and less active reliance on them due to the strong tendency towards on market based instruments. The need to reduce the tax on bank (compared to non-bank) intermediation has been one important motive. In Korea and Singapore, there has been a marked movement towards ratios that are both lower and less dispersed. In these two countries, the ratios are now 3% on average. Moreover, Indonesia, Korea and Singapore change the ratio infrequently only to accommodate structural change. Sri Lanka is another example of this tendency. In Sri Lanka, the ratio was changed 12 times during 1990~1999, but has changed only 2 times since 2000.

Table 5
Main Features of Reserve Requirements

	Range of ratios	Avera -ging	Maintenance period		Remuneration / penalty
			Durat -ion	Lag with respect to calculation period	
Fiji	5%	yes	1 month	-	yes/yes
Indonesia	5-8%	yes	1 week	2 weeks	no/yes
Korea	1-5%	yes	2 weeks	7 days	no/yes
Malaysia	4%	yes	2 weeks	1 month	no/yes
Mongolia	14%	yes	2 weeks	1 month	yes/yes
Nepal	5%	yes	2 weeks	1 week	no/yes
Philippines	21%	yes	1 week	-	yes/yes
Singapore	3%	yes	2 weeks	2 weeks	no/yes
Sri Lanka	10%	yes	1 week	1 week	no/yes
Taiwan	0.125-10.75%	yes	1 month	3 days	yes/yes
Thailand	6%	yes	2 weeks	2 weeks	no/yes

3.3 Standing Facilities

Currently, few SEACEN countries use typical standing facilities in order to signal the monetary policy stance through the typical interest rate corridor[23]. First of all, many countries rely more on discretionary market operation as a tool of monetary policy.[22] Almost all the countries responded that they regard standing facilities as less important or only a complementary instrument, compared to discretionary market operations.

Malaysia has a deposit facility as well as a lending facility, which forms a typical interest corridor around the overnight policy rate. Sri Lanka also uses RP and reverse RP for the banks which fail to obtain the requirements of the daily OMO. Bank Indonesia (BI) provides a kind of deposit facility which acts as a 'de facto' floor for inter-bank overnight rate. However, BI does not have any instrument yet that serves as a ceiling for market interest rate.

However, all the countries have some lending or refinancing facilities for more diverse purposes. Most central banks of SEACEN counties, as a lender of last resort, use those lending facilities, in order to meet banks' unexpected liquidity needs and to smooth settlement system.

A first development of note in the area of standing facilities has been the movement away from facilities designed to support particular sectors. In Korea and Philippines, rediscount was initially used as a selective financing instrument

22. Central bank in most developed countries have in recent years come to rely more on discretionary market operations in managing liquidity, and less on standing facilities. Driving forces behind this development have been the growing maturity and diversity of financial markets and the process of interest rate liberalisation.

23. The use of standing facilities as a tool of monetary policy serves several functions. The first is to signal the central bank's policy intention. In some cases, the standing facility will provide an interest rate which serves as a pivot for other interest rates. In other cases, standing facilities effectively define and interest rate corridor, with a ceiling set by a credit facility and a floor determined by the rate at which the central bank borrows (or accepts deposits). In many cases, the width of interest rate corridors depends on the underlying situation. For example, pressure in several foreign exchange markets might lead many central banks to accept greater day-to-day movement in overnight interbank interest rates. Hence, the corridor will widen.

    The second major function of standing facilities is to act a safety valve in response to unexpected liquidity developments or to various obstacles or inefficiencies that prevent a smooth redistribution of reserve via the interbank markets. In order to preserve the special or exceptional feature of recourse to standing facilities, central banks have often incorporated several restrictions in the design of the facilities which include 1) limiting the volume of funds to be borrowed 2) limiting access to a certain number of consecutive days 3) setting the interest rate on the facility above the market rates. The safety valve function continues to be important in several countries where the primary emphasis is on market operations, largely because of the difficulty of forecasting the demand for bank reserves.

for a certain industry or sector like small and medium enterprises. The rediscount system, designed to support small and medium enterprises at an interest rate well below market rates, does not allow the central bank to use standing facilities to adjust market liquidity and signal changes in the monetary authorities' stance. A second significant evolution concerns the role of access to the discount window in supporting weak banks. In many countries, it is weak banks that have tended to rely most on central bank discount facilities.

In many SEACEN countries, lending facilities are in practice, of diverse types, such as RP arrangement, re-discount, and unsecured advance facilities, with many of them being used at the same time in some countries. In most SEACEN countries, the interest rate of lending facility is a kind of penal rate to commercial banks. In Fiji, Korea, Malaysia and Thailand, it is some policy rate plus margin while in others, it is usually some margin set above the market rate.

Lending facilities are uniformly available to all commercial banks in automatic provision. The amount is, therefore, usually not restricted, but naturally capped by eligible collateral in most of the countries. Government bonds and central bank notes are the main eligible collaterals in SEACEN countries.

3.4 Open Market Operation

More SEACEN countries are now relying more on market operations. The notable thing is that most of SEACEN countries have suffered a structural liquidity surplus and open market operation aims mainly at absorbing liquidity in most countries.

Among the possible instruments, [24] the most widely used instrument is a domestic repo, which many countries rely on for a short-term liquidity management.

24. Market operations available to the central bank fall into five general categories. 1) repurchase transactions against domestic currency assets. In cash-flow terms, they are equivalent to collateralized lending. 2) Foreign exchange swaps are equivalent to the above but are against foreign currency. Liquidity can be injected by a spot purchase of foreign currency combined with an equivalent forward sale and can be withdrawn by spot sale/forward purchase. 3) Outright transaction in the secondary market. 4) Issue of short-term paper is a primary market issuance of either central bank paper or government paper. 5) Inter-bank market transactions, including taking deposits or making (possibly unsecured) loans.

    In general, the most widely used instrument is domestic currency repos, followed by foreign exchange swaps. The issuance of short-term paper and secondary market transaction are also significant. By contrast, direct interventions in the interbank market are relatively infrequent. One important general consideration may be that the need to send the market clear signals which favors the use of one or two particularly visible instrument even if greater flexibility might dictate a wider range of instruments. A second general point is that central banks use different instruments to address different situations.

Table 6
Use of Central Bank Standing Facilities

	Types of Facilities	Functions
Fiji	- Unsecured advance facility (overnight facility) - RP agreements - Re-discount RBF buyback operations	Temporary liquidity shortfall
Indonesia	- Sort-term funding facility - Intraday liquidity facility - Deposit facility	Availability of daily liquidity need, and guide the market rate
Korea	- Aggregate credit ceiling loan - Loans to meet temporary shortages of funds - Intraday overdrafts	Support banks in meeting shortages of funds
Malaysia	- Lending facility (Overnight RP agreements and overnight collateralised loans - Deposit facility	Typical standing facility: satisfy temporary liquidity needs/place overnight excess funds
Mongolia	- Discount facility - Repo financing - Overnight loans	Provide temporary liquidity, and conduct open market operations
Nepal	- Standing liquidity facility	Smooth functioning of internal payment and settlements system
Philippines	- Refinancing facility (rediscount facility) - Deposit facility	Meet banks' unexpected liquidity needs, signals the monetary policy stance
Singapore	- End-of-day facility - Intraday facility	Cover banks net positions and ensure adequate liquidity
Sri Lanka	- RP facility - Reverse RP facility	Typical standing facility : cover shortages/invest excess funds
Taiwan	- Discount window	Meet temporary liquidity needs
Thailand	- End-of-day liquidity window - Intra-day liquidity window	Provide insufficient liquidity, ensure money market stability, and set an upper ceiling on overnight market rates

Next to the repo, secondary market operation is used in many countries, particularly to offset structural liquidity changes, even though secondary markets are not very active or well developed in many SEACEN countries. Many SEACEN central banks issue their own short-term papers, mainly to absorb liquidity and provide some liquid papers to be used as collateral for diverse financial transactions. Foreign exchange swaps are used regularly only in a few countries, despite their similarity with repos, because of some risks involved in the transactions.[25] However, in Singapore, the bulk of liquidity management is done mainly through FX swap. Direct intervention in the interbank market is relatively infrequent as in general case.

Most SEACEN countries use different instruments in order to address different situations. In general, for a long-term adjustment, either issuance of central banks bill or secondary market operation is often used in Korea, Malaysia, Philippines, Sri Lanka, Taiwan and Thailand. In these countries, reversed transactions are often used to meet temporary shortages or surpluses of bank reserves[26].

25. First, the value of the underlying asset may be prone to sudden valuation changes. The central bank may incur sizable losses with the unwinding of the forward leg of the foreign exchange swap. Secondly, in many emerging market countries, forward markets are not deep enough to generate market prices for foreign exchange swaps. The central bank may then be forced to determine the swap rate itself. Not only would this have important announcement effects (and influence the spot rate), but it could also expose the central bank to losses. Finally, the central bank might have a very narrow choice of counterparties in the swap operation as only a limited number of large banks might be active in the foreign exchange markets.

26. As will be seen, Taiwan seldom manages day-to-day liquidity through repurchase transaction, since the banks usually have surplus in liquidity.

Table 7
Discretionary Operations

	Reversed transactions					
	Domestic currency Assets		Foreign currency assets	Outright transact-ions	Issues of short term paper	Interbank market transac-tions
	Inject	With-draw				
Fiji					o	
Indonesia	(o)	o		(o)	o	
Korea	o	o	o	o	o	
Malaysia	o	o	o	o	o	o
Mongolia	o	o			o	o
Nepal	o	o		o		
Philippines	o	o		o		o
Singapore	o	o	o	o		o
Sri Lanka	o	o		o		
Taiwan	(o)	o	o	o	o	
Thailand	o	o	o	o	o	

* (o) : very limitedly implemented.

3.4.1 Auction Procedures

All market operations involve some kinds of auction though the modalities of auctions vary considerably. One dimension is whether the central bank fixes volumes or prices, so called fixed price and varied price.[27]

27. The most liberal solution is for the central bank to auction a pre-announced volume of paper: in this system the interest rate is quite free. However, concern that such a procedure might yield excessive volatility of interest rates has discouraged many central banks from pre-announcing volumes that they wish to transact. In contrast, a fixed price tender prevent the market from influencing the interest rate. In repurchase transactions, many central banks use fixed rate tenders. Fixed price tenders may limit the information the central bank can extract from the market although the distribution of banks' bids could provide some information. In recent years, the frequency of tenders has increased (with the average maturity declining), thus allowing market forces to exert greater influence. Least sensitive to market conditions are tap sales at fixed interest rates that can be maintained for prolonged periods of time. Here, the dividing line between market operations and standing facilities becomes very blurred. Finally, in some cases, non-competitive bids can be made, i.e. a certain volume is bid/offered at the weighted average yield or at the uniform yield resulting from the bids or offers made by competitive bidders during the auction.

Table 8
Auction Procedures

	Fixed Rate (F) / Variable Rate (V)	Single (S) / Multiple (M) Prices	Notes
Fiji	V	M	RBF notes are auctioned twice a week through public tender
Indonesia	V	M	Value of auction is an indicative target
Korea	F	S, M	Sale and issue are done by single price, but purchase and repurchase are based on conventional auction
Malaysia	F, V	-	Used as either uncollateralised direct borrowing via money market, or the auction of Bank Negara Bills to principal dealers on a continuous rollover programme
Mongolia	V	M	BOM announces auction amount and discount rate, after auction, weighted average price be informed to the public
Nepal	F	S, M	Sealed and secret quotation on RP and reverse RP, and multiple price issuance of TB
Philippines	F	-	BSP announces its borrowing and lending rate
Singapore	F	S, M	SGS auction results include total amount applied, average yield in allotment, cut-off yield and price, and percentage of applications at cut-off allotted; results are published
Sri Lanka	V	M	Each participant can make up to three bid per auction, and allocations to successful bidder at their bid rate
Taiwan	F, V	S, M	Non-competitive bidding take fixed rate and single price, whereas variable and multiple price are taken in competitive bidding
Thailand	F, V	M	BOT operated RP are on the variable rate tender, while bilateral RP operate fixed rate or variable rate. BOT bond issuance and outright transaction are multiple price auction

The second practical issue is the choice of auction type. A key distinction is between single or uniform price auctions. [28] In a uniform price auction or Dutch allocation method, bidders are to pay a uniform price that exhausts the whole issue. In multiple or discretionary price auctions, or American method, successful bidders pay their individual bid.

Most SEACEN members use variable rate and multiple prices in issuing their short-term paper. In this respect, the Korean case is noteworthy as it uses a fixed rate and single price tender in issuing its own bills (called MSBs). In RP transaction, many countries use a fixed rate and multiple prices in general. Again, in Korea, repos to absorb liquidity make use of the Dutch method, in which the highest interest rate tendered is uniformly applied to all successful bidders, whereas those injecting liquidity are at multiple prices. Similar to Korea, non-competitive bidding in Taiwan, takes fixed rate and single prices, while variable rate and multiple prices are taken in competitive bidding. Malaysia uses direct borrowing through money market tender of daily variable rates.

3.4.2 Repurchase Transactions

Repurchase transactions have become the main policy instrument in many countries because of their great flexibility[29].

Based on the survey, only Fiji does not yet use them for market operations. Most SEACEN countries have given repos a major role in the day-to-day management of bank reserves. This practice, however, is still rather new and further development continues. A very active market in repos and reverse repos

28. The choice between the two methods will also depend in practice on the assessment of the different possibilities for collusion under the various systems. Some have argued that multiple price auctions provide greater incentives to collude – by pooling bids, bidders can reduce the risk overbidding. Others have argued that collusion can be more easily enforced in a uniform price auction. It is perhaps for this reason that most Treasury bill auctions are of the discriminatory type. Another concern has been the so-called "winner's curse": as winners at a multiple price auction have to pay their own bid, they may try to minimise the chances of over-assessing the security's resale value by lowering their bids. The average price reached at a multiple price auction may then be less than the single low price that results from a single price auction.

29. Compared with outright open market operations they do not require a liquid underlying market for securities, they only have an indirect impact on the prices of the underlying securities, and no link needs to exist between the maturity of the underlying securities and that of the repurchase transaction. Moreover, repos are cost-effective, as a temporary reserve adjustment that can be accomplished with a single operation, rather than with two outright operations. Another advantage some see in repos is that they are based on the standardisation of the underlying contract by the markets.

has developed in Korea, Philippines and Thailand. In these countries, a wide range of financial institutions including non-bank financial institutions are now accepted as counterparties to the central bank.[30] Moreover, more securities other than government bonds have become eligible as underlying assets although the underlying eligible assets still consist mainly of government fixed income securities. Individual countries usually define in non-ambiguous terms, what paper qualifies as collateral. Government securities are used as collateral in Thailand, while Korea permits not only government bonds, but also government guaranteed securities.

One recurrent problem seems to be the lack of eligible underlying papers in the market (e.g. Indonesia, Malaysia and Thailand) or the depletion of the stock of eligible collateral papers. As this situation is usually associated with thin or narrow markets in government securities, some central banks have responded by widening the range of eligible paper.

Maturities of repos also vary widely, extending up to 91 days or even longer as in the case of Korea. However, in most countries, the maturity is substantially shorter. The maturity of actively used RP is especially short, which is consistent with its use in daily liquidity management, averaging mostly for 1 day or less than a week.

Finally, repos are often valued because of their efficacy in signaling the intentions of the central bank to the market in a transparent way.[31] Signals may also be given by changing the underlying conditions of the repo, for example by allowing new participants, adding or withdrawing the underlying collateral assets or changing the auction procedures.

3.4.3 Use of Open Market Operations by Country

In Fiji, the main open market operation is the issuance of central bank bill. The Reserve Bank of Fiji (RBF) issues RBF note in the primary market for short-term liquidity management. RBF maintains the actual 91-day RBF note rate at the policy indicator rate by selling and buying back RBF notes. RP is not

30. In Korea, banks, merchant banks, investment and trust companies and securities companies are accepted as counterparties.

31. For instance, in the unsettled exchange rate environment following the mid-1997 crisis, the Bank of Thailand kept the repo rate firmly at over 20%; this was meant to clearly communicate to the market the Bank's desire to stabilize the currency.

used for market operations, even though it is introduced as a lending facility to ease possible over-tightening liquidity. No foreign exchange swap is carried out for market operation. The participants to the market for base money are limited to the Reserve Bank, the government, and institutions (commercial bank) that hold accounts at the Reserve Bank.

In Indonesia, the market operations of Bank Indonesia (BI) are mainly aimed at absorbing liquidity from the market. BI relies heavily on the issuance of its own paper (called SBI). Market operations are also more in the form of outright selling of SBI through the auction, in order to absorb liquidity. There are no available instruments for injecting liquidity on regular basis such as RP transactions and foreign exchange swaps are not used for monetary operations. BI's counterparty in its market operation is only commercial banks – more than 50% of the current 134 banks are involved regularly in BI's operations.

Four types of transactions are used for open market operations in Korea. For a long-term adjustment, issuance of central bank bill (called MSB) and outright transactions of securities are often used. The Bank of Korea (BOK) has begun to engage in FX swaps in response to the tremendous increase of MSBs. RP transactions are most actively used as a major instrument of daily liquidity management. BOK designates the counterparties every year, and currently, the counterparties for RP transaction are 21 commercial banks (including regional branches of foreign banks) and 9 securities companies.

All the instruments are currently used for open market operations in Malaysia. Direct borrowings are mainly used to absorb liquidity while RP transactions are also conducted for term borrowing by central bank (BNM). For longer term management, the issuance of BNM securities and the outright transactions of securities are usually used. FX swap is an additional option for daily management for BNM. BNM also implements a deposit centralisation of government, statutory agencies and government pension funds deposits with BNM. BNM is selective of counterparties and they include commercial and merchant banks, finance companies and discount houses.

In Mongolia, the central bank bill (called CBB) issued by The Bank of Mongolia (BOM) is a main instrument of market operations. BOM has the right to repurchase un-matured CBB at a discount price. RP transactions have been used recently and BOM can be a lender of the inter-bank overnight market with its own interest initiative. Outright transactions of CBB are also used while FX swaps are not.

In Nepal, outright and RP transactions comprise of main market operations. Government TB is regarded as an important, flexible and short-term instrument for market operations. All the transactions are undertaken through market auction. No foreign exchange swap is implemented and commercial banks are main counterparties for the conduct of monetary policy.

In the Philippines, regular RP and reverse RP are the most commonly used, especially for a short-term liquidity management. For liquidity management on a more permanent basis, the central bank (BSP) enters the secondary market by doing outright transactions of government securities. The BSP also uses special deposit account while FX swaps are seldom used for market operations. Purchases and sales in the open market are made through banks, non-banks with quasi-banking functions and accredited government security dealers.

Monetary policy of Singapore has been centered on the management of the exchange rate. When the exchange rate breaches the policy band, or when there is undue volatility or speculation, intervention operations are conducted using spot or forward transactions. As for open market operation, FX swap and RP and reverse RP against government securities are widely used instruments. FX swap also plays a major role in liquidity management while direct borrowing and lending are also adopted. Money market operations are daily conducted, in addition to exchange rate operations.

In Sri Lanka, daily RP and reverse RP auctions are the most important instruments. RP and reverse RP make up the standing facility to stabilise the interest rate at a level considered appropriate within the interest rate corridor. For long term liquidity management, outright transactions of government securities are also conducted, to either inject or absorb long term liquidity. No operations are conducted in the FX market for monetary operation. RP and reverse RP are used by commercial banks and primary dealers.

A wide range of instruments is used simultaneously in Taiwan. The Central Bank of China, Taipei (CBC) absorbs excess liquidity by issuing certificate of deposits (CDs), selling securities and swapping out FX. As long as the implied interest rate from FX swaps is below the CD rate, there is room for executing FX swaps. CBC injects funds by carrying out repurchase agreements, but CBC seldom manages day-to-day liquidity through repurchase transaction due to banks usually having surplus in liquidity. Repurchase transactions are undertaken mostly for the purpose of absorbing reserves for a short-period of time. Counterparties are general designated dealers and primary dealers.

Table 9
Market-based Operation by Country

	Instruments/Markets	Operating Procedures
Fiji	Issue RBF short term paper to the primary market	Maintaining the actual 91-day RBF note rate at the policy indicator rate by selling and buying back RBF notes
Indonesia	Outright selling of Bank Indonesia certificates (SBI)	BI rate will be a guide in weekly SBI using variable rate tender
Korea	RP transactions, Issuance of central bank paper (MSB), and Outright transactions of government and public bonds	RP are mainly used as a major instrument of a daily management. For longer term adjustment, issuance of MSB and secondary market transactions
Malaysia	All instruments including direct borrowing and FX swap	RP and direct borrowing are mainly used to absorb liquidity. For long-term management, issuance of BNM securities, and secondary market transactions
Mongolia	Central Bank Bill (CBB)	Central bank has a right to repurchase un-matured CBB at discount rate, and can be a lender of the inter-bank overnight market with its own interest initiative
Nepal	Government bonds	Outright transactions and RP transactions are main operation
Philippines	RP transactions, and outright transactions	RP are mainly used as a major instrument of a daily management. For longer term adjustment, secondary market transactions
Singapore	RP against government securities, and FX swap	Policy is centred on management of the exchange rate, and RP and direct borrowing are also used
Sri Lanka	RP transactions and outright transactions of government bonds	RP and reverse RP forms standing facility, and for long-term, outright transactions of government bonds
Taiwan	Issuance of central bank CDs, outright transaction, FX swap and RP transactions	Issuing CD and selling securities to absorb excess liquidity, and PR are used only to absorb reserves for a short-period of time
Thailand	RP market, outright transactions and re-issuance of central bank bond	RP are mainly used to for temporary liquidity management, and outright transactions to address a permanent change in liquidity. Central bank started to reissue its own bond in 2003

All types of instrument are used in Thailand. The Bank of Thailand (BOT) utilises RP and are developing bilateral RP markets to be used mainly for temporary liquidity management. To address a permanent change in liquidity, outright transactions of government securities are also used. BOT started reissuing BOT bonds in 2003, with the aim to expand the range of instruments used in the implementation of monetary policy. FX swap supplements other market operations, especially when domestic debt securities are scarce. Currently, there are 58 RP members, including commercial banks, finance companies, finance and securities companies, and specialised financial institutions. For BOT bonds, eligible bidders of BOT bonds are some public funds in addition to RP members.

4. Measures of Real Interest Rate and Expected Inflation

4.1 Real Interest Rate

As be seen, many SEACEN countries employ interest rate as their policy instrument. Moreover, interest rate becomes even more important for the countries which have monetary aggregates as their intermediate target. This tendency will be stronger as financial market is more liberalised, and interest rate better reflects the market situation. In light of this, some measures of interest rate are now one of key indicators of monetary policy.

Several different measures of interest rate can be used as a key indicator of monetary policy. Nominal short-term interest rate is a first indicator representing the policy stance. However, although central banks directly control money market rates, nominal interest rate is not actually very important in the transmission of monetary policy, especially when inflation is high or unexpected. It is well known that real rates govern private expenditure, aggregate demand and inflation.[32] Hence, real interest rate is used as a good alternative for nominal interest rate, assuming that central banks are aware of this fact, and they control nominal rates or money stock so as to hit a path for the short-term real interest rate. Actually, real interest rate, that is, nominal interest minus inflation rate, can be a good measure since real short term interest rate plays an important role in the transmission mechanism of monetary policy other than the nominal interest rate itself.

However, ex-ante real interest rate, defined as nominal interest rate minus expected inflation instead of measured actual inflation, is preferably used in practice. It is theoretically more plausible to believe that economic agents base their decisions on the expected inflation rate and not the actual inflation rate. It is a

32. Economic agents are normally supposed to make their rational decisions based on the real interest rate not nominal interest rate, and they simply are not in the absence of money illusion.

general situation that economic agents need to know the inflation of the future because of their decision problems, and they cannot know actual inflation when they make an economic decision.[33] In many studies, real interest rate simply means ex-ante real interest rate. Moreover, real interest rate is more volatile than nominal interest rate, since measured actual inflation is very volatile in most of cases. We note that ex-ante real rate is normally less volatile than ex-post real rate since, most of time, expected inflation changes more smoothly than actual inflation.

However, the use of ex-ante real interest rate in practice is quite limited. First of all, the actual estimation involves many technical problems and difficulties in relation to estimating the expected inflation. Before the estimation of ex-ante rate and expected inflation, we need to dwell on the measurement problem related to the unobservability of real interest rates or inflation expectations. It has been shown that the issue can be addressed by using survey data on inflation expectation. Despite some important drawbacks of survey data, the available evidence has shown that the survey is a good measure for inflation expectations, especially when considering alternatives. However, we know that in almost all the SEACEN countries, no survey data on inflation expectation are available. Second, it is not clear either to which extent monetary policy can affect real interest rates.[34] We note that monetary policy can be proxied by the short-term real interest rate, and fiscal policy by government net borrowing and public debt.

Finally, even if we did have information on the level of real interest rates and if the central bank could affect it, we still need some benchmark to assess the current level of the real rate, in order to determine the stance of monetary policy[35]. These questions are not easy to address at all.

33. As for an expected inflation, changes in expected inflation may account for most of the fluctuations in nominal interest rates. It has been raised by some theories such as the expected inflation hypothesis, and supported by some empirical studies.

34. It is much less clear whether monetary policy has much of an effect on medium- to long-term real interest rates.

35. As for benchmark rate, a few member banks are actively using the natural rate of interest rates. Korea estimates it on a quarterly basis and reports it to MPC members. The estimation is done by using the Kalaman Filter and MLE method with the co-movements in GDP and the core inflation. Taiwan also actively uses the natural rate of interest rate as guide to adjust the target rate. To estimate the natural rate of interest, Taiwan uses many methodologies; averages of the actual real rate, the actual GDP growth rate, real rate of return on capital, subtracting the maturity related term premium from the growth rate of potential GDP, and time varying neutral rate in interest rate in state space models. Malaysia uses an indicator of the natural rate of interest rates as part of the information set, and Thailand also regard as a rough guide and for internal analysis, the natural rate of interest estimated by historical long-run averages of the real interest rate.

This section is devoted to estimating the historical time series of the inflation expectation and ex-ante real rate together with the long-run real interest rate, and ultimately assessing the monetary policy stance.

4.2 Estimating Real Interest Rate and Expected Inflation

4.2.1 Model and Structural VAR

The model is based on the key assumption that nominal interest rate fluctuations are a function of inflation expectation shocks and shocks to ex-ante real rate.[36] That assumption is well backed both theoretically by the Fisher relation and rational expectation and empirically, by time series properties of interest rate found in many established work[37]. The objective is to identify these two shocks

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36. The following sections use as a methodology a structural VAR model, and refer much to Gottschalk (2001) which followed the approach proposed by St-Amant (1996)

37. The St-Amant model starts with two relationships. First is the Fisher relation, which states the nominal interest rate is the sum of the ex-ante real interest rate and expected inflation.

$$i_t = r_t^e + \pi_t^e$$

where i is the nominal interest rate at time t, r^e is the corresponding ex-ante real rate and π^e denotes the inflation expectation. The second relationship defines the inflation forecast error ε as the difference of actual and expected inflation.

$$\varepsilon_t = \pi_t - \pi_t^e \sim I(0)$$

Normally, the forecast error ε is I(0), which is the case under rational expectation hypothesis. The above two equations lead to the following equation.

$$i_t - \pi_t = r_t^e - \varepsilon_t$$

which shows that the ex-post real rate, $i - \pi$, can be expressed as the sum of the ex-ante real rate and the inflation forecast error. The nominal interest rate and the inflation rate are normally found both I(1) variables, and the ex-post real rate is a stationary variable, which implies that both variables are cointegrated with the coefficients (1, -1). These findings have several implications. First, the non-stationarity of the nominal interest rate implies that this variable can be decomposed into a non-stationary component comprised of changes in the nominal interest rate with a permanent character, and a stationary component which is comprised of transitory fluctuations in the interest rate. Second, the cointegration relationship of the nominal interest rate with the inflation rate implies that both variables share a common stochastic trend. This stochastic trend is the source of the non-stationarity of both variables and can be interpreted as the nominal trend in the economy which is responsible for the underlying trend in inflation and the nominal interest rate. Third, the finding that the nominal interest rate and the inflation rate are cointegrated (1,-1) provides evidence for the Fisher relation to hold in the long run.
As for the SEACEN countries, cointegration test can not be conducted properly because of some factors making the test unreliable. The power of stationarity test is low with only a decade of data, and most countries suffered a massive structural break caused by a financial crisis during the sample period.

and subsequently compute empirical measures of the ex-ante real rate and the inflation expectation components of the nominal interest rate.

From the assumption, the following model is set up. The bivariate model is comprised of the nominal interest rate and the stationary component of the interest rate, where the nominal interest rate is differenced so that both variables are stationary. The moving average representation of the model is a starting point.

$$x_t = \begin{bmatrix} \Delta i_t \\ r_t^d \end{bmatrix} = A(L) = \begin{bmatrix} \varepsilon_t^{\pi} \\ \varepsilon_t^{r} \end{bmatrix} A(L)\varepsilon_t, \quad \mathrm{E}(\varepsilon_t \varepsilon_t') = \mathrm{I} \tag{1}$$

where Δi is the nominal interest rate change, r^d is long-run trend of real interest rate, and ε^{π} presents the inflation shock, and ε^{r} is real interest rate shock. Both shocks are assumed to be orthogonal to each other and they are not auto-correlated, which is reflected in the normalised variance-covariance matrix of ε, $E(\varepsilon\varepsilon') = I$.

To obtain the historical decomposition given by the above structural model, the following reduced form of the system is actually estimated simply by ordinary least square estimation (OLS).[38]

$$x_t = \begin{bmatrix} \Delta i_t \\ r_t^d \end{bmatrix} = \Pi_1 x_{t-1} + \ldots + \Pi_1 x_{t-\mathrm{p}} + e_t, \; E(e_t e_t') = \Sigma \tag{2}$$

where p is the lag length of the system and e is a vector of estimated reduced form residuals with a general variance-covariance matrix, $E(\varepsilon\varepsilon') = I$. The choice of the lag length p is one of the most important factors in actual estimation of the reduced form (2), and here it is selected based on Akaike information criterion, as usual in this kind of model.

For diverse purposes, the reduced system may also be inverted to the moving-average representation form following way.

$$x_t = \begin{bmatrix} \Delta i_t \\ r_t^d \end{bmatrix} = e_t + C_1 e_{t-1} + \ldots + C(L)e_t, \; E(e_t e_t') = \Sigma \tag{3}$$

38. Although this assumption is standard in this kind of model, it might be restrictive assumption (Pennachi, 1991).

The estimation of the reduce form (2), and hence getting the estimate of reduced parameter C(L) are not sufficient to get the estimate of the structural parameter A(L), due to the so called identification problem.[39] The identification problem is easily illustrated by the relationship between the estimated reduced form residuals and the structural form shocks. The following relationship is directly from the comparison of (1) and (3).

$$e_t = A_0 \varepsilon_t \tag{4}$$

Applying the variance-covariance operation on both sides of the equation (4) gives the relationship, $\Sigma = A_0 A_0'$ which clarifies the identification problem. That is, the matrix given by $A_0 A_0'$ has four elements, but the estimated variance-covariance matrix, Σ is symmetric, and thus has only three elements. So even though we get the estimate of Σ, we can not identify the matrix given by $A_0 A_0'$ without further assumption.

Hence, the estimation of the structural model, (1) requires one more identifying restriction. The needed restriction is again from the Fisher relation and time series properties of interest rates: the long-run restriction that only shocks to inflation has a permanent effect on the nominal interest rate, whereas ex-ante real rate shocks have a transitory effect on the nominal interest rate. How this restriction addresses the identification problem can bee seen the following conditions obtained from (1), (2) and (4).

$$A(1)\varepsilon_t = C(1)e_t \, C(1)A_0\varepsilon_t \tag{5}$$

where $A(1)$ and $C(1)$ denote the long-run effects of the structural and reduced form shocks on the nominal interest rate, respectively. Estimation of the reduced form yields the matrix, $C(1)$. Restricting the long run effect of an ex-ante real rate shock on the interest rate to zero implies that the corresponding element in the matrix, $C(1)$ is set to zero. Then one restriction can be imposed on the matrix A_0 through (5), which in turn solves the identification problem illustrated by the equations (4) and $\Sigma = A_0 A_0'$.

39. For identification analysis for structural VAR, refer to Giannini (1992).

After getting structural parameter matrix, by, it is now possible to compute the following decomposition of the nominal interest rate.

$$\Delta i = A_{\pi}(1)\varepsilon^{\pi} + A_{\pi}^{T}\varepsilon^{\pi} + A_{r}\varepsilon^{r} \qquad (6)$$

The first two terms of the right hand side of (6) show the effect of the inflation expectation shock on the change of the nominal interest rate; the first term gives the permanent effect of inflation expectation shocks on the change of nominal interest rate, and the second term represents the transitory component of this shock. The last term represents the effects of a shock to the ex-ante real rate, and this shock only has a transitory component of real interest rate, since permanent effects have been ruled out. While equation (6) gives the effects of two shocks on the change of the nominal interest rate, accumulation of the effects yields the level of the short-term rate as a function of the inflation expectation and the ex-ante real rate shocks.

Next, the estimate of the ex-ante real rate is obtained by computing first the measure of the deviations of the ex-ante real rate from the equilibrium real interest rate. The deviations of the ex-ante real rate from the equilibrium are obtained by the third term of the equation (6), effects of the ex-ante rate shocks on the nominal interest rate. The equilibrium real rate is approximated in the empirical investigation with the band-pass filter estimate of the trend component of the real interest rate[40]. The ex-ante real rate is just the sum of both series. As for expected inflation, subtracting the estimated ex-ante real rate from the nominal interest rate yields the expected inflation by the Fisher relationship.

4.2.2 Data and Estimating Results

The estimation was conducted for 9 countries including Fiji, Indonesia, Korea, Malaysia, Nepal, Singapore, Philippines, Taiwan, and Thailand.[41] The data set consist of monthly data, available for a time span beginning 1995 and ending 2005. The interest rate is a 3-month money market rate, since the time series data of this rate is available in all the countries. The inflation rate is calculated as the annualized rate of change in the seasonally adjusted consumer price index

40. The band-pass filter methodology was first proposed by Baxter and King (1995). The band-pass filter can, by construction, ensure that the deviations of the ex-ante real rate from the trend path are stationary.

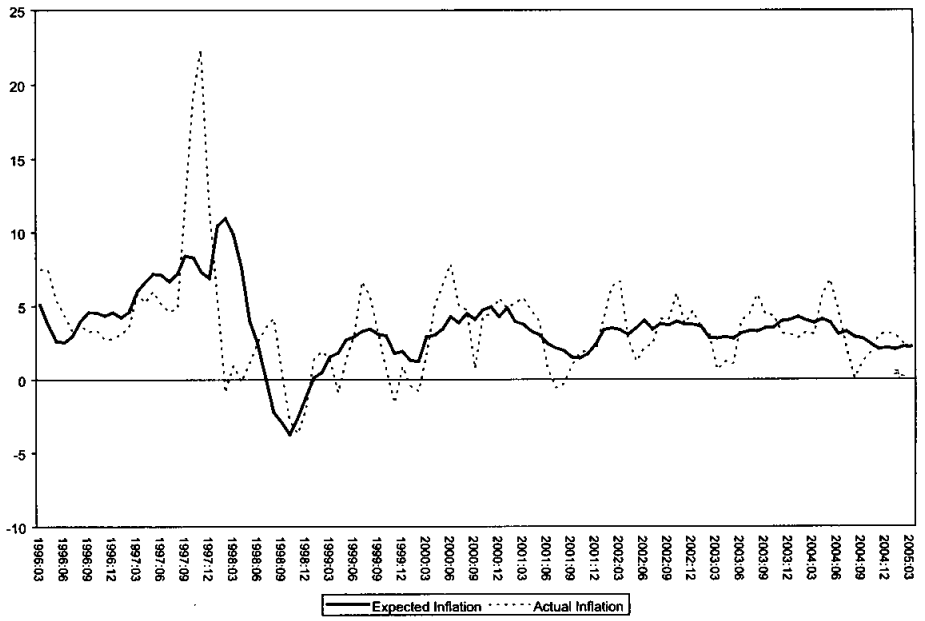
41. As will be discussed, the countries have different monetary regimes and are at different stages of the development of their financial markets.

(CPI) over 3 months. The use of seasonally adjusted CPI may reduce the volatility reflected in the model.

The estimated resulting time series for expected inflation and the ex-ante interest rates are reported in the following figures[42].

Figure 1 shows expected inflation to the actual inflation for Korea. As can be observed, inflation expectation is less volatile than observed actual inflation over the whole period[43]. It is also noted that unexpected shocks lead to some big deviations of expected inflation from actual inflation. For example, expected inflation is much lower than actual inflation during the 1997 crisis, reflecting that expectation fails to catch up with an actual rapidly rising inflation. Expected inflation is also shown to lag the actual inflation after the unexpected shocks.

Figure 1
Expected Inflation and Actual Inflation (Korea)

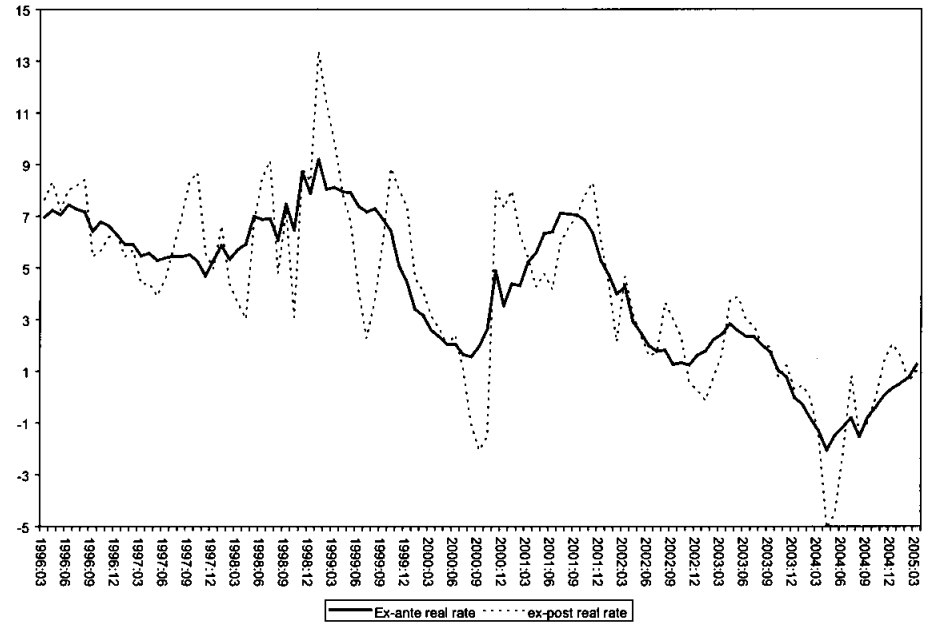


42. One of the clearest ways to express the results are through graphs in which some measures can be compared.

43. As a whole, most of the results are not very different across the countries.

Figure 2 compares ex-ante real rate to actual ex-post rate in Philippines. The cases of remaining countries are presented in Figures A2 of the appendix. As can be seen in Figure 2, ex-ante real rate is much smoother than ex-post rate, and difference between two rates may persist for a certain period of time over many countries, especially in the countries which suffered the Asian crisis in 1997. From the view point of using the ex-ante real rate as a measure of the policy stance, a smoother ex-ante rate is an advantage since the monetary authorities normally tend to smooth interest rates.

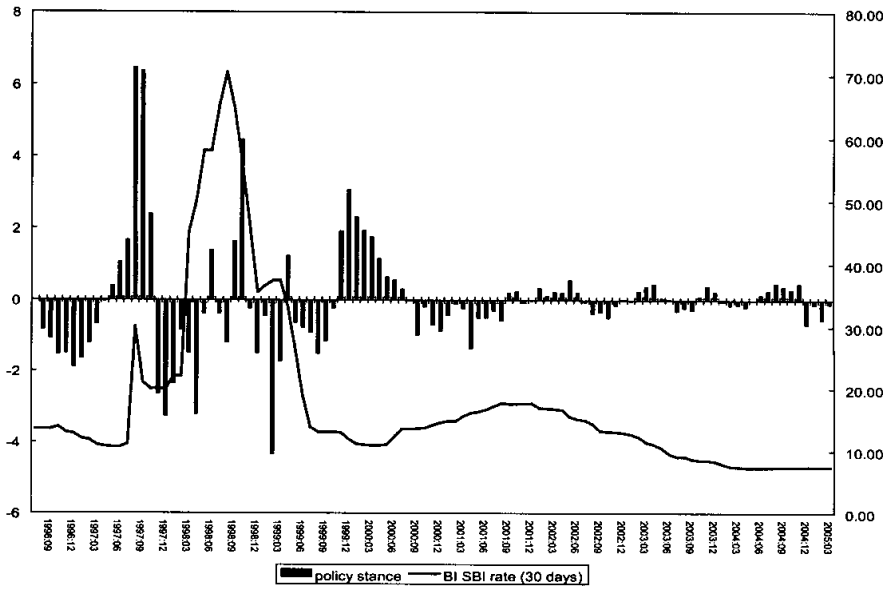
Figure 2
Ex-ante Real Rate and Ex-post Real Rate (Philippines)



Finally, we can see the resulting time series for the monetary policy stance, defined by the difference between the ex-ante real rate and equilibrium rate. The deviation of the ex-ante rate from the long-term trend of real rate due to the ex-ante shocks can be interpreted as a measure of the monetary policy stance, since other shocks like fiscal or some technological shocks are assumed to have persistent effects on the real rate.

Figure 3 shows the monetary stance measure together with the actual policy rate in Indonesia. Again the same graphs are in Figure A3 of the appendix for the other countries. The measure of monetary policy stance moves closely with the actual policy rate over all the countries[44]. However, the measure of policy stance sometimes moves differently from the policy rate, due to some other unexpected shock. The main reason that the policy stance is different from the policy rate is some other unexpected shocks affecting temporarily on ex-ante real rate. Of course, these shocks may actually include fiscal or some technological shocks in addition to some supply shocks like oil prices.

Figure 3
Monetary Policy Stance and Actual Policy Rate (Indonesia)



It should be noted that this approach is simple and can provide timely estimates of expected inflation and the corresponding ex-ante real rates, and it also is done easily for the purpose of comparative analysis. However, it should also be noted that the effectiveness of this approach may differ from one country to another, depending on the regime of monetary policy, the depth of financial market, and time-series characteristics of the movements in the interest rate.

44. In the countries, during the periods of time in which the interest rate is adopted as main operating target, the measure of monetary stance looks to move more closely than in the countries or during the period of time in which monetary target is set up.

Therefore, in applying this approach to each country, there need to be prior studies and investigation like a time-series analysis on the interest rate movement to find out whether actual nominal interest rate is closely consistent with the Fisher relation. The practical use of the measures may also be determined on country basis by the monetary policy framework, and other indicators of information set currently used.

5. Conclusion

The SEACEN countries have embarked on various financial structural reforms, especially since the Asian crisis in 1997. As a result of such unprecedented reforms, monetary policy has undergone radical changes. In many cases, traditional monetary tools such required reserves and direct controls have been increasingly replaced by market-based, as well as newer and more innovative instruments. Furthermore, several SEACEN countries have also adopted inflation targeting. Major forces for changes have been the rapid development and deepening of a variety of financial markets and instruments, the diversification of financial institutions and the globalization of intermediaries.

Based on the survey of 12 SEACEN members, a number of common and general trends can be detected in relation to the operational framework of monetary policy in the SEACEN countries. Firstly, it was found that price stability is the most important objective of monetary policy and many central banks focus more on interest rates rather than bank reserves, due to the increased importance and flexibility of the price mechanism. Many central banks are increasingly concentrating more on the short-term interest rate, through which central banks can now have greater impact, given payment and settlement arrangements. Secondly, SEACEN countries have increased the market orientation of their instruments. In most cases, a higher proportion of reserves are now supplied through operations in open markets, with the use of standing facilities limited to providing marginal accommodation or serving as an emergency finance. Consequently, the use of reserve requirements and standing facilities are now rather limited in many SEACEN countries. Thirdly, domestic repos are used in a major way for day-to-day management of liquidity and the diversity and variety of instruments used in many SEACEN countries have grown tremendously.

The structural VAR with the Fisher relation can provide timely estimates of expected inflation and the corresponding ex-ante real rates for the SEACEN countries, and can also give a proper measure of monetary policy stance. The estimates were done for the purpose of a comparative analysis. However, it

should also be noted that applying this approach to each country needs further prior studies and investigation such a time-series analysis on the interest rate movement to find out whether actual nominal interest rate is closely consistent with the Fisher relation. The practical use of the measures may also be determined on country basis by the monetary policy framework, and other indicators of information set currently used.

Most of member banks attribute recent challenges to be highly related to deregulation and liberalization, and the introduction of new technology and financial innovations. The other, and perhaps not unrelated, challenge is how to factor into the monetary policy framework, more virulent boom and bust cycles in asset prices, typically occurring alongside similar fluctuations in credit. The rapidly increase in commodity price, especially oil price is another important concern for central banks in the SEACEN region, especially its impact on inflation and growth. (see the appendix, A1. New Environments and Challenges for Monetary Policy)

In these new environments and challenges, monetary policy may need to be modified and tailored accordingly even though the ultimate goals or objectives remain unchanged. Central banks should continue to articulate policy frameworks based on a longer-horizon and in terms of balance of risks. They should also be prepared to monitor indicators relevant for the identification of financial imbalances.

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A1. New Environments and Challenges for Monetary Policy

Over the last decade, much of the world has entered a phase of low and comparatively stable inflation. Several factors have contributed to this development. In relation to monetary policy, it needs to be noted that central banks' strong anti-inflation commitment and increased credibility have played a critical role. Some SEACEN central banks, however, are concerned that this kind of disinflation may limit their monetary policy tools, as can be seen in the situation where the policy rate could be driven toward zero. Central banks should, therefore, work out whether or not low inflation is sufficient for economic stability, and whether credit and asset prices should be more seriously considered again or otherwise.

Despite the present low and stable inflation, SEACEN central banks still face challenges related with deregulation and liberalization, and introduction of new technology and financial innovations. This is especially so in the face of increased volatility in capital flows which has been singled out as the most difficult problem for the SEACEN countries, most of which are small open economies due to the continuing policy of the opening and deregulation. The increased capital mobility has increased the difficulties of central banks to have monetary autonomy and exchange rate target at the same time. In addition, it is almost impossible to distinguish between desirable and undesirable capital flows for exchange rate control. Many member banks also point out that the institutional improvement and the introduction of new technology has brought with them some uncertainties that central banks have to learn to deal with. Currently, many central banks are concerned about the uncertainty involved in the transmission mechanism of monetary policy.

The other, and perhaps not unrelated challenge, is how to factor into the monetary policy framework, more virulent boom and bust cycles in asset prices, typically occurring alongside similar fluctuations in credit.[45]

45. Now two different strategies have been proposed for dealing with market bubbles. Kohn (2006) label them the conventional strategy and extra action strategy respectively. The first approach calls for central banks to focus exclusively on the stability of prices and economics activity over the next several years. Under this policy, a central bank responds to stock prices, home values, and other asset prices only insofar as they have implications for future output and inflation over the medium term. The extra action strategy is more activist and attempts to damp speculative activity directly. This approach amounts to a cautious policy of 'leaning against wind' of an incipient bubble. Kohn points that extra action pays only if three tough conditions are met. First, policy makers much are able to identify bubbles in a timely fashion with reasonable confidence. Second, there must be a fairly high probability that a modestly tighter policy will help to check the further expansion of speculative activity. Finally, the expected improvement in future economic performance that would results from a less expansive bubble must be sizable.

Contrary to the prevailing experience in the postwar period, the slowdown was not triggered by a tightening of policy designed to quell rising inflationary pressures but by the unwinding of an investment boom, associated with a boom-and-bust movement in equity prices. The problems are compounded by implementation problems such technical difficulty to identify bubbles, and political economy constraints.[46]

Rising commodity price, especially energy prices is another important concern. Oil prices have been rising so rapidly, and its impact on inflation and growth are now one of the main concerns for central banks of SEACEN countries. Central banks have many problems, in relation to the current rising oil prices; whether they will lead to cost push or demand pull or they will end up with temporary shock or become the trend.

In these new environments and challenges, monetary policy may need to be modified and tailored accordingly even though the ultimate goals or objectives do not need to change.[47] Central banks should continue to articulate policy framework based on a longer-horizon and in terms of balance of risks. They should also be prepared to monitor indicators relevant for the identification of financial imbalances.

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46. Financial and banking crises have sometimes accompanied such developments. Some countries have experienced deflation and policymakers there have struggled to reflate the economy, with policy rates reaching the zero lower bound. More recently, central banks have had to contend with an unexpected and in some cases sharp slowdown in economic activity.

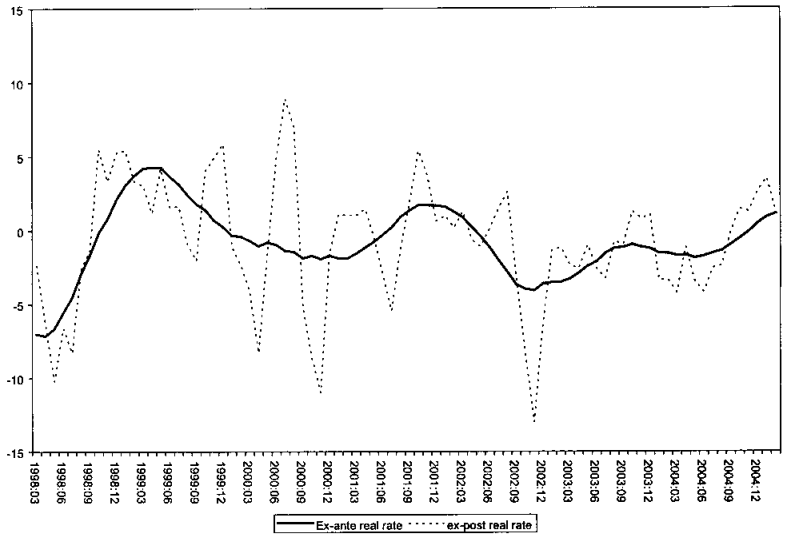
47. While trying to identify the challenges that central banks might face going forward, two alternative perspectives lead to somewhat different conclusions in terms of the balance of risks faced by central banks in the current environment and the appropriate policy responses.

    The first view, which can be called "continuity" view, sees that the current economic environment as a natural extension of that which prevailed during much of the previous inflation period. Accordingly, the lessons drawn from that period apply with little, if any, modification to present conditions. The dynamics of the economic system have not significantly changed. This view tends to regard some of the new challenges faced during the more recent period, and the corresponding unexpected economic developments, as essentially the result of unusual "shocks"

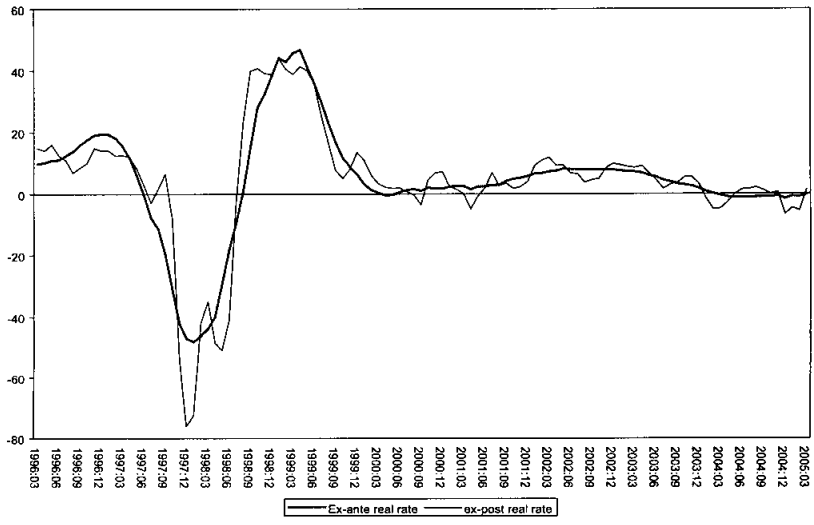
    The alternative view, called the "new-environment" view, recognizes the new challenges faced as inherent in the current landscape, characterized by liberalized financial markets, low inflation and uncertainty about the degree of structural supply side improvements. The challenges, that is, are in part the footprints of the gradual emergence of a new environment. A key characteristic of this new environment is that during unsustainable booms overt inflationary pressure may take longer to emerge. This can make it harder for monetary policy to be sufficiently preemptive. Monetary policy may thus unwittingly accommodate the build-up of financial imbalances and associated distortions in the real economy, notably excessive capital accumulation. Moreover, with inflation initially at a low level, the risk that the process may unwind in a disruptive manner could result in a subtle shift in the balance of risks, away from higher inflation and towards economic weakness and, possibly, even deflation. This view highlights the role of financial imbalances in the dynamics of the economy and suggests that central banks may need to respond in a more purposeful way to the imbalances as they build up.

A2. Ex-ante and Ex-post Real Interest Rate

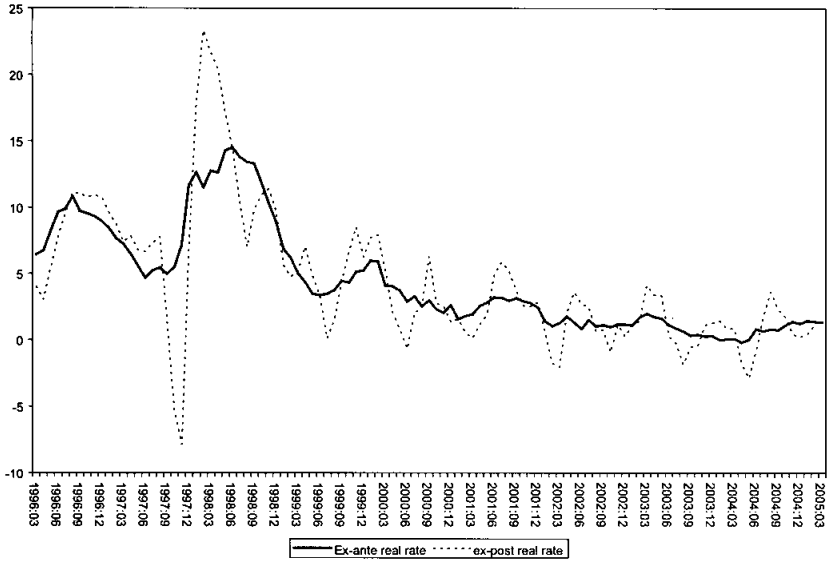
- **Fiji**



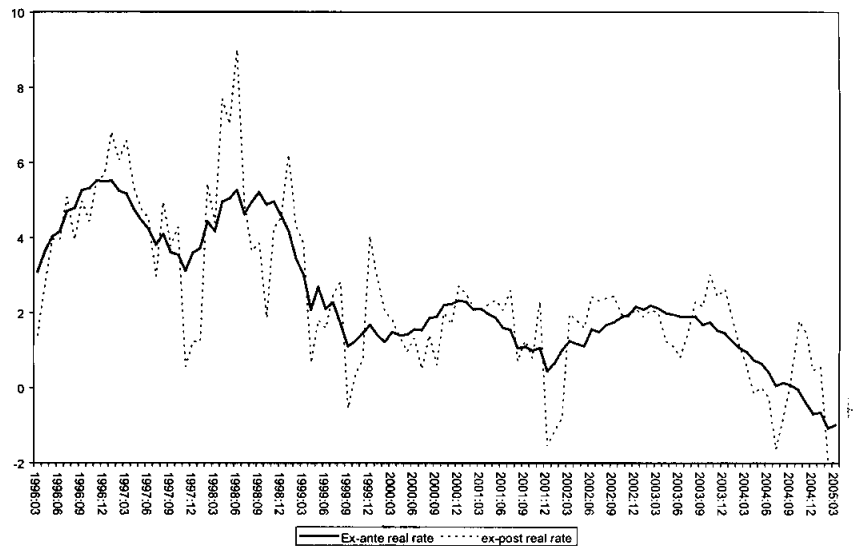
- **Indonesia**



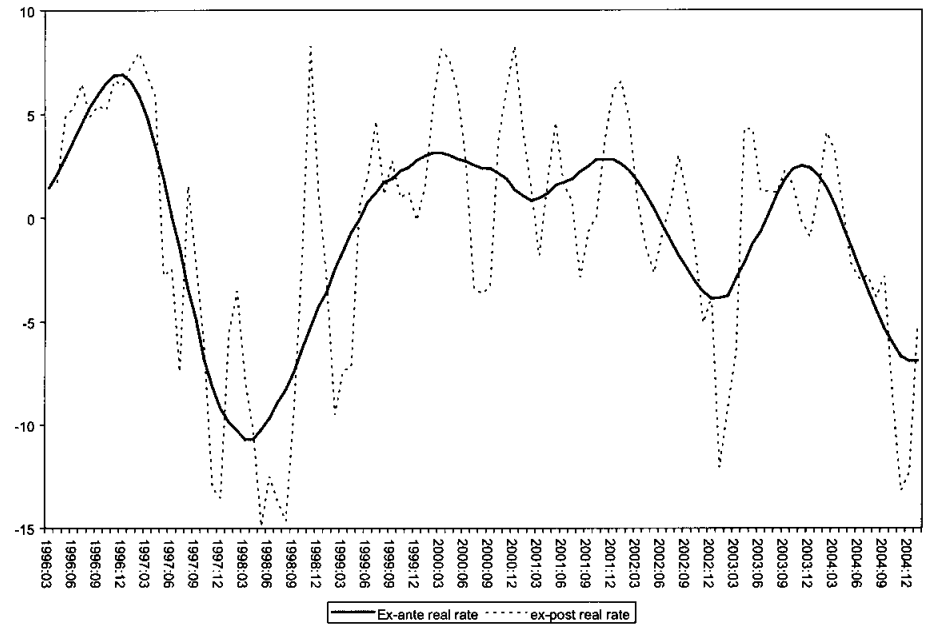
- **Korea**



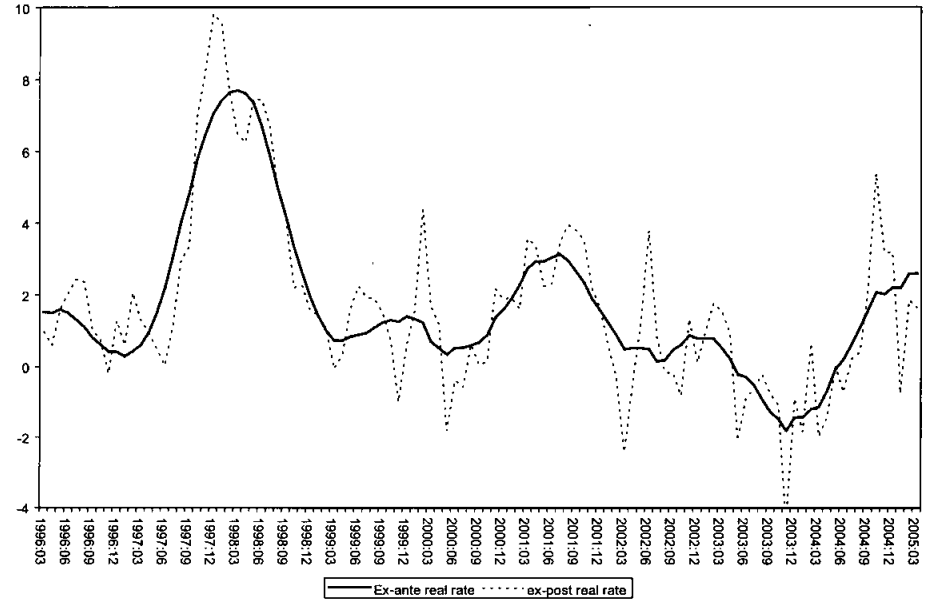
- **Malaysia**



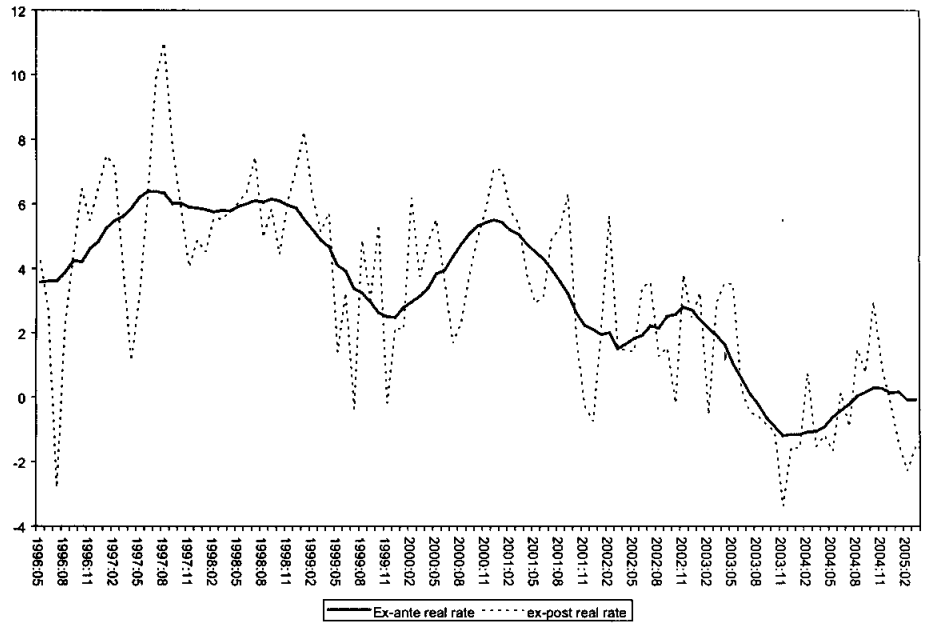
- **Nepal**



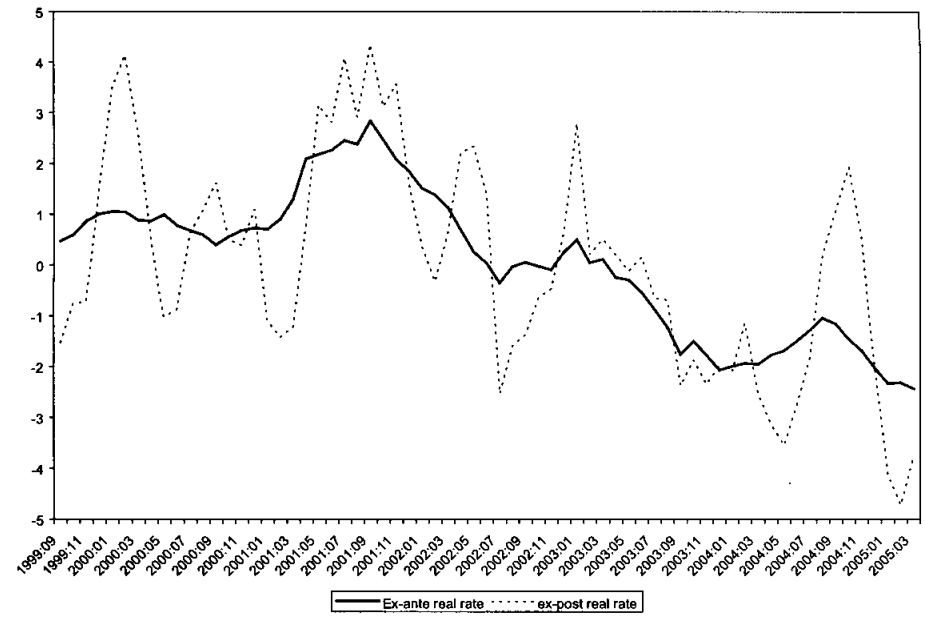
- **Singapore**



- **Taiwan**

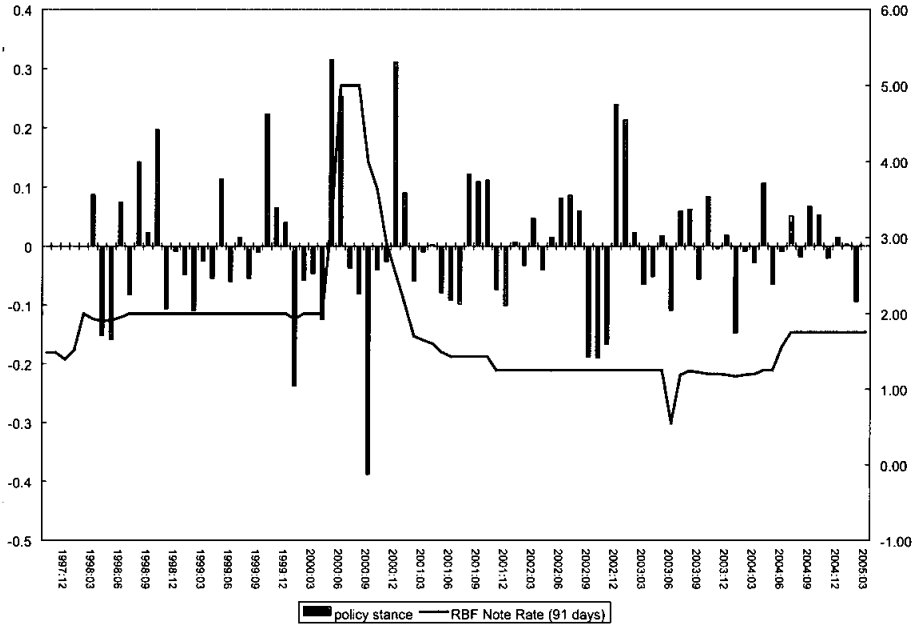


- **Thailand**

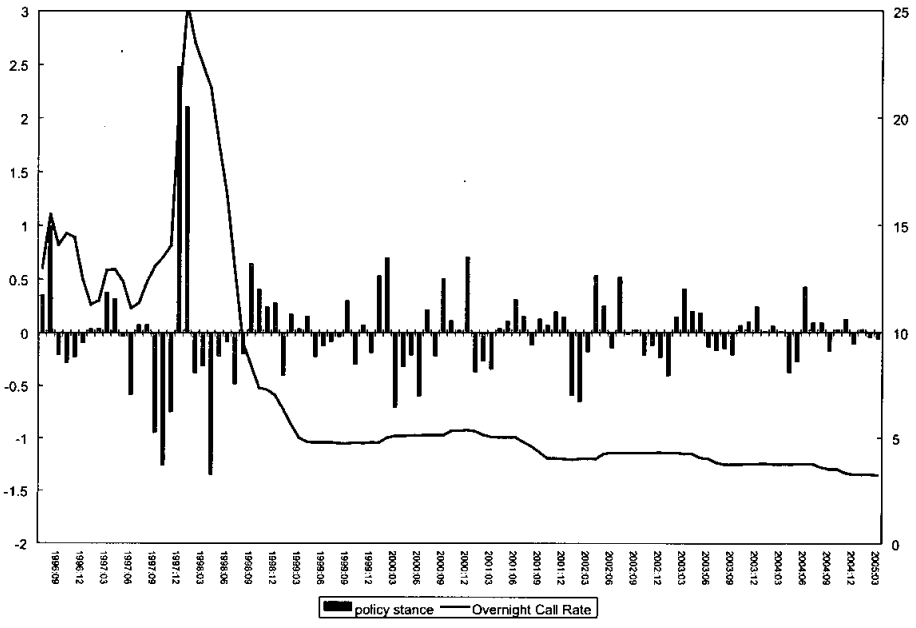


A3. Policy Stance and Actual Policy Rate

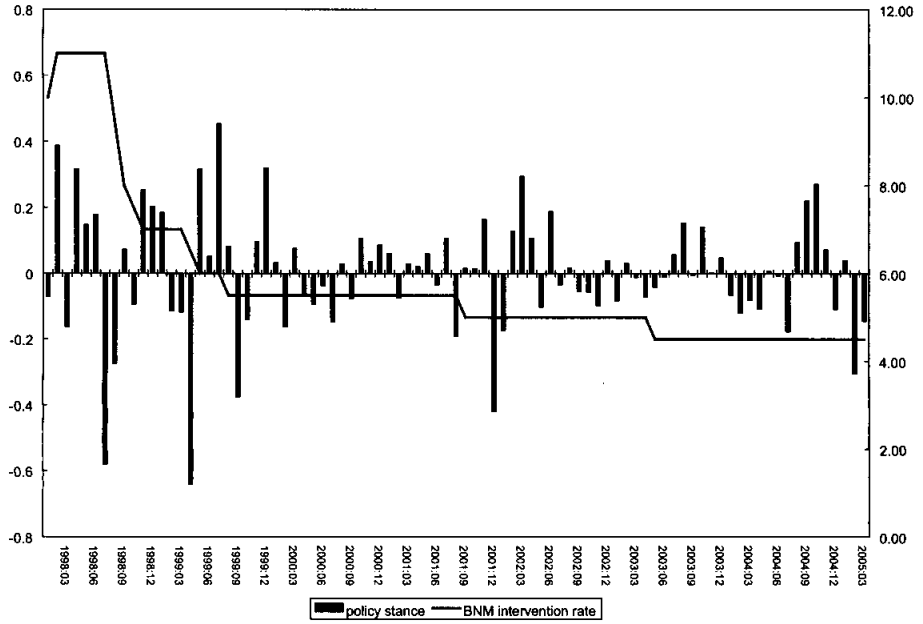
- **Fiji**



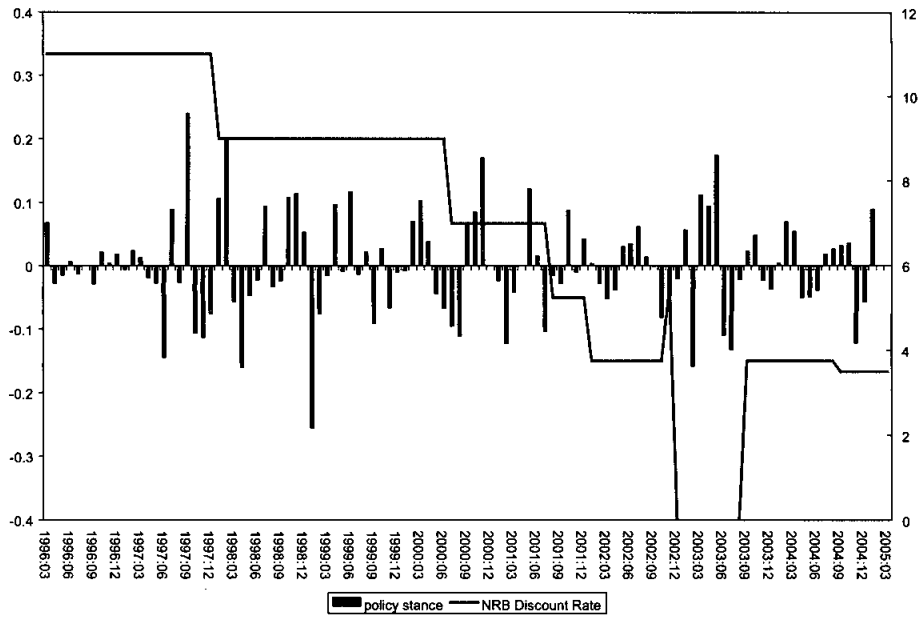
- **Korea**



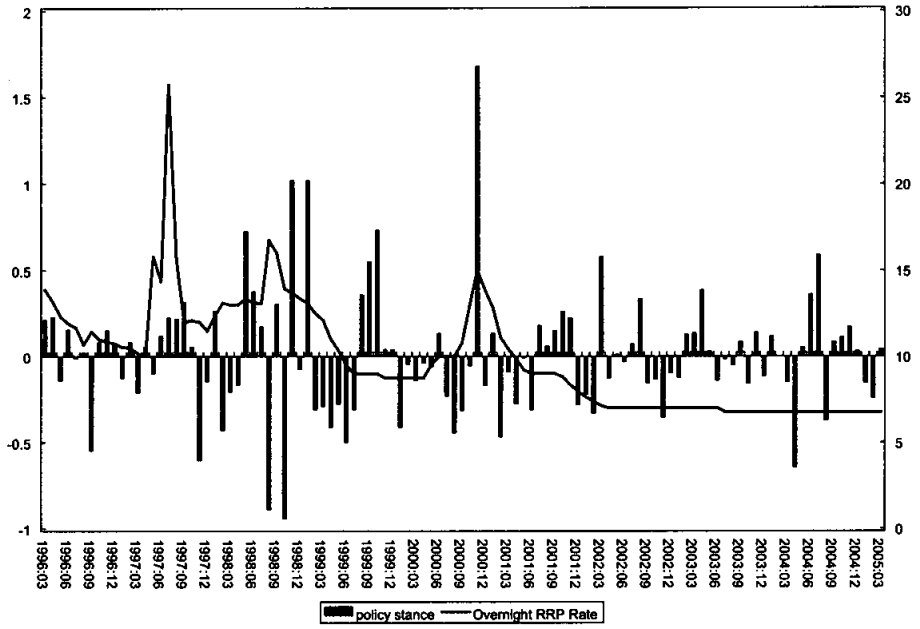
- **Malaysia**



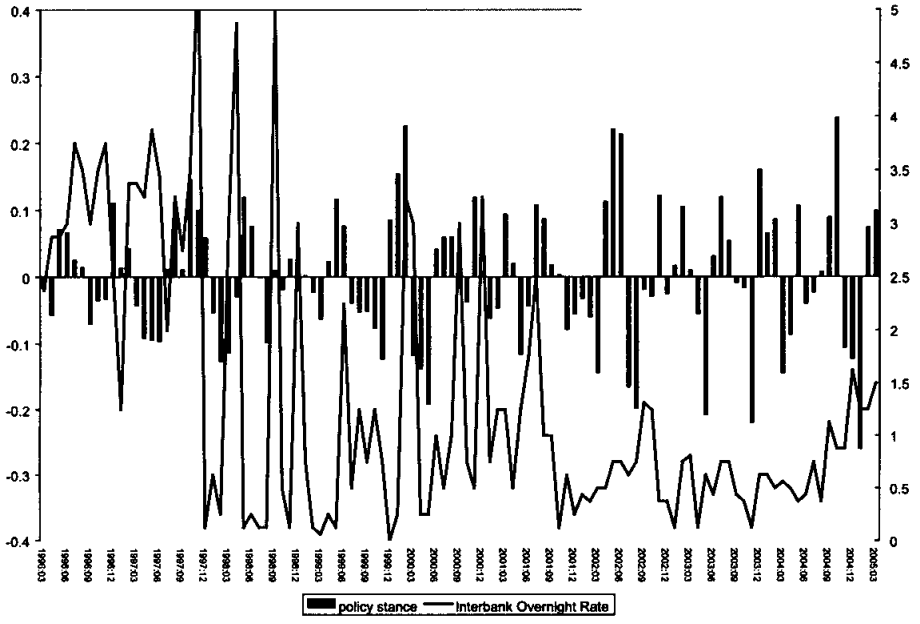
- **Nepal**



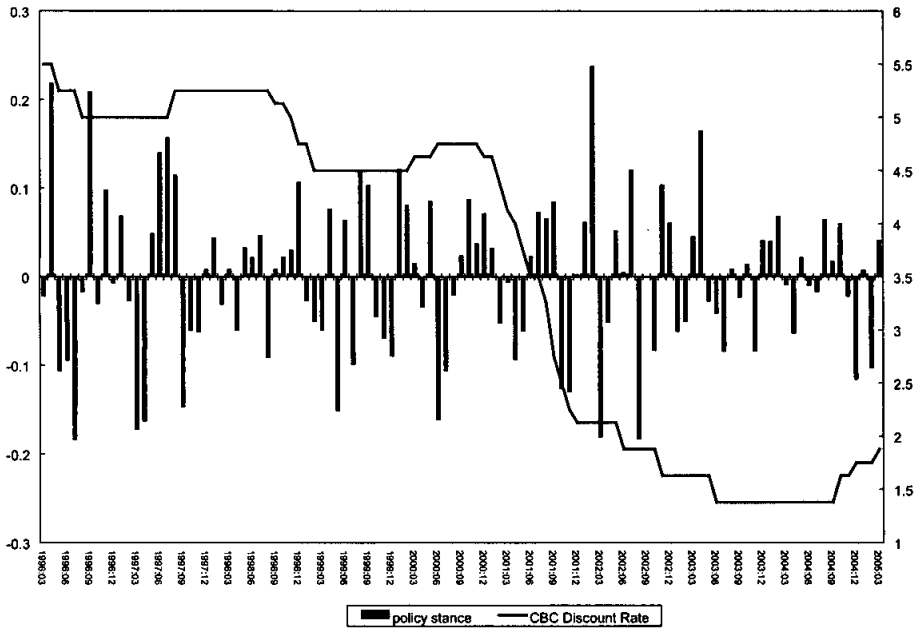
- **Philippines**



- **Singapore**



- **Taiwan**



- **Thailand**