MACROECONOMIC SURVEILLANCE FOR MONETARY POLICY MANAGEMENT IN THE SEACEN COUNTRIES

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FOREWORD

With increased economic openness and financial integration, monetary policy management has become a challenging task. In order to make the monetary policy credible and effective, the central banks should monitor the macroeconomic environment more accurately, understand the market conditions clearly and pre-emptively implement appropriate policy measures. For this purpose, a strong and effective macroeconomic surveillance system is required. In this connection, the SEACEN member countries have put their efforts in developing and strengthening their macroeconomic surveillance systems. This study reviews the current macroeconomic surveillance systems of the SEACEN countries and assesses the challenges in strengthening the macroeconomic surveillance systems of these countries.

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ABBREVIATIONS

ADB	Asian Development Bank
ASEAN	Association of South East Asian Nations
BI	Bank Indonesia
BNM	Bank Negara Malaysia
BOE	Bank of England
BOK	Bank of Korea
BOT	Bank of Thailand
BPNG	Bank of Papua New Guinea
BSA	Balance Sheet Approach
BSP	Bangko Sentral ng Pilipinas
CBM	Central Bank of Myanmar
CBC	Central Bank of the Republic of China (Taiwan)
CBSL	Central Bank of Sri Lanka
ECB	European Central Bank
EWS	Early Warning System
FPP	Financial Programming and Policies
FRS	Federal Reserve System
IMF	International Monetary Fund
IMFI	International Monetary Fund Institute
IFS	International Financial Statistics
MAS	Monetary Authority of Singapore
NBC	National Bank of Cambodia
NRB	Nepal Rastra Bank
RBF	Reserve Bank of Fiji
SEACEN	South East Asian Central Banks Research and Training Centre
SBV	State Bank of Vietnam
SEG	SEACEN Expert Group on Capital Flows
SKEI	SEACEN Key Economic Indicators

EXECUTIVE SUMMARY

Effective monetary policy management requires a competent surveillance system capable of analysing the macroeconomic developments, making more accurate projections, and proposing appropriate policy measures. However, the development of macroeconomic surveillance systems for monetary policy management in the SEACEN region has not been uniform. Among the 14 SEACEN countries covered in this study, the surveillance systems of Singapore, Korea, ROC (Taiwan), Malaysia, Thailand, Indonesia and the Philippines are relatively more developed compared with the systems in Fiji, Sri Lanka, Vietnam, Cambodia, Papua New Guinea, Nepal, and Myanmar.

Availability, frequency, coverage, timeliness and quality of data have been the major challenges commonly faced in the macroeconomic surveillance process particularly in the SEACEN economies with comparatively less developed surveillance systems. In some of these countries, absence of proper institutional setup, lack of technical expertise, lack of coordination between concerned agencies and lack of the knowledge on advanced surveillance methods and models also limit the effectiveness of macroeconomic surveillance. Significant gap between the target of monetary policy and actual target achievement in most of these countries is also an indicator of the lesser effectiveness of their macroeconomic surveillance. In the case of countries employing comparatively developed surveillance systems, there is little or no gap between monetary policy target and actual target achievement.

In order to enhance the effectiveness and credibility of monetary policy, SEACEN members with less advanced macroeconomic surveillance system need to put in place proper institutional set-ups, develop human resources with required technical expertise, enhance the availability, frequency and quality of data; and develop and employ effective surveillance methods and models to strengthen their macroeconomic surveillance.

Several new surveillance frameworks have been developed recently to detect the symptoms of a looming crisis so that the crisis can be prevented or the impact of such crisis can be lessened by implementing appropriate measures preemptively. These newly developed frameworks among others include the early warning system (EWS) and balance sheet approach (BSA). Some of the SEACEN countries have already employed or are in the process of employing these frameworks in their surveillance systems. The utilization of these

frameworks by all the member countries would be helpful in detecting problems in the SEACEN economies beforehand so that a potential crisis can be averted in the region.

As mentioned above, the current macroeconomic surveillance systems of almost half of the SEACEN member countries are fairly developed while those of the other half are relatively less developed. In the process of strengthening their surveillance systems for monetary policy management, the SEACEN members can benefit by sharing their experiences among themselves. The countries with comparatively strong macroeconomic surveillance systems can help to develop and strengthen the surveillance system of other member countries through technical assistance and sharing of experiences. In this regard, The SEACEN Centre can provide a forum to develop necessary skills and share experiences.

The new frameworks developed for the macroeconomic surveillance focus on the known type of currency and financial crises. Recently, a new type of financial crisis has surfaced in USA in August 2007 originating from the problems in the subprime mortgage lending. The agencies monitoring the economy in the national and international levels employing highly advanced surveillance systems, such as the Federal Reserve, IMF, market participants and credit rating agencies could not read the vulnerabilities present in the market that led to the aforementioned crisis. Because of the increasingly integrated global financial markets and development of uncountable types of new financial products, the global economy may face new types of market vulnerabilities not experienced before. Therefore, SEACEN countries also need to restructure and further strengthen their macroeconomic surveillance systems by taking into consideration the recent developments in the financial markets.

There have been several initiatives to establish regional surveillance mechanisms in Asia and the Pacific. However, there is still lack of a permanent mechanism to conduct such regional surveillance effectively on a regular and integrated basis. In this context, instead of increasing the number of initiatives, some of the existing mechanisms can be revived and strengthened. The SEACEN Expert Group on Capital Flows (SEG) may be one such framework which can be utilized more effectively in the regional surveillance.

Chapter One

INTRODUCTION

1.1 Background

A central bank is the authority entirely responsible for monetary policy management in an economy. Its primary task is to manage the money supply and maintain the stability of domestic currency. In some countries, the central bank objectives also include full employment, industrial development, and so on. The objectives and functions of a central bank have gone through a significant change in the last few decades. Besides monetary policy management, central banks in the past were directly engaged in various developmental activities aimed at facilitating economic growth. More recently, the central banks are concentrating their focus primarily on maintaining price stability.

Traditionally, when the countries had controlled economic systems, the government's influence over the financial sector was exercised through the central banks. Monetary policy management was comparatively easy and straight-forward under such a regime. The central banks fixed interest rates and directed the banks to extend loans to specified sectors in order to maintain the stability in the financial sector as well as to channel the funds to priority sectors. Similarly, in order to ease the balance of payment situation, the governments controlled the foreign exchange market and foreign trade through the licensing system.

However, the objective of maintaining financial and external stability and achieving higher growth could not be achieved under the controlled regime. Instead, financial systems suffered from market distortions, inefficiency in resource allocation and low productivity. Similarly, balance of payments related problems led to currency instability. This resulted in low capacity enhancement and ultimately, growth suffered. These concerted developments pressured countries into adopting the policy of economic and financial liberalization. After the shift towards economic openness and financial liberalization, the monetary policy management task has become extremely challenging.

Monetary policy management is the process by which central banks or monetary authorities manage the quantity or cost (i.e., interest rate) of money in the country. This process also encompasses management of exchange rates and foreign exchange markets. Monetary policy is mainly concerned about interest rate, supply of money and supply of credit in the economy. These variables are

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affected by the developments in various sectors of the economy. In order to make the monetary policy credible, the central banks must be able to monitor the macroeconomic environment closely, understand market conditions correctly, forecast money demand accurately, and announce policy measures carefully.

With economic liberalization and globalization, the economic environment in every country has become highly uncertain. In such a situation, a close monitoring of the macroeconomic environment is very important for central banks in setting their monetary policy. This need is even more pronounced in the countries with highly open economies and well developed capital markets. The 1997 Asian financial crisis demonstrated the high risks associated with volatile and liquid capital markets in some of the highly open SEACEN member countries.

Given the different levels of economic and financial developments among SEACEN member countries, it is interesting therefore to study the current macroeconomic surveillance frameworks and practices of the central banks or the monetary authorities in this region. It is argued that an effective surveillance should entail a comprehensive assessment of economic development, a candid analysis of the short- and medium-term outlook, and a stock taking of the policy strategy and the effectiveness of the measures. It also must be effective in leading to better policies, so that risks and vulnerabilities are minimized and growth is more sustainable. In this regard, it would be worthwhile to find a more suitable system of macroeconomic surveillance for these countries, specifically in the light of data availability, coverage of surveillance, and sophistication of the techniques.

1.2 Objectives of the Study

The objectives of this research are to determine the basic features of a good macroeconomic surveillance system which is useful and suitable for policy makers in formulating monetary policies, to examine the challenges in developing such a system in the SEACEN countries, and discuss possible alternatives to remedy the problems. In this context, this study aims at reviewing the current macroeconomic surveillance practices adopted by central banks and monetary authorities in the SEACEN countries. The study focuses specifically on the surveillance frameworks employed by these institutions and the effectiveness of their current surveillance practices.

This in-house research also discusses key frameworks and approaches in the field of macroeconomic surveillance and sheds light on the challenges in developing an effective macroeconomic surveillance system in the SEACEN

countries. It also discusses the pros and cons of international as well as regional surveillance mechanisms.

1.3 Data and Methodology

Out of the total 16 SEACEN member countries, 14 are covered in this study. These countries include: (i) Cambodia, (ii) Fiji, (iii) Indonesia, (iv) Korea, (v) Malaysia, (vi) Myanmar, (vii) Nepal, (viii) Papua New Guinea, (ix) the Philippines, (x) Singapore, (xi) Sri Lanka, (xii) Republic of China (Taiwan) [hereafter referred to as ROC (Taiwan)] (xiii) Thailand, and (xiv) Vietnam. Due to the data unavailability, Brunei Darussalam and Mongolia could not be included in the study.

As an in-house project, the research was designed to be based mainly on questionnaire and published sources for necessary data and information. Accordingly, a structured questionnaire was sent to all the SEACEN member institutions. The responses received from the above mentioned 14 countries have been used in this study as the main sources of data to analyse the current macroeconomic surveillance practices in these countries. Various publications of the International Monetary Fund, Asian Development Bank, and the respective SEACEN member institutions have also been used. The country time series data have been obtained from the International Financial Statistics database, CEIC database and the SEACEN Key Economic Indicators.

1.4 Organisation of the Study

This study is organised into six chapters. Following this introductory chapter, Chapter 2 presents an overview of the macroeconomic surveillance systems where the concept, process and features of macroeconomic surveillance and the surveillance systems of some of the advanced central banks and the International Monetary Fund are discussed. Chapter 3 discusses the macroeconomic surveillance frameworks employed by the SEACEN countries. Chapter 4 analyses the effectiveness of the macroeconomic surveillance in the region. Country-specific challenges in developing a reliable macroeconomic surveillance framework in the SEACEN region are discussed in Chapter 5. This chapter also sheds light on the initiation for regional surveillance in East Asia and discusses the applicability of balance sheet approach and early warning system in strengthening the macroeconomic surveillance in the SEACEN countries. Finally, Chapter 6 presents the concluding remarks on the overall observations of the study and outlines their policy implications.

Chapter Two

MACROECONOMIC SURVEILLANCE SYSTEMS

2.1 Concept of Macroeconomic Surveillance

Central banks are primarily concerned with monetary policy management. Monetary policy is not an end but a means for achieving sustainable economic growth, development and prosperity in the country. Therefore, monetary policy is aimed at creating a stable monetary and financial environment conducive to sustainable growth and development. While monetary policy can affect every sector of the economy, it is also true that conditions of various sectors of the economy affect the implementation of monetary policy. Therefore, central banks need to properly assess the existing situation and monitor carefully each and every development taking place in the economy for credible monetary policy management.

Almost every country are implementing comprehensive economic programs designed to achieve broad macroeconomic goals, which includes improvement in the balance of payments, enhancement of productive potential, and increase in the long-term rate of economic growth. In this context, monetary policy formulation requires an assessment of economic problems and identification of a set of policy instruments to achieve the desired outcomes consistent with the broad macroeconomic goals. This necessitates a competent surveillance system capable of analysing the macroeconomic developments, preparing consistent projections of the major sectoral accounts, and proposing appropriate policy measures.

Despite various surveillance frameworks in place, many countries in the past have gone through several crises one after another. Against this backdrop, preventing the economy from crises has become an important objective of macroeconomic surveillance. In the case of a looming crisis, effective surveillance can provide meaningful recommendations for minimizing the negative impacts of the crisis and for the speedy recovery of the economy. In this regard, the performance of the economy needs to be assessed based on a macroeconomic framework that includes the national accounts, the balance of payments, and the fiscal and monetary accounts.

In short, the objectives of macroeconomic surveillance are to monitor closely the developments in the economy, identify the interlinkages between various

economic variables, and make projections of likely future scenarios. Based on the information on the current state of the economy and the likely future developments, appropriate measures can be recommended to achieve monetary policy objectives consistent with various macroeconomic goals. Moreover, accurate identification of problems in each and every sector can help avert the economy from crises.

2.2 Macroeconomic Surveillance Process

The macroeconomic surveillance practice has evolved at different paces in various countries. In a closed economy, the market developments are comparatively easy to monitor and the likely developments could also be forecasted almost accurately. However, with the opening of economy and globalization, the economies have become highly integrated, interrelated and interdependent. As a result, any event taking place in one corner of the world may have significant influence in another part. In such a situation, monitoring the developments taking place in the domestic as well as the international markets and to analyze their likely effects at present as well as in the future, becomes a crucial issue in monetary policy management. The increasing uncertainty in the economy and inability to properly identify the problems has resulted in various types of crises. Realising that the crises are very costly, many countries have placed enormous efforts in strengthening their surveillance capacities with the objective of preventing the economy from such crises.

The macroeconomic surveillance process mainly involves the collection and analysis of empirical data on a regular basis for almost all the variables affecting the economy. Several types of surveys are conducted to understand the level of confidence and expectations of various economic agents. A central bank formulates its monetary policy for the new fiscal year by explicitly or implicitly setting the target on the level of inflation as final target and targets on monetary aggregates as intermediate targets. While implementing the announced monetary policy, the central bank uses various monetary policy tools, which primarily affect the liquidity, interest rates and credit supply in the economy. The commonly used monetary policy tools include the central bank policy rate, open market operations and reserve requirement. The transmission of the changes in central bank policy rate to inflation takes place as shown in Figure 2.1.

Figure 2.1: The Monetary Transmission Mechanism
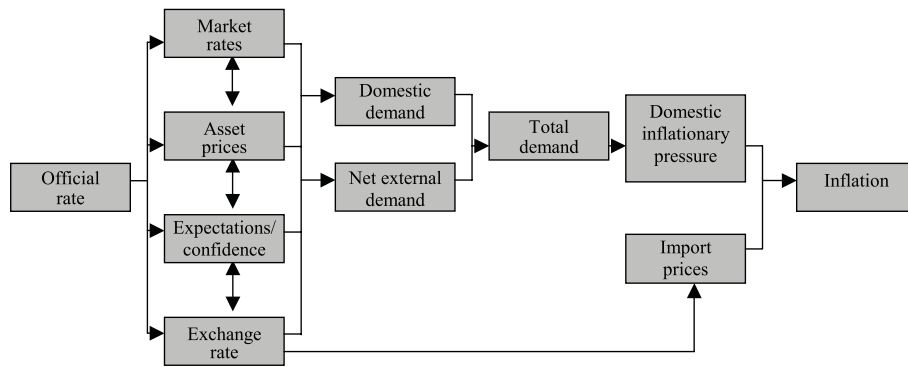
Adapted from "How Monetary Policy Works", Bank of England, www.bankofengland.co.uk/monetarypolicy.how.htm

During the formulation as well as implementation of monetary policy, the central bank needs to monitor and analyze the price data as well as the data on the variables that affect the price level. The following are the key variables analyzed in this regard:

- Consumer prices (shown by CPI)
- Wholesale prices (shown by WPI)
- Other prices (wage rates, asset prices, etc)
- Output level (Gross Domestic Product, output gap)
- Employment condition (employed and unemployed labours)
- Market interest rates (interest on deposits and credits, government papers yields)
- Stock market condition (stock market index, trading volumes, market capitalization, volatility)
- Credit supply situation (growth of total credit and private sector credit, demand for credit)
- Liquidity situation (liquidity with banking sector)
- Supply situation (supply of essential goods and services)

The fiscal policy and operations of the Government have direct implications for the monetary environment in the economy. For example, an increase in the tax rate may lead to increased prices of goods and services while increased fiscal deficits may result in increased domestic borrowing and thus less credit supply to the private sector. Therefore, to monitor the government's fiscal operations, the central bank monitors the following data:

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- Total revenues (from tax and non-tax sources)
- Total expenditures (current expenditure and capital expenditure)
- Fiscal deficits (primary surplus and overall deficits)
- Borrowings (borrowing from domestic and foreign sources)
- Debt servicing (principal and interests paid regularly)
- Changes in tax rates and their implications

The central bank is also responsible for defending the value of the domestic currency and maintaining foreign exchange reserves at a level sufficient for imports of essential goods and services. In a country where the monetary policy framework employs exchange rate targeting, a certain band is set for currency fluctuations as a target. With regard to maintaining currency stability, the central bank monitors the movements of the following variables:

- Net exports (exports of goods minus imports of goods)
- Service income and expenditures
- Inward and outward capital flows (foreign direct investment as well as portfolio investment)
- Overall balance of payments situation
- Exchange rates of currencies of major trading partners to major foreign currencies
- Interest rates in international markets
- Price levels in international markets

The compilation of various data is done by different agencies at varied frequencies. Price related data are collected and published by the central bank in some countries while other agencies are responsible for these data in other countries. Monetary and financial data are compiled by the central bank with input from banks and financial institutions. Other major data sources include the Department of Statistics, Department of Customs, Department of Revenues, Ministry of Finance, Ministry of Commerce and other agencies.

In order to analyze the trend of development in economic variables, to determine their interlinkages with other variables, and to perform forecasting, central banks employ various statistical techniques and econometric models. More sophisticated econometric models are employed in countries where reliable high frequency data are available.

2.3 Features of an Effective Surveillance Mechanism

The main objective of economic surveillance is to maintain stability in the economy and prevent crises from occurring. In the event of a crisis, an effective surveillance can help greatly in the formulation of appropriate crisis resolution policies.

Macroeconomic stability is an essential precondition of economic success in every country. A strong, credible and transparent macroeconomic surveillance framework provides the foundation for such stability. In today's increasingly integrated global markets, the need for effective surveillance has become even more pronounced.

According to Balls (2003), an effective surveillance mechanism needs to be authoritative, comprehensive, focused, influential and accountable. This is essential in order to ensure that surveillance detects problems at an early stage, has an appropriate impact on country's policies, and so helps to strengthen crisis prevention and promote stability and sustainable growth.

In the case of international surveillance, an authoritative surveillance can command international respect, become a source of international expertise and best practice, and provide sound and credible policy advice. To be comprehensive, the surveillance must cover all the issues that are relevant to economic stability. To be well focused, it needs to highlight the most important risks and vulnerabilities in order to ensure that problems are detected at an early stage.

Similarly, surveillance framework can be influential only if the recommendations are reflected in the policies of member countries to address the problems at an early stage in order to avert the crises. To retain the necessary influence and legitimacy through accountability, the surveillance must provide a sound basis for its findings and recommendations, be prepared to justify and defend them, and respond to criticisms and suggestions for change.

## 2.4 Surveillance Systems of Advanced Central Banks

2.4.1 European Central Bank

The Governing Council of the European Central Bank (ECB) is responsible for taking monetary policy decisions aimed at the maintenance of price stability. In this regard, the ECB develops a view about how monetary policy affects developments in the price level. Since the ECB is responsible for an entirely

new currency area, it faces a greater uncertainty than that faced by other central banks. The ECB influences conditions in the money market and therefore the level of short-term interest rates, ensuring that price stability is maintained over the medium term. In so doing, the Bank is continuously confronted with a high level of uncertainty regarding both the nature of the economic shocks hitting the economy and the existence and strength of the relationships that link macroeconomic variables.

The ECB has adopted and announced a monetary policy strategy to ensure a consistent and systematic approach to monetary policy decisions. The first element of the ECB's monetary policy strategy is a quantitative definition of price stability. The Governing Council of the ECB defines 'price stability' as a year-on-year increase in the Harmonised Index of Consumer Prices (HICP) for the euro area of below a given percent, which is to be maintained over the medium term. In the ECB's strategy, monetary policy decisions are based on a comprehensive analysis of the risks to price stability. This analysis is organised on the basis of two complementary perspectives on the determination of price developments. These perspectives are also known as two pillars and referred to as "economic analysis" and "monetary analysis" (See Figure 2.2).

Figure 2.2: The Monetary Policy Strategy of the ECB
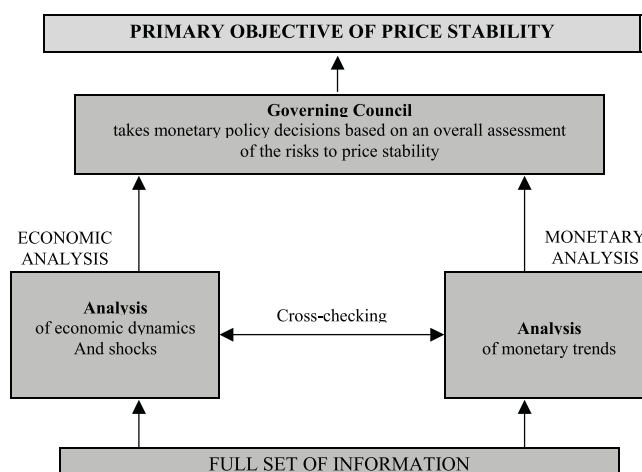
Source: "The Monetary Policy of the ECB 2004", European Central Bank

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Economic Analysis

Economic analysis focuses mainly on the assessment of economic and financial variables which include: developments in overall output; aggregate demand and its components; fiscal policy; capital and labour market conditions; a broad range of price and cost indicators; developments in the exchange rate, the global economy and the balance of payments; financial markets; and the balance sheet positions of euro area sectors. All these factors are helpful in assessing the dynamics of real activity and the likely development of prices from the perspective of the interplay between supply and demand in the goods, services and factor markets at shorter horizons (ECB 2004).

The ECB's economic analysis has been significantly extended and enriched over time. A number of analytical and empirical models have been developed to better assess and understand past and ongoing developments, to make more reliable short-term forecasts and to underpin the regular macroeconomic projection exercises for the euro area economy. By monitoring incoming data and using all the available analytical tools, a comprehensive assessment of the economic situation and the outlook for the euro area can be conducted and updated continuously.

Monetary Analysis

The ECB recognises the fact that monetary growth and inflation are closely related in the medium to long run. This widely accepted relationship provides monetary policy with a firm and reliable nominal anchor beyond the horizons conventionally adopted to construct inflation forecasts. The ECB's policy stance is signalled by the announcement of a reference value for the growth of the broad monetary aggregate M3. The reference value for the growth of M3 is derived so as to be consistent with the achievement of price stability. Substantial or prolonged deviations of monetary growth from the reference value, under normal circumstances, can be taken as the signal of risks to price stability over the medium term.

The monetary analysis emphasizes on a comprehensive assessment of the liquidity situation based on information about the growth as well as the composition of M3. Such a detailed analysis of M3 growth is helpful for extracting the signal being sent by monetary developments that is relevant for identifying the longer-run trend in inflation. In this context, the most liquid components of M3 receive particular attention as they closely reflect the transaction motives for holding money, and may thus be most tightly related to aggregate spending.

The two-pillar approach of the ECB provides a cross-check of the indications that stem from the shorter-term economic analysis with those from the longer-term monetary analysis. This cross-check ensures that monetary policy does not overlook important information relevant for assessing future price trends.

2.4.2 Federal Reserve System

The Federal Reserve System (FRS) is the central bank of the USA responsible for conducting the nation's monetary policy. The objectives of monetary policy as spelt out in the Federal Reserve Act are "to promote effectively the goals of maximum employment, stable prices and moderate long-term interest rates". The FRS is composed of a Board of Governors as a central level government agency and twelve Federal Reserve Banks. The Federal Reserve Banks are the operating arms of the central banking system. A major component of the Federal Reserve System is the Federal Open Market Committee (FOMC) which establishes monetary policy and oversees open market operations, the main tool used by the Federal Reserve to influence overall monetary and credit conditions. The FOMC sets the federal funds rate, but the Board has sole authority over changes in reserve requirements and must approve any change in the discount rate initiated by a Reserve Bank.

The Chairman of the Board of Governors of the Federal Reserve System, also referred to as Federal Reserve Board (FRB), submits the Monetary Policy Report to Congress every year pursuant to the Federal Reserve Act. The Report which is based on the surveillance of various sectors of the economy presents an overview of monetary policy and the economic outlook; analysis of recent economic and financial developments; discussion on monetary policy of the current year and early following year; and a summary of economic projections. The Federal Reserve Board publishes the Report on current economic conditions eight times per year. This Report, also known as the Beige Book, analyses the current economic conditions of 12 Districts. Each Federal Reserve Bank gathers information on the current conditions in its District through reports from banks and branch directors and interviews with key business contacts, economists, market experts, and other sources. An overall summary of the twelve district reports is prepared by a designated Federal Reserve Bank on a rotation basis (FRB 2008).

With regard to monetary policy management, the FRS monitors the current situation and likely developments in the household sector, business sector, government sector, national savings, external sector, labour market, price situation, financial markets, and international developments. For the household sector, key

data on residential investment and finance, and consumer spending and household finance are analysed. The data on residential investment and finance include home sales and prices, inventories of homes, housing demand, residential investment, construction, interest rate on mortgages, etc. The data for monitoring consumer spending and household finance include real personal consumption expenditures, wages and salaries, household wealth, growth in real disposal income, sector-wise average hourly earnings, household balance sheets, aggregate net worth of households, overall household debt, credit quality of consumer loans, delinquency rates on consumer loans, rate of household bankruptcy filings, etc.

To monitor the developments in the business sector, the data on fixed investment, inventory investment, and corporate profits and business finance are analysed. These include real business fixed investment, sectoral distribution of fixed investment, inventory balances, inventory investment in various sectors, corporate profit, non-financial business debt, corporate bond issuance, equity issuance, amount of outstanding non-financial commercial papers, liquidity position, mergers and acquisitions, credit quality of non-financial corporations, etc.

The economic activities of the government sectors are analysed at the federal as well as state and local government levels. In this regard, growth in revenue, real federal expenditures on consumption and investment, federal budget deficits, federal debt, etc are analysed. In order to determine the fiscal condition of state and local governments, their revenue and spending data are studied.

To study the current level of net national saving, data on the saving of households, businesses, and governments are examined and the contribution on national saving on capital formation is ascertained.

Under the external trade sector, developments in international trade and the financial account are monitored. Key variables analyzed include real exports, real imports, trade deficit, demand and prices of major oil and non-oil commodities in the international market, exchange rate of US dollar, current account deficit, inflow of financing from abroad, foreign private demand for US Treasury securities, foreign acquisitions of US corporate securities, foreign direct investment into US, foreign official inflows, net purchases of foreign securities by US residents, US direct investment abroad, etc.

To monitor the development in the labour market, the levels of employment and unemployment as well as productivity and labour compensation are assessed. Key variables monitored include demand for labour, private employment in the various sectors, average monthly gain in private non-farm payroll employment,

unemployment rate for men and women, overall labour market conditions, output per hour in the non-farm business, hourly compensation, technological change, capital per worker, employment cost index for private industry workers, etc.

The price situation is monitored through the headline consumer price inflation and core price inflation. The consumer price index (CPI), personal consumption expenditure (PCE) chain-type price index, core consumer price index and chain-type price index for core PCE are the indices employed to study the price situation. Various surveys conducted by public entities as well as professional-academic agencies help examine the price behaviour and forecast the likely scenario.

To monitor the developments in the financial markets, various data on market functioning and financial stability, policy expectations and interest rates, equity markets, debt and financial intermediation, and monetary aggregates are studied. These data include credit quality, prices of indexes of credit default swaps, valued of mortgage-related securities, debt of collateralized loan obligations, index of loan-only credit default swaps, asset-backed commercial papers, short term funding, structured investment vehicles, interbank funding, mutual fund investing, Treasury bill market, nominal treasury yield, yields on inflation-indexed Treasury securities, yields on corporate bonds, broad equity indexes, stock indexes, equity prices, flows into equity mutual funds, total debt of non-financial sectors, commercial bank credit, bank profits, M2 growth, market volatility, overall financial condition, etc.

International developments are monitored focusing on the international financial markets, advanced foreign economies, emerging market economies and other key regions and countries.

2.4.3 Bank of England

The monetary policy objective of the Bank of England (BOE) is to deliver price stability and, subject to that, to support the Government's economic objectives including those for growth and employment. The Bank of England Act 1998 made the Bank independent to set interest rates. The Government announces the inflation target each year while the Bank seeks to meet the inflation target by setting an interest rate. The interest rate decisions are made by the Monetary Policy Committee (MPC) of the Bank. The MPC, which consists of nine members, meets once a month to set the interest rate and the decisions are made based on voting by the members. The MPC receives extensive briefing

on the economy from staff of the BOE. The Committee are made aware of all the latest data on the economy and listen to explanations of recent trends and analysis of relevant issues and business conditions in the country.

The BOE has twelve Agents across the United Kingdom, the primary role of which is to assess the economy as seen by the part of the country they cover. The Agents are a vital link between business and the Bank as they have well developed lines of communication with Business Links, Chambers of Commerce, the Confederation of British Industry, the Engineering Employers Federation, Enterprise Agencies, Regional Development Agencies, Trade Unions and Universities. A summary of the information gathered by the Agencies is published in a monthly review entitled "*Bank of England Agents' Summary of Business Conditions*." These reports cover discussions which the Agents have had, on average, with around 700 businesses across the UK each month (BOE 2008a).

Each quarter, the Bank publishes the "*Inflation Report*" under the guidance of the members of the MPC. The Report presents a detailed analysis of economic conditions and the prospects for economic growth and inflation. The preparation of the report provides a comprehensive and forward-looking framework for discussion among MPC members and also aid in their decision making and allows them to share their thinking and explain the reasons for their decisions (BOE 2008b).

The BOE monitors economic conditions by analysing data on money and asset prices, demand, output and supply, and costs and prices. In order to assess the prospects for inflation, the Bank also examines various risks. The data analysed to monitor the developments in money and asset prices include the data on financial markets and asset prices (interest rates, exchange rates, equity prices, property prices), credit conditions (bank lending behaviour, price and quantity of household credit, price and quantity of corporate credit), and monetary aggregates (M4, M4 lending).

The aggregate demand situation is analysed by monitoring domestic demand (household consumption, investment, Government spending), and external demand and net trade (the United States, the euro area, rest of the world, net trade). To understand the output and supply situation, the data on output (quarterly GDP, sectoral trend), capacity pressures (capacity utilization), and labour demand and supply (companies' demand for labour, labour supply, labour market tightness) are looked at.

The data on CPI inflation, global costs and prices (commodity prices, import prices), business pricing and inflation expectations, and labour costs (influences on earnings, latest developments in earnings) are analysed to determine the cost and prices situations. Based on the knowledge of the present conditions of each and every sector of the economy, prospects for inflation are analysed and with this, the projections are made for demand and inflation while risks to demand and CPI inflation are analysed.

2.5 The IMF Surveillance System

The establishment of the International Monetary Fund (IMF) along with the World Bank in 1944 began a new era in the field of economic surveillance. The main objectives and responsibilities of the IMF were to maintain international monetary stability specifically by helping the member countries correct their balance of payments problems and maintain a certain discipline in their exchange rate management. The IMF Article IV mandated the Fund to monitor the developments in the exchange management and exchange rate policies of its member countries. For this purpose, IMF developed and implemented a surveillance framework to monitor the developments in the international economic system. In order to comply with the IMF requirement in economic surveillance, the member countries also needed to develop a domestic surveillance system. For this, the IMF assisted the member countries in developing their domestic surveillance systems by providing technical assistance in the form of consultancy and staff training.

Financial programming and policies (FPP), or simply financial programming is the main surveillance framework employed by the IMF. The same framework is being used by the member countries to fulfil their informational obligations. After the amendment in the IMF Articles of Agreement in 1977, the Fund's scope of surveillance has expanded to cover every major sector of the economy. As a result, the financial programming model of the IMF has become one of the most widely applied models in macroeconomics. The FPP framework divides the economy into 4 major sectors, viz., real sector, fiscal sector, monetary sector and external sector. In this framework, the past trends of development are analyzed and inter-linkages between sectors are determined and based on the past trends, inter-linkages and the present condition, a baseline scenario is developed. The baseline scenario gives a picture of future developments which are likely to take place if there is no policy change.

In several developing countries, central banks started systematic data collection and monitoring of various sectors of the economy following the FPP

format to fulfil their obligation under the IMF surveillance. Thus, although the IMF surveillance is intended for monitoring developments at a global level in order to maintain the international monetary stability, the efforts made in this direction have helped individual member countries develop and strengthen their domestic surveillance systems. The FPP framework is depicted in Figure 2.3.

Figure 2.3: Financial Programming and Policies Framework
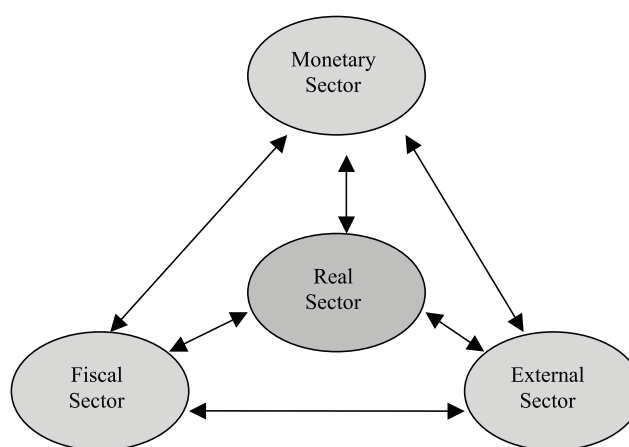
In Figure 2.3, the real sector is at the centre. The policy measures implemented in fiscal, monetary and external sectors are directed toward achieving the set real sector goals. In general, the real sector goals include low inflation, stable currency and sustainable higher economic growth. Given the interlinkages among these sectors shown by arrows in the Figure, policy measures implemented in one sector must be consistent with those of the other sectors and should be collectively directed towards achieving the real sector goals.

2.5.1 Accounting Identities

The IMF emphasis is on three accounting identities, *viz.*, monetary, balance of payments, and fiscal identities in its design of macroeconomic programs for developing countries with goals for inflation and foreign exchange reserve accumulation, and secondarily for calculating debt relief requirements and import requirement for growth (Easterly 2004).

The monetary identity is the most important identity in financial programming. Barth et al. (2000) argue that a change in the size of the money stock is one of the main policy instruments by which the authorities influence macroeconomic developments. The monetary accounts consist of a comprehensive set of stock and flow data on the financial and non-financial assets and liabilities of an economy's financial corporations sector.

The monetary identity implies that broad money liabilities (M2) equal the sum of net foreign assets (NFA), domestic credit (DC), and other items, net (OIN):

$$M2 = NFA + DC + OIN \qquad (2.1)$$

Total flows (closing stocks less opening stocks) can be expressed as:

$$\Delta M2 = \Delta NFA + \Delta DC + \Delta OIN \qquad (2.2)$$

where Δ denotes change over previous year.

The second basic identity used in financial programming is the balance of payment (BOP) identity. The current account balance (CAB) is the difference between receipts and payments in the current account of the BOP. This balance also reflects the gap between income and spending (or absorption) in the economy:

$$GNDI - A = CAB \qquad (2.3)$$

Where GNDI is the country's gross national disposable income, and A is domestic absorption, defined as economy-wide spending by households, business and the government on domestic and foreign made goods and services:

$$A = C + I + G \qquad (2.4)$$

where C stands for consumption, I for investment, and G denotes government.

The current account balance is also equal to the economy's saving-investment gap:

$$CAB = S - I \qquad (2.5)$$

A country running a current account surplus (CAB>0) is a net saver *vis-a-vis* the rest of the world as it uses up for domestic consumption or investment less than the national income currently available to it and makes surplus available to foreign residents. Conversely, in a country that runs a current account deficit (CAB<0), economy-wide consumption and investment exceed gross national income. This country is financing its net acquisition of resources from the rest of the world by liquidating part of its foreign assets, or increasing its foreign liabilities (IMFI 2007).

In order to reduce a current deficit, the country's income must be increased and/or absorption must be reduced. Increasing output (and therefore income) in the short term requires unused production capacity, and in the medium term, increased production capacity through investment, labour force participation, and adequate structural policies to promote gains in productivity. Domestic absorption can be reduced by contracting final consumption and / or gross investment.

The third basic identity in IMF financial programming is the identity for financing the budget deficit. This identity is used to set the budget deficit that is consistent with the monetary and balance of payments targets.

The overall fiscal balance (B) is the difference between total revenue (R) and grants (G) and total expenditure and net lending:

$$B + (NE + IE^f + IE^d) - (R + G) \qquad\qquad (2.6)$$

where *NE* stands for non-interest expenditure (including net lending), IE^f stands for interest expenditure on foreign debt, and IE^d for interest expenditure on domestic debt.

If this balance is negative, it is termed as fiscal deficit. The government covers this deficit through financing operations. Financing operations serve the same purpose as revenue, in the sense that they help to finance the outlays of the government. But they are also very different from revenue. A financing operation usually creates a debt that the government will eventually have to repay.

The macroeconomic impact of the government deficit depends in part on the way the deficit is financed. There are basically three ways of financing a fiscal deficit: i) borrowing abroad, ii) borrowing from the central bank, and iii) borrowing from domestic commercial banks and nonbank sector. Each form of financing can be associated with a major macroeconomic imbalance.

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The accounting identities discussed above can be helpful in identifying the imbalances in the economy. When macroeconomic imbalances exist, some form of correction (or adjustment) will be necessary in order to bring claims on resources in line with those available. If deliberate policy actions are not taken at an early stage, the adjustment is likely to be disorderly and inefficient. For example, if international reserves reach very low levels, foreign creditors may become unwilling to lend further to a country. A drastic cut in imports could ensue, with consequent negative effects on economic growth and welfare. The distinguishing feature of a financial program is that it seeks to achieve an orderly adjustment, through the early adoption of corrective policy measures, and through the provision of appropriate amounts of external financing.

In financial programming, projections are developed sector by sector, with the intention of providing an understanding of the issues and methods needed for forecasting individual accounts. However, while the focus at any point is on a particular sector, the overall aim is to develop consistent macroeconomic projections for a given economy. A first step is the preparation of a baseline scenario, constructed on the assumption that policies remain unchanged from the recent past. The baseline scenario is intended to indicate whether the existing problems are likely to be resolved by themselves, to remain the same, or become worse.

Easterly (2004) argues that all of the identities contain large statistical discrepancies, which weakens the case for them as a "consistency check". Killick (1995) criticizes financial programming on the grounds of unstable parameters and the endogeneity of other items in the identities besides the policy and target variables. In the view of Edwards (1990), financial programming "has failed to formally incorporate issues related to the inter-temporal nature of the current account, the role of risk and self-insurance in portfolio choices, the role of time consistency and precommitments in economic policy, the economics of contracts and reputation, the economics of equilibrium real exchange rates ... and the theory of speculative attacks and devaluation crises, just to mention a few of the more important recent developments in international macroeconomics".

Agenor and Montiel (1999) argue that although all of the Fund's models have been applied frequently in policy formulation in developing nations, all of them are subject to limitations that constrain their usefulness for both policy guidance and analytical work as medium-term models. The limitations pointed out by them include (a) the larger statistical discrepancies in all the identities;

(b) the poor performance of predictions even when an element of the identity is known in advance with certainty; (c) the failure of econometric tests to yield a strong association between the "policy" variable and the "endogenous" variables; and (d) the systematic instability and high variance of the "behavioural" parameters that are used as "consistency checks" on the endogenous variables with growth and inflation targets.

2.5.2 IMF Surveillance of Member Countries

As outlined in its Articles of Agreement, surveillance of the international monetary system is one of the major responsibilities of the IMF. The second amendment of the Articles of Agreement in 1977 has redefined these responsibilities. Section 3 of Article IV defines areas for Fund surveillance and also outlines the obligation of member countries:

(a) The Fund shall oversee the international monetary system in order to ensure its effective operation, and shall oversee the compliance of each member with its obligations under Section 1 of this Article.

(b) In order to fulfill its functions under (a) above, the Fund shall exercise firm surveillance over the exchange rate policies of members, and shall adopt specific principles for the guidance of all members with respect to those policies. Each member shall provide the Fund with the information necessary for such surveillance, and, when requested by the Fund, shall consult with it on the member's exchange rate policies.

The IMF surveillance involves monitoring economic developments, both globally and in individual countries, and letting policymakers know if adjustments are warranted. In today's globalized economy, where the economic and financial policies of one country may affect many other countries, international cooperation to monitor economic developments on a global scale is essential. With its nearly universal membership of 185 countries, IMF surveillance provides the mechanism for this cooperation (IMF 2007a).

The IMF surveillance emphasizes on fiscal prudence, pursuit of low inflation and sound exchange rate policies (Mussa 1997). Fiscal deficits are the root cause of economic difficulties of many countries. Therefore, the IMF offers consistently vigorous advice on the virtues of fiscal probity. Many countries do face an urgent need to reduce their fiscal deficits and levels of public debt over the medium term.

The inflation in many industrial countries has returned to relatively low rates. For countries that have achieved acceptably low inflation and are experiencing recession or weak growth, the IMF has generally recommended accommodative monetary policies. Similarly, for countries with very high inflation, the IMF has pressed them to reduce inflation. However, several developing countries have sustained rapid growth with inflation rates running in double digits; and some countries that aggressively sought further inflation reduction have seen growth suffer and real exchange rates become overvalued.

The IMF also needs to pay attention to exchange rates policies. It is not realistic to suppose that the main economic policies of the countries should be diverted from supporting sustainable economic growth with reasonable price stability in order to pursue the exchange rate objective. Nevertheless, the wide swings in exchange rates generate significant economic disturbances and such swings are not always well-justified by economic fundamentals. Indeed, in a few instances, the IMF has concluded that markets have pushed exchange rates beyond reasonable bounds and that countervailing policy actions were appropriate.

To carry out surveillance, a team of IMF economists visits the member countries on a regular basis. Such visits are known as "Article IV Consultations". The IMF economists gather information and hold discussions with government and central bank officials, and often business entrepreneurs, labor representatives, members of parliament, and civil society organizations. The mission then submits a report to the IMF's Executive Board for discussion. The Board's views are subsequently summarized and transmitted to the country's authorities. The IMF staff also prepares semi-annual reports on the World Economic Outlook which are reviewed by the Executive Board and form the basis for ministerial-level discussions at the IMF's Interim Committee. In recent years, surveillance has become increasingly transparent. Nine out of ten member countries now agree to the publication of a Public Information Notice, which summarizes the views of Fund staff and the Board. Four out of five countries publish the staff report themselves (IMF 2007a).

2.5.3 Limitations of IMF Surveillance

The developments in the global economy and capital markets have emphasized the need for effective surveillance and they have also called into question the effectiveness of the Fund's surveillance and advice. According to Balls (2003), the crisis in Argentina in 2001 has raised a number of questions about the effectiveness of the IMF's crisis prevention efforts and the quality and impact of its policy advice during a decade in which Argentina was continuously engaged

in IMF supported programs. The case of Turkey also demonstrates some of the dangers that can arise when surveillance fails to pick up key risks. Turkey's December 1999 disinflation program ended in crisis when its fixed exchange rate regime collapsed in February 2001, with huge impacts on the balance sheets of a range of banks, which had taken unhedged foreign currency positions. Pre-program surveillance did actually identify some risks in the financial sector. However, the link with the proposed exchange rate regime was not adequately made – despite the recent experience of bank losses under a fixed exchange rate regime in the Asian crisis.

Mussa (1997) argues that IMF surveillance has shown significant deficiencies in providing specific warning of potential economic crises. Analytic work in the IMF during 1990-91 identified likely pressures within the European Exchange Rate Mechanism (ERM) associated with the effects of German unification; but there was no specific warning of the ERM crisis that erupted in the summer of 1992. The Article IV Report on Mexico discussed in early 1994 was not able to warn on the crisis that was about to beset Mexico and spread to other countries through the 'tequila effect.'

According to Balls (2003), the international community has recognized that further reform of IMF surveillance is necessary. The challenge is to make the IMF credible and independent from political influence in its surveillance of economies. The world community of nations can implement new reforms to build a new system of international economic governance and surveillance which can strengthen their ability to prevent crises and advance their shared objectives of stability, development, and prosperity.

The Fund's Biennial Surveillance Review in April 2002 has identified specific areas for surveillance improvement which include: more rigorous assessments of potential vulnerabilities, with particular attention to debt sustainability and the private sector's balance sheet exposure; more candid and comprehensive assessments of exchange arrangements and exchange rates; focusing on the global impact of the policies of systemically important countries, including trade; expanding financial sector surveillance to the entire membership; and stronger coverage of relevant structural and institutional issues.

2.6 Concluding Remarks

Central banks are primarily concerned with monetary policy management which is aimed at creating a stable monetary and financial environment conducive to sustainable growth and development. Effective monetary policy management

requires a strong macroeconomic surveillance system which is capable of monitoring closely the developments in the economy, identifying the interlinkages between various economic variables, and projecting likely future scenarios. Based on the analysis of the current state of the economy and likely future developments, appropriate measures can be recommended to achieve monetary policy objectives consistent with various macroeconomic goals. A strong macroeconomic surveillance can avert an economy from crisis by accurately identifying problems in each and every sector of the economy.

The macroeconomic surveillance process primarily involves regular analysis of data on variables that affect the economy in general and specific variables that are directly related to the interest rate, liquidity, credit supply and price situation. The structure of the transmission mechanism of monetary policy determines the time lag and the level of impact of monetary policy tools on the price situation. The key data monitored in connection with monetary policy management include data on price and supply situation, fiscal policy and government operations, and exchange rates and balance of payment situation. Various statistical techniques and econometric models are employed to analyse the changes in economic variables and determine the required policy measures in order to achieve the set monetary policy objectives and targets.

An effective surveillance mechanism needs to be authoritative, comprehensive, focused, influential and accountable. This is essential in order to ensure that surveillance detects problems at an early stage, has an appropriate impact on country's policies, and so helps to strengthen crisis prevention and promote stability and sustainable growth. However, most international and national surveillance systems contained weaknesses and were unable to identify the vulnerabilities in the economy that led to severe crises.

The macroeconomic surveillance of advanced central banks is centred on the comprehensive analysis of the risks to price stability, for instance, in the European Central Bank and Bank of England, or on price stability and employment, for instance in the Federal Reserve System. These central banks are highly independent in monetary policy management and have well developed organisational frameworks for macroeconomic surveillance with clearly defined responsibilities. In their surveillance processes, these Banks analyse numerous data from multiple sources to track the developments in the economy at the domestic as well as international levels. Since the financial markets are highly developed in their respective region/country and the monetary transmission mechanisms are very robust, their monetary policy actions are transmitted to the economy effectively with short time lags mainly through the financial markets.

The establishment of the International Monetary Fund along with the World Bank in 1944 marked a new era in the field of economic surveillance. In order to maintain international monetary stability, the IMF monitors the developments in the international economic system. For this purpose, IMF conducts regular surveillance of its member countries via "Article IV Consultations". Financial programming is the main surveillance framework employed by the Fund. In order to comply with the IMF requirements in economic surveillance, member countries also needed to enhance their domestic surveillance system. In this process, IMF has assisted member countries in strengthening their domestic surveillance systems by providing technical assistance in the form of consultancy and staff training.

IMF surveillance today covers a wide range of economic policies that are crucial to international monetary and financial stability, with the emphasis varying in accordance with a country's individual circumstances. Exchange rate, monetary, and fiscal policies remain at the centre of IMF surveillance. After the Asian financial crisis, financial sector issues have received greater emphasis in surveillance. Despite the regular surveillance by the IMF, some countries in Europe, Asia and Latin America went through several financial crises, thus raising the question about the effectiveness of the Fund's surveillance and advice.

Chapter Three

CURRENT MACROECONOMIC SURVEILLANCE
FRAMEWORKS IN THE SEACEN COUNTRIES

3.1 Country Cases

3.1.1 Cambodia

The primary objective of the National Bank of Cambodia (NBC) is to maintain price and exchange rate stability in the country in order to facilitate economic development within the framework of the government's economy and financial policy. In addition, as the regulatory authority of country's banking sector, NBC's activities are directed toward ensuring a sound banking and financial system which can provide a firm basis for economic growth of the nation.

Cambodia's financial system is still at an early stage of development. The capital market is not developed and at present, banks are the major financial institutions. Domestic monetary transactions are characterized by a high degree of dollarization. The balance sheets of all but a few financial institutions are in US dollars. Cash is the main payment instrument in Cambodia - cash in national currency in the hands of the non-bank public comprises about 25 percent of the money supply. In addition to this, a significant amount of foreign bank notes, in particular US dollars, is circulated alongside local currency cash. The non-cash payment system is very small in size, and of limited sophistication. Due to the young history of the country's banking system, the majority of all financial transactions are still carried out outside the banking system.

The apex body of NBC is the NBC Board which comprise of the Governor, the Deputy Governor and five other members. The Board is mainly responsible for establishing the policies for the operations of the central bank; issuing decisions, regulations, circulars and other directives to govern the business of the central bank; and establishing internal rules and regulations.

The Policy Committee of NBC is responsible, among others, for the formulation of the country's monetary policy. It is chaired by the Governor and consists of the Bank's senior officials at the general directorate level. The Committee meets every two weeks to assess the economic and financial conditions as well as the risk factors that may affect future inflation, internal imbalance and economic growth. In formulating monetary policy direction, the

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Policy Committee considers the various economic indicators and information provided by relevant departments, especially the Economic Research and Statistics Department. Its view on inflationary pressure as well as the purchasing power of the local currency is derived from a forecast based on a number of statistical methods together with each Committee member's judgment. This information is incorporated into the formulation of its monetary policy.

NBC enjoys operating autonomy with respect to establishing its operational and intermediate targets of monetary policy, as well as in choosing the management and implementation tools. In keeping with the move towards improving the accountability and transparency of monetary policy, decisions on monetary targets have been regularly submitted to the Board and communicated to the public through NBC's semi-annual and annual reports.

The Economic Research and Statistics Department (ERSD)'s mandate is to assist the decision making process of the Policy Committee. In order to fulfill its task, the ERSD exercises its macroeconomic surveillance on a monthly basis by monitoring and analyzing the performance of key economic variables, making an assessment of the impact of these indicators on inflation and the country's international reserves, and submitting to the Policy Committee, the reports which serve as a basis for their decisions.

The tools employed by the ERSD for macroeconomic surveillance comprise the traditional analysis framework that focuses on the examination of flow variables and the financial programming approach adopted by the IMF. NBC is fully aware that macroeconomic conditions can have implications on the health of the banking and financial sector and vice versa. Therefore, in addition to the analysis of the flow variables in the economy, some key elements of the balance sheet items have also been compiled and regularly assessed.

An Early Warning System called "VIEW" was very recently developed and installed within the ERSD of NBC with the technical assistance of the Asian Development Bank (ADB). The system is, however, still in the testing stage and requires more time and work for it to function smoothly, accurately and reliably.
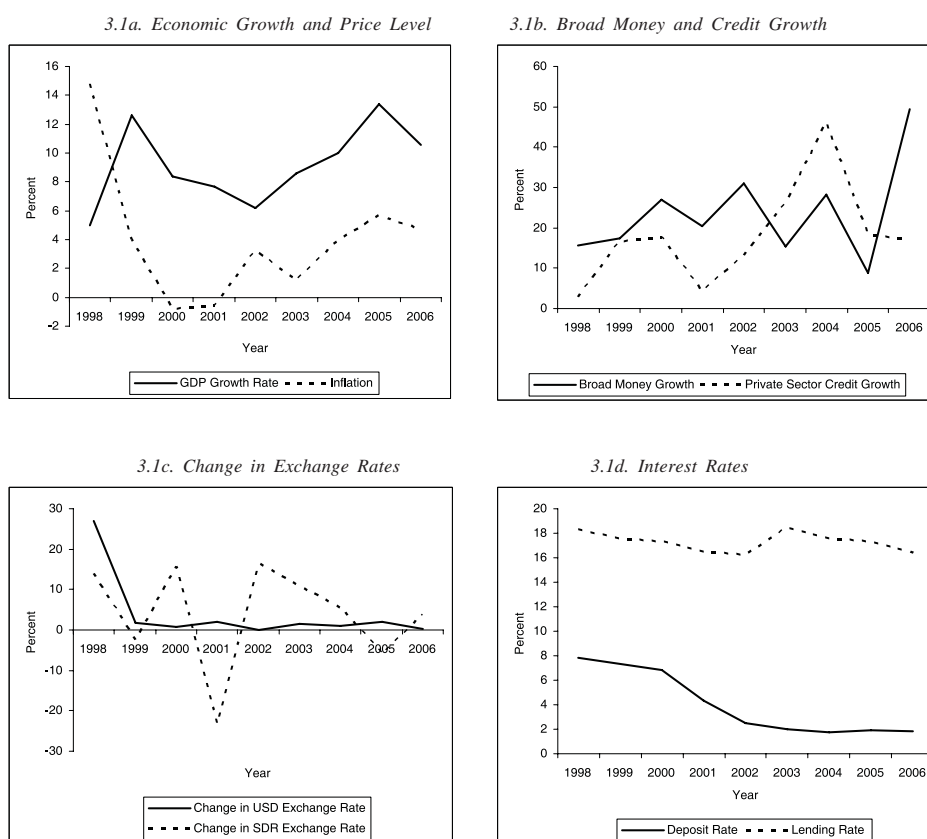
Cambodia's statistical infrastructure and capacity were largely not developed a decade ago. However, in recent years, the quality and coverage of economic and socio-demographic statistics have gradually improved. A significant number of donor-led data collection and compilation activities have been undertaken with technical assistance from various international institutions including ADB, IMF, UNFPA, UNDP, World Bank, etc., which have provided significant support over

the past decade on capacity building for macroeconomic statistics, demographic and social statistics. In January 2001, Cambodia was able to adopt the General Data Dissemination Standards (GDDS).

Although the current database is still relatively small in relation to the need for comprehensive monitoring and assessment of the economy, a basic data set containing key indicators is already in place. At present, the data set covers three major sectors of the economy, viz. (i) the government sector, including the central bank; (ii) the monetary and banking sector; and (iii) the external sector.

On the other hand, it is still difficult to collect information related to the corporate sector and the household sector given the present limited capacity and resources. Very recently, NBC initiated an enterprise survey aimed at identifying private companies operating in Cambodia for improving its foreign direct investment database.

Figure 3.1: Movement of Key Economic Variables in Cambodia

3.1a. Economic Growth and Price Level

3.1b. Broad Money and Credit Growth

3.1c. Change in Exchange Rates

3.1d. Interest Rates

Data Source: IFS, CEIC and SKEI

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Presently, for the assessment of current economic conditions, the ERSD relies on a fundamental data set that is made available through a number of administrative sources, some survey activities, and the central bank's own estimates. In its monthly economic report, the ERSD presents the latest economic developments that cover financial market development and conditions, international economic and financial environment, domestic economy conditions both demand and supply sides, fiscal position and monetary conditions as well as other factors that may affect the price level, including, for instance, prices of important imported commodities, and US interest rates. The plausible trends of these variables are widely discussed and subsequently incorporated into the inflation, monetary, and GDP forecasts.

3.1.2 Fiji

The main objectives of monetary policy in Fiji are maintaining price stability and ensuring an adequate supply of foreign reserves. With these objectives in mind, the developments in the economy are assessed monthly to identify potential risks so that necessary precautionary measures can be taken.

The Government prepared a new decision in 2007, which outlines measures to improve policy implementation and which requires the submission of periodic progress reports and updates by the Reserve Bank of Fiji (RBF) to the Ministry of Finance, National Planning and Sugar Industry. As per this new decision, the first update has to be submitted by mid-year and the second update by October.

The three major groups in the RBF involved in the surveillance of the economy include the Economics Group, Financial Markets Group, and Financial Institutions Group. Each Group makes presentations to the RBF Board on a monthly basis on various policy matters.

The Economics Group is responsible for formulating monetary policy. It has its own internal Policy Coordinating Committee that meets early every month to discuss economic developments and its policy recommendation for the month. The Senior Management of the Group then presents the recommendations to the Monetary Policy Committee of the Bank, which comprises the Governor and the Executive Management Team. The policy recommendations are finalized and presented by the Head of the Economics Group to the Board members towards the end of the month.

The Financial Markets Group has the primary responsibility for monetary policy implementation, foreign reserves management and exchange control. The Group implements monetary policy in accordance with the objectives of the Bank and ensures that the country's foreign reserves are managed within the parameters of stability, liquidity and profitability. In addition, the Group provides registry services for debt securities issued by Government and statutory corporations. The Group monitors developments in the domestic and external markets and submits reports and policy recommendations to the Market Operations Policy Committee and Board on a monthly basis. The Group is also overseeing the Real Time Gross Settlement System (RTGS), which was started at the end of August 2007.

The Financial Institutions Group is involved in ensuring financial system stability. This entails the monitoring and overall supervision of all licensed financial institutions, ensuring compliance with established policies and international best practices. Internal policy coordination meetings are held to discuss and review and pass policy papers, statements and licensed financial institutions condition reports, which are in turn presented by the Group's senior staff to the Bank's Financial Policy Committee and Board. Returns are submitted from all licensed financial institutions (commercial banks, credit institutions, insurance companies, restricted foreign exchange dealers and the Fiji National Provident Fund). The data is analysed on an individual institution basis for supervision purposes and also on a consolidated basis to allow policy formulation. RBF staff liaise closely with the various institutions to ensure timely compliance with the data deadlines.

The updates for Fiji's National Budget Address are coordinated by the Ministry of Finance, National Planning and Sugar Industry. Policy commitments that are announced in the Budget Address are outlined for each implementing agency. The updates are required on timeframe, measurable indicators, progress and constraints. In this regard, the Ministry sends a memo to the Governor enclosing a spreadsheet for required data updates. At the RBF, the Corporate Planning and Assurance (CPA) Group coordinates the Bank's response. A copy of the spreadsheet is sent to the respective Groups within the Bank for updating. A quality check is done by the CPA Group. Once all responses are collated, the completed form is emailed to the Finance Ministry. This update is discussed at the Cabinet meeting.

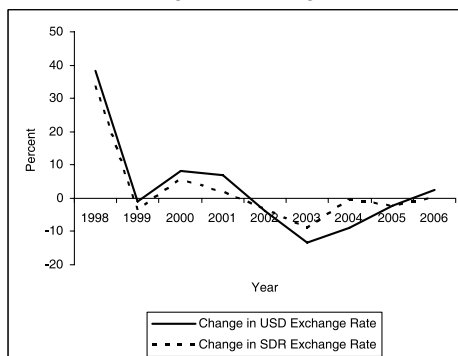**Figure 3.2: Movement of Key Economic Variables in Fiji**

3.2a. Economic Growth and Price Level
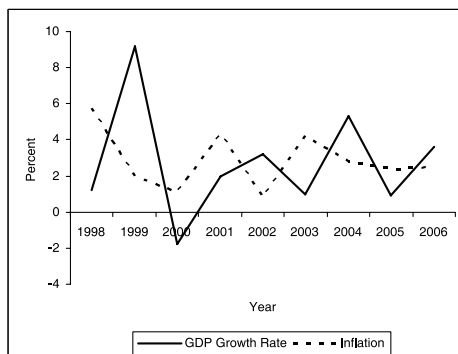
3.2b. Broad Money and Credit Growth
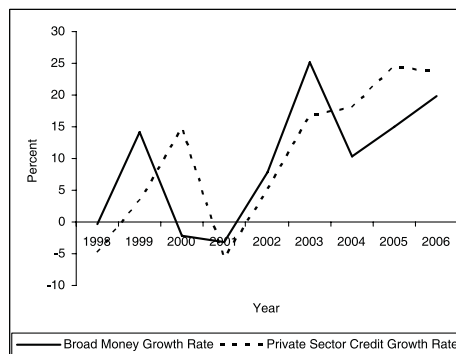
3.2c. Change in Exchange Rates

3.2d. Interest Rates
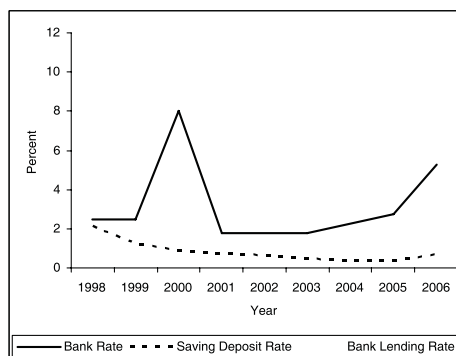
Data Source: IFS

Within the Bank, policy papers are prepared on a monthly basis by various Groups for the Board's information and decision, including special policy briefs that might often be requested on an adhoc basis. An update on the monetary policy formulation and implementation is provided in the Supplement to the Budget Address annually.

Various publications and the website are used extensively to disseminate information about monetary policy formulation and implementation. The Board

meets at least 10 times a year according to the Reserve Bank of Fiji Act and decides on the stance of monetary policy. After each Board meeting, the Bank issues a press release on the stance of monetary policy and any other policy changes. Update on other projects handled by the Bank is also provided to Cabinet. These projects include the RTGS, establishment of financial ombudsman, regulation of fees and charges as well as exchange control policies.

3.1.3 Indonesia

The objective of Bank Indonesia (BI) is to achieve and maintain stability of the rupiah value. This objective is linked to the price stability for goods and services as measured by the inflation rate, and foreign currencies as measured by the exchange rates. The amendment in the central bank law in 2004 has enhanced BI's accountability while maintaining its mandate and ability to independently implement an inflation targeting framework. Under the amended law; BI is now charged not solely with maintaining the stable value of the rupiah, but also to "conduct monetary policy on a sustained, consistent and transparent basis, taking in account the general economic policies of the government."

Bank Indonesia guides monetary policy towards the achievement of the government mandated inflation target. Since 2005, Bank Indonesia has been adopting the inflation targeting framework (ITF). Monetary policy formulation and implementation system is governed by internal regulations called the Board of Governor Regulations on Inflation Targeting Framework which gives a clear standard and procedures in monetary policy making to ensure good governance for the entire process of monetary policy formulation and implementation.

Based on the regulations, BI is obliged to make weekly, monthly, quarterly, and yearly monetary reviews. The yearly review, focuses on the assessment of the inflation target and related policies throughout the year and the medium term economic and policy outlook. The quarterly review covers comprehensive analysis on goods and financial market condition and policy response during the quarter. Bank Indonesia also provides the outlook of GDP and inflation 2 years ahead of time. The monthly review is part of a tracking or monitoring mechanism, especially on GDP and inflation development. Meanwhile, the weekly review mainly covers the operational aspects of monetary operation and market updates.

Figure 3.3: Movement of Key Economic Variables in Indonesia

3.3a. Economic Growth and Price Level

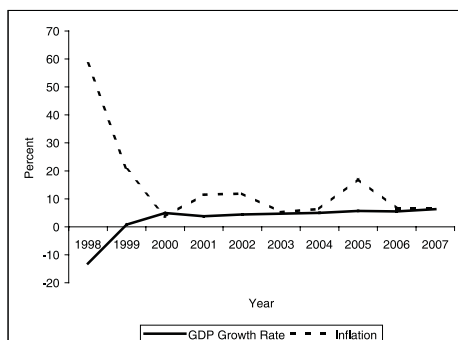*3.3b. Broad Money and Credit Growth*
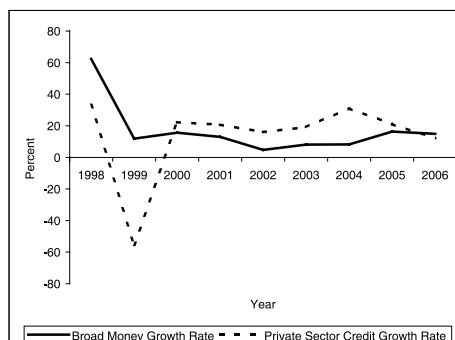
3.3c. Change in Exchange Rates
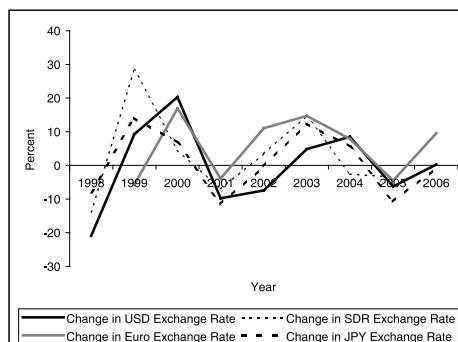
3.3d. Interest Rates
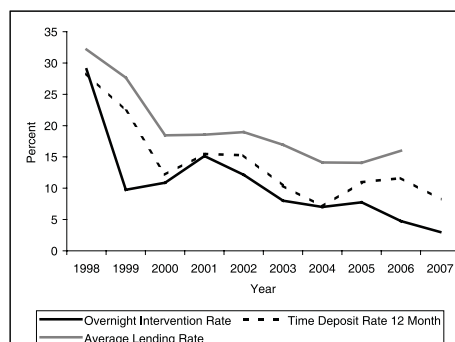
Data Source: IFS and CEIC

For dissemination and garnering feedback on monetary policy implementation and the framework itself, BI regularly conducts discussion forums, meetings and seminars with stakeholders (i.e. member of the parliament, government, real sector analyst, banking practitioner, businessman, and academics). BI also regularly invites prominent experts to review the implementation of the inflation targeting framework.

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Figure 3.4: Interrelations among Different Models used in Bank Indonesia
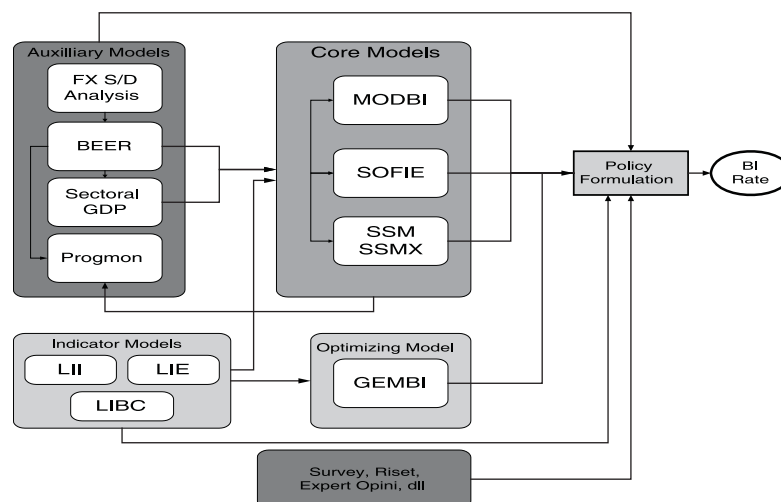
Abbreviation:
   FX S/D Analysis *- Foreign Exchange Supply Demand Analysis Model*
   BEER *- Behavioral Effective Exchange Rate*
   LII *- Inflation Leading Indicator*
   LIE *- Economic Leading Indicator*
   MODBI *- Macroeconomic Model of Bank Indonesia*
   SOFIE *- Short Term Forecasting Model for Indonesian Economy*
   SSM *- Small Scale Macro Model*
   SSMX *- Small Scale Macro Model - Extended*
   GEMBI *- General Equilibrium Model of Bank Indonesia*

Source: Bank Indonesia

BI utilizes various methods, tools and techniques for macroeconomic surveillance. The core economic models are used to forecast GDP and inflation outlook, while the auxiliary models focus on specific variable outlook such as foreign exchange, GDP by sectors, and monetary aggregates. The indicator models consist of leading indicators of economic activity, investment, business cycle, and early warning system for financial market vulnerability. BI also has a DSGE-type model called GEMBI. Interrelations among different models are depicted in the Figure 3.4.

Bank Indonesia and the Ministry of Finance are also collaborating with the ADB on developing an Early Warning System (EWS) for regional surveillance. This signal based framework monitors various economic indicators individually and as a composite.

3.1.4 Korea

The primary objective of The Bank of Korea (BOK) is to maintain price stability. The Bank sets the inflation target every year in consultation with the government and publishes its monetary policy and operational plans. The Monetary Policy Committee is the apex body in BOK. The main functions of the Committee are formulation of monetary and credit policies.

The BOK keeps track of various financial and economic variables and analyzes them quantitatively using macroeconometric models. Along with econometric analysis, the BOK conducts qualitative research and analysis on structural changes and unusual developments. It also identifies any signs of change through interviews with financial market participants and academic experts.

Figure 3.5: Movement of Key Economic Variables in Korea

3.5a. Economic Growth and Price Level
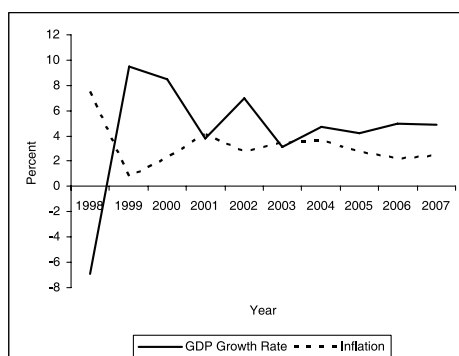
3.5b. Broad Money and Credit Growth
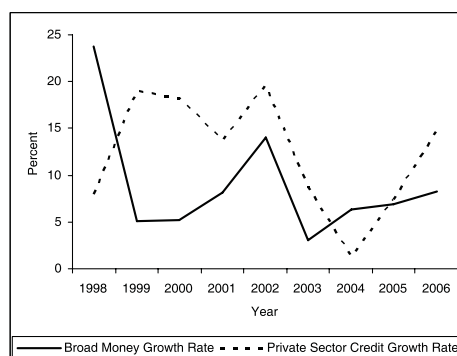
3.5c. Change in Exchange Rates
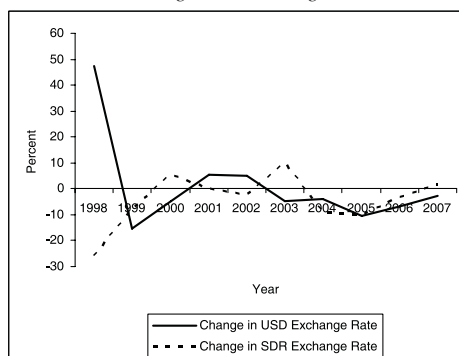
3.5d. Interest Rates
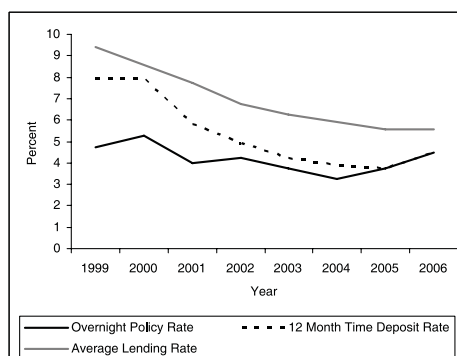
Data Source: IFS, CEIC and SKEI

Macroeconomic developments are analysed regularly by the relevant departments. Trends in the real economy, the financial markets, and the FX market are watched by the Research Department, the Financial Markets Department, and the International Department, respectively. Settlement trends and risk factors are looked into by the Payment Systems and Treasury Services Department and the Financial System Stability Department, respectively. Unusual developments and risk factors are examined and reported separately. Before the policy rate is decided every month, the relevant departments verify and analyze developments in the real sector, the financial markets, and the foreign exchange market.

The BOK uses the overnight call rate as its policy rate and target rate and the main monetary policy instruments are open market operations and the reserve requirement system as well as various loan systems. Monetary Stabilization Bonds and RPs are main instruments used for open market operations. The BOK's reserve requirement system is based on a half-month maintenance period with a 7-day deferment. The current reserve requirement ratio is about 3.8 percent. Among its loan systems, the BOK mainly uses intraday overdrafts, aggregate credit ceiling loans, etc. However, the use of loan systems is limited to the minimum amount necessary, since the BOK has to absorb liquidity from the money market.

3.1.5 Malaysia

The main objectives of Bank Negara Malaysia (BNM) are price stability and sustainable economic growth. The principal functions of the Bank include the issuance of currency and maintaining reserves to safeguard the value of the currency; to act as a banker and financial adviser to the government; to promote monetary stability and a sound financial structure; to promote reliable, efficient and smooth operation of the national payment and settlement systems; to ensure that the national payment and settlement systems policy is directed to the advantage of Malaysia; and to influence the credit situation to the advantage of the country.

The Board of Directors of the BNM is responsible for the strategy and general administration of the central bank's affairs and business. The Board entrusts the Governor with the tasks pertaining to the conduct and formulation of monetary policy. Various departments are involved in surveillance of their functional areas including the Monetary Assessment and Strategy Department, Economics Department, Investment Operations and Financial Markets Department, Financial Surveillance Department, and the Foreign Exchange
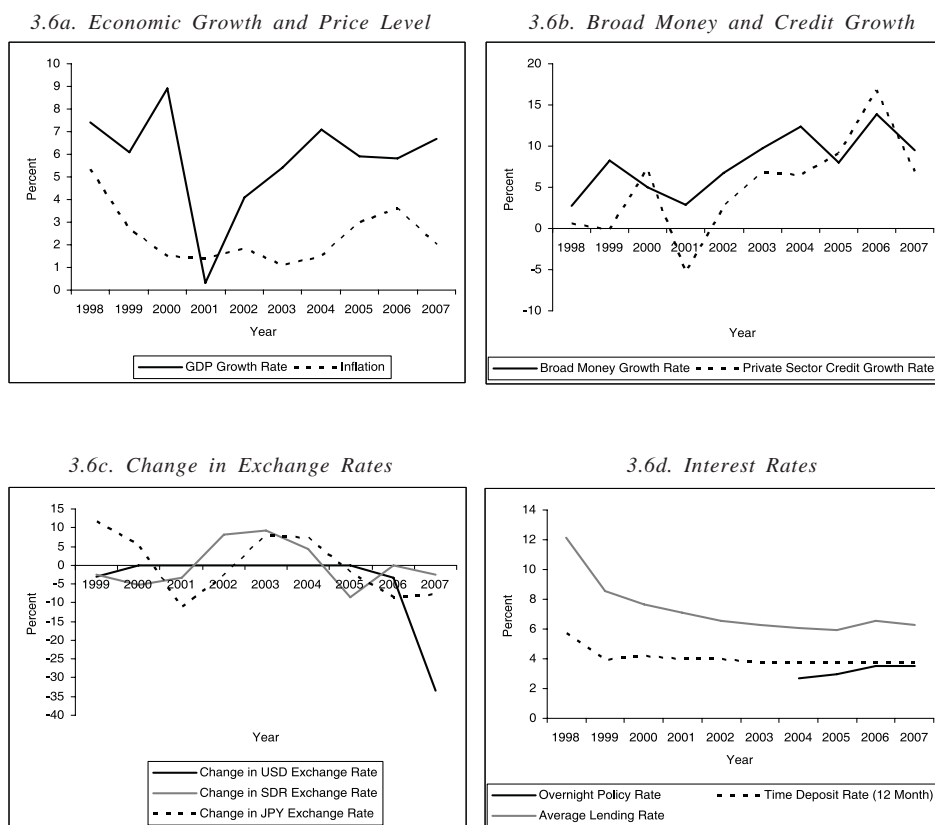
Administration Department. The Monetary Policy Working Group (MPWG) and the Monetary Policy Committee (MPC) provide a forum for discussion on various surveillance related surveys and study reports.

The work process leading to an MPC meeting begins from the regular surveillance and research work undertaken by the Bank's staff. Before presenting to the MPC, the staff's findings are first presented and deliberated upon at the MPWG meeting. This meeting is primarily a technical discussion forum, chaired by the Assistant Governor for monetary policy. Other members of the MPWG comprise the Directors of the Monetary Assessment and Strategy Department, Economics Department, Investment Operations and Financial Markets Department, Financial Surveillance Department and the Foreign Exchange Administration Department.

The main agenda of each MPWG meeting is the presentation and deliberation on the recent economic, financial and monetary developments in the global and domestic economy. As and when appropriate, there will also be presentations and deliberations on policy issues and proposals, as well as the findings of research studies, which are relevant to the conduct of monetary policy. Besides ensuring the technical accuracy and robustness of the analysis, participation by the various departments also enables the issues and developments to be discussed from various perspectives. Where necessary, the analysis will be enhanced before they are presented to the MPC.

The Governor chairs the Monetary Policy Committee (MPC), whose other members are the deputy and assistant governors. The primary objective of the MPC meetings is to serve as a formal platform for comprehensive discussions on issues and developments relevant to the formulation and implementation of monetary policy. The MPC is not a decision-making committee and its role is limited to that of an internal advisory group. The Governor has the sole responsibility for monetary policy, and is accountable to the Bank's Board of Directors. Extensive deliberation during the MPC meetings ensures that the Governor has the benefit of hearing alternative opinions and perspective before making a policy decision.

Figure 3.6: Movement of Key Economic Variables in Malaysia

3.6a. Economic Growth and Price Level

3.6b. Broad Money and Credit Growth

3.6c. Change in Exchange Rates

3.6d. Interest Rates

Data Source: IFS, CEIC and SKEI

The Monetary Policy Committee (MPC) meets eight times a year. Additional meetings can also be held if a situation arises that requires the urgent attention of the MPC. At the end of the day following each MPC meeting, a Monetary Policy Statement (MPS) will be released to inform the public of the Bank's monetary policy decision, as well as to provide the Bank's assessment of the balance of risks to economic growth and inflation.

A typical MPC meeting would begin with a presentation on the recent economic, financial and monetary developments, followed by the MPC's deliberation on the balance of risks to economic growth and inflation, and the drafting of the MPS. Occasionally, the meeting will also include presentations on longer-term issues facing the economy, as well as the findings of research studies relevant to the conduct of monetary policy. During the meeting, queries

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and issues of concerns are frequently raised by the MPC members; where necessary, staff will conduct further research on the issues raised and revert to the MPC at subsequent meetings.

3.1.6 Myanmar

The primary objectives of monetary policy in Myanmar are to ensure adequate expansion of money supply appropriate for supporting a growing economy at reasonably stable prices and to promote domestic savings. The Central Bank of Myanmar (CBM) is responsible for preserving the internal and external value of Myanmar currency, the Kyat. Other responsibilities of CBM include promoting efficient payments systems, developing a sound based financial system, and fostering favourable monetary, credit and financial conditions conductive to sustainable economic development.

Under the Ministry of Finance and Revenue, CBM is mainly responsible for the macroeconomic surveillance process. The Ministry of National Planning and Economic Development also plays an important role in the surveillance process as it is responsible for coordinating and formulating economic development plans and for preparing economic indicators such as gross domestic product (GDP), consumer price index (CPI), wages, population and so on.

The Ministry of Finance and Revenue is organized into six commercial arms and five fiscal administrative departments. The Central Bank of Myanmar, Myanma Economic Bank, Myanma Foreign Trade Bank, Myanma Investment and Commercial Bank, Small Loan Enterprise and Myanma Insurance are the institutions that come under the commercial arm. The fiscal administrative departments include the Budget Department, Internal Revenue Department, Customs Department, Pension Department and Revenue Appellate Tribunal. Among these agencies, the Central Bank of Myanmar and Budget Department are the principal agencies involved in country's economic and financial monitoring process.

Figure 3.7: Movement of Key Economic Variables in Myanmar

3.7a. Economic Growth and Price Level
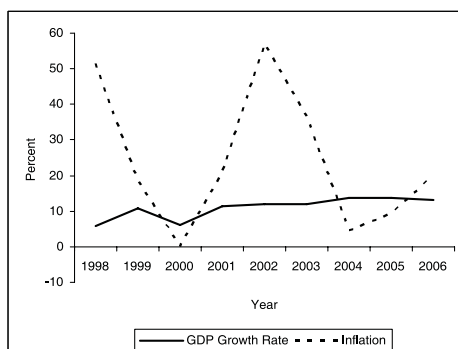
3.7b. Broad Money and Credit Growth
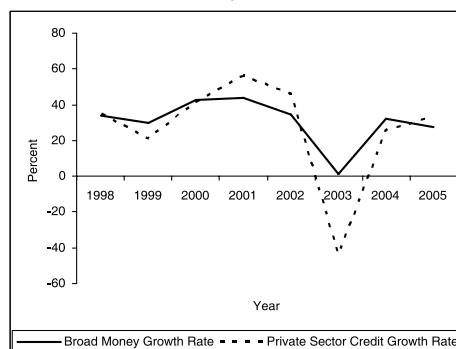
3.7c. Change in Exchange Rates
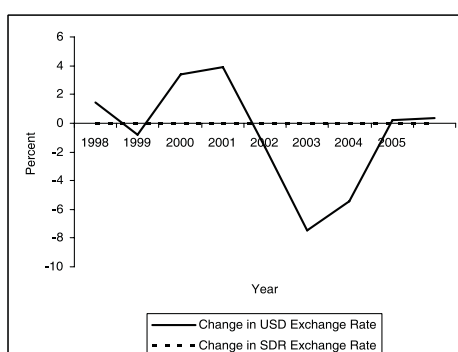
3.7d. Interest Rates
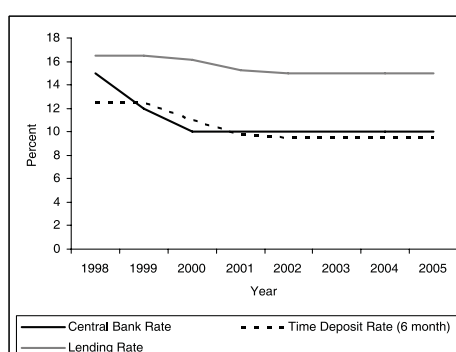
Data Source: IFS and SKEI

The CBM works as an arm of the Ministry of Finance and Revenue and is therefore, not independent in monetary policy management with fiscal policy frequently overriding monetary policy. Fiscal deficits are financed by monetary expansions which lead to higher levels of inflation. The inflation in Myanmar has persistently remained in the double digit during the last few years. In such a case, the monitoring of the economic indicators for monetary policy management becomes less meaningful. However, as the country is in transition, various improvements are underway in this direction and monetary policy management also can be expected to be independent in due course.

3.1.7 Nepal

The monetary policy of Nepal has twin objectives of price stability and balance of payments consolidation. Nepal Rastra Bank (NRB) formulates and announces monetary policy at the beginning of the fiscal year which starts from mid July. Broad money is set as the intermediate target and its growth is tracked with the view to maintaining price stability given the expected economic growth. There is dual exchange rate system in Nepal where the Nepalese currency is pegged with the Indian currency while the exchange rate of the Nepalese currency with other major currencies is market determined. The NRB announces the exchange rate of major currencies only for its official purpose. The pegged exchange rate with Indian currency is taken as nominal anchor.

Various departments and high level committees are involved in the monitoring of the economic developments in the country in NRB. The NRB Board of Directors chaired by the Governor is at the apex. Other committees include the Management Committee chaired by the Governor; Open Market Operations Committee (OMOC) chaired by the Deputy Governor; and Foreign Exchange Investment Committee also chaired by the Deputy Governor. Departments involved in surveillance include the Research Department, Banks and Financial Institutions Regulation Department, Banks Supervision Department, Financial Institutions Supervision Department, and Foreign Exchange Management Department

The Research Department prepares and publishes the monetary survey on a monthly basis using the balance sheets of NRB and all commercial banks. It collects, analyzes and makes public the macroeconomic data. The Department also prepares and releases reports on the current macroeconomic situation on monthly basis, including the data on monetary, real, fiscal and external sector of the economy. The economy is monitored with the aid of these macroeconomic indicators.

The Foreign Exchange Management Department manages the international reserves and maintains exchange rate stability in line with monetary policy. It also manages reserves following the broad and operational guidelines provided by the NRB Board and the Foreign Exchange Investment Committee. The Department monitors and regulates foreign currency transactions and intervenes, if deemed necessary, in the foreign exchange market to maintain exchange rate stability.

Figure 3.8: Movement of Key Economic Variables in Nepal

3.8a. Economic Growth and Price Leve
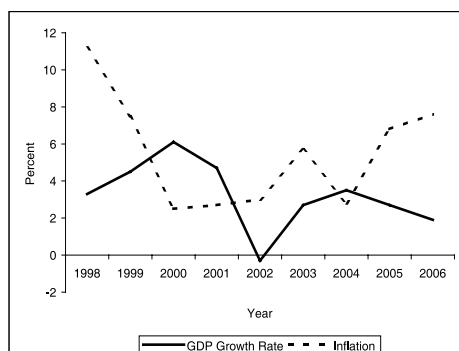
3.8b. Broad Money and Credit Growth
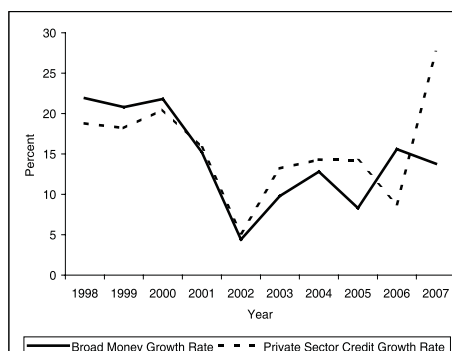
3.8c. Change in Exchange Rates
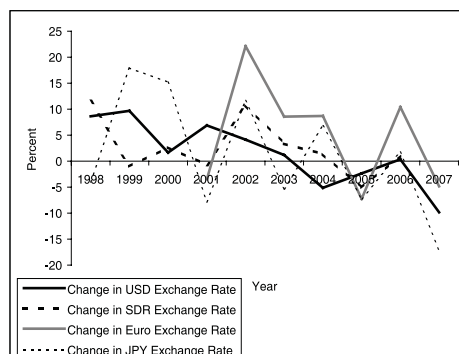
3.8d. Interest Rates
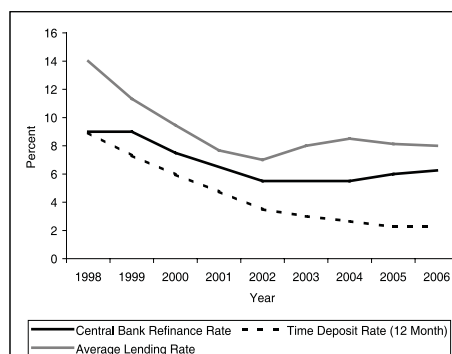
Data Source: IFS and Quarterly Economic Bulletin October 2007, Nepal Rastra Bank

The Banks and Financial Institutions Regulation Department regulates banks and financial institutions. Different prudential norms are formulated and executed to regulate these institutions. The Banks Supervision Department and the Financial Institutions Supervision Department regularly supervise banks and financial institutions via off site and on site methods of supervision applying the CAELS and CAMELS rating system and they also formulate different indicators for supervision of banks and financial institutions.

The Public Debt Management Department manages debt for the government and makes necessary arrangements for open market operations. Nepal Rastra Bank manages the liquidity situation in the economy with open market operations,

The Research Department drafts the monetary policy statement which is submitted to the NRB Board for final approval, after which the Governor will

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make public the policy statement. The monetary policy statement analyzes the current macroeconomic situation and likely development in the coming year.

The NRB offers the amount for auctions in open market operations which commercial banks will bid for. Interest rate is therefore largely market determined. Based on the report of Liquidity Monetary and Forecasting Framework (LMFF), the OMOC decides on the amount to be offered for auctions. The LMFF report is prepared from the weekly balance sheet of NRB, taking into account likely activities such as foreign exchange intervention, maturity of government securities, etc. The outcome of open market operations is closely monitored to assess the liquidity situation in the banking system.

3.1.8 Papua New Guinea

The formulation of monetary policy in Papua New Guinea has been broadly guided by the analysis of the main factors that influence the achievement of price stability, and an understanding of their economic consequences. In designing monetary policy, the Bank of Papua New Guinea (BPNG) considers actual and projected developments in the international economy, domestic economic conditions, the balance of payments, and fiscal operations of the Government and their potential impact on monetary aggregates, the exchange rate and inflation.

BPNG's macroeconomic surveillance framework is governed by a number of Acts, particularly the Central Banking Act 2000, the Banks and Financial Institutions and the Life Insurance Acts. The surveillance process is carried out by the policy departments with the support from non-policy departments. Generally, the Bank keeps a close watch on macroeconomic developments and formulates and implements monetary policy. This can be seen as surveillance at the national level for monetary policy purposes. Surveillance in the multilateral level through the IMF's Article IV consultation is a broader coverage of the economy and the policies, in which the Bank has a greater input. The Bank has a close working relationship with other relevant departments and organizations that provide the necessary information for monetary policy formulation and implementation.

There are several departments involved in the surveillance process in BPNG. The Economics Department focuses on the monetary aspects while the focus of the Financial System Supervision Department is on prudential standards. In the monetary sector, BPNG uses primary data to conduct the surveillance; mainly monitoring developments in the price level, interest rates, monetary aggregates, foreign reserves and the exchange rate. Whilst interest rates are monitored on a daily, weekly and monthly basis, inflation data is sourced from the National Statistical Office on a quarterly basis. Inflationary pressures are further monitored through the Bank's survey on retail price index of Port Moresby city. Other than monetary data, BPNG also collects data from other government institutions, through its Banking Department. In addition to data gathering, projections and surveys are also carried out by the relevant departments. The Economics Department carries out quarterly Business Liaison and Employment Surveys, covering a sample of over 500 private sector companies.

One important part of the PNG surveillance process is the close link between fiscal policy and monetary policy, particularly on issues regarding debt management, revenue and expenditure. For BPNG, it is crucial to monitor the private sector's demand for foreign currency to service its external debt, as this can have an effect on the movement of the exchange rate. The Government external debt is transacted at the official Central Bank exchange rate and so it does not influence the exchange rate.

On the external sector, the Bank's Financial Markets Department closely monitors foreign reserves. From time to time the relevant units in the Bank would call on the party who has engaged in large volumes of transaction/s to explain and provide additional details. Another important part is the monitoring of the stock market. The Monetary Policy Unit closely monitors the stock market through the collection of data on the Kina Stock Index on a daily basis. Meanwhile, to monitor foreign direct investment flows, the Bank, through its Balance of Payments Unit, receives monthly forms from the commercial banks on which such information is disclosed. BPNG also monitors the movement in the short-term portfolio investment.

Figure 3.9: Movement of Key Economic Variables in Papua New Guinea

3.9a. Economic Growth and Price Level
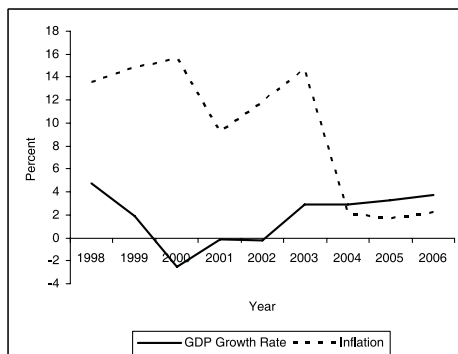
3.9b. Broad Money and Credit Growth
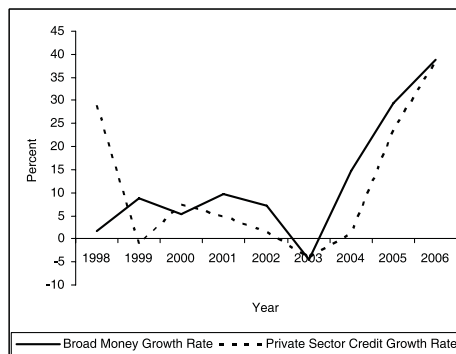
3.9c. Change in Exchange Rates
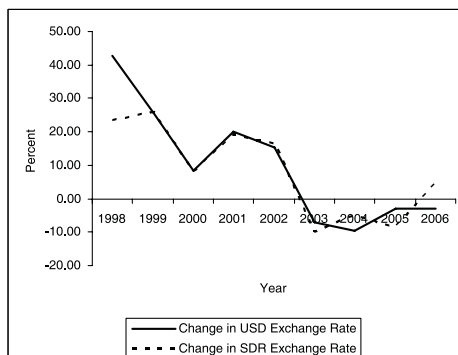
3.9d. Interest Rates
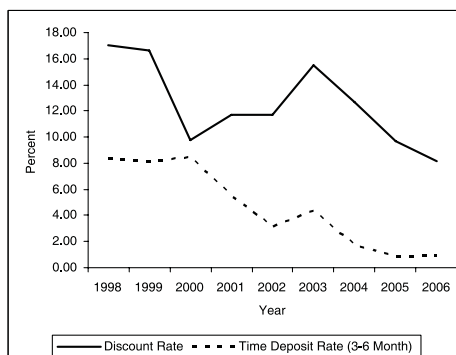
Data Source: IFS and SKEI

In its supervisory function, the BPNG monitors compliance on two major fronts including off-site surveillance and on-site examination. Off-site supervision is conducted through the analysis of financial and other prudential statistics provided by Authorized Financial Institutions (AFIs). Tests are conducted with statistics to ensure that AFIs meet specific requirements with respect to capital, large exposures and concentration, provisioning and asset quality classification, foreign exchange overall and single currency exposure levels, and investments portfolio diversification. On-site supervision involves visits by examiners to AFIs' premises and close reviews of the institutions' operations, policies and procedures. These reviews may entail a general examination of an institution's overall operations, including compliance matters and financial condition, or may be

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targeted on a specific area, particularly if off-site surveillance or other information has suggested problems, or potential problems, in that area. They also ensure adherence to the prudential standards, directives and guidelines.

3.1.9 Philippines

Apart from the primary objective of maintaining price stability, the Bangko Sentral ng Pilipinas (BSP) is also mandated by its Charter (Republic Act No. 7653) to preserve the stability of the financial sector. This has given the BSP regulatory and supervisory responsibilities over financial and non-financial institutions. This twin mandate of the BSP implies a crucial balancing act between resolving distress in the banking sector and mitigating the impact of such assistance on the money supply and inflation. Thus, in order to address the possible trade-off between the two objectives, the BSP organized the Task Force on Banking and Systemic Risks to: (a) address the possible risks in the conduct of monetary policy due to unforeseen liquidity expansion arising from financial assistance to problem banks; (b) facilitate the determination of potential systemic risks in the banking sector arising from the non-grant of financial assistance; and (c) formulate alternative risk management strategies to address potential conflicts between BSP's twin objectives.

Currently, the BSP is maintaining forward-looking early warning system (EWS) models to predict the likelihood of future financial crises. The non-parametric EWS Model for currency crisis utilizes a signals approach which is a non-parametric method for evaluating a set of variables as indicators in providing advance warning of an impending crisis. This approach makes it possible to monitor the movements of key economic variables when their behaviours deviate from normal trends in a given period prior to a crisis. Deviations of these variables from their normal threshold levels are taken as warning signals of possible crisis occurring within a specified period of time.

The identification of business cycles is an additional component to the EWS model which provides general information on the direction of economic activity that can support policy decisions on whether to expand or contract money supply as well as the timing of such decisions.

Figure 3.10: Movement of Key Economic Variables in Philippines

3.10a. Economic Growth and Price Level
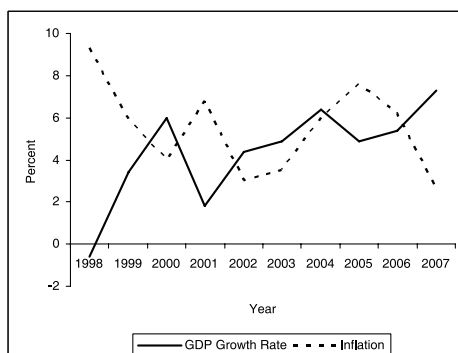
3.10b. Broad Money and Credit Growth
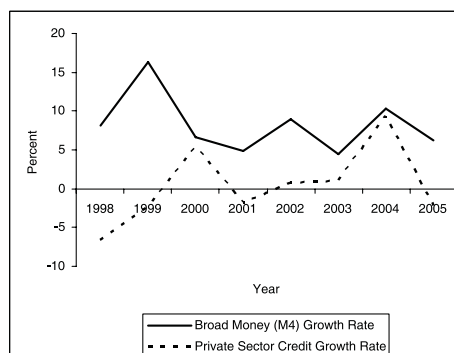
3.10c. Change in Exchange Rates
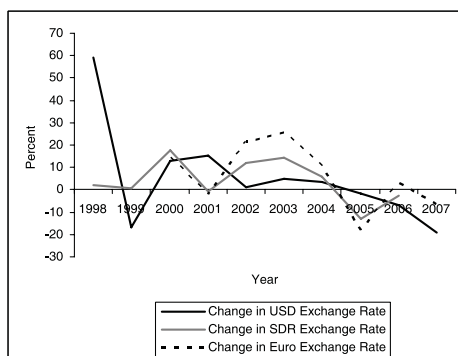
3.10d. Interest Rates
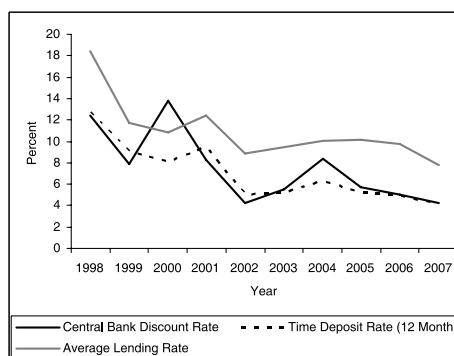
Data Source: IFS and SKEI

The External Debt Sustainability Assessment utilizes the indicative threshold approach where "danger" threshold values of external debt indicators are identified. A non-parametric EWS model is used to derive the threshold levels for relevant debt indicators. These threshold values, when exceeded, tell of imminent future debt servicing difficulties with an increasing probability of debt crisis occurring within a year.

The development of the EWS for the macroeconomy is part of the BSP's strategy to fully institutionalize the process of managing the risks involved in monetary policy formulation. This ensures that the risks to the achievement of the inflation target are properly considered and incorporated in the monetary policy recommendations to the Monetary Board.

3.1.10 Singapore

Macroeconomic surveillance by the Monetary Authority of Singapore (MAS) is geared towards informing policy makers on monetary policy formulation and financial stability issues. The effort is spearheaded by two departments, *viz.*, the Economic Policy Department (EPD) and the Macroeconomic Surveillance Department (MSD). The geographical coverage of surveillance provides a natural distinction between the two departments.

The EPD monitors and analyses developments in the Singapore economy, while the MSD conducts surveillance of the G-3 and regional economies as well as international financial markets. At the same time, the latter also tracks the domestic financial system to identify potential vulnerabilities that could heighten systemic risk. This is supplemented with inputs from MAS' supervisory departments to ensure that both macro and micro-prudential perspectives are brought to bear on financial stability issues.

Inputs from the two departments are central to the formulation of Singapore's monetary policy. In the context of Singapore's small size and the high degree of openness, the assessment of conditions in the external macroeconomic environment and key sectors such as IT would have a major impact on domestic macroeconomic outcomes, and more importantly, the optimal monetary policy path. To this end, the EPD, being the lead department in the formulation process, holds extensive discussions with the MSD staff on the outlook for the external environment with the aim of creating scenarios for policy simulations.

On the domestic front, the EPD adopts a "top-down, bottom-up" strategy in the surveillance of the Singapore economy. From the top-down, EPD uses the MAS' Monetary Model of Singapore (MMS), a macro-econometric model of the Singapore economy, to analyse and forecast domestic economic activity. In addition, the model is used extensively for policy simulations across a variety of scenarios that are developed jointly with the MSD. The simulation results, in the form of medium-term growth and inflation trade-offs, would provide an analytical anchor to the discussion of monetary policy.

Figure 3.11: Movement of Key Economic Variables in Singapore

3.11a. Economic Growth and Price Level
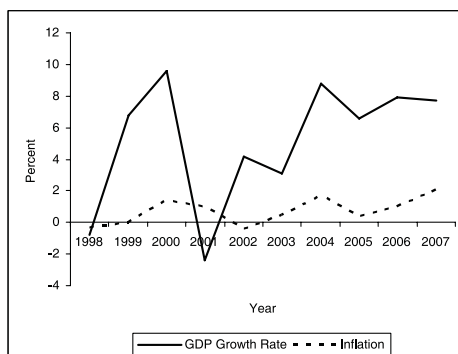
3.11b. Broad Money and Credit Growth
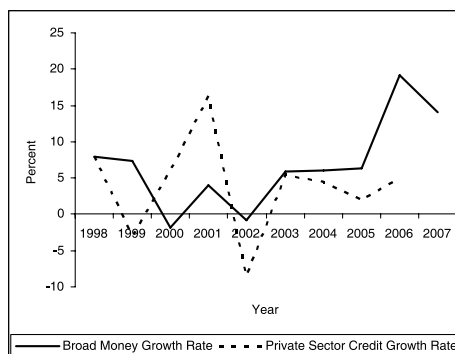
3.11c. Change in Exchange Rates
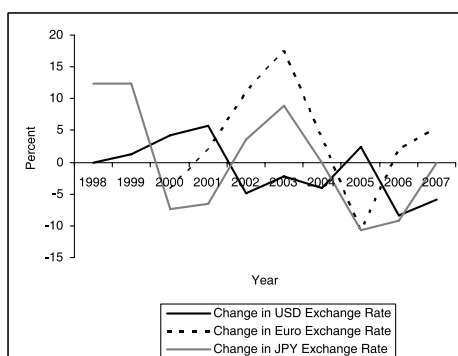
3.11d. Interest Rates
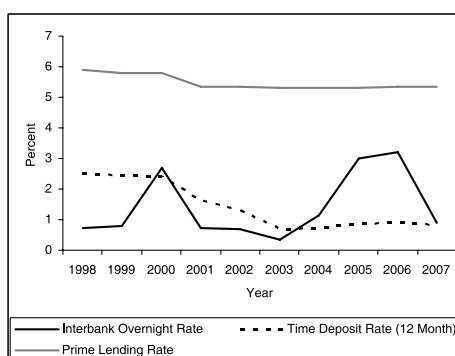
Data Source: IFS and CEIC

The bottom-up approach, as the name suggests, focuses on the analysis and forecast of sector-specific developments and trends. Sectoral data analysis and spreadsheet modelling aside, the staff also gather feedback on monetary policy and qualitative assessments of the economy from industry players and government economic agencies. These views from the ground are then built into MAS' baseline forecasts and policy recommendations.

Between the two approaches, the role of sectoral analysis is most important in the near-term forecasts and assessments, while the model itself plays a greater role in the outlook of the medium and longer term, as well as simulations of alternative scenarios. Staff from both sides would come together to reconcile their outlook for the economy with a view to fine-tuning their policy recommendations.

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At a broader level, the department tracks a host of macroeconomic indicators, including the output gap, labour market conditions, inflation, interest rates and exchange rates, as guides to the formulation process. In-depth special studies on topics ranging from industry-specific trends to macroeconomic issues also form an integral part of macroeconomic surveillance, especially with respect to understanding the transmission mechanism of monetary policy and the structural shifts in the economy.

In addition, MAS also holds regular and extensive meetings with other government agencies, private sector economists as well as business and industry organisations to garner additional feedback on price and economic activity developments across different sectors of the economy. The forums include roundtable discussions, formal closed-door meetings and industry visits.

3.1.11 Sri Lanka

The Central Bank of Sri Lanka (CBSL) targets the maintenance of monetary growth, consistent with economic and financial system stability, with the view to encouraging and promoting the development of productive resources in the country. Monetary policy of the CBSL works through the monetary targeting framework in achieving the pre-announced monetary targets and thereby price stability.

Monetary policy operates primarily by influencing the cost and availability of money in the economy through the interest rate and credit availability mechanism. As the velocity is stable and the money multiplier is broadly constant, the monetary targeting framework is still effective in achieving the objective of monetary policy. In the framework, the CBSL adheres to an intermediate targeting approach and reserve money is the intermediate target. Open Market Operations are conducted to achieve reserve money targets.

Figure 3.12: Movement of Key Economic Variables in Sri Lanka

3.12a. Economic Growth and Price Level
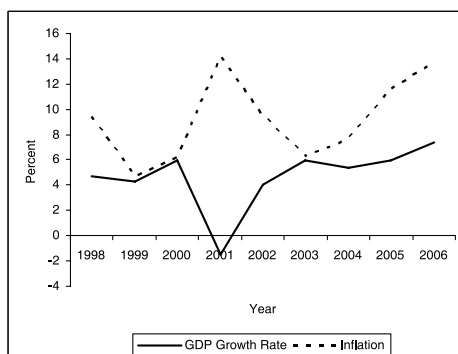
3.12b. Broad Money and Credit Growth
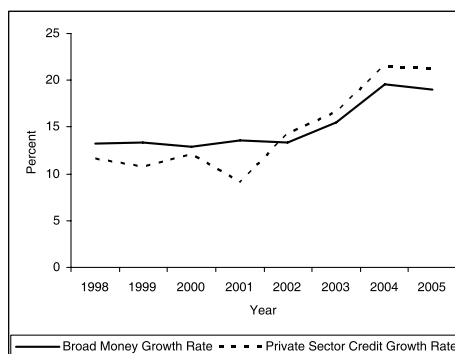
3.12c. Change in Exchange Rates
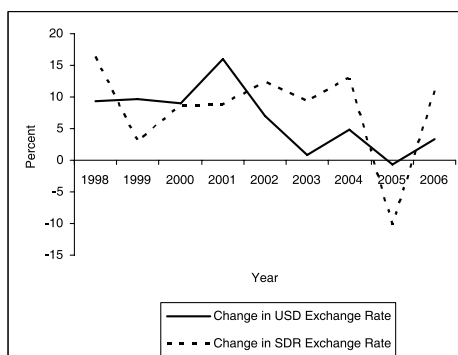
3.12d. Interest Rates
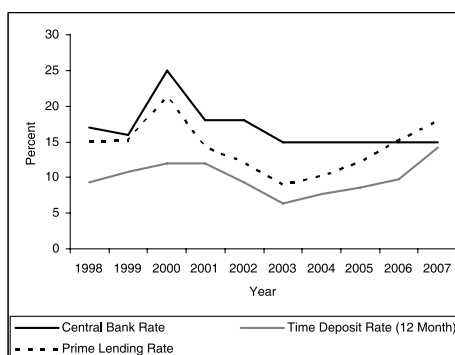
Data Source: IFS

The ultimate responsibility of maintaining price and financial system stability in the country rests with the Monetary Board of CBSL while the organization of the CBSL is structured to achieve these objectives. The two Deputy Governors (DGs) of CBSL are each responsible for price stability and financial system stability, while several departments headed by directors work under the two DGs on related areas. The Assistant Governors responsible for Economic and Price Stability, Policy Review, and Monitoring and Financial System Stability, are hierarchically positioned between the DGs and Heads of Departments, to provide useful insights to the processes.

With a view to further strengthen the institutional arrangement for the monetary policy decision making process, the Monetary Board of the Bank has established two committees, viz., the Monetary Policy Committee (MPC) and Market Operations Committee (MOC) in 2002. While the MPC is a policy making body responsible for making policy recommendations to the Monetary Board, the MOC is responsible for determining the daily direction and magnitude of open market operations in the conduct of monetary policy.

A monetary policy review is made on a monthly basis by the MPC while policy recommendations are made to the Monetary Board. As a further step in improving the monetary policy decision making process, a Monetary Policy Consultative Committee (MPCC) has been established at the beginning of 2007 comprising of 7 stake holders and economists representing the private sector. The monetary policy and implementation processes are expected to be strengthened further by the expertise and insight of the private sector members who will provide useful insights into the monetary policy decision making process of the Bank.

3.1.12 ROC (Taiwan)

The ultimate goals of monetary policy of the Central Bank of the Republic of China (Taiwan) (CBC), include price stability, financial stability and sustainable economic growth. Since the mid-1980s, the CBC has adopted monetary targeting. From 1992 onwards, it has been setting intermediate targets on a yearly basis. For policy formulation, the M2 monetary aggregate is the intermediate target. Every November, the Department of Economic Research suggests a target zone of M2 for the coming year based on its estimation of M2 money demand. The CBC then gathers a panel of scholars and experts to discuss the estimation results. The Board of Directors reviews the suggested annual target zone at its December meeting. The target zone set by the Board serves as a guide for monetary policy operations throughout the year.

Macroeconomic surveillance has been the foundation of monetary policy decisions. To steer its monetary policy towards the set goals, the CBC exercises its macroeconomic surveillance mainly on a quarterly basis. A wide range of economic and financial variables are analyzed to form the basis for policy decisions. The highest policy making body of the CBC is the Board of Directors. Members of the Board meet quarterly and take decisions on official rates and reserve requirements.

For macroeconomic surveillance, the Department of Economic Research is responsible for analyzing and forecasting the changes in the external and internal macroeconomic and financial situation, as well as providing policy suggestions. The Department of Banking implements monetary policy operations to influence bank reserves and short-term interest rates as well as monitor the payment systems. The Department of Foreign Exchange is responsible for the management of foreign exchange markets and capital movements.

After the establishment of the Financial Supervisory Commission in 2004, the CBC no longer shares the responsibility of bank examination. The Department of Financial Inspection has therefore shifted its main task to the assessment of financial stability. The CBC has established a committee for financial stability assessment in 2007, which meets quarterly to discuss the soundness of financial institutions and the potential factors affecting financial stability.

To take a forward-looking perspective on the domestic and international economic development, the CBC analyzes and forecasts economic growth and inflation on a quarterly basis. It uses econometric models and time series analysis for economic forecasting, and also conducts a quarterly business survey on 30 large corporations via visitations and discussions with their executives. The information gathered from the survey is used to ascertain whether it is necessary to revise its economic forecast.

As price stability is a major goal, the CBC began to forecast inflation on a monthly basis since 2004, utilizing a component approach with leading indicators and econometric models. On the monetary front, the CBC monitors and forecasts monetary aggregates every month while also monitoring bank credit expansion, capital flows and other financial indicators ranging from exchange rates to asset prices. The Taylor's Rule and the monetary condition index (MCI) are also used on a monthly basis to help assess whether monetary policy action is required.

In order to strengthen the capacity of detecting vulnerabilities and risks in the early stages of crisis development, the CBC has employed an early warning system for financial crises consisting of a set of macro prudential indicators and econometric models to forecast the likelihood of financial crises.

The macro prudential indicators include aggregated microprudential and macroeconomic indicators. The former are basically derived from the IMF financial soundness indicators, together with market-based information, such as

stock prices and credit ratings for financial institutions. The latter indicators include the ones related to external sustainability, financial conditions, fiscal positions, robustness of the real sector, and global economic conditions. These indicators are reviewed on a quarterly basis.

Figure 3.13: Movement of Key Economic Variables in ROC (Taiwan)

3.13a. Economic Growth and Price Level
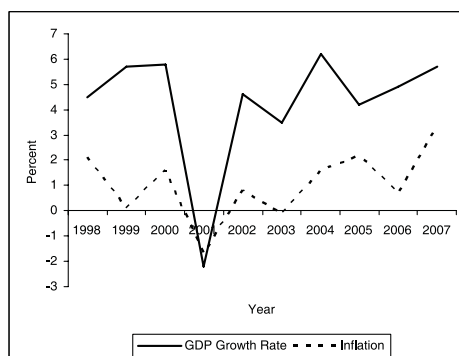
Percent
Year
GDP Growth Rate — — Inflation

3.13b. Broad Money and Credit Growth

Percent
Year
Broad Money Growth Rate — — Private Sector Credit Growth Rate

3.13c. Change in Exchange Rates

Percent
Year
Change in USD Exchange Rate
Change in JPY Exchange Rate

3.13d. Interest Rates

Discount Rate

Percent
Year
Discount Rate
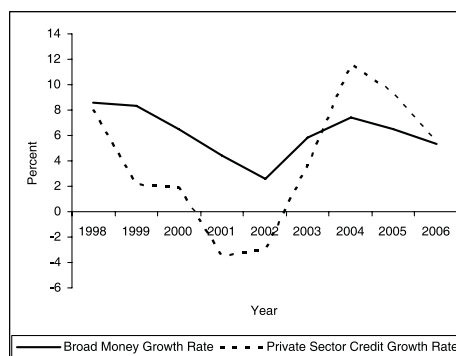
Data Source: CEIC and SKEI

To estimate the likelihood of financial crises, the CBC has developed ordered probit models. In addition, it has adopted thresholds for the credit and asset price gaps to assess the risk of asset price bubbles and these are conducted as and when necessary.

To enhance surveillance over the foreign exchange market, the CBC monitors foreign exchange transactions on a daily basis through the Foreign Exchange Declaration System and the Reporting System of Foreign Exchange Transactions. It also sets regulations on foreign exchange derivatives to reduce excessive speculative trading in the market.

3.1.13 Thailand

The analytical framework to monitor monetary and financial stability at the Bank of Thailand (BOT) is based on macroeconomic surveillance complemented by macro-financial linkage analysis. The main goal is to assess possible exposures that may allow shocks to be transmitted to the overall economy through the financial system and review the ability of the financial system to withstand those potential shocks. In addition, the framework's aim is to serve the surveillance process under international forums such as ASEAN+3 Finance Ministers' Meetings and the Monetary and Financial Stability Committee initiated by the EMEAP.

The macroeconomic assessment of the stability monitoring framework is performed through an integrated risk assessment approach that enables an identification of possible risks and vulnerabilities which can lead to financial instability. The task is undertaken by the Macro Surveillance Team under the Monetary Policy Group. The surveillance process builds on contributions from other departments which include the Financial Institutions Policy Group, Financial Market Operations Group, Data Management Group, and Domestic Economy Department.

The macroeconomic surveillance framework involves the analysis and assessment, both quantitatively and qualitatively, of the various sectors of the economy such as the external sector, fiscal sector, real estate, financial institutions, financial markets, corporate sector, and household sector.

After the Asian Financial Crisis in 1997, the monitoring process of the external sector has extended from the plain current account and capital flow

movements monitoring to a more comprehensive monitoring that also covers the country's foreign currency debt exposures and its ability to service external debts. The composition of flows as well as adequacy of international reserves has received more attention. In this light, the key indicators derived from both stock and flow variables are compared against international standards as well as Thailand's "pre-crisis" levels.

Figure 3.14: Movement of Key Economic Variables in Thailand

3.14a. Economic Growth and Price Level
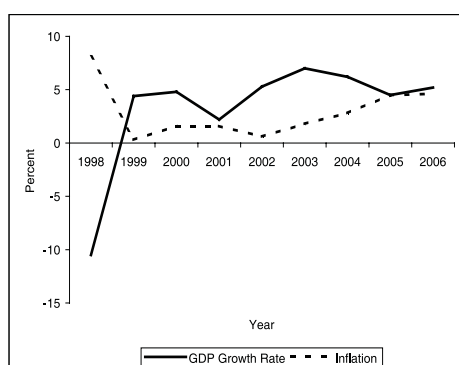
3.14b. Broad Money and Credit Growth
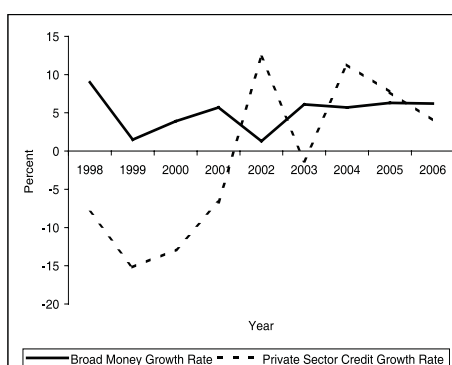
3.14c. Change in Exchange Rates
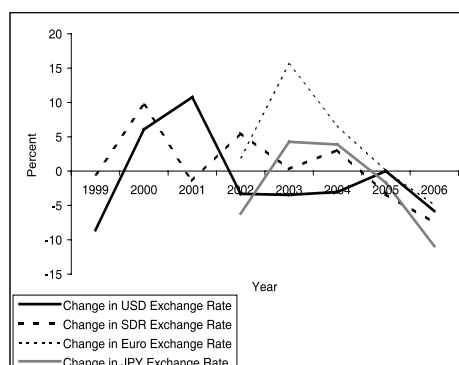
3.14d. Interest Rates
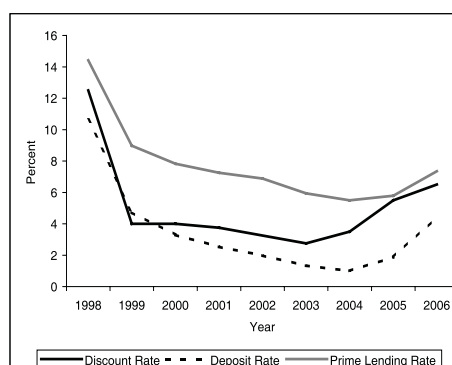
Data Source: CEIC and SKEI

In the fiscal sector, fiscal discipline has been well-maintained, partly due to the legal limits to safeguard the country's fiscal sustainability implemented over the past several years. The real estate sector has been another important area of focus after the 1997 crisis. The assessment concentrates on emerging signs of a bubble both in terms of real estate prices and activities.

The Financial Institutions Policy Group (FIPG) carries out an extensive surveillance process to oversee financial institutions at the micro level. The macro surveillance process attempts to complement the work of FIPG from a macro-prudential standpoint such as monitoring possible economic threats to financial institutions as well as possible shocks to the economy through financial institutions.

Due to the short-term nature of shocks and market behaviours in the financial markets, the Financial Market Operations Group (FMOG) closely monitors market movements and regularly reports the developments to the Bank of Thailand's top executives. Th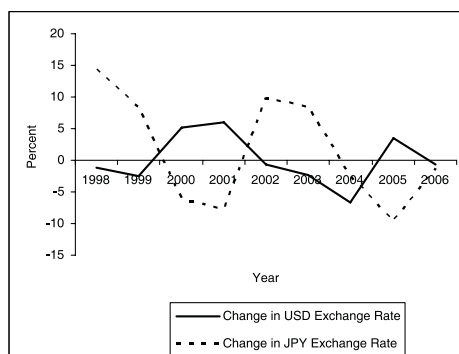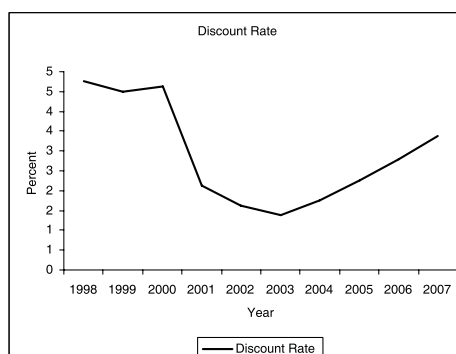e macro surveillance framework, therefore, aims to complement the FMOG's short-term surveillance process by providing longer-run financial stability and an analysis of the financial impact on the overall economy of equity, bond and foreign exchange market movements.

The banking system's credits are primarily allocated to the corporate sector. As a result, a healthy performance of the corporate sector, judged not only from firm's financial status but also their ability to absorb shocks, should bring about a greater contribution to the soundness of financial institutions as well as the overall financial system.

The household sector is closely linked to financial institutions through both their deposits with and credits drawn from financial institutions. The household sector's balance sheet and borrowing behaviour thus have an implication on banks' balance sheet and overall financial stability.

3.1.14 Vietnam

The Law on the State Bank of Vietnam (SBV) states: "The national monetary policy is a component of the economic-financial policies of the State, aimed at stabilizing the value of the currency, controlling inflation, facilitating the socio-economic development, ensuring the national defence, security and improving the living standards of the people."

According to the Article 3 (item 1) of the Law, the National Assembly decides on and supervises the implementation of the national monetary policy and estimated annual inflation rates in a correlation with the state budget and economic growth rates.

The government prepares the plan for national monetary policy and the estimated annual inflation rate and submits these to the National Assembly for its decision. The implementation of the national monetary policy and decision making on the amount of additional money to be injected to annual circulations are made by the Government. The Government submits periodic reports of these activities to the Standing Committee of the National Assembly and also decides on other specific policies and relevant solutions.

Figure 3.15: Movement of Key Economic Variables in Vietnam

3.15a. Economic Growth and Price Level   *3.15b. Broad Money and Credit Growth*
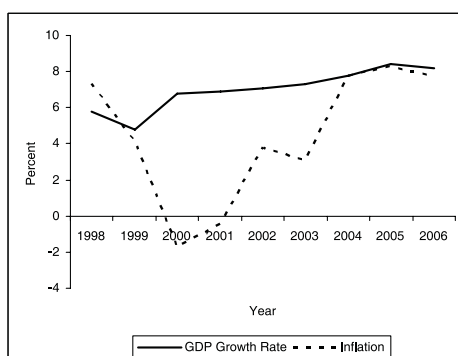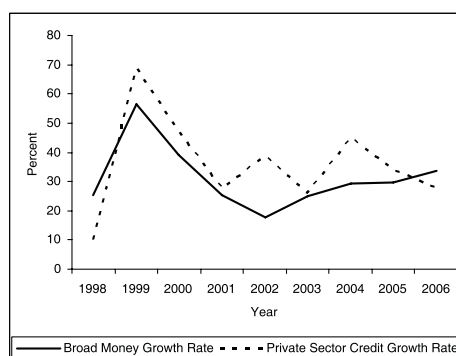
3.14c. Change in Exchange Rates   *3.14d. Interest Rates*

Data Source: CEIC and SKEI

59
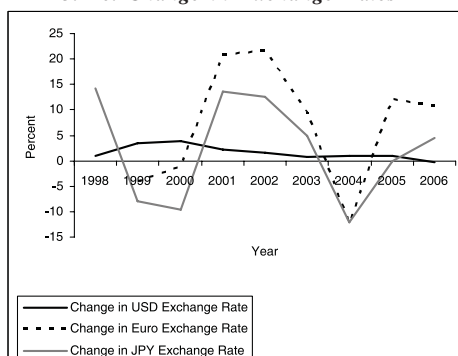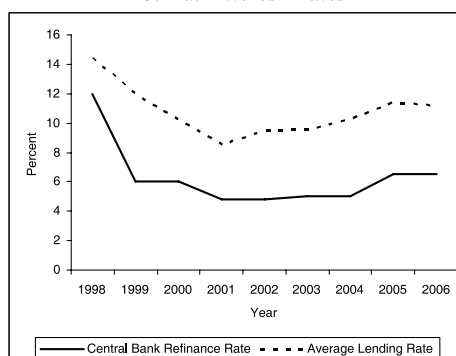
The Advisory Board for the national monetary policy advises the Government in decision making on matters under the duties and powers of the Government with respect to monetary policy. The Advisory Board for national monetary policy comprises a Chairman who is one of the Deputy Prime Ministers, a standing member who is Governor of the State Bank of Vietnam, and other members of the Ministry Of Finance, the Ministry Of Planning and Investment, other relevant ministries, bodies and banking experts.

As stated in the Law on the State Bank of Vietnam, the SBV develops a plan for national monetary policy which is submitted to the Government for consideration before presenting to the National Assembly for decision. In light of this, monetary policy in Vietnam is, therefore, not independently managed by the central bank. In the formulation of monetary policy and its implementation plans, the SBV monitors available economic as well as financial indicators to form the basis for its policy and plans.

## 3.2 Concluding Remarks

The macroeconomic surveillance system in the SEACEN region has evolved at a varied pace. Based on their current macroeconomic surveillance frameworks and practices, the SEACEN countries can be divided roughly into two groups. Among the 14 countries covered in this study, half or seven countries come under the first group, which include: (i) Singapore, (ii) Korea, (iii) ROC (Taiwan), (iv) Thailand, (v) Malaysia, (vi) Philippines, and (vii) Indonesia. In order to monitor risks and vulnerabilities in the domestic as well as in the international markets, these countries have developed and improved their macroeconomic surveillance mechanisms. However, the surveillance mechanisms of these countries failed to identify the vulnerabilities which occurred in the market resulting in the 1997 financial crisis. In the aftermath, many of the crisis hit countries have put a lot of effort in developing a competent macroeconomic surveillance system to prevent similar crises from occurring.

The countries that fall under the second group include: (i) Fiji, (ii) Sri Lanka, (iii) Vietnam, (iv) Cambodia, (v) Papua New Guinea, (vi) Nepal, and (vii) Myanmar. These countries are still depending on less developed macroeconomic surveillance systems. Since these economies are being gradually integrated into the global economic system following global trends, they will see not only new

opportunities but also increasing risks and vulnerabilities in coming days. In order to be able to exploit the opportunities and to deal effectively with the risks and vulnerabilities that globalization and integration bring with them, these countries need to improve their macroeconomic surveillance systems. In this regard, this group of countries can learn significantly from the experience of the first group countries as mentioned above.

Chapter Four

EFFECTIVENESS OF MACROECONOMIC SURVEILLANCE IN THE SEACEN COUNTRIES

4.1 Country Cases

4.1.1 Cambodia

In Cambodia, the focus of monetary policy over the past years has been geared towards achieving exchange rate and price stability. This is a necessary condition for creating a conducive environment for growth and development. Despite the limitation for NBC in terms of monetary policy options, the economy experienced moderate growth, with the exchange rate and inflation rate maintaining relative stability. The current monetary policy framework therefore seems to be appropriate and well implemented in view of the current circumstances in the country leading to the conclusion that the current surveillance system has provided adequate support for the decision-making process.

However, given the dynamics of the economy and the rapid growth of the banking and financial sector, it is beyond doubt that the formulation and implementation of the monetary policy will face new challenges, which in turn will require an enhanced surveillance framework.

Emerging from a dearth of economic and financial data in the early 1990s, NBC, through various efforts, is now in the position to put in place the basic framework for macroeconomic surveillance. There have been positive developments with respect to the improvement of the process and scope of macroeconomic surveillance, which covers the provision of the traditional economic outlook, prospect for price and exchange rate stability as well as the detection of vulnerability and risks associated with the banking sector.

To assess the momentum of the economy in the real sector, where GDP is defined on demand-side, a number of important indicators that could be proxies for the components are being monitored. In addition, on the supply-side of the economy, administrative data and estimates are used to capture the contributions of agriculture, manufacturing (especially, the garment industry), mining, construction and service sectors, and, in particular, the tourist sector.

Table 4.1: Monetary and Economic Performance in Cambodia

Year	Target Achievement			Economic Performance		
	Broad Money Growth (%)		Deviation	Inflation Rate	Real GDP Growth Rate (%)	Current Account to GDP ratio (%)
	Target	Actual				
2004	20.00	30.05	> Target	3.9	10.0	- 8.2
2005	20.00	16.07	< Target	5.8	13.5	- 9.4
2006	20.30	38.16	> Target	4.7	10.8	- 7.2

Source: National Bank of Cambodia

On the fiscal front, the analytical focus rests on scrutinizing budget performance - whether the government is gradually building up unsustainable fiscal deficits with possible impacts on other macroeconomic variables.

Concerning the internal stability issue, the inflation and the exchange rates have been monitored closely so that interventions can be carried out to ensure that the ultimate goal is achieved. In addition, external stability is mainly assessed though an analysis of balance of payments statistics that allows monitoring of current and capital account positions, international reserves, external debt, etc.

On the financial front, money supply, base money growth, broad money growth, bank assets growth, net claims on the government, interest rates, banks credit, customers' deposits, and interest rates are among the crucial indicators.

Global economic and financial conditions are also under constant monitoring with respect to their implications for the national economy, in general, and for inflation in particular.

As a supplement to the macroeconomic indicators, for the purpose of assessing the health of the financial sector and the risks involved, a basic data set is prepared and continuously examined. This set includes capital adequacy, earnings and profitability, liquidity, and sensitivity to market risk related indicators. Given that banks currently focus their business on a few traditional banking operations such as credit issuing, deposit taking and monetary transfers, and that financial markets and sophisticated financial instruments are not yet developed, the above indicators seem to provide a fair view of the condition of the banking sector in Cambodia.

4.1.2 Fiji

The Reserve Bank of Fiji provides the updates as requested by the Ministry of Finance. There is a stipulated deadline which the Bank needs to comply with. The online updating online at the RBF is very efficient and the spreadsheet is user friendly. This task is important as the information will be discussed at Cabinet meetings. Any information on current monetary policy formulation and implementation is posted on the Bank's website. The public can provide feedback on effectiveness of the Bank's policies. The Board at its meetings is updated on the effectiveness of the Bank's policies as well.

Table 4.2: Monetary and Economic Performance in Fiji

Year	Inflation Rate (%)	Real GDP Growth Rate (%)	Current Account to GDP ratio (%)
2004	3.3	5.4	- 13.6
2005	2.7	0.7	- 13.4
2006	3.1	3.6	- 22.7

Source: SKEI 2008

In order to strengthen the macroeconomic surveillance of RBF, capacity enhancement as well as methodological improvements is necessary. In this regard, lack of staff with relevant training and experience in the area of macroeconomic surveillance and quantitative work has been a major challenge.

4.1.3 Indonesia

The Monetary Policy Department of Bank Indonesia (BI) focuses on monetary stability, especially exchange rate stability while the Financial Stability Bureau focuses on banking stability. The indicators that are monitored in the monetary sectors are money in circulation, inflation, domestic credit, net foreign assets, real exchange rate and foreign portfolio investment. On the financial side, financial soundness indicators consists of capital adequacy indicators, asset quality indicators, profitability indicators, liquidity indicators and sensitivity to market risk indicators that classified as core indicators.

Overall, the macroeconomic surveillance system in BI seems to be effective. Strong institutional framework, use of advanced methodology and tools and good coordination among departments are the reasons behind the effectiveness of surveillance. However, further enhancement is always welcomed. Currently, BI continues to develop new tools, techniques, indicators and surveys to better capture the potential risks to the economy. In this connection, efforts have been made to enlarge the understanding on the transmission mechanism of monetary policy through widening research activities on market microstructure as well as macrostructure.

Table 4.3: Monetary and Economic Performance in Indonesia

Year	Target Achievement			Economic Performance	
	Inflation Rate (%)		Deviation	Real GDP Growth Rate (%)	Current Account to GDP Ratio (%)
	Target	Actual			
2004	-	6.4	-	5.0	0.6
2005	-	17.1	-	5.7	0.1
2006	6.0 – 8.0	6.9	None	5.5	2.7

Source: Bank Indonesia

In order to strengthen monetary policy formulation and to further enhance the analytical as well as research skills, BI is working on implementing various measures. These include: (i) strengthening capability of professional staff to enable them to make sound judgments on the macroeconomic condition and outlook; (ii) compiling a standard set of macroeconomic time series data in a well organized electronic database; (iii) developing fully forward-looking models of the economy (with emphasis on the monetary transmission mechanism) to support forecasts and analysis; and (iv) developing an organization structure and work processes that allow the knowledge and information to be effectively used by policy making board.

4.1.4 Korea

Each department of the Bank of Korea (BOK) has skilled personnel and expertise in its assigned area. In addition, the BOK operates a separate department (the Monetary Policy Department) for the comprehensive analysis of macroeconomic trends in the financial and real economic areas and for making suggestions on policy measures. With its expertise and know-how, the BOK's

analytical capacity (in terms of speed and accuracy) of macroeconomic conditions and major issues is immense.

The BOK has continued to conduct market-friendly open market operations to maintain a market rate close to the Bank's policy rate which has contributed substantially to financial market stability. However, this has led to a weakening of financial institutions' abilities to manage liquidity by themselves, as they have become overly dependent upon the central bank's short-term liquidity management. Moreover, the call money market has become excessively large, while other short-term financial markets have contracted in size.

Table 4.4: Monetary and Economic Performance in Korea

Year	Target Achievement			Economic Performance	
	Inflation Rate (%)		Deviation	Real GDP Growth Rate (%)	Current Account to GDP Ratio (%)
	Target	Actual			
2004	2.5 – 3.5	2.9	None	4.7	4.1
2005	2.5 – 3.5	2.3	None	4.2	1.9
2006	2.5 – 3.5	1.8	None	5.0	0.7

Source: Bank of Korea and SKEI 2008

The structure of the Korean economy has changed after the 1997 currency crisis and the impact of external factors on the domestic financial and real economic sectors is increasing. Due to the increased capital inflows from overseas, the central bank's ability to control the economy has weakened. There is a need to improve the bank's organizational structure to facilitate more integrated risk management in the changing context.

As the effectiveness of the existing econometric analysis framework has declined somewhat, the BOK plans to improve its existing models for enhancement of econometric analysis capabilities, while also developing a more sophisticated analytical model based on the latest economic theories. The Bank will work to improve its monetary policy framework to increase the effectiveness of its monetary policy.

4.1.5 Malaysia

The BNM monitors a range of indicators that encompasses the global economic outlook, current domestic conditions and outlook, inflation developments and outlook, and monetary and financial conditions. Developments and future prospects in the global economy are assessed drawing on analyses and forecasts by international agencies, national authorities and central banks and selected sources in the private sector.

To assess current domestic economic conditions and near-term prospects, a range of demand and production indicators are analysed. These include among others, the leading index produced by the Department of Statistics Malaysia, and various consumption and investment indicators such as imports of consumption goods, car sales and sales and service tax collected, credit extended for consumption, imports and production of capital goods and funds raised by businesses from the financial system. Production indicators include manufacturing industrial production and sales, experts, and inventories; and in the construction sector – property market transactions, house prices, projects announced, occupancy rates.

Indicators of inflationary pressures include indicators of core inflation, producer prices, labour costs, consumer sentiment, capacity utilisation, and global commodity and food prices. The assessment of monetary and financial conditions is based on indicators of financing development and conditions in the banking system and capital markets; exchange rate and capital flows; monetary operations; and financial market expectations of the direction of interest rate based on interest rate futures and market polls.

In addition to the above indicators, surveillance is routinely supplemented by surveys and frequent discussions with representatives from the economic and financial sectors. For instance, to gauge economic activity, there is extensive contact with companies from different economic sectors to provide a more comprehensive view from the ground. In addition, in terms of monetary and financial surveillance, meetings with banking institutions are held to gauge demand and supply factors affecting financing trends.

Table 4.5: Monetary and Economic Performance in Malaysia

Year	Target Achievement			Economic Performance	
	Inflation Rate (%)		Deviation	Real GDP Growth Rate (%)	Current Account to GDP Ratio (%)
	Initial Forecast	Actual			
2004	1.5	1.5	None	6.8	12.1
2005	2.5	3.0	> Forecast	5.0	14.6
2006	3.5 – 4.0	3.6	None	5.9	16.3

Source: Bank Negara Malaysia Annual Report 2003, 2004 and 2005; and SKEI 2008

Projections and scenario analysis also make up a core activity of surveillance. GDP projections are based on the macroframe analysis and a macromodel. The inflation forecast is based on a combination of an autoregressive (AR) model of past values of inflation, exchange rate and output to forecast non-administered prices, as well as largely judgmental forecasts of administered prices. Scenario analysis is also incorporated into these forecasting tools.

The current macroeconomic surveillance system has been effective in the context of achieving the Bank's goal of sustainable growth with price stability. A key element towards ensuring this effectiveness has been continuous efforts towards enhancing the surveillance system, for instance by systematic capacity building, and enhancing the breadth of data collection along with implementing better IT monitoring systems. To enhance the efficiency and effectiveness of monetary operations, the range and flexibility of monetary instruments has been widened with the introduction of the Bank Negara Monetary Notes and Bank Negara Floating Rates Notes, which has added to the depth and breadth of the financial markets. The Ringgit Operations Monitoring System (ROMS) has also been developed to monitor the types of capital flows close to a real-time basis.

However, there are several challenges in strengthening a surveillance system. A key challenge relates to the methodological aspect. There is a need, in particular, to obtain better indicators in certain areas where gaps have been identified, for example, to conduct wage-price analysis and to better measure inflation expectations. Data on wages is also inadequate, especially for the services sector.

The Bank is continuously looking towards improving its overall surveillance framework and efforts are underway to conduct benchmarking studies of other central banks in terms of the organisational structure of departments responsible

for monetary and financial surveillance, and the frameworks encompassing indicators and forecasting tools used for analysis and assessment.

4.1.6 Myanmar

Myanmar is transitioning from a centrally planned economy to a market oriented one. In this process, the Central Bank of Myanmar (CBM) also has started using more indirect policy instruments in its monetary policy management in the place of the conventional direct instruments used earlier. In the present context, the effective formulation and implementation of monetary policy requires an effective macroeconomic surveillance system.

The CBM monitors the monetary condition in the country by analysing reserve requirement, liquidity, capital adequacy ratio, and the legal lending limit. On the banking side, the Banking Supervision Department regularly examines various ratios to gauge the soundness of a financial institution. These ratios are (i) loans to deposit ratio; (ii) total assets to deposit ratio; (iii) total assets to loans ratio; and (iv) non-performing loans to total loans ratio.

Table 4.6: Monetary and Economic Performance in Myanmar

Year	Inflation Rate %)	Real GDP Growth Rate (%)	Current Account to GDP ratio (%)
2004	3.8	13.6	2.4
2005	10.7	13.6	4.0
2006	26.1	12.7	6.3

Source: SKEI 2008

The CBM formulates and implements monetary policy under the guidance of the Ministry of Finance and Revenue to manage money supply according to the economic needs of the country. As a country in a transitory phase, its monetary policy stance is also changing from a direct to indirect one. In this context, the monitoring of the development in the market becomes much more important for the effectiveness of the monetary policy management. However, the country's current economic surveillance framework which is traditional in

nature and which may have been sufficient under the previous regime, seems to be inadequate now, making effective surveillance of macroeconomic variables a challenging task. In this regard, CBM has established study groups on interest rate, inflation targeting, exchange rate unification and government bond market development in order to address some of these challenges.

4.1.7 Nepal

The Nepal Rastra Bank Act, 2002 has granted autonomy to Nepal Rastra Bank (NRB) for policy formulation and execution. For the last couple of years, the NRB has been formulating monetary policy independently and carrying out the mid-term review of the policy statement. So far, monetary policy formulation has been quite effective.

Table 4.7: Monetary Policy and Economic Performance in Nepal

Year	Target Achievement						Economic Performance	
	Inflation Rate (%)		Deviation	Broad Money Growth (%)		Deviation	Real GDP Growth Rate (%)	Current Account to GDP Ratio (%)
	Target	Actual		Target	Actual			
2004	4.0	4.5	> Target	12.5	8.3	< Target	4.7	2.7
2005	5.0	8.0	> Target	13.0	15.6	> Target	3.1	1.9
2006	6.0	6.4	>Target	16.1	14.0	< Target	2.8	2.2

Source: Nepal Rastra Bank and SKEI 2008

As mentioned earlier, the prime objective of the monetary policy in Nepal is to attain price and external sector stability. Given the pegged exchange rate with the Indian currency, open and porous border, and high trade concentration with India, prices in Nepal are highly influenced by the Indian prices. In this context, economic surveillance has also to closely monitor the developments in the Indian economy. As a result of this linkage, the NRB Research Department carries out in-depth analysis of the possible impact of Indian monetary and fiscal policies immediately after each Indian budget and other policy announcements.

Various measures have been planned to improve the effectiveness of macroeconomic surveillance in Nepal including the initiation of the Computable General Equilibrium (CGE) based modeling exercise; strengthening the monitoring

and supervisory mechanism compatible with international norms and standards; establishing a one window system to collect necessary data from banks and financial institutions; improving the timeliness of data dissemination system; following international frameworks for collecting, processing, compiling and disseminating macroeconomic and financial data; and implementing Basel-II for the effective regulation and supervision of banking and financial institutions

4.1.8 Papua New Guinea

The current methods, tools and techniques used for macroeconomic surveillance in Papua New Guinea are effective to some degree. However, there is still room for improvement, specifically for the data collection process which requires further enhancement as the usefulness of data submitted to the Bank of Papua New Guinea (BPNG) depends on the quality and timeliness of its submission.

Since the amendment to the Central Bank Act 2000, the formulation and implementation of monetary policy has been very effective in achieving the core objectives of the Bank. Inflation has been kept within the anticipated levels; the financial system has been stable and macroeconomic stability and growth has been realized as indicated by the growth in gross domestic product.

As outlined in the 2005-2008 Strategic Plan, BPNG has been carrying out various measures towards strengthening institutional as well as methodological frameworks effective management of monetary policy and financial sector. In this regard, upgrading of the efficiency of data management is expected to reduce the reporting burden, timeliness of analysis and an improved feedback to the reporting organizations. An improvement in managerial efficiency is also envisaged as Bank's staff must have a clear understanding of current internal processes and required changes in order to achieve the objectives of the Bank.

Table 4.8: Monetary and Economic Performance in Papua New Guinea

Year	Target Achievement						Economic Performance	
	Inflation Rate (%)		Deviation	Broad Money Growth (%)		Deviation	Real GDP Growth Rate (%)	Current Account to GDP Ratio (%)
	Forecast	Actual		Forecast	Actual			
2004	2.9	2.4	< Forecast	21.5	38.9	> Forecast	2.7	4.7
2005	2.9	4.6	> Forecast	8.3	29.5	> Forecast	3.4	12.4
2006	2.5	1.3	< Forecast	7.9	14.8	> Forecast	2.6	7.4

Source: Bank of Papua New Guinea and SKEI 2008

BPNG has implemented the first phase of the Standardized Report Format (SRF) in 2006, with the expansion of data coverage to include other depository corporations (ODCs) in the compilation of monetary and financial statistics. The second phase of the project will include other financial corporations (OFCs) such as pension funds, insurance companies and other financial auxiliaries. The Economics Department is currently working closely with the Financial System Supervision Department (FSSD) in an attempt to develop a standard report form to be completed by all financial institutions to reduce the reporting burden placed on them.

4.1.9 Philippines

Bangko Sentral ng Pilipinas (BSP) is adopting a forward-looking approach to monetary policy for which a wider set of information on the economy is required. However, since not all variables that are relevant to the inflation target and to monetary policy formulation can be captured by BSP's macroeconometric model, the development of early warning system (EWS) was pursued as part of the Bank's risk management activities. These EWS models provide a useful framework for systematically studying crises and are, therefore, necessary complements to the macroeconomic models for inflation maintained by the BSP.

Currently, the results generated by the EWS currency crisis model have already been integrated in the regular review of monetary policy to help alert the BSP of potential weaknesses in the different sectors of the economy and enable it to implement preemptive measures to address possible risks of missing the inflation target.

To complement the current surveillance models, a parametric EWS model for currency crisis is being developed. This model is based on the regression techniques for formally establishing the significance of the indicators used in the non-parametric model on the probability that speculative currency pressures will occur. The major advantage of a regression-based EWS model is that it considers all explanatory variables simultaneously, thus, impacts of a particular indicator on crisis probability are conditional on the values of the other indicators. Furthermore, it allows formal testing of the statistical significance of individual indicators.

Table 4.9: Monetary and Economic Performance in Philippines

Year	Target Achievement			Economic Performance	
	Inflation Rate (%)		Deviation	Real GDP Growth Rate (%)	Current Account to GDP Ratio (%)
	Target	Actual			
2004	4.0 – 5.0	5.5	> Target	6.4	1.9
2005	5.0 – 6.0	7.6	> Target	4.9	2.0
2006	4.0 – 5.0	6.2	> Target	5.4	5.0

Source: Bangko Sentral ng Philipinas

Similarly, a Bank Distress Index is also under the development process which utilizes the numerical-based method in identifying banking crises. The index provides an indication of the effects on the economy of bank rescues and also suggests whether the costs involved in implementing the rescue measures have reached a certain proportion that could be considered systemic.

Moreover, a macroprudential surveillance indicators framework is also being developed which will consider existing conditions as well as emerging or increasing risks to the stability of the financial system. Due to the growing complexity of the global financial system, monetary and banking policies should also include in its considerations other possible events with significant probabilities of occurrence which could result in huge losses and affect the stability of the financial system.

4.1.10 Singapore

The effectiveness of a macroeconomic surveillance system can perhaps be assessed on two measures. First, the system should be able to identify and

monitor risk factors that could substantially impact the outlook for the economy. A useful analogy is that of a radar system that continually scans the external environment for incoming threats. The second measure is the ability of the system to provide robust analysis of the risk factors in terms of the potential economic impact and the associated transmission mechanism. If the risk factor materialises, the system should also be sufficiently resilient to continue providing updates and relevant analysis on the evolution of the impact to bear on policy decisions.

Given Singapore's small and open economy and the increasingly volatile external environment, the macroeconomic surveillance of Monetary Authority of Singapore (MAS) has always been a challenging task. Nevertheless, the surveillance system has thus far proved to be effective in supporting the process of monetary policy formulation on both measures. An excellent example of the output of MAS's surveillance work is the Macroeconomic Review, a semi-annual report that is published in conjunction with the release of the MAS Monetary Policy Statement. The Review documents the Economic Policy Department's analysis and assessment of macroeconomic developments in the Singapore economy, and provides the basis for the policy decisions conveyed in the Monetary Policy Statement.

Table 4.10: Monetary and Economic Performance in Singapore

Year	Inflation Rate %)	Real GDP Growth Rate (%)	Current Account to GDP ratio (%)
2004	1.7	9.0	16.7
2005	0.5	7.3	18.6
2006	1.0	8.2	21.8

Source: SKEI 2008

Turning to the resilience of the system, the MAS recognises that the need for surveillance work would be the greatest in the midst of a crisis. However, it is also in such times that the surveillance capability could be potentially disrupted, if the nature of the crisis is akin to the Sars outbreak or the 9/11 incident. The concept of business continuity planning has thus been incorporated in the design of the system. Call tress and relocation of offices are hardly the stuff of macroeconomics, but without such facilities in place, the surveillance system could be completely useless in a crisis.

Given that the performance of the Singapore economy is tied closely to the fortunes of the external environment, the MAS is continuously reviewing and strengthening the surveillance and forecasting capabilities, as described in the various issues of the Review. For example, the most recent issue of the Review contains a box-item on the forecasting performance of the MAS Electronics Leading Index, while the special feature in the January 2002 Issue provides an in-depth analysis of forecast errors from the model and sectoral spreadsheets.

On the macro-modelling side, there have been further improvements to the Monetary Model of Singapore (MMS), including developing a demographic module. This also allows the MMS to incorporate various demographic assumptions in estimating Singapore's long-term growth potential. In addition, the MMS is also recalibrated periodically with new information to reflect changes in the fundamentals of the economy.

In times of greater uncertainty, there is also a lot more emphasis on scenarios around the central baseline projection. This provides MAS with some guidance as to how the economy could evolve under plausible alternative outcomes and allows it to prepare ex-ante possible policy responses. However, long or extreme tailed events are extremely difficult to anticipate, but MAS also routinely conducts stress-testing exercises in collaboration with the industry on financial stability issues.

4.1.11 Sri Lanka

The Central Bank of Sri Lanka (CBSL) has introduced a new monitoring mechanism at the beginning of 2007 to strengthen macroeconomic management. This mechanism monitors the developments of key macro-economic variables and helps the Bank in achieving desired targets. Under this mechanism, risks in achieving expected targets are identified so that necessary policy measures can be taken early.

CBSL prepares the Monetary Program for the forthcoming year at the beginning of each year, taking into consideration the projected real GDP growth, GDP deflator and the change in velocity. CBSL usually publishes the Monetary Program and its explanatory notes for each year at the beginning of the year. As a further development in 2007, CBSL has started to publicly announce its monetary targets at the beginning of the year through its detailed policy document.

The changes to CBSL rates and changes to other operating procedures, including the reasons for such changes is regularly and simultaneously made available to the public through press releases. Special press briefings are also arranged by the senior officers of the Bank when there are important changes.

Table 4.11: Monetary and Economic Performance in Sri Lanka

Year	Target Achievement			Economic Performance		
	Broad Money Growth (%)		Deviation	Inflation Rate	Real GDP Growth Rate (%)	Current Account to GDP ratio (%)
	Target	Actual				
2004	13.5	19.6	> Target	9.0	5.4	- 3.2
2005	15.0	19.1	> Target	11.0	6.2	- 2.7
2006	15.0	17.8	> Target	10.0	7.7	- 5.3

Source: Central Bank of Sri Lanka

During recent years, most central banks around the world have moved away from monetary targeting and adopted inflation targeting. Although the CBSL has recognized the need to move to inflation targeting in the future, it believes that the monetary targeting framework still works in achieving the objective of monetary policy on the assumption that the velocity is relatively stable. The current system depends on the efficiency of pass through from the central banks policy rate to market interest rates, which involves a significant time lag. Accordingly, the Bank's monetary policy impact on aggregate demand is seen only after 18-24 months, even though the change in interbank rates is almost immediate, as some components of credit are insensitive to changes in interest rates. These components include credit to the public sector and high-interest bearing credit to household sector such as credit cards.

Moreover, the current official price index, the Colombo Consumers Price Index (CCPI) with a base year of 1952, is oversensitive to few items that have a larger weight. As a result, the index over responds to changes in certain administered prices and international commodity prices. Even though such increases in the CCPI are not due to changes in aggregate demand, it alters market expectations, exerting pressure on interest rates and wages. In order to overcome this weakness, the country is in the process of constructing a new consumer price index.

4.1.12 ROC (Taiwan)

The current institutional framework of the Central Bank of the Republic of China (Taiwan) (CBC) is largely effective. However, the institutional arrangements of the Committee for Financial Stability Assessment for monetary policy management are still at an experimental stage.

The CBC continues to study new techniques developed and introduced by international organizations and academic circles. However, new financial crises or economic issues often arise in different forms. It is hard to judge whether the current tools and techniques are effective for future macroeconomic issues.

Table 4.12: Monetary and Economic Performance in ROC (Taiwan)

Year	Target Achievement			Economic Performance		
	Broad Money Growth (%)		Deviation	Inflation Rate	Real GDP Growth Rate (%)	Current Account to GDP ratio (%)
	Target	Actual				
2004	2.5 - 6.5	7.5	> Target	1.6	6.2	5.6
2005	3.5 - 7.5	6.2	None	2.3	4.2	4.5
2006	3.5 - 7.5	6.2	None	0.6	4.9	6.7

Source: Central Bank of the Republic of China (Taiwan)

Over the years, the difference between the actual and target levels of reserve money has been small. For the performance of the monetary target between 1992 and 2006, M2 growth fell within the target range only in 1996 in the first 6 years. However, it did a better job in monetary targeting for the rest of the period. M2 growth only missed the target range in 2004. The CBC's overall performance of monetary targeting has improved over time.

The average inflation rate under monetary targeting was 1.8%, much lower than the periods without adopting monetary targeting, although price stability cannot be completely attributed to monetary targeting.

The complexity of conducting monetary policy has increased due to factors such as financial globalization, the rise of direct financing, the development of financial derivatives and financial asset securitization. Although the CBC's monetary targeting is running smoothly, there are increasing challenges, including the emergence of new financial products that blur the definition of money and

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affect the stability of money demand, and increasing cross-border capital flows, which pose a challenge to monetary control.

The CBC may extract valuable information from the derivatives markets regarding market expectations on future interest rates and exchange rate movements for its monetary policy operations. The more complex variations of structured financial products, however, have given rise to concerns about the risk exposures faced by financial institutions from their abusive use of complex structured financial transactions. The rapid development of complicated financial derivatives also brings new challenges to monetary policy transmission. The CBC needs to identify and evaluate the related risk exposures of financial institutions as well as the impact on the transmission channels to other sectors.

4.1.13 Thailand

To complement the sectoral assessment based on indicators for each of the seven aforementioned sectors, the team utilizes the software called VIEWS developed by the Asian Development Bank for the overall check-up of macroeconomic stability. The program computes the probability of currency crisis at the current state of the economy based on various indicators used as inputs into the program. Each quarter, data in all areas of the economy including economic growth, inflation, exchange rates, loan growth, government spending as well as balance of payment variables, are updated in the model. Any alarming signals will be reported to the MPC along with additional in-depth analysis on the issue.

Currently, macroeconomic stress testing or model-based stress testing is used for the analysis of corporate and household vulnerabilities. Small satellite models for corporate and household sectors are used to determine the level of financial stress that macroeconomic variables would put on the corporate and household sectors. The financial stress is revealed through important financial ratios in particular the corporate debt-to-equity and interest coverage ratios as well as the household's income gearing ratios.

However, this macro-stress testing has important limitations. Firstly, the estimates represent the impact of shocks at the aggregate level rather than shocks specific to any group of individuals or firms. Secondly, there is no feedback from the household and corporate balance sheets to the macroeconomic profile.

Table 4.13: Monetary and Economic Performance in Thailand

Year	Target Achievement			Economic Performance	
	Inflation Rate (%)		Deviation	Real GDP Growth Rate (%)	Current Account to GDP Ratio (%)
	Target	Actual			
2004	0.0 – 3.5	0.4	None	6.3	1.7
2005	0.0 – 3.5	1.6	None	4.5	- 4.3
2006	0.0 – 3.5	2.3	None	5.1	1.1

Source:Bank of Thailand

The other approach to stress testing is simple scenario stress testing, the advantages of which include the simplicity of the concept, methodology and data requirements such that it can be carried out for any sector deemed relevant to a given scenario. Moreover, the test can be extended to incorporate more than a single scenario as far as the data allow. One example that can easily be done based on the scenario test of the US Office of Comptroller and the Currency (OCC), a supervisory authority, is to identify the exposure of bank credits to external risks which, if become troubled, could threaten the stability of financial institutions as well as the overall economy.

The effectiveness of the current framework largely depends on data quality and the analytical tools and techniques. The main challenges to the macroeconomic surveillance system can be summarized as (a) lack of firm level data in the corporate sector that can effectively indicate the root of possible vulnerability. Currently, Bank of Thailand (BOT) monitors only large companies listed in the Stock Exchange of Thailand (SET) which are less likely to be vulnerable; and (b) with regard to technical challenges, as most statistical models are linear, there are concerns for non-linearity especially when shocks are extreme.

BOT aims to constantly improve the surveillance system in keeping with the increasing complexity and interdependencies of financial systems. The statistical framework should be expanded to include more micro-information and the quality of data incorporated in the model should be improved. Meanwhile, the corporate and household satellite models are being refined. In addition, firm-level (bottom-up) stress testing and feedback from firm-level stress to macro variables as well as interactions among firms should be explored.

Efforts have also been made to develop new indicators with more information content and more forward-looking in nature. Work in the pipeline includes the

estimation of the probability of defaults for important business sectors, risk reversals to obtain more information content in foreign exchange market as well as in-depth real estate indicators such as real prices and real demand of the sector.

4.1.14 Vietnam

Monetary policy in Vietnam is directed towards stabilizing the currency value; containing inflation at a low level; boosting economic growth and securing the safety of banking activities and the system of credit institutions. In this regard, monetary policy implementation has continuously been modified and improved. Direct monetary policy tools have gradually been removed and new monetary policy instruments have been put in place in conformity with international best practices. On the whole, monetary policy implementation of the SBV has become more active, effective and market-based.

Table 4.14: Monetary and Economic Performance in Vietnam

Year	Target Achievement			Economic Performance	
	Inflation Rate (%)		Deviation	Real GDP Growth Rate (%)	Current Account to GDP Ratio (%)
	Target	Actual			
2004	< 5.0	9.5	> Target	6.8	- 2.1
2005	< 6.5	8.4	> Target	8.4	- 1.1
2006	8.0	6.6	< Target	8.2	- 0.3

Source: State Bank of Vietnam

As the State Bank of Vietnam (SBV) has not been empowered by existing laws with sufficient authority, the independence of the SBV is still limited as its operations depend heavily on State administrative relations, which in part, limits the flexibility and creativeness of the Bank in the developing the process of national monetary policy. The operational target of the SBV is too broad and overlaps with monetary policy target.

In these circumstances, the macroeconomic surveillance in SBV is limited to following traditional practices which may be adequate in the current context. However, the surveillance system needs to be strengthened to deal with challenges that will arise in the changing context.

4.2 Concluding Remarks

With the adoption of the policy of economic openness and financial liberalization, monetary policy management has become a challenging task in the SEACEN region. To enhance the effectiveness of monetary policy management, central banks and monetary authorities in the region have made significant improvements in their monetary policy regime, targeting and or policy instruments as well as in their surveillance systems. However, the development of the macroeconomic surveillance systems in the region has not been uniform.

Specifically after the 1997 financial crisis, Singapore, Korea, ROC (Taiwan), Malaysia, Thailand, Indonesia and Philippines have strengthened their surveillance systems by developing and employing several types of surveillance models, methods and mechanisms. In most of these countries, institutional frameworks have been developed with clear objectives and responsibilities. The frequency and quality of data have also been enhanced. Various indexes are compiled and monitored to assess the vulnerabilities in the different sectors. Based on the target achievement, the overall performance of the monetary policy in the above mentioned SEACEN countries have been quite effective.

Based on the surveillance frameworks employed, frequency and quality of data available, and methods and models used, it can be inferred that the surveillance systems of Fiji, Sri Lanka, Papua New Guinea, Vietnam, Cambodia, Nepal, and Myanmar are less advanced. The significant gap between monetary policy targets and their actual achievements clearly indicate that monetary policy management in these countries has been less effective and credible. Since these countries are heading toward increased economic openness and higher integration with the global financial markets, they will encounter increased risks and volatility in their economies. In this context, their surveillance systems will have to be strengthened drastically to meet the new challenges that will arise with increased openness and integration.

Chapter Five

CHALLENGES IN DEVELOPING EFFECTIVE MACROECONOMIC SURVEILLANCE SYSTEMS IN THE SEACEN COUNTRIES

5.1 Regional Character of Crises

The surveillance system of the IMF has been criticized for not being able to capture regional characteristics, for its 'one size fits all' approach, and specifically being unable to predict past crises such as the European Exchange Rate Mechanism (ERM) crisis of 1992, the Mexican crisis of 1994, the Asian financial crisis of 1997, and the Argentine and Turkish crises of 2001. In all of these cases, countries were continuously engaged in IMF supported programs with regular surveillance conducted by the Fund. However, in every case, the IMF was unable to provide specific warnings before the crisis.

In order to deal with regional characteristics and to analyze regional vulnerabilities properly, the need of a regional surveillance mechanism has been highlighted. In this regard, regional organizations such as the OECD, European Union, ASEAN and others have established regional surveillance mechanisms. Specifically, after the Asian financial crisis, the IMF has made several improvements in its surveillance system make it more effective. In this connection, data disclosure (SDDS, GDDS, PIN) was emphasized; surveillance on capital markets and the financial sector was strengthened by creating a new Capital Markets Department and the introduction of the Financial Sector Assessment Program (FSAP); and facilities of crisis management such as the SRF, CCL, and PSI (SDRM) were devised. These efforts show that the process of surveillance and crisis management has been evolving at the IMF.

Despite the improvements, it is argued that the IMF surveillance is inadequate for regional surveillance. IIMA (2005) argues that the IMF has little regional expertise with regard to Asia and it tends to do surveillance bilaterally. While some regional surveillance was made, it was too weak and ineffective to prevent contagion.

With the belief that regional issues can be reviewed effectively by a regional surveillance mechanism, a number of initiations have taken place in Asia and the Pacific since the 1990s. Such initiations have accelerated especially after the Asian financial crisis. The Manila Framework Group (MFG), Association of

South East Asian Nations (ASEAN), ASEAN plus China, Japan and Korea (ASEAN+3), Asia Pacific Economic Cooperation (APEC), Asia-Europe Meeting (ASEM), Executives' Meeting of East Asia-Pacific Central Banks (EMEAP), and South East Asian Central Banks Expert Group on Capital Flows (SEG) are specifically notable in this regard.

The Manila Framework Group[1] (MFG) was established in November 1997 with the objective of developing a concerted approach to restoring financial stability in Asia and the Pacific region. This framework included initiatives such as (a) a mechanism for regional surveillance to complement global surveillance by the IMF; (b) enhanced economic and technical cooperation particularly in strengthening domestic financial systems and regulatory capacities; (c) measures to strengthen the IMF's capacity to respond to financial crises; and (d) a cooperative financing arrangement that would supplement IMF resources (IIMA 2005). However, the Framework was terminated in 2004.

The Association of Southeast Asian Nations (ASEAN) was established in August 1967 by Indonesia, Malaysia, Philippines, Singapore, and Thailand with Brunei Darussalam, Vietnam, Lao PDR, Myanmar, and Cambodia joining later. The ASEAN Finance Ministers established the ASEAN Surveillance Process in October 1998. The objectives of this process included: (i) exchanging information and discussing economic and financial development of Member States in the region; (ii) providing an early warning system and a peer review process to enhance macroeconomic stability and financial system in the region; (iii) highlighting possible policy options and encouraging early unilateral or collective actions to prevent a crisis; and (iv) monitoring and discussing global economic and financial developments which could have implications on the region and propose possible regional and national level actions. Under this framework, the scope of the surveillance includes monitoring and analyzing the macroeconomic situation and developments within the region, and monitoring any other specific areas, including structural and sectoral issues, as approved by the ASEAN Select Committee. The surveillance process is coordinated by the Finance and Macroeconomic Surveillance Unit located at the ASEAN Secretariat in Jakarta.

The ASEAN+3 cooperation, which began with an informal summit in December 1997 was institutionalised in 1999. All the 10 members of ASEAN and People's Republic of China, Japan and Korea are members of this set-up. The ASEAN+3 Finance Ministers Meeting is held once every year to discuss

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1. The participant countries included Australia, Brunei Darussalam, Canada, People's Republic of China, Hong Kong SAR of China, Indonesia, Japan, Republic Korea, Malaysia, New Zealand, Philippines, Singapore, Thailand, and United States.

currency and financial issues in East Asia. Similarly, the ASEAN+3 Finance Deputy Ministers' Meeting is held twice a year with the objective of mutual surveillance and exchange of their views on macroeconomic and structural problems in the region.

The Asia-Pacific Economic Cooperation (APEC)[2] began in 1989 as an informal Ministerial-level dialog group with 12 members. The APEC Finance Ministers Meeting is held once a year to discuss economic issues related to the macroeconomy and capital flows. The first meeting was held in March 1994. The 1997 meeting agreed to the preparation of a Voluntary Action Plan for promoting the freer and more stable flow of capital in the APEC region, specifically aimed at enhancing APEC economies' understanding of the benefits and risks associated with cross-border capital flows; developing a sound understanding of the policies needed to maximize the benefits and minimize the risks associated with cross-border capital flows; and encouraging the implementation of policies to promote robust and open economies in the APEC region.

The Asia-Europe Meeting (ASEM) is an informal dialogue process initiated in 1996 to build a new partnership between Asia and Europe. Presently, the twenty five EU Member States, the European Commission and thirteen Asian countries[3] participate in the process. The ASEM Finance Ministers' Meeting is held to increase economic and financial cooperation between Asia and Europe. The first meeting was held in September 1997. The agenda of the meetings include macroeconomic outlook and foreign exchange markets, cooperation in the financial and other sectors, and strengthening the international financial system. The ASEM Deputy Finance Ministers' meeting focuses on conducting economic surveillance among the participating countries.

The Executives' Meeting of East Asia-Pacific Central Banks (EMEAP)[4] was established in 1991 with the objective to strengthen cooperation among the central banks and monetary authorities in the East Asia and Pacific region. EMEAP activities are conducted at three levels: Governors' Meetings; Deputies'

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2. The APEC members include Australia, Brunei Darussalam, Canada, Chile, People's Republic of China, Hong Kong SAR of China, Indonesia, Japan, Republic of Korea, Malaysia, Mexico, New Zealand, Papua New Guinea, Peru, Philippines, Russia, Singapore, Chinese Taipei, Thailand, United States, and Vietnam.

3. Brunei, China, Cambodia, Indonesia, Japan, Republic of Korea, Malaysia, Myanmar, Laos, Philippines, Singapore, Thailand, and Vietnam

4. EMEAP members include Reserve Bank of Australia, People's Bank of China, Hong Kong Monetary Authority, Bank Indonesia, Bank of Japan, Bank of Korea, Bank Negara Malaysia, Reserve Bank of New Zealand, Bangko Sentral ng Pilipinas, Monetary Authority of Singapore, and Bank of Thailand.

Meetings; and working groups. The Governors' Meetings, which are held on an annual basis, mainly discuss policy issues and macroeconomic surveillance. The Deputies' Meetings are held twice a year and play an important role in ensuring the continuity of EMEAP activities. The meeting closely monitors the rapid economic and financial movements in the region. Each of the working groups have subject experts who contribute in their respective areas.

The SEACEN Expert Group (SEG)[5] on capital flows was established in May 2000 with the objectives of developing a regional framework to promote information sharing on capital flows among members, and drawing up concrete and practical proposals that members can implement individually or collectively to enhance the management for capital flows. The SEG activities are focused on developing a regional framework to promote the sharing of capital flows data; assessing the methods and systems of risk management among members; and capacity building. An electronic data exchange facility has been installed at The SEACEN Centre where member banks can exchange their data on capital flows electronically using the SEG Data Templates. The SEG also holds teleconferencing to discuss trends, developments and issues of concern arising from the SEG data analysis.

5.2 Applicability of New Macroeconomic Surveillance Frameworks

5.2.1 Balance Sheet Approach

Since 2002, the IMF has started using the Balance Sheet Approach (BSA) as an additional instrument in its surveillance activities. The BSA is an analytical framework based on the examination of stock variables in the aggregate balance sheet of a country and the balance sheet of its main sectors. This framework helps to explain how problems in one sector can spill over into other sectors, eventually triggering an external balance of payments crisis

Unlike the financial programming framework, which is mainly based on the examination of flow variables, the BSA focuses on the examination of stock variables in a country's sectoral balance sheets and its aggregate balance sheet

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5. SEG comprises 19 members, 16 SEACEN member central banks and 3 other central banks. The SEACEN members include the Ministry of Finance, Brunei Darussalam, National Bank of Cambodia, Reserve Bank of Fiji, Bank Indonesia, The Bank of Korea, Bank Negara Malaysia, The Bank of Mongolia, Central Bank of Myanmar, Nepal Rastra Bank, Bank of Papua New Guinea, Bangko Sentral ng Pilipinas, Monetary Authority of Singapore, Central Bank of Sri Lanka, Central Bank of the Republic of China (Taiwan), Bank of Thailand, and State Bank of Vietnam; and other central banks include Reserve Bank of Australia, Hong Kong Monetary Authority, and Bank of Japan.

(asset and liabilities). A financial crisis occurs when there is a plunge in demand for financial assets for one or more sectors. In such a case, creditors may lose confidence in a country's ability to earn foreign exchange to service the external debt, in the government's ability to service its debt, in the banking system's ability to meet deposit outflows, or in corporations' ability to repay bank loans and other debt. An entire sector may be unable to attract new financing or roll over existing short-term liabilities (Allen et al. 2002).

The BSA framework identifies four types of balance sheet mismatches, all of which help to determine a country's ability to service debt in the case of shocks. These mismatches are (i) maturity mismatches, (ii) currency mismatches, (iii) capital structure mismatches, and (iv) solvency problems.

Maturity mismatches arise when assets held are of long-term and mainly illiquid, while liabilities are of short-term. This type of mismatches can create rollover risk and also an interest rate risk. According to Allen et al. (2002), if the assets are of long-term and the liabilities are of short-term, a sector may become unable to honour its contractual commitments if the market declines to roll over debt. It may create exposure to the risk that interest rates will rise.

Currency mismatches arise when assets and liabilities are denominated in different currencies. In such a case, a change in the exchange rate may lead to a capital loss. In the emerging economies, financial intermediaries tend to borrow from abroad in foreign currency and lend domestically in the local currency. If the domestic currency depreciates sharply, these intermediaries suffer a huge loss. Hofer (2005) argues that currency mismatches can also trigger capital flows, which in turn create pressure on a country's currency reserves.

Capital structure mismatch results when a firm relies heavily on debt financing instead of equity financing. The absence of "equity buffer" can lead to a financial crisis when a sector encounters a shock. Excessive debt financing is usually accompanied by excessive short-term borrowing, and thus not only leads to capital structure mismatches but also to maturity mismatches (Hofer 2005).

Solvency risk arises when the present value of future revenue streams are insufficient to cover liabilities. Maturity mismatches, currency mismatches, and a poor capital structure all can contribute to solvency risk, but solvency risk can also arise from simply borrowing too much or from investing in low-yielding assets (Allen et al. 2002).

All of the above risk types are closely interrelated and can generate credit risk, which is the risk that debtors will no longer be able to repay their debts. Solvency risk for the debtor is equivalent to credit risk for the creditor. Due to its specific functions, the banking system is especially susceptible to credit risk, which itself can lead to a run on deposits (Hofer 2005).

The BSA is a useful surveillance framework for crisis prevention as well as crisis resolution. It develops data sources necessary to analyze financial asset and liability positions of each sector in order to monitor their position effectively. Assessment of a country's vulnerability to crises and the detection of currency and maturity mismatches on the country's aggregate and sectoral balance sheets can help the authorities in preventing a crisis. As long as a country's aggregate and sectoral financial balance sheet does not show severe mismatches, economic entities in the country can borrow in order to sustain imports. However, persistent deficits can translate into balance sheet problems. In the case of eruption of a crisis, the BSA can be helpful in determining suitable economic policy measures and external financing needs through the analysis of sectoral imbalances.

In the BSA, an economy is divided into four sectors and the interlinkages between these sectors are analyzed. The four sectors of the economy are: (i) government sector (including monetary authorities), (ii) financial sector (banks and financial institutions), (iii) non-financial private sector (corporations and households), and (iv) rest of the world (non-residents).

The government sector, financial sector and non-financial sector each have claims and receivables vis-à-vis one another and the rest of the world. When the first three sectoral balance sheets are consolidated to yield a country's aggregate balance sheet, the assets and liabilities held by residents are netted out, and what remains is the external balance sheet vis-à-vis the rest of the world.

Sectoral balance sheets provide important information which is not visible in the aggregate financial balance sheet. One conspicuous example is foreign currency-denominated debt between residents, which is netted out in the aggregate balance sheet. Weaknesses in a sectoral balance sheet can contribute to the development of a nationwide balance of payments crisis without even appearing on a country's aggregate balance sheet (Hofer 2005).

Table 5.1: Financial Interlinkages between the Sectors in an Economy

Government Sector
(Incl uding monetary authorities)

Assets	*Liabilities*
Financial claims on Financial sector Non-financial private sector Rest of the world	**Financial obligations to** Financial sector Non-financial private sector Rest of the world **Net worth**

Financial Sector
(Banks and other financial institutions)

Assets	*Liabilities*
Financial claims on Government sector Non-financial private sector Rest of the world	**Financial obligations to** Government sector Non-financial private sector Rest of the world **Net worth**

Non-financial Private Sector
(Corporations and households)

Assets	*Liabilities*
Financial claims on Government sector Financial private sector Rest of the world	**Financial obligations to** Government sector Financial private sector Rest of the world **Net worth**

Rest of the World
(Non-residents)

Assets	*Liabilities*
Financial claims on Government sector Financial sector Non-financial private sector	**Financial obligations to** Government sector Financial sector Non-financial private sector **Net international Investment position**

Source: Allen et al. 2002, p. 14.

Allen et al. (2002) argue that the risk of problems in one sector spilling over into other healthy sectors is exacerbated in countries which have liberalized their capital flows if external investors only take country risk into account and do not necessarily differentiate between sectors.

According to Hofer (2005), an economy which shows mismatches on its sectoral financial balance sheets will tend to be more vulnerable to financial as well as real economic shocks. Shocks can trigger a loss of confidence in the economy and this loss of confidence can trigger three effects:

Rollover shock – that is banks will demand repayment of their claims

Exchange rate shock – that is corporations which have foreign-denominated liabilities and earn the bulk of their revenues in domestic currency will have to make higher capital repayments on their foreign-denominated liabilities.

Interest rate shock – that is refinancing costs will rise along with interest rates.

Information about sectoral financial balance sheets can also be useful in evaluating the tradeoffs between various economic policy goals; such tradeoffs arise as soon as sectoral problems spill over into other sectors and thus pose a systemic danger to the economic and financial system. Finally, the BSA makes it possible to assess whether and to what extent financial intervention by the government is warranted. (Hofer 2005)

As argued by Allen et al. (2002), the balance sheet approach also focuses attention on policies that can reduce sectoral vulnerabilities. It reinforced the importance of:

(i)   Sound debt management by the public sector to minimize the risk that weaknesses in the public sector balance sheet will be a source of financial difficulty
(ii) Policies that create incentives for the private sector to limit its exposure to various balance sheet risks;
(iii) The need to maintain a sufficient cushion of reserves. Flexible exchange rates can help to limit exposure to currency risk and encourage ongoing hedging as well as facilitating adjustment to external shocks.
      The BSA is particularly helpful in the case of emerging market economies.

The corporate sector in these countries tends to borrow from external market in foreign currency. Similarly, banks also refinance themselves externally in foreign currency. Thus, foreign borrowing has made it possible to finance higher investment volumes than would not have been possible with domestic savings alone. However, high volatility of private capital flows has become the source of financial crises in several emerging market economies.

The IMF has been using the BSA as a supplement to traditional flow-based analysis and many of its elements are applied in the practical work of the IMF in (country) analyses, e.g., Article IV consultations, fiscal and external sustainability, liquidity and debt management, debt sustainability analysis (DSA), quarterly external vulnerability exercise or the Financial Sector Assessment Program (FSAP). However, this framework also suffers from some limitations.

The BSA is a data intensive framework. The information about sectoral balance sheets is most useful if it is available on time to allow policymakers to identify and correct weaknesses before they contribute to financial difficulties. In practice, however, balance sheet information is often only partly available and can be obtained only with significant time lags, which limits its utility for all but ex post analysis. On the other hand, the analysis of the corporate sector in particular is subject to practical limitations. The available data often only cover publicly listed corporations that are a sub-group of firms which does not adequately reflect the complex vulnerabilities of this heterogeneous sector.

A country's aggregate financial balance sheet can reveal the potential extent of its vulnerability to changes in external financial flows. However, as argued by Hofer (2005), it is rarely suited for examining the causes behind such changes.

The practical application of the BSA is highly dependent on high quality data. In this regard, efforts to integrate the BSA into the ongoing work of the IMF have been supported by statistical and transparency initiatives. The requirements of the Special Data Dissemination Standard (SDDS), the Coordinated Portfolio Investment Survey and the new Government Finance Statistics Manual (GFSM) have improved the availability, accuracy and comparability of important balance sheet stock figures (IMF 2003).

5.2.2 Early Warning System

Despite the careful monitoring of the economy and in-depth analysis of likely developments by national and international agencies, a number of crises occurred in the last two decades without the early detection by these agencies.

Before the Asian financial crisis, the economic performance of East Asian countries was regarded as an economic miracle and their economies were deemed as fundamentally strong. Therefore, when the financial and currency crisis broke out in July 1997, neither the market participants nor the policy makers or international agencies read the warning signals before the crisis happened.

Various crises that happened in the 1990s in Europe, Mexico and East Asia have highlighted the need for an early warning system that could flash a timely alarm signal of an impending crisis. In this regard, several studies have tried to identify factors responsible for various crises in an attempt to identify the variables that may provide an early warning signal as the earlier models mainly analysed currency crises.

The first generation models of currency crisis show that weak economic fundamentals could push a country into a currency crisis. According to Krugman (1979), crises occurred when a continuous deterioration in the economic fundamentals became inconsistent with an attempt to fix the exchange rate. Krugman's work has been extended by Flood and Garber (1984) and Connolly and Taylor (1984). According to Connolly and Taylor (1984), the real exchange rate appreciated and the current account deteriorated prior to a collapse.

The second generation models capture the speculative attack from market participants showing that currency crises can occur even without the weakening of economic fundamentals. According to Obstfeld (1994, 1996), a key aspect of these models is the existence of a circular process that leads to more than one equilibrium in the exchange-rate regime. Basically, multiple equilibria arise from nonlinearities in government behaviour. Countries with relatively sound fundamentals could suffer from currency attacks simply because of a sudden adverse shift in market confidence, which is essentially unrelated to their economic fundamentals. The second generation models include the work of Calvo (1995), Cole and Kehoe (1996), Sachs, Tornell and Velasco (1996), and Drazen (1998).

The third generation models view a currency crisis as a financial panic or run on an economy. These models were developed on the experience of the Asian crisis of 1997 to 1998, where weaknesses in the private sector played a more important role than fiscal imbalances. These models, which are based on the analysis of financial balance sheets, show that additional vulnerabilities in the financial and corporate sectors may lead to currency crises which in turn, often bring about banking crises (Kaminsky et al., 1998; Calvo 1998; Kaminsky 1999; Krugman 1999; Dornbusch 2001, etc).

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Kaminsky et al. (1998) propose signal based early warning system that involves monitoring the evolution of a number of economic indicators that tend to systematically behave differently prior to a crisis. Every time that an indicator exceeds a certain threshold value, this is interpreted as a warning signal that a currency crisis may take place within the following 24 months. They examined 76 currency crises from a sample of 20 countries during 1970-1995 by monitoring 15 economic variables. These variables are as follows:

1. International Reserves
2. Imports
3. Exports
4. Terms of Trade
5. Deviations of the Real Exchange Rate from Trend
6. Differential between Foreign and Domestic Real Interest Rates on Deposits
7. Excess Real M1 Balances
8. Money Multiplier of M2
9. Ratio of Domestic Credit to GDP
10. Real Interest Rate on Deposits
11. Ratio of Lending to Deposit Interest Rates
12. Stock of Commercial Banks Deposits
13. Ratio of Broad Money to Gross International Reserves
14. Index of Output
15. Index of Equity Prices

While analysing the above variables, Kaminsky et al. (1998) find that international reserves, real exchange rate, domestic credit, credit to the public sector, and domestic inflation are useful in predicting crises.

Following the signal model proposed by Kaminsky et al. (1998), Wu et al. (2000) investigate the macroeconomic indicators that could help predict currency crisis in a sample of seven SEACEN economies, *viz*, Indonesia, Korea, Malaysia, Philippines, Singapore, ROC (Taiwan) and Thailand. The empirical results indicate that some economic variables may help predict the timing of currency crises. These variables include the real US interest rate, the ratio of import to foreign reserves, the ratio of M2 to foreign reserves, the real effective exchange rate, and the money multiplier.

Based on the signal approach, the Asian Development Bank has developed an Early Warning System prototype "VIEWS" for regional economic surveillance in the ASEAN+3 countries. This prototype aims to detect macroeconomic, financial and corporate sector vulnerabilities and preventing financial crises in the region.

The Early Warning System prototype developed by the ADB has four different components, *viz.*, (i) macropurdential indicators, (ii) nonparametric model, (iii) parametric model, and (iv) leading indicators of business cycles.

Macroprudential indicators (MPIs), broadly defined as indicators of health and stability of financial systems can be classified into two categories. The first is the aggregated macroprudential indicators, mostly derived by aggregating indicators of the health of individual financial institutions, including capital adequacy, asset quality, management soundness, earnings, liquidity and sensitivity to market risk. The second category pertains to indicators of macroeconomic developments and external shocks. These cover growth performance, balance of payments positions, monetary and fiscal conditions, interest rates and exchange rate, and asset prices. Worsening of these indicators could affect the stability of financial systems leading to currency and banking crises.

Based on economic rationale as well as findings of empirical studies of various currency and banking crises, the ADB (2002) classifies key macroeconomic indicators into the following six groups by sources of financial vulnerability:

1. *Current account indicators*
    - real exchange rates,
    - export growth,
    - import growth,
    - ratios of the trade account balance to GDP, and
    - ratios of the current account balance to GDP

2. *Capital account indicators*
    - ratios of short-term debt to foreign reserves,
    - ratios of M2 to foreign reserves,
    - ratios of banks' foreign liabilities to foreign assets,
    - ratios of residents' deposits in the Bank of International Settlement to foreign reserves, and
    - growth of foreign reserves

3. Financial sector indicators
- ratios of domestic credit to GDP,
- M2 money multipliers,
- excess real M1 balances,
- domestic real interest rates, and
- lending deposit rate spreads

4. Fiscal account indicators
- ratios of the fiscal balance to GDP,
- ratios of government consumption to GDP, and
- ratios of public debt to GDP

5. Real sector indicators
- growth of industrial production
- changes in stock prices; and

6. Global economy indicators
- growth of world oil prices,
- the US real interest rate,
- US GDP growth, and
- the US dollar/yen real exchange rate

Based on the above classification, six sectoral composite leading indices and two overall indices are constructed. The sectoral indices include (i) current account composite index, (ii) capital account composite index, (iii) financial sector composite index, (iv) fiscal account composite index, (v) real sector composite index, and (vi) global economy composite index. Composite leading indices contain more information than individual leading indicators, and are considered to be more reliable. Among the two overall composite leading indices, the first index is a weighted average of the above six sectoral composite indices with weights being its noise-to-signal ratio, while the second index is a simple sum of all the one/zero signals of individual leading indicators. The composite indices are found to be able to predict three quarters of the currency crisis episodes during the 1970-1995 sample period with a reasonable level of accuracy and lead time (ADB 2002; ADB 2005).

The second component of the regional EWS prototype is a nonparametric EWS model based on the signalling approach pioneered by Kaminsky and Reinhart. Technically, the model can generate, for each country and on a monthly basis, estimates of the likelihood of a currency crisis within the next 24 months. The model was initially estimated using monthly data from 1970 to 1995 for

Indonesia, Korea, Malaysia, Philippines, Singapore, and Thailand. After demonstrating that the model is capable of predicting the 1997 Asian financial crisis out-of-sample, it was re-estimated and updated to include data up to 2000 (ADB 2002).

In the nonparametric EWS model, a crisis episode is considered to occur in a particular month if the month-over-month percentage change in a bilateral nominal exchange rate (e.g., local currency/the US dollar) exceeds its sample mean by two standard deviations. Thirty-eight economic and financial indicators are used to predict such depreciation episodes. Most of these indicators are among the MPIs of the first component.

The threshold value of a leading indicator is set such that the so-called noise-to-signal ratio-that is the ratio of the likelihood of the indicator signalling during times with low financial vulnerability (or tranquil period) to the likelihood of it signalling during times with high vulnerability (or crisis period) – is minimized. To take into account country-specific characteristics that are not necessarily related to financial vulnerability but due to factors such as differences in policies, institutional structures, and variable definition, the thresholds of leading indicators are all country-specific (ADB 2002).

Nineteen of the 40 selected leading indicators are found to be at least twice as likely to issue early warning signals within a crisis window as they are outside a crisis window (ADB 2005). The top 10 leading indicators are:

    i)   Ratio of foreign liabilities to foreign assets of the banking sector,

    ii)   Months of imports covered by foreign reserves,

    iii)   US real interest rate,

    iv)   Ratio of short-term external debt to foreign reserves,

    v)   12-month change in the domestic real interest rate,

    vi)   12-month change in the ratio of short-term capital flows to GDP,

    vii)   Ratio of deposits in BIS banks to foreign reserves,

    viii) Level of world oil prices in US dollars,

    ix)   Ratio of net credit to the public sector to GDP, and

    x)   12-month change in the ratio of short-term external debt to foreign reserves.

A third component of the regional EWS prototype is a parametric EWS model based on the probit regression analysis. Compared to the signalling

approach, a major advantage of a regression-based EWS model is that it is multivariate and considers all explanatory variables simultaneously. Hence, impacts of a particular indicator on crisis probability are conditional on values of other indicators in the model, and could be more accurately measured. A further advantage is that it allows testing of statistical significance of individual indicators (ADB 2002).

The parametric EWS model of currency crises for East Asia is estimated using panel data and discrete choice econometric techniques. It differs from the parametric currency crisis EWS model developed by the IMF, known as the Developing Country Studies Division (DCSD) model, in that it is estimated using a smaller data set than the one used by the DCSD model, involving only six East Asian countries, *viz.*, Indonesia, Korea, Malaysia, the Philippines, Singapore, and Thailand. It also builds on the nonparametric currency crisis EWS model in two ways. First, it adopts the same definition of a currency crisis and has the same set of identified crisis episodes. Secondly, the explanatory variables are selected from the top 15 leading indicators identified by the nonparametric currency crisis EWS model (ADB 2005).

The estimation results of the ADB parametric EWS model show that the following explanatory variables are good predictors of currency crises in the six East Asian countries during 1970-1995:

i)   Deviation of the real exchange rate against the US dollar from its trend,
ii) Deviation of the US dollar/yen real exchange rate from its trend,
iii) Ratio of current account balance to GDI,
iv) Ratio of short-term external debt to foreign reserves,
v)   2-month change of the lending-deposit rate spread.
vi) 12-month change in the ratio of deposits in BIS banks to foreign reserves, and
viii) Ratio of M2 to foreign reserves

The last component of the regional EWS prototype is leading economic indicators of business cycles. Leading indicators are arguably the main forecasting tool used to predict recessions and recoveries. They can provide advance warning of a sharp economic upturn (overheating) or downturn (recession) and thus enable policymakers to initiate pre-emptive actions.

In addition to the currency crisis models, the regional EWS also estimates the banking crisis model separately using banking crisis episodes documented by Goldstein, Kaminsky, and Reinhart (2000). For the banking crisis model, two general and six sector-specific composite indexes are constructed based on 40 leading indicators. The model, with a reasonable level of accuracy and lead time, was able to predict most of the eight banking crisis episodes during the 1970-1995 in-sample period. The out-of-sample test shows that the 1997 banking crisis episodes in the Philippines and Thailand are predicted by the general composite indexes at a cut-off probability of 30 percent, with a lead time of 8 months.

The financial sector composite index is found to issue persistent warning signals in most crisis-affected countries as early as 18 months prior to the 1997 crisis at a cut-off probability of 30 percent. At a cut-off probability of 50 percent, it still predicted the crisis in Indonesia, Korea, Philippines, and Thailand, although with less warning signals and a shorter lead time.

Overall, the currency crisis model outperforms the banking crisis model. For both models, the weighted general composite index is the most reliable. Three sector-specific composite indexes also have significant predictive power: the current account and capital account indexes for the currency crisis mode, and the financial sector index for the banking crisis model.

EWS models may help policy makers understand the nature of crises and single out early warning signals of a potential crisis. This framework is also useful in identifying the extent of fragility or vulnerability that the economies could suffer from an attack during turbulent times and in taking effective actions to reduce the distortionary impact of the crisis. However, the EWS approach has certain limitations. Data availability and accuracy are major constraints as high frequency data are required for these models to be useful.

EWS models have so far been found to perform reasonably well when they are applied for currency crises, while the track record of EWS models for banking crises is not as good. For these reasons, EWS models should be used to complement, rather than substitute sound and balanced judgements on financial weaknesses. At their current stage of development, EWS models can complement but not yet substitute traditional methods of economic monitoring and policy analysis, and results obtained from EWS models need to be interpreted with caution and care (ADB 2005).

5.3 Country-Specific Challenges

It is clear that the effectiveness of monetary policy management depends on the efficacy of macroeconomic surveillance. Realizing this, SEACEN countries have put concerted efforts in strengthening their macroeconomic surveillance systems. However, the macroeconomic surveillance systems of all these countries have not been equally effective due to various country-specific challenges.

5.3.1 Cambodia

The prolonged catastrophic civil war in Cambodia left even the most basic economic data in many institutions in shambles. After emerging from war, the country has made valiant efforts to revive its statistical system. The loss of vital records, data and information has been indeed been a critical challenge for Cambodia. The challenges toward an effective macroeconomic surveillance remain multifaceted and could be described as follows:

(i)   The statistical coverage to support monitoring purposes is still inadequate;

(ii) The inconsistency in data across sectors remains high;

(iii) The time lag of data availability is still substantial; and

(iv) The methodology, techniques and indicators employed are not sophisticated enough.

Thus, a great deal has to be done to improve the statistical data for the effectiveness of surveillance. Efforts also need to be made to strengthen all the relevant bodies responsible for statistics, not only in terms of personnel, but also in terms of collection of much needed data on important areas of the economy. The immediate priority of statistical development is improving data coverage, frequency, timeliness, and quality of data with respect to accuracy and reliability.

5.3.2 Fiji

The lack of staff with relevant training and experience in the area of surveillance and quantitative work has been the main challenge in strengthening the macroeconomic surveillance in Fiji. For the surveillance system to be effective it must be communicated well to the stakeholders on why it is in place, what it is being used for and what are the benefits of the system. Lack of clarity in objectives, accountability and responsibility also create problems for developing an effective macroeconomic surveillance system.

5.3.3 Indonesia

There are some lead period related issues in the current surveillance system. During the last 1997 crises, the warning signal emerged one year before the crises happened. However, as the prediction period of the current models is one month (lead 1 month, this short lead period makes it difficult to anticipate the pressure on time. As a result, it provides little maneuvering room for taking appropriate action. In order to compensate for this weakness, various key indicators are evaluated separately and the judgments are based on the combination of the results of various models.

Moreover, the involvement and ownership of high level staffs, particularly on the monetary policy process (projection and forecasting cycle) need to be improved.

5.3.4 Korea

As the structural framework of the economy has changed after the currency crisis, the impact of external factors on the domestic financial and real economic sectors is increasing.

Due to increased capital inflows from abroad, the central bank's ability to manage the economy has weakened. There is a need to improve the bank's capacity to facilitate more integrated risk management. The BOK plans to improve its existing models to enhance the econometric analysis techniques, while developing a more sophisticated analytical model based on the latest economic theories. The BOK is working towards improving its macroeconomic surveillance framework to increase the effectiveness of monetary policy.

5.3.5 Malaysia

A key challenge is related to the methodological aspect of the surveillance system. In particular, there is a need to obtain better indicators in certain areas where gaps have been identified. For example, to conduct wage-price analysis and to measure inflation expectations accurately, data on wages are crucial. However, such data are less adequate, especially for the services sector.

BNM is continuously looking towards improving its overall surveillance framework. In this regard, efforts are underway to conduct benchmarking studies of other central banks in terms of the frameworks, encompassing indicators and forecasting tools used for analysis and assessment.

5.3.6 Myanmar

Myanmar is under going a transformation process from a centrally planned economy to a market oriented one since 1988. Various efforts have been made toward the effective formulation and implementation of public policies including monetary policy. However, the central bank has still to achieve full independence and there is lack of clarity between monetary policy and other macroeconomic policies objectives. As a result, macroeconomic surveillance remains in a development stage.

5.3.7 Nepal

There are some institutional as well as methodological challenges in developing an effective macroeconomic surveillance system in Nepal. The institutional challenges can be listed as: (i) lack of timely and regular availability of economic and financial data; (ii) poor mechanism to obtain data from household and non-financial sector at regular intervals; (iii) lack of good corporate governance in the banking and financial sector; (iv) inadequate use of information technology; (v) policy ambiguity and conflicting objectives of various institutions; (vi) weak coordination between the stakeholders; (vii) duplication of tasks by the various agencies; and (vii) poor implementation of existing rules and regulations.

The methodology related challenges include: (i) lack of effective execution and follow up of inspection reports of banks and financial institutions; (ii) inconsistency in the reporting system between Nepal Rastra Bank and the Government of Nepal as the central bank adheres to a quarterly reporting system while the government follows a four monthly one; (iii) no mechanism for compilation of quarterly GDP; (iv) unavailability of data and information on a timely and regular basis to prepare financial soundness indicators and financial survey on monthly basis; and (v) inadequate coverage of balance of payments data.

Another challenge is the data gap for monetary policy. There is no methodological base for the compilation of quarterly GDP data such that the impact of monetary policy to the real sector can be assessed on quarterly time frame. Moreover, liquidity forecasting exercises are also constrained by lack of data such as weekly pattern of government expenditure and revenue, and updated data and information on likely changes in government transactions.

5.3.8 Papua New Guinea

The Bank of Papua New Guinea faces various challenges in developing an effective macroeconomic surveillance system. The Bank has to keep pace with the global developments with regards to internationally accepted methodologies and techniques of macroeconomic surveillance in order to develop and effectively implement them in the country.

A particular challenge for the Bank is cooperation with other policy makers to ensure that decisions are coordinated and consistent, and contribute to price and economic stability and growth. Sound policies at every level are the best assurance that the benefits of development and growth are equitably shared out among the people of Papua New Guinea. The optimal contribution to stability and growth would normally emanate from effectiveness in the three core areas of monetary policy, financial system stability and efficiency in the payments system.

5.3.9 Philippines

In general, the challenges in developing effective surveillance systems lie primarily in the methodology, such as in identifying indicator variables that would capture accurately the nuances of the economy. This entails issues on data availability and accuracy in measurement. Once the models have been identified and fitted, the next area of development would be to validate the results and refine the forecasting performances of the model. Furthermore, as the economy evolves and new external risks emerge, the maintenance of the models would require a constant review of the indicator. Thus, the maintenance of the EWS models requires the continuing development of complementary models that would support existing results and further improve the monitoring and surveillance exercises.

In order to strengthen macroeconomic surveillance, BSP is working on developing a Parametric EWS Model for currency crisis, a Bank Distress Index, and also the Macroprudential Surveillance Indicators Framework. The main advantage of the Parametric EWS Model for currency crisis is that it considers all explanatory variables simultaneously, thus, impacts of a particular indicator on crisis probability are conditional on the values of the other indicators. The Bank Distress Index utilizes the numerical-based method in identifying banking crises. The ratio would give an indication of the effects on the economy of bank rescues and would provide a measure of whether the costs involved have reached a certain proportion that could be considered systemic. Similarly, the

Macroprudential Surveillance Indicators Framework will consider existing conditions as well as emerging or increasing risks to the stability of the financial system.

5.3.10 Singapore

Given Singapore's small and open economy and the increasingly volatile external environment, MAS' macroeconomic surveillance has always been a challenging task. Nevertheless, the surveillance system has thus far proved to be effective in supporting the process of monetary policy formulation on both measures.

As the structure of the economy is rapidly evolving, it is important that Singapore's statistical databases are constantly reviewed so that they are relevant, timely and sufficiently disaggregated for surveillance and policy analysis. On this front, the departments have been working closely with the statistical agencies to identify any gaps and weaknesses in the existing economic databases.

5.3.11 Sri Lanka

There are several challenges in developing an effective surveillance system for price stability and financial system stability, one of which is the unavailability of a more representative price index to measure inflation. The current official price index used in the country is the Colombo Consumers Price Index (CCPI) with a base year of 1952. The index is overly sensitive to a few items that have a larger weight, as a result of which the index over responds to changes in certain administered prices and international commodity prices. Even though such increases in CCPI are not due to changes in aggregate demand, it changes market expectations exerting pressure on interest rates and wages.

5.3.12 ROC (Taiwan)

The Board of Directors is the top decision making body in the macroeconomic surveillance system and with the exception of the Governor and Deputy Governors of the CBC, other directors serve on a part time basis only. However, as the financial environment becomes increasingly complicated, it would be more prudent if the directors served on a full time basis at the CBC. Moreover, the authority of financial inspection of the CBC has shrunk due to the establishment of the Financial Supervisory Commission in 2004. In light of this, cross-agency coordination and cooperation becomes even more essential for effective macroeconomic surveillance.

On the methodological aspect, analytical frameworks such as scenario analysis, stress testing, balance sheet approach and the like have not been employed in evaluating economic and financial risks. The CBC is evaluating the cost and benefit of using the Balance Sheet Approach as a supplementary tool in macroeconomic surveillance. The regulation for banking liquidity management is under review and will be revised to improve banks' liquidity management. Currently, the monitoring of maturity mismatch is conducted on a quarterly basis and will be changed to a monthly one in due course. Financial stability evaluation and analysis will expand from depository institutions to other financial institutions. The Department of Financial Inspection plans to adopt stress tests and develop econometric models for macroeconomic and financial stability.

5.3.13 Thailand

The effectiveness of the current surveillance framework largely depends on data quality, analytical tools and techniques. The main challenges to the macroeconomic surveillance system in Thailand can be summarized as follows:

(i)   Lack of data on firms in the corporate sector that can effectively indicate the root of possible vulnerability. Currently, only the large companies listed in the Stock Exchange of Thailand (SET), which are less likely to be vulnerable, are monitored.

(ii) With regard to technical challenges, most statistical models are linear. However, when shocks are extreme, non-linearity also needs to be considered.

The statistical framework needs to be expanded to include more micro-information and the quality of data incorporated in the model should be improved. Currently, the corporate and household satellite models are being refined. In addition, firm-level (bottom-up) stress testing and feedback from firm-level stress to macro variables as well as interactions among firms should be explored.

5.3.14 Vietnam

The Bank's operations depend heavily on State administrative relations, which in part, limit the flexibility and creativeness of the Bank in the developing a process for national monetary policy. Due to the lack of appropriate information, the SBV remains passive even during the occurrence of market fluctuations. In the absence of a well developed economic surveillance system, the ability of SBV to make market analysis and forecast is limited. The less efficient implementation of monetary policy is frequently observed as the SBV has to

achieve various targets simultaneously. In addition, a relatively deficiency in coordination and clarity between monetary policy and other macroeconomic policies has decreased the effectiveness of monetary policy management in the country.

5.4 Concluding Remarks

With the belief that regional issues can be resolved more effectively by a regional surveillance mechanism, a number of initiations have taken place in Asia and the Pacific since 1990s. Such initiations have been accelerated specifically after the Asian financial crisis. The Manila Framework Group (MFG), Association of South East Asian Nations (ASEAN), ASEAN plus China, Japan and Korea (ASEAN+3), Asia Pacific Economic Cooperation (APEC), Asia-Europe Meeting (ASEM), Executives' Meeting of East Asia-Pacific Central Banks (EMEAP), and South East Asian Central Banks Expert Group on Capital Flows (SEG) are specifically notable in this regard.

Since 2002, the IMF has started using stock variable based Balance Sheet Approach (BSA) as an additional instrument in its surveillance activities. The BSA is an analytical framework based on the examination of stock variables in the aggregate balance sheet of a country and the balance sheet of its main sectors. This framework helps to explain how problems in one sector can spill over into other sectors, eventually triggering an external balance of payments crisis. The framework identifies four types of balance sheet mismatches, all of which help to determine a country's ability to service debt in the case of shocks. These mismatches are closely interrelated and can generate credit risk. In the BSA, an economy is divided into four sectors and the interlinkages between these sectors are analyzed. Sectoral balance sheets provide important information which is not perceptible in the aggregate financial balance sheet.

Past crises have highlighted the need for an early warning system that could provide a timely warning signal of a potential crisis. Several studies have attempted to identify factors responsible for various crises in the endeavour to identify variables that may provide early warning signals. The Asian Development Bank has developed an Early Warning System prototype "VIEWS" for regional economic surveillance in the ASEAN+3 countries. This prototype aims at detecting macroeconomic, financial and corporate sector vulnerabilities and preventing financial crises in the region. EWS models have so far found to perform reasonably well when they are applied to currency crises, while the track record of these models for banking crises is not as good.

Most of the SEACEN countries have implemented various measures to strengthen their macroeconomic surveillance systems. However, several member countries still face a number of challenges in their surveillance process. Among the many challenges, unavailability of required data is the most pronounced. In some of the member countries, whatever available data are also not reliable. In addition, data available after an exceptionally long lag may not be helpful in the timely monitoring of developments taking place in the economy. In order to utilize the BSA and EWS frameworks for macroeconomic surveillance,, SEACEN central banks first need to have a reliable database of economic and financial variables with high frequencies and shorter time lags.

In some SEACEN countries, the institutional framework for macroeconomic surveillance has not been developed properly and the surveillance responsibilities of various agencies are not clear. Lack of human resources with technical expertise in macroeconomic surveillance and lack of coordination between various related agencies are other common challenge faced by these countries.

Chapter Six

CONCLUSION

6.1 Major Observations

A strong macroeconomic surveillance system can closely monitor the developments in the economy, identify the interlinkages between various economic variables, and make projections of likely future scenarios. Based on the information on the current state of the economy and future likely developments, appropriate measures can be recommended to achieve monetary policy objectives consistent with various macroeconomic goals. The macroeconomic surveillance process for monetary policy management involves regular analysis of the data on the variables that affect the interest rate, liquidity, credit supply in the financial sector on the one hand, and price, output and employment situations in the real sector on the other hand, in the economy. Various statistical techniques and econometric models are employed to determine the present conditions, make forecasts and determine required policy measures to achieve monetary policy objectives. The macroeconomic surveillance of advanced central banks is centred on the comprehensive analysis of the risks to price stability, for instance, in the European Central Bank and Bank of England, or on price stability and employment, for instance in the Federal Reserve System. They have well developed organisational structures for macroeconomic surveillance and conduct their surveillance activities by monitoring various data from multiple sources.

The IMF monitors the developments in the international economic system as well as its member countries. For this purpose, the Fund conducts regular surveillance of its member countries, which is known as "Article IV Consultation". In the process, the IMF has assisted member countries in strengthening their domestic surveillance systems by providing necessary technical assistance. The IMF uses the financial programming framework in its surveillance exercise. This flow-based framework divides the economy into 4 major sectors, *viz.*, real sector, fiscal sector, monetary sector and external sector. After the Asian financial crisis, financial sector issues have received greater emphasis in the surveillance. However, despite regular surveillance by the IMF, some countries in Europe, Asia and Latin America still underwent several financial crises, raising the question on the effectiveness of the Fund's surveillance.

The macroeconomic surveillance systems in the SEACEN region have evolved at different paces. Among the 14 countries covered in this study, the

macroeconomic surveillance systems of Singapore, Korea, ROC (Taiwan), Malaysia, Thailand, Indonesia and Philippines are comparatively developed and effective. After the 1997 financial crisis, these countries have strengthened their surveillance systems by developing and employing various advanced surveillance methods, models and mechanisms. Their institutional frameworks have also developed with clear objectives and responsibilities as well as with the quality of their databases.

On the other hand, Fiji, Sri Lanka, Vietnam, Cambodia, Papua New Guinea, Nepal, and Myanmar are still using less advanced surveillance systems. In most of these countries, a significant gap is seen between the monetary policy target and target achievement, showing that monetary policy management has been less effective and credible. As these countries are gradually heading toward increased economic openness and higher integration with global market, their surveillance systems will have to be strengthened considerably to meet the new challenges that will come along with increased openness and integration.

A surveillance system needs to be authoritative, comprehensive, focused, influential and accountable to support monetary policy management effectively. An effective surveillance can detect problems at an early stage, have an appropriate impact on country's policies, and thus can help to strengthen crisis prevention and promote stability and sustainable growth. However, most existing international and national surveillance systems suffer from weaknesses and are unable to identify vulnerabilities in the economy which in turn had led to several crises in the recent past. Some international surveillance systems such as the IMF surveillance framework are criticized as being insufficient for regional surveillance. Many past global crises show that they often have important regional elements. With the belief that regional issues can be resolved effectively by a regional surveillance mechanism, a number of initiations have taken place in Asia and the Pacific since 1990s. Such initiations have been accelerated especially after the Asian financial crisis.

In order to develop an early warning system that could flash a timely warning signal of an impending crisis, the Asian Development Bank has developed an Early Warning System (EWS) prototype for regional economic surveillance for East Asia. This prototype aims at detecting macroeconomic, financial and corporate sector vulnerabilities and preventing financial crises in the region. EWS models perform reasonably well when applied to currency crises, while their track record for banking crises is not as good.

The IMF has started using the stock variable based Balance Sheet Approach (BSA) as an additional instrument in its surveillance activities since 2002. In contrast to the financial programming framework, which is based on the examination of the flow variables, the BSA examines stock variables in the aggregate balance sheet of a country and the balance sheet of its main sectors and helps to explain how problems in one sector can spill over into other sectors, eventually triggering an external balance of payments crisis. In this framework, an economy is divided into four sectors and the interlinkages between these sectors are analyzed. Sectoral balance sheets provide important information which is not perceptible in the aggregate financial balance sheet.

Most of the SEACEN countries have taken various initiatives to strengthen their macroeconomic surveillance systems. However, several members still face a number of challenges in making their surveillance systems effective. The most pronounced challenge faced by these countries is the availability of timely and quality data. Because of data problems, the surveillance frameworks such as EWS and BSA cannot be used meaningfully in these countries. In some of the member countries, the institutional frameworks for macroeconomic surveillance have not been developed. Lack of human resources with technical expertise and lack of coordination among concerned agencies are other challenges faced by these countries.

6.2 Policy Implications

Despite the implementation of various measures, the macroeconomic surveillance systems of about half of the SEACEN countries still need significant improvement. In order to enhance the effectiveness and credibility of monetary policy, these countries need to strengthen their surveillance systems. Establishing proper institutional set-ups, reforming data collection and compilation systems, developing human resources with required technical expertise, and developing and employing advanced surveillance methods and models are the major tasks that need to be carried out urgently. In this process, enhancement of the availability, frequency and quality of data should be emphasized. While integration of SEACEN countries into international economies brings benefits, it also comes with new challenges, even for SEACEN countries that have comparatively developed macroeconomic surveillance systems. They should continually strengthen their systems to deal with these potential challenges.

Based on the experience of past crises, various mechanisms, methods and models have been developed to accurately identify vulnerabilities that can lead

to crisis. The early warning system and balance sheet approach are good examples of these new models and frameworks. Some of the SEACEN countries are using or in the process of using the EWS framework developed by the ADB for regional economic surveillance. It would be helpful for surveillance consistency and effectiveness if all the SEACEN member countries could employ EWS type models. Similarly, SEACEN members can further strengthen their surveillance systems by using the BSA framework as a supplementary tool.

The newly developed surveillance frameworks and models are designed to address the better known type of crises. After the various currency crises in early 1990s and earlier, macroeconomic surveillance focused on currency crisis. In the aftermath of the 1997 financial crisis, various national, regional and international agencies placed emphasis on monitoring financial market vulnerabilities. However, yet another new type of financial crisis surfaced in USA in August 2007 that originated from the problems in the subprime mortgage lending. Neither the Federal Reserve and the IMF nor market participants and credit rating agencies read the vulnerabilities in the market that led to the crisis. Because of the increasingly integrated global financial markets and development of uncountable types of new financial products, the global economy constantly faces new types of market vulnerabilities. Therefore, new mechanisms for macroeconomic surveillance should also consider previously unknown type of crises instead of focusing on known types only.

In the SEACEN region, the current macroeconomic surveillance systems of almost half of the member countries are fairly developed while those of the other half are less so. In the process of strengthening their surveillance systems, the SEACEN members can benefit by the sharing of experiences. Such initiations would have the additional advantage of identifying and addressing regional characteristics properly. In this regard, The SEACEN Centre can provide a forum for exchanging surveillance expertise and experiences among its members.

As various past crises have shown some regional characteristics, there have been several initiatives to establish regional surveillance mechanisms in Asia and the Pacific. Most of these initiatives have been successful in making various decisions regarding regional cooperation on information sharing. However, there is still lack of a dynamic permanent mechanism to conduct such regional surveillance on a regular and integrated basis. In this context, instead of increasing the number of initiatives, some of the existing mechanisms can be revived or strengthened.

6.3 Limitations of the Study

As an in-house project, this research was designed to be based on questionnaire and published sources for the required data and information. Due to the varied levels of responses received from member central banks and monetary authorities on the questionnaire, the discussions on country cases have not been consistent in terms of the information presented. As the information on macroeconomic surveillance systems of the more advanced central banks have been drawn indirectly from their monetary policy reports, inflation reports and other publications, the discussion on their surveillance systems is only a rough overview. While the example of an established macroeconomic surveillance system, such as the IMF's system has been discussed in detail, due to time and resource limitations, the surveillance systems of other prominent international organizations such as the United Nations, Bank for International Settlements, Organisation for Economic Cooperation and Development, and Asian Development Bank could not be included.

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