Financial liberalization and economy crisis: macromodelling the Thai economy

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NOTE

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1.1 Background to the Study

The major recent global event in financial markets was the financial turmoil in East Asia that erupted after mid 1997, which had a widespread impact on world financial markets. The problems broke out in Thailand and spread rapidly to other South East Asian countries, and then later to Korea, Russia and Brazil. Although the precise economic situation differed among the five most damaged countries by the ongoing Asian crisis -Indonesia, Korea, Malaysia, the Philippines and Thailand, there were a number of broad similarities (See Table 1.1).

These countries had experienced rapid and exported-dominated growth with generally modest inflation for several years, and had attracted large foreign capital inflows. In 1996, net private capital inflows to these countries, except Korea, were between 6 percent-10 percent of GDP, exceeding the size of their current account deficits. The large amount of capital inflows led to a rapid growth in these countries' outstanding external debt. When the Thai currency was floated on 2 July 1997 it depreciated by 20 percent in its first month. The currency crisis then spread contagiously to Malaysia, Indonesia and the Philippines. All these countries abandoned their ties to the US dollar within the following six weeks and they also experienced substantial falls in their stock markets. The currency crisis in Thailand affected the currencies and stock markets in a number of other Asian countries, and Korea was seriously affected from October 1997 (See Table 1.2). There were also spillovers to currency and equity markets in other regions, such as Brazil, Argentina, Mexico, Greece, Russia and Ukraine. The long-term effect of these events in East Asia are still far from clear.

In the case of Thailand, this study pays particular attention to the economic and financial difficulties faced by the country since mid 1997 and its substantial impact upon the development of the Thai economy. Up to 1995 the Thai economy had
been growing at a rapid pace, with the highest growth rate of 13 percent occurring in 1988 and with growth averaging 8 percent over 1991-1995. Thailand's economic performance was regarded internationally as extraordinarily successful. However, in hindsight, this success led domestic and foreign investors to underestimate the country's economic weaknesses. In the first half of the 1990s current account deficits, which partly resulted from the large capital inflows and financial liberalization policy undertaken in the late 1980s and early 1990s, began to widen considerably; rising from about 5 percent of GDP in 1993 to over 8 percent of GDP in 1995 and 1996. In 1996 total exports declined by 0.2 percent, compared to increases of over 20 percent per annum in prior years. This partly resulted from cyclical factors such as reduced demand in major trading partners and world trade volume. Structurally, Thailand's loss of international competitiveness in labour intensive products became very apparent in 1996. In addition the sharp fall in the export growth rate in 1996 partly resulted from the real appreciation of the Thai currency. This partly reflected higher rates of inflation relative to its trading partners, such as the US inflation rate. As the US$ strengthened against other currencies and in particular the Japanese yen, the Thai currency, which was tied to the US$, appreciated accordingly reducing its competitiveness in the export sector against its largest trading partner, Japan.

Table 1.1 Selected Economic Indicators of Some East Asia Countries
(1996 levels as a percentage of GDP unless otherwise stated)

<table>
<thead>
<tr>
<th></th>
<th>Indonesia</th>
<th>Malaysia</th>
<th>Philippines</th>
<th>Thailand</th>
<th>Korea</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP growth (a) (%)</td>
<td>7.9</td>
<td>9.0</td>
<td>4.9</td>
<td>7.9</td>
<td>8.2</td>
</tr>
<tr>
<td>Inflation (b) (%)</td>
<td>7.3</td>
<td>3.6</td>
<td>8.4</td>
<td>5.9</td>
<td>4.9</td>
</tr>
<tr>
<td>Domestic saving (% of GDP)</td>
<td>28.8</td>
<td>36.7</td>
<td>19.7</td>
<td>33.1</td>
<td>33.3</td>
</tr>
<tr>
<td>Fixed capital formation (% of GDP)</td>
<td>28.1</td>
<td>42.2</td>
<td>23.2</td>
<td>40.8</td>
<td>36.8</td>
</tr>
<tr>
<td>General government balance (% of GDP)</td>
<td>1.0</td>
<td>4.2</td>
<td>0.2</td>
<td>2.7</td>
<td>0.3</td>
</tr>
<tr>
<td>Current account balance (% of GDP)</td>
<td>-3.3</td>
<td>-4.9</td>
<td>-4.7</td>
<td>-7.9</td>
<td>-4.9</td>
</tr>
<tr>
<td>Net private capital inflows (% of GDP)</td>
<td>6.3</td>
<td>9.6</td>
<td>9.8</td>
<td>9.3</td>
<td>4.9</td>
</tr>
<tr>
<td>External debt (US$ billion)</td>
<td>53.4</td>
<td>43.9</td>
<td>67.8</td>
<td>53.2</td>
<td>29.3</td>
</tr>
</tbody>
</table>

Sources: IMF World Economic Outlook and Institute of International Finance. (a) and (b) average annual growth for 1993-96
The situation was aggravated by the radical and rapid liberalizing of capital account flows emanating from the Bank of Thailand. The introduction of the Bangkok International Banking facilities (BIBF) created a heavy inflow of foreign capital, especially during 1993-1995. Net capital inflows increased from 8 percent of GDP in 1990 to 14 percent of GDP in 1995. By 1995 BIBF accounted for around 39 percent of net private capital inflows.

The large amount of capital inflows also contributed to rapid growth in the country's outstanding foreign debt. The total outstanding external debt increased from 33.8 percent of GDP in 1990 to 50.9 percent of GDP at the end of 1996. Almost all of the increase in debt was generated by the private sector. This led to a rapid increase in the share of short-term debt to total foreign debt, which increased from 35.5 percent in 1990 to 55.6 percent in 1995. These excessive short-term and unhedged foreign borrowings supported high levels of investment, often in real estate where there were property price bubbles, giving rise to substantial maturity mismatches that exposed the borrowers to liquidity risk.

Table 1.2 Currency and Stock Market Movements in Asia: 1997-1998

| Please see print copy for image |


In addition, in domestic developments, an enormous amount of non-performing loans held by financial institutions arising from the collapse of the asset price bubble, both in the real estate sector and in the stock exchange market, became very apparent in 1996. Finance and securities companies in particular were much
affected because their exposure to the real estate sector was substantial, with credits extended to this sector accounting for 25-30 percent of their total credits.

All of these negative signs led to lower confidence of the international financial markets in the Thai economy. Speculative attacks against the value of the Thai currency started during 1996 on several occasions, but did not become significantly aggressive until May 1997. The Thai authorities failed to stem the speculative onslaughts by raising interest rates and intervening heavily in the foreign exchange markets. They finally broke the peg to the US dollar on July 2 1997, and eventually asked the IMF for assistance.

Thailand, Indonesia, and Korea have been implementing IMF rescue and restructuring plans. The remedial measures proposed by the IMF have been criticized on several grounds. For example the financial crises in East Asia are not driven by fiscal deficits which are, after all, what traditional IMF rescue packages are designed to deal with. One year after the crisis erupted in Thailand and its spread to other countries in the region, East Asia faced a deep and severe economic contraction; insolvent financial institutions; loan defaults; and bankrupt businesses, both large and small. The stock markets in the region were depressed and showed little sign of recovery. Current account balances have moved into sizeable surplus in several crisis countries, in particular Thailand, almost entirely because of the collapse in imports rather than the rise in exports. The decline in imports also implying a continuing export downturn.

In the Thai case export growth is being held back by shortages of credit for exporters to buy imported parts, components, and other industrial materials needed to produce export goods. This partly resulted from the liquidity crisis early in 1997. The situation was aggravated in the first half of 1998 by the policy of the Bank of Thailand, as supported by the IMF, to maintain very high repurchase rates at the Bank

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1 In all three countries, Thailand, Indonesia and Korea, the major components of the IMF programs include: i) a macroeconomic policy framework based on fiscal tightening and monetary contraction aimed at stabilizing the nominal exchange rate; ii) financial, corporate and labour market restructuring; and iii) market deregulation and opening, including the financial sector.
of Thailand. Pursuing a high interest rate policy was aimed at strengthening the value of the Thai currency or to slow down capital outflows. However, it also created negative effects because it encouraged banks to deposit the money with the repurchase window at the central bank, at low or no risk, rather than to lend the money to exporters, Thai industries and businesses. Hence the situation in 1998 was one in which exporters and Thai businesses could not gain access to new loans from banks, and instead the banks tried to call back their loans. It was expected that after the IMF programs were initiated these countries' economies would recover substantially like Mexico in 1994 and 1995. However it has not been true in the case of the East Asian crisis, with many economies still suffering a deep, sharp shock with long lasting effects. It is too early to declare the crisis as being over. Although the crisis countries seem to be slightly rebounding enormous problems remain, with difficult tasks of financial and corporate sector restructuring still in their early phases.

The crisis in East Asia has raised questions such as what has gone wrong in these economies, and in particular in their financial markets. Why has the crisis in East Asia had substantial impact on world financial markets? This thesis aims to investigate developments in world financial markets (See Chapter 2) by paying particular attention to the financial crisis in the East Asian countries (See Chapter 3). What were the causes and consequences of the financial crisis in East Asia, and in particular Thailand? What has gone wrong in East Asia and Thailand following an IMF program? How has the crisis and the IMF-supported programs, in particular the macroeconomic policies, affected the development of the Thai economy. These will be investigated in details in Chapter 3, and also in Chapter 7 where a simulation analysis is conducted. What are the appropriate macroeconomic policies for Thailand in dealing with the financial crisis in the initial stage and later on (See Chapter 7).

The East Asian crisis has raised serious doubts about the IMF role in policy management. Radelet and Sachs (1998, 1999) argue that a combination of panic on the part on the international investment community, policy mismanagement at the onset of the crisis by the Asian governments, and poorly designed IMF supported
programs turned a moderate macroeconomic adjustment into a deep and severe economic contraction. The IMF suggested that to tighten fiscal and monetary policies in the initial stage of the crisis would stabilize the exchange rate, and slow down capital outflows, and that the benefits of currency stabilization would outweigh the short-run output costs. Radelet and Sachs (1999) argue that higher interest rates are likely to make it more difficult for businesses to service domestic currency loans, reduce the expansion of bank loans, and hence contribute to a further rise in non-performing loans on bank balance sheets. They further argue that despite sharply higher interest rates Asian currencies during the panic phase of the crisis had not appreciated as the IMF expected, so the supposed benefits of this policy are in question. They also argue that fiscal contraction, aimed at supporting the monetary contraction and defend the exchange rate as well as provide for funds necessary to inject into the financial system, may not be an appropriate policy in dealing with such a crisis in the early stage. The reason is that fiscal policy has been fairly prudent across the region, and budget profligacy was clearly not the source of the crisis. So there was no clear reason why the IMF had to impose fiscal contraction (fiscal surplus) on top of the market panic and massive contraction that was already automatically taking place in the region. These mis-steps led to an unnecessarily harsh economic contraction. This study aims to construct a macroeconomic model so as to compare the macroeconomic consequences between the IMF policy approach and Radelet and Sachs (RS) policy approach arising from exogenous shocks to the Thai economy.

Another policy lesson of the crisis is financial sector liberalization. Financial liberalization, which stimulates large capital inflows, made a major contribution to sustaining the economic expansion in East Asia. However, with the benefit of hindsight, the massive capital inflow, and particularly the short-term flows, became an important factor in creating the crisis. The basic theoretical framework for analyzing the impact of financial liberalization are the seminal contributions of Mundell (1963, 1968) and Fleming (MF) (1962), Dornbusch (DB) (1976) and the Portfolio balance
models (PBM) (Branson (1976, 1977, 1984)) respectively. The MF model examines the implications of international capital mobility in response to interest rate differentials. For small economies the simultaneous removal of international capital controls and domestic interest rate controls under a fixed exchange rate regime created an inconsistency of financial liberalization. The MF model provides some explanations why massive capital inflows, resulting from a radical dismantling of capital controls undertaken in the late 1980s and early 1990s in East Asia and Thailand in particular, might lead to a real appreciation of the exchange rate and consequently deteriorate the current account balance. The financing of this has important implications for external debt and the structure of such debt (i.e. between short and long run debt).

The Dornbusch (DB) model extends and amends the MF model by introducing dynamics of adjustment into it. A crucial underlying assumption of the DB model is that financial markets continuously clear while non-financial markets are subject to sticky price and quantity adjustment resulting in non-market clearing. With perfect capital mobility and a flexible exchange rate, financial markets respond instantaneously to exogenous shocks. However non-financial markets are much slower to react to such shocks, hence this asymmetric adjustment speed of the non-financial markets and financial markets coupled with exchange rate expectations may contribute to the overshooting of the exchange rate in the short run. This may explain partly the rapid and substantial depreciation of the Asian currencies after allowing their exchange rate to float and the significance of the financial sector in transmitting the impact of exogenous shocks to the real sector of the economy.

However a defect in the MF and DB models arises from the assumption of perfect substitutability of domestic and foreign assets. Under the circumstance where domestic and international investors' confidence in holding Asian currencies has substantially deteriorated, domestic and foreign assets can not be regarded as perfectly substitutable because investors perceive that domestic assets have become more risky as compared with foreign assets. The Portfolio balance model (PBM) allows changes
in perceived risk to play a significant role in determining the exchange rate. A substantial increase in the risk premium on holding domestic assets after the crisis countries allowed their exchange rate to float, was a major factor in contributing to the sharp depreciation of the Asian currencies in 1997. Hence a major contribution of this thesis is that the model developed will allow the effects of a change in risk perceptions to influence exchange rates and ultimately the current account balance as well as other key macroeconomic variables.

A comparative analysis of the theoretical framework and assumptions of these three models will be examined with the aim of developing a long run macroeconomic model for Thailand. The model to be developed can be used to analyze the macroeconomic consequences of exogenous shocks to the Thai economy operating during and after the crisis. This is the major aim of this study. Apart from these three models, the model developed also has its foundations in models such as Harvie (CH) (1993) and Harvie and Kearney (HK) (1994), which are long-run macroeconomic models which themselves have their theoretical foundations based on the three general models. The contributions of the CH and HK models are that they incorporate capital stock accumulation in stimulating economic growth. It also emphasizes the role of equity claims on the domestic physical capital stock in linking the financial and real sectors. Both approaches will be discussed in this study.

These three models, in particular the CH and HK models, provide the building blocks in developing a macroeconomic model for Thailand. The model to be developed enables the identification of the way in which exogenous shocks transmit their effects to the domestic economy. The domestic financial markets, which tend to adjust instantaneously, will transmit such shocks to the real economy through a change in interest rate, exchange rate and share prices and also through wealth effects on consumption/investment decisions. This forms the core of this thesis. The model will enable the exploration of future shocks to the Thai economy and the policy implications which flow from them. The model developed can be used to compare two approaches; the IMF approach which demanded the Thai government to tighten
monetary and fiscal policies in preventing and dealing with the Thai financial crisis in the initial stage of the crisis, and the Radelet and Sachs approach (RS) which viewed tightening of macroeconomic policies during the panic phase of the crisis led unnecessarily to a deepening of the crisis.

In addition, the model will pay particular attention to the major factors underlying the Thai financial crisis, such as: excessive non-productive investment; heavy reliance on short-term capital flows in financing its current account deficits; collapsing in aggregate supply brought about through financial and corporate sector insolvencies; real perception of risk. All of these are incorporated into the model, and represent novel contributions of this study.

The macroeconomic model for Thailand developed will be empirically estimated by using cointegration and error-correction techniques. These techniques allow for the possible determination of both long run and short run relationships among the economic variables involved. The estimation results will provide the basis for analyzing long run dynamic macroeconomic adjustment in Thailand. The estimated, and where found necessary imposed, parameters are then used to conduct a simulation analysis. The "Saddlepoint Program" will be utilized in order to achieve the objective of recommending appropriate policy settings in response to exogenous shocks, and in particular the Thai financial crisis since mid 1997, for economic development in Thailand.

1.2 Objectives of the Study

The study has four main objectives:

(1). To examine the factors underlying the development of world financial markets, including increased international financial integration and financial liberalization in both developed and developing countries, and the economic implications arising from world financial market developments. To achieve this objective an overview of world financial developments during the period 1944-1973 (the Bretton Woods system) and after the breakdown of the Bretton Woods system
(1973-1996) will be investigated, and will be presented in Chapter 2. Discussion will be focused upon critical factors in creating the process of financial globalization. Financial liberalization policies introduced in each of the crisis countries in the late 1980s and early 1990s, which was motivated by world financial market developments and which itself generate an environment of highly integrated world financial markets, has played a significant role in creating the financial crisis in these countries and spread over to other regions. Hence the economic implications from world financial market developments, and in particular financial liberalization policies, will be discussed.

(2). To analyze the causes, consequences and policy lessons of the financial crisis in Thailand and selected East Asian countries. Chapter 3 will provide an overview of the East Asian financial crisis by focusing on early warning indicators of the crisis. It then turns to an analysis of the factors generating the crisis that mainly came from the structural weakness in the domestic financial sector and policy mistakes at the onset of the crisis by Asian governments. The Thai financial crisis will be analyzed in more detail, focusing upon specific difficulties facing Thailand. Policy lessons of the crisis, in areas including financial liberalization, exchange rate policy, and management of capital flows will be emphasized.

(3). To develop a long run and dynamic theoretical macroeconomic model to analyze the effects of exogenous shocks arising from Thai financial liberalization policies in the late 1980s and the early 1990s, and their impact upon the development of the Thai economy. Particularly the current Thai financial and economic crisis is focused upon.

A macroeconomic model is developed in Chapter 5. It has its foundation in three general theoretical models, namely, the MF, DB and the PBA models which are presented in Chapter 4. The innovative components of the model developed in Chapter 5 are described in detail in the next section.

(4). To examine appropriate policies to overcome economic problems arising from exogenous shocks, such as those occurring in domestic and global financial
markets. This will enable an analysis of the macroeconomic consequences of exogenous shocks to the Thai economy operating during and after the crisis. In addition, the model developed in Chapter 5 will be utilized to identify and evaluate macroeconomic policies implemented by the IMF in response to the Thai financial crisis in the early stage. This is presented and discussed in Chapter 7.

To achieve objective 4 a numerical simulation of the theoretical macroeconomic model developed in Chapter 5 will be conducted. Such simulations will focus upon the adjustment of key macroeconomic variables, namely physical capital stock, aggregate supply, foreign asset stocks (or current account), trade balance, real exchange rate and the Tobin\'q ratio.

1.3 Methodology

1.3.1 Data Sources

The statistical data used in empirically estimating some of the model relationships developed in Chapter 5 is limited to annual data for the sample period 1960 to 1996 inclusive. The data is mainly from "the Data of National Income" estimated and collected by the National Economic and Social Development Board of Thailand (NESDB) and International Financial Statistics (IFS) published by the International Monetary Fund, (Washington D.C.). The other sources of the data used in this study is from World Bank, Bank of Thailand, the Economist, Far Eastern Economic Review, Asiaweek and various Web Sites (mainly from www.stern.nyu.edu/~nroubini/asia/asiaHomepage.html), and general literature concerning world financial developments since the Bretton Woods system (1944-1996), and also that concerning the current financial crisis in Thailand and East Asia.

In addition, in order to examine the long run dynamic macroeconomic adjustment process in response to projected shocks in Thailand, the coefficient parameter values were derived from both the estimation of the developed model in
Chapter 6 and previous macroeconomic models, namely SIAM1 and SIAM2\(^2\), and CH and HK for use in the simulation analysis.

1.3.2 Method of Study

**A. Developing a Macroeconomic Model**

This study will primarily be a modeling exercise. A macroeconomic model of Thailand will be developed and presented in Chapter 5. The model developed has its conceptual foundations in the original contribution of the three general models, namely, MF, DB and PBM models, and most importantly CH and HK.

In the CH and HK models, and also in this study, a deterministic framework is adopted. A deterministic model is one in which the adjustment process is determined or known by economic agents. The deterministic model used here is analyzed under the assumption of rational expectations and this is equivalent to the case of perfect foresight. It is assumed that non-financial markets are subject to sticky price and quantity adjustment in the short run but can vary over the long run. Such stickiness of adjustment of non-financial markets might lead to economic variables overshooting or undershooting their equilibrium values, and produces different adjustment processes. The analysis will emphasize both short and long run effects upon the development of the Thai economy. To capture the long run adjustment process the model developed will incorporate capital stock accumulation in the goods market and foreign asset stock accumulation arising from developments in the current account.

However, a number of significant amendments are required to make this framework more applicable to the case of Thailand. The model developed will pay particular attention to the effects of exogenous shocks arising from Thai financial liberalization policies in the late 1980s and early 1990s, and in particular the current Thai financial crisis, and their impact upon the development of the Thai economy. Four different scenarios arising from financial liberalization will be constructed and

\(^2\) SIAM 1 and SIAM 2 are macroeconomic models which have been developed by the World Bank and NESDB since 1980, for analyzing the impact of shocks on the macroeconomic adjustment processes in Thailand.
analyzed (in Chapter 5), in which an exogenous shock occurs in an economy operating with different exchange rate regimes and under different degrees of capital mobility. Scenario I represents an economy operating under imperfect capital mobility and a flexible exchange rate and this may be regarded as representative of the Thai economy during the period of the financial crisis since mid 1997. Scenario II is a situation of imperfect capital mobility associated with a fixed exchange rate. This scenario therefore is representative of the Thai economy prior to the current financial crisis. Scenario III is associated with perfect capital mobility and a fixed exchange rate. Scenario IV implies perfect capital mobility with a flexible exchange rate. As a result the model developed can be utilized to compare the macroeconomic consequences of exogenous shocks to the Thai economy operating prior to the onset of the financial crisis (under a fixed exchange rate regime) and during/after the onset of the crisis (under a flexible exchange rate regime). However in the context of this study, the simulation analysis in Chapter 7 will focus only upon the flexible exchange rate version of the model.

In addition the model developed will focus upon the important aspects of the current Thai financial and economic crisis, which have not been considered before for Thailand in the context of the theoretical framework adopted. Firstly, the role of productive and non-productive investment, during the adjustment process, in altering output supply will be explicitly analyzed. The crisis in the East Asian countries, and Thailand in particular, suggests that too much emphasize on non-productive investment, specifically in real estate, fueled real asset speculation and created a bubble in the property market. This may have been one of the factors which made these countries more vulnerable to a crisis. Secondly, to distinguish between the role of short-term and long-term capital flows and their impact on the economy. A higher share of short-term capital in total flows, the higher the probability of a sudden reversal of these inflows. The reason is that short-terms flows are perceived to be relatively more volatile and destabilizing than long-term flows to cyclical fluctuations in domestic and international interest rates. The heavy reliance on short-term, private
sector capital to finance large current account deficits was a crucial ingredient precipitating the Thai crisis. Thirdly, to distinguish the role between public investment spending and public consumption spending upon the adjustment process. Public investment may contribute to the level of aggregate supply. A massive cut in public spending, and in particular on infrastructure projects, in Thailand following the IMF program may lead to adverse developments for the Thai economy. The model will also pay particular attention to the relative riskiness of different financial assets. An increase in the risk premium on holding domestic assets seems to have played a significant role in the rapid depreciation of the Thai currency in 1997. In addition an exogenous shock arising from a collapse in aggregate supply brought about through financial and corporate sector insolvencies will be investigated. Finally the model will focus upon the adjustment of a flexible exchange rate regime under different degrees of capital mobility. All of these are major novel contributions of this study.

B. Estimation of the Model

The model is estimated using the Microfit 4 package. The data utilized for the estimation are yearly data from 1960 to 1996. Before estimating the model the relevant variables will be tested for "unit roots" to determine whether the variables are stationary or nonstationary. If nonstationary, trended data will cause misleading statistical and therefore economic inferences. It is therefore necessary to ensure that the relevant variables are stationary before proceeding to econometric estimation.

The Dickey-Fuller (DF) and the Phillips-Perron (PP) tests will be applied to test for the presence of unit roots. Tests for structural breaks are also conducted because failure to adequately account for breaks in the deterministic trend function can bias the Dickey-Fuller statistic toward incorrectly not rejecting the null hypothesis for a unit root.

In general practice if a series is found to have a unit root it is necessary to take differences of the variable involved before performing the regression analysis, so as to avoid problems of spurious regression arising from non-stationary time series. This does not seem to be an ideal solution because it may lose a valuable long-term
relationship between variables because the model in differences did not have a long run solution. However if variables are found to be cointegrated then there is a long run relationship between two (or more) nonstationary variables. In this case, although those variables themselves are nonstationary, a linear combination of them might be stationary. If that is the case the regression on the levels of the variables is meaningful (not spurious); and it does not lose any valuable long-term information which results from using their first (or higher order) differences instead.

The maximum likelihood cointegration technique (Johansen (1988) and Johansen and Juselius's (1990)) is applied to detect for the existence of long run relationships between the variables involved. Where evidence of a long run relationship is found, the error correction model (Granger (1986) and Engle and Granger (1987)) is estimated by OLS, incorporating the short run dynamic of the system with the information from the long run cointegration relationship.

C. Simulation

The parameters, both estimated and imposed, are then used to conduct a simulation analysis to examine what policy options should be used in response to future shocks. Due to the complexity of the model developed here, it is not possible to derive analytically unambiguous results for the steady state properties of the model. Hence, an analysis of the steady state and dynamic properties of the model is conducted by numerical simulation. The program utilized to derive these results is called "Saddlepoint", which is designed for solving linear rational expectations models with constant coefficients. It is a continuous time analogue of the first order linear difference model with rational expectations of the type studied in Blanchard and Khan (1980). The simulation results are presented in Chapter 7.

1.4 Organization of the Study

The second chapter will present an overview of world financial developments. This chapter will consist of three parts: evolution of the world financial system during the period of the Bretton Woods system (1944-1973), focusing upon the
reasons behind the rise and fall of the Bretton Woods system; developments of world financial markets from 1973 to date, focusing upon three markets, namely-foreign exchange markets, Eurocurrency markets and international bond and equity markets; and finally the economic implications of world financial market developments.

Chapter 3 reviews financial liberalization in Thailand and selected East Asian countries. This chapter is organized into three parts: it reviews the recent experience of financial crisis in East Asia by distinguishing indicators that might give warning signals of a currency crisis; explains the root causes of the ongoing financial and economic crisis in East Asia; specifies difficulties facing Thailand; and discusses the policy conclusions about the impact of financial liberalization on the macroeconomic consequences in East Asia.

Chapter 4 reviews the theoretical models concerned with financial liberalization and its macroeconomic effects in a small open economy. A comparative analysis of the three basic theoretical models, namely, the MF, DB, and PBM will be examined. These three models will be analyzed to identify the macroeconomic adjustment process arising from the effects of financial liberalization.

Chapter 5 aims to develop a dynamic macroeconomic model for Thailand based on the contributions of these three models, in particular the PBM model and most importantly that of the CH and HK models. However a number of amendments to these general models, and also that of CH and HK, are discussed in order to make them more applicable to Thailand.

Chapter 6 presents the empirical estimations derived from the model developed in Chapter 5. The data sources and the econometric methods used to estimate the model will be described. Tests for the existence of unit roots to determine whether the time series are stationary will be explained and conducted. A cointegration analysis and an error-correction model will be conducted in order to obtain long run and short run estimated coefficients for the model presented in chapter 5 respectively.
Chapter 7 presents the simulation results and the policy implications for Thailand. The simulation analysis was conducted in order to analyze the macroeconomic consequences of exogenous shocks arising from the current Thai financial crisis on the Thai economy. The major factors creating the Thai crisis are as follows: an increase of non-productive investment in stimulating an excessive aggregate demand; an increase of short-term flows in financing large current account deficits; an increase in the risk premium on holding domestic assets, in generating the rapid depreciation of the Thai currency in 1997; and finally a substantial decline in aggregate supply as a result of financial and corporate sector insolvencies.

In addition the simulation is conducted so as to analyze competing macroeconomic policies including that of the IMF in response to the Thai crisis in the early state. The results from the simulation analysis will be use to draw the major lessons that follow from the impact of such shocks and the impact of alternative policy response to it.

A summary of the major conclusions, and issues for further study, and their relation to the stated objectives in the introductory chapter are presented in Chapter 8.