FINANCIAL SECTOR REFORMS IN THE ASEAN ECONOMIES IN THE 1980s: MACROMODELLING OF DEBT AND TWIN DEFICITS

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INTRODUCTION

Background

Debt is an important form of financing economic development, especially external debt is in the form of foreign exchange inflows. Exports may not bring in the necessary amount of foreign exchange needed for more imports, or foreign direct investment may not be sufficient for rapid economic development. Debt may bring in benefits/profits or may become a problem of liquidity or solvency. Debt is profitable when its usage brings in discounted streams of rates of return greater than its discounted streams of costs. Illiquidity is a short-run inadequacy of foreign exchange whereas solvency is a long-run problem in the same respect. Debt crisis - a long run solvency problem - refers to a situation where a country or a region undergo rescheduling; i.e. postponement of interest and principal repayments as a result of inability to repay debt. Rescheduling occurs often through the process of negotiations between debtors and creditors. A country can also declare a moratorium which is more severe because it means repayments of interest or both interest and principal are stopped temporarily until creditors agree to negotiate.

The 1980s marked a decade where there were developing country-wide debt problem. The nature of debt problem broadly differ among regions. The Latin American countries went into debt crisis due to excessive borrowings in the international credit markets including the Euro-currency market. The debt crisis in the African region predates that of the Latin American's due to scarcity of foreign exchange earnings via exports. The ASEAN region has lesser debt problems of illiquidity in nature, thus perceived as creditworthy by over-viewers, facilitating more capital inflows in either the form of foreign investment or foreign debt.

Although debt and deficits mounted in the ASEAN region, growth of output though relatively low, were positive. In the late 1980s, the growth of output increased together with the mounting debt and increasing deficits. All of the ASEAN countries were categorised among the heavily indebted developing countries in the mid-1980s; South Korea ranked fourth, Indonesia, the Philippines and Thailand (possibly Malaysia too) ranked amongst the top ten. The puzzling question is how did they not ran into debt crisis! Is the usage of debt profitable in the ASEAN countries? These questions are the rationale for investigating the ASEAN experience. There is also a lack of concern pertaining to debt and deficits in the ASEAN region while there are widespread concern about

the Latin American debt crisis. In chapter 2 we indicated that the world has focused too much on the crisis aspect of debt! We are also concerned with the question as to whether ASEAN can turn from being major debtor to creditor (or capital exporting) countries, with its movement towards "NICdom' or towards 'high-growth' region.

The usage of debt in ASEAN is mostly by the private sectors in tradables which brings in exports earnings as opposed to usage by the government sector in basic infrastructures. Aggressive industrialization policies in the region have promoted exports diversification and reduced import protection. Hence, debt usage is likely to generate foreign exchange in these circumstances. Debt is in yen denominated, as opposed to the US dollar denominated, in the Latin American countries. Possibly the terms and conditions of loan differ, appreciation of the dollar does not affect valuation changes and debt denomination matches major currency in exports earnings.

The study of debt and deficits links up the financial and the real sectors of an economy. External deficits reflect deficits in the government or the private sectors (or both). To prevent debt from becoming a problem, both internal and external accounts should be considered.

Structure of the thesis

This thesis addresses issues of debt and the twin deficits - two serious 'economic ills'. The central issue in this thesis (Part II) is on macromodelling of the twin deficits in an attempt to identify their determinants. This involves an investigation of the underlying theory and empirical evidence to show the workings of the links between debt and the twin deficits and between the twin deficits themselves. The usual practice in both theory and in empirical work, is to take the accounting identity and one or two other variables that are hypothesised to have effects on the twin deficits and posit causal linkages. We try to avoid this by building on the stylized facts on each of the macroeconomic aggregates and linking them to debt issues in building a full structural model of debt and the twin deficits. We arrive at a system of simultaneous equations, which none of the previous theory or empirical work has derived. We rename the deficit system of simultaneous equations which incorporates a debt identity and an output equation the 'new twin deficits' model - signifying a departure from the conventional wisdom discussed in the literature survey.

With the macromodel, we address three issues simultaneously, which are:

(1) the linkages between twin deficits and increased indebtedness.

(2) the details of internal policies that have effects on the twin-deficits and increased indebtedness.

(3) the linkages between debt, twin-deficits and output.

The first issue involves the broader mechanism that explains the link between the government, the private and the external sector balances, and their links to changes in debt. Previous studies on the twin deficits covers the first part of this issue and gives evidence for the U.S. that the government sector caused the unprecedented level of external deficits in the mid 1980s and early 1990s. In our case, we argue that the change in debt equals the external deficits because according to our findings in Part I debt and deficits seem to co-move.

Our macromodel also focus on the second issue, that is, the details of the internal policies that affect each of the three sector deficits and eventually increased indebtedness. The variables involved are numerous such as tax policies (rates, revenue elasticities, etc.), financial policies (interest rates, investment versus savings behaviour, etc.), trade policies (import liberalisation/control, exports strategies, exchange rates, prices, etc.), debt policies, etc. as shown in the system of simultaneous equations in Chapter 5. Although the variables are numerous, there are some common ones appearing together in either two or all three of the system of equations which are expected to cause co-movements in the system. Obviously, consideration has to be made on their significance, magnitude and signs.

The third issue involves recognising the supply side in response to debt and deficits which are demand-side management. The model thus ensures not only equilibrium in the internal and external sectors but also equilibrium in aggregate supply and the aggregate demand. The former equilibrium always holds because the identity serves as a constraint. For the latter equilibrium to hold, either one or a combination of the price variables found in the system adjust to maintain equilibrium in the short-run, while output adjusts to maintain equilibrium in the long-run.

Having outlined the core of the thesis, it is appropriate to comment on the other parts. Part I presents the roots of debt and deficits; how developing countries accumulated debt and how it became a crisis in the 1980s. The debt and deficits situation in ASEAN in the 1980s is a particular focus. The essence of debt problem seems to be the adverse economic situation of the 1980s, against the background of mounting accumulation of debt. Exogenous shocks such as the second oil shock, terms of trade shocks, interest rates hikes, dollar exchange rate appreciation, are among the factors

that are associated with debt problems. Debt and deficits co-move in the representative Latin American and ASEAN countries. Differences among regional experiences are highlighted. For example the African countries went into debt problem not because of debt accumulation. The main crux of their problem is non-performance export sector. Excessive lending by creditors are associated with the Latin American countries, apart from loans contracted on floating rates which are associated with valuation changes and capital flight. The ASEAN region moved towards yen credit in the mid 1980s, presumably insulating their economy with further spill-overs from other NICs' recycling of surpluses. The differences in experiences necessitates different treatment, or case by case approach to debt problems.

In Part III, we present some empirical work on aspects of debt management. Debt servicing capacity or creditworthiness is examined using the logit approach. We built-in the marginal and elasticity analysis into the logit model so as to identify which variables are the most significant determinants. The exercise combines variables taken from the balance of payments and financial variables from the balance sheet to detect which variables cause debt servicing breakdown. The breakdown of debt servicing capacity is proxied by reschedulings, taken in terms of probabilities because it is not known *a priori* that a debtor will become illiquid and unable to repay interest payments falling due. We postulate that it is the foreign exchange scarcity, measured by their net borrowing requirements which comprise of the current account deficits including interest repayments and the principal due, that drive a country to demand for rescheduling.

We investigate the determinants of rescheduling for each region separately to capture the differences in their experiences with indebtedness. The most important determinants of rescheduling are; the ratio of the current account deficits to export, the reserves to import ratio and the total debt to exports. In the African sample, the current account deficits to exports, the total debt to exports and the use of IMF credits are the most important determinants for rescheduling. As in the case of the Latin American countries, The current account deficits to exports, the debt service ratio and the use of IMF credit are most important. In ASEAN, the debt service ratio appears to be the single most significant ratio. Thus, the differences in experiences among regions, a cross section for all developing countries will ignore the uniqueness of each region in running into debt servicing difficulties.

In the last part of the thesis, the exchange rate management is discussed in Chapter 7, relating exchange rate to import and export demand function to eventually determine the contribution of foreign exchange, through the elasticity approach, towards foreign

exchange earnings and reducing debt service. Debt service seems to have links with exchange rates movements. We suggest that devaluation does have positive effects in the ASEAN countries to increase its foreign exchange earnings.

Finally, we conclude and suggest some policy implications, especially pertaining to our twin deficit model. It is hoped that ASEAN would turn the already huge debt accumulation to more profitable investments so that not only timely repayment of loans is possible, the growth of output is ensured and the sustained industrialisation is possible!

PART I: BACKGROUND

CHAPTER 1: ORIGINS OF DEVELOPING COUNTRY DEBT AND DEFICITS IN THE 1980s.

1.1 Introduction

The events most closely connected with the sharp increase in international bank debt for the developing countries were the massive oil price increases of 1973-74 and 1979-80 and the worldwide recession of 1981-82. The oil shock of 1973-74 had a significant effect on international lending. Borrowing was necessary to smooth the adjustment to the oil shock. Lending expanded in association with the expansion of the Euro-currency market and international bank lending (OECD Survey, 1983). Besides other non-bank funding sources, a special oil facility was set up by the IMF to make adjustment financing easier. Still, commercial loans became the main source of funds for a small group of borrowers - the middle-income developing countries. The availability of such funds appeared likely and international lending was viable, since borrowings did not retard most of these countries' prospects at least to the extent that they continued to grow rapidly (see pages 23 and 24 for example, for the growth trends of some of the higher income countries of Latin America and ASEAN, respectively). However, the 1970s decade marked the beginning of debt build-up.

After the second oil shock, the debt picture began to worsen. The global economic system was subjected to a number of strains which contributed to the eventual breakdown in international lending. The second oil shock emphasized the continued need for further real adjustment to the oil price rise by the major developing-country borrowers. It was also becoming apparent that the favourable performance of developing nations in the mid-1970s had resulted in part from the availability of bank financing itself. Although it might have been appropriate after the second oil-shock for developing countries to borrow funds on a temporary basis to finance the needed adjustments, a permanent expansion of debt was not justified.

In 1982, the full scope of the recent debt problems among developing countries became evident. Massive arrears on external payments necessitating partial or total suspension of debt servicing and a host of ad hoc official and private rescheduling arrangements have characterised the international financial market since 1982. The former net flow of capital from the industrialised countries to the non-oil developing countries has been reversed, as interest payments on accumulated external debt exceed net new inflows of foreign capital. Estimates by the IMF suggest that there was a resource flow from the seven largest developing country borrowers to the creditors of an amount of US$ 32 billion in 1985, or nearly one fifth of their entire earnings from the sales of goods and services (International Financial Statistics, 1987/88).

The debt problem in the 1980s resulted from a number of related factors - cumulative changes in the magnitude and structure of developing countries' borrowing that had been taking place since the early 1970s; inappropriate domestic policies - including both inadequate demand management and policies that lowered the productivity of resources; and an unusual conjuncture of adverse external developments (Solomon, 1992). The adverse impact of the exogenous shocks namely the first oil shock of 1973/74, the second oil shock of 1979/80, lower commodity prices throughout the 1980s (apart from a small increase in 1987), the increase in real interest rates from 1971 to 1985 and the increase in the US dollar from 1980 to 1985 combined to cause further deterioration in current account deficits, increased the gross indebtedness and slowed down the growth of output of developing countries.

In 1989, Solomon's appraisal of the debt situation showed little has changed and the debt problem continued (Solomon, 1992). Upon examining the fifteen heavily-indebted countries, Solomon concluded that the essence of the debt problem, apart from poor domestic policies, had been the negative net outward transfers (net borrowing minus interest payments).

The performance in 1990 and 1991 has been very much affected by recessions and slowdowns in the industrial countries. For example, export volume increased only by 1.3% in 1991 in the fifteen heavily-indebted developing countries compared to 4.9% in 1986-1988. The terms of trade of those debtor countries deteriorated to -1.7% and -3.4% in 1990 and 1991 respectively as compared to +1.3% in 1989 (Solomon, 1992).

This chapter attempts to explore the origins and growth of the 1980s developing countries' debt - at the time when debt became a problem leading to iliquidity world-wide. We focus on the relationship between external debt, balance of payments deficit and growth of output since the late 1970s. Although our later findings suggest that the causes of indebtedness in general are similar across developing countries, the emergence of debt problems seemed to differ in some ways among regions. Some comparative analysis between regions will also be discussed. The role of debt and non-debt creating flows in financing current account deficits will be highlighted.

In the next sub-section of the chapter, the economics of debt is outlined. In the second section, the origins and growth of developing countries' debt will be presented. In the third section, the focus is on the financial and commodity price risks that confront the indebted developing countries. The fourth section assesses debt burden and debt's association with deficits and growth. In the fifth section, the focus is on comparisons

on financing current account deficits by debt and non-debt creating flows among regions.

1.1.2 The Economics of External Debt

External debt relaxes the constraint imposed by domestic saving and foreign exchange. It allows a country to enjoy a higher standard of living in the short-term than it otherwise would have been. The benefits of debt depend on how it is used and on the marginal productivity of capital. By borrowing externally, countries are, in effect, trading off future domestic absorption (i.e. consumption and investment) in favour of current absorption.

Borrowing initially allows investment to exceed domestic saving, and imports to exceed exports. The condition has to be reversed at some future date (in accordance with the terms of loans stipulated) in order to service the debt. In other words, the savings gap has to be closed in order to generate excess saving to service debt. Since external debt has to be serviced in foreign exchange, it is then necessary to convert the excess saving into foreign exchange, and to achieve this, exports have to increase relative to imports.

Taking the simplest savings function whereby aggregate saving depends on the level of income, saving will increase either when the propensity to save increases or the national income increases. For both conditions to occur simultaneously, the marginal propensity to save must rise, or the usage of loan causes national income to rise. If repayment of the principal could be financed by further borrowing, national income will rise provided the marginal productivity of the resources borrowed exceeds the rate of interest on borrowing. However, marginal productivity is often difficult to determine in developing countries, especially when loan contracted are for infrastructural projects.

Foreign exchange will increase if exports exceed imports or if there is import substitution (all in value terms). A shift of domestic resources to the tradable sector is thus required. The timing of debt repayments is very important in debt management. If the solvency criterion is fulfilled, (i.e. the marginal productivity of resources borrowed exceeds the rate of interest on the loan), liquidity problems may still be encountered in certain years of temporary shortages of foreign exchange. Liquidity problems may end up as solvency problems if lenders become less keen on refinancing debt or decide to increase the spreads on loans because of increased risks.

Also, borrowers may have to repay debt in certain specific foreign currencies, yet their foreign exchange earnings may be in other currencies. Variations in exchange rates can therefore create debt difficulties if the earning power of exports fall when expressed in the particular currency required.

We can outline the use of debt by reference to the balance of payments items. Assume that the growth of imports of capital goods leads to an increase in investment, and an increase in investment further increases the growth of output. Further, assume that the growth of output is associated with the growth of capital, holding other factors of production constant, any increase in the inflow of capital, used to finance imports of capital goods leads to an increase in the growth of output. Thus, firstly, if debt is used to finance imports other than imports for consumption goods, the growth of output will be sustained. Dornbusch (1987) considers import availability as exports plus new borrowings less debt service, and import availability is the constraining factor on growth. If new borrowings fall short of debt service payments then export revenues cannot fully finance imports, limiting import volume and hence growth.

Secondly, in terms of the balance of payments items, debt can also be used to finance interest payments, principal repayments and capital flight. If debt is used for financing these items, then gross indebtedness will increase, output will not grow and the current account deficits will rise because more interest will be incurred on new debt and any excess imports are not financed. This is the condition that may lead to debt problems.

Thirdly, debt can be used to finance reserve holdings. In this case the gross indebtedness will increase without any rise in the growth of output. However, it may be associated with an increase in the current account deficit because of growing interest payments on debt, but the reserves can then be gradually drawn down if the need arises to finance the deficits.

Debt financing may or may not become a problem. The analysis that follows from now on detects how and why debt became a problem in the 1980s, hence, historical data especially prior to the debt crisis are important indicators. It will be shown that financing by debt in the 1970s is associated with increasing growth of output, whereas debt financing after the second oil-shock is the root of the debt problem.

1.2 Origins of Developing Countries' Debt Problems

The significant growth of developing countries' debt began in the early 1970s when there was an expansion of the Euro-currency markets and international bank lending in general in that period (OECD Survey, 1983). There was an expansion in demand in the industrial countries in 1972 and 1973 which caused increases in commodity prices by 13% and 53% respectively. As a result of the commodity price boom, there was an improvement in the terms of trade of developing countries in 1972 to 1973 (World Economic Outlook, April 1988). The effect was the emergence of a number of creditworthy developing countries with healthy balance of payments' positions and strong growth potential. Borrowing did not cause a debt problem in the 1970s, in that, there was no mass reschedulings or debt defaults. The oil price increase from US$ 2.70 a barrel in 1970 to US$ 10.00 and above in 1974 and 1975 (World Economic Outlook, 1988), had immediate effects on current account balances around the world.

Table 1.1: Current Account Balances, 1973-1988 (US$ bns)

Year	Industrial countries		Developing countries		Total
	7 largest	Others	Oil-exporting	Non-oil	
1973	12.7	5.0	6.7	-11.6	12.8
1974	-4.9	-8.9	68.3	-37.0	17.4
1975	22.1	-4.3	35.4	-46.5	6.7
1976	7.5	-9.7	40.3	-32.0	6.1
1977	7.6	-12.6	30.8	-28.3	-2.4
1978	33.9	-3.5	2.9	-39.2	-5.8
1979	2.7	-12.9	69.8	-58.9	0.7
1980	-17.5	-26.2	116.4	-86.2	-13.7
1981	13.0	-16.7	68.6	-99.0	-34.1
1982	23.5	-12.5	25.0	-97.0	-61.0
1983	-0.9	-2.7	-22.2	-42.0	-67.8
1984	-8.8	3.7	-7.6	-26.2	-38.9
1985	-7.5	1.3	3.6	-27.5	-30.1
1986	-2.6	0.5	-32.7	-14.3	-49.1
1987	-5.3	-1.7	-10.5	-9.2	-26.7
1988	-6.2	-0.8	-4.0	-15.3	-26.3

Source: World Economic Outlook, 1986, 1987, 1988

Table 1.1 shows the current account position of major groups of countries from 1973 to 1988. The pattern in 1973 is typical of that prevailing before the oil shock, surpluses in the industrial countries and deficits in the non-oil developing countries. The oil-exporting countries moved from a surplus on their current account of US$ 7

billion in 1973 to about US$ 68 billion in 1974.

The current account surplus of the industrial countries of US$ 12 billion in 1973 deteriorated to a deficit of US$ 4 billion in 1974. From 1975 until 1978, the surpluses of OPEC countries were deposited in the larger industrial countries. Thus, a large proportion of the OPEC surpluses were deposited in the international capital markets (Bank of England Quarterly Bulletin,1981). The oil-price rise effects on oil-importing developing countries was even greater. Their current account deficits rose from US$ 11 billion in 1973 to US$ 37 billions in 1974. Meanwhile in 1975, the pressure of demand fell in industrial countries which was associated with commodity prices to fall by 19% (World Economic Outlook, April 1988). The non-oil developing countries incurred larger deficits amounting to US$ 46 billions in spite of slower growth as a result of the oil-price increase, thus a reduction in their terms of trade as well as developing countries' contraction of imports reduced their exports.

The second oil shock of 1979/80 led to almost the same balance of payments pattern. Prices of Saudi crude oil rose from US$ 13 a barrel in 1978 to US$ 32.50 in 1981 (World Economic Outlook, 1988). The OPEC nations ran huge surpluses in 1979 and 1980 which were quickly deposited in the industrial countries because of their low absorption capacity. The current account deficits of non-oil developing countries increased drastically. Oil as a percentage of import payments in the non-oil developing countries was 5.9% in 1973 but rose to 21% in 1981, and hence became the largest and fastest growing item (World Economic Outlook, 1988). Among the industrial countries, the current account of the seven largest industrial countries shifted drastically towards deficit in 1980 but moved into surpluses again in 1981 and 1982. Other smaller industrial countries moved slowly towards balance while other developing countries had their largest deficits in 1981 and 1982. This was the period when the debt "crisis" became evident. After 1982, the balance of payments position shows that the oil exporting countries recorded deficits again in 1983 and 1984 with a counterpart surplus in other industrial countries (see Table 1.1). The seven largest industrial countries record deficits between 1983 and 1984 largely composed of huge deficits incurred in the US. The deficits of the non-oil developing countries reached their peak in 1981 and 1982 of more than US$ 97 bn. Since 1984, deficits of the non-oil developing countries gradually decreased.

The main source of financing the deficits after the first and second oil shocks was external borrowing and the creation of foreign denominated debt. In 1973, that is before the first oil shock, non-debt sources in the form of official aid and foreign direct investment financed 80% of the deficits of developing countries (IMF Annual

Report, 1982), and most borrowings were used to build up reserves. From 1974 to 1979, non-debt sources provided only one-third to one-half of the much larger volume of financing and since then, the ratio has fallen even further. While debt became the primary source of financing, the extent to which debt has been offset by increases in reserves has diminished rapidly: the ratio of reserve accumulation to net external borrowings averaged 45% in 1976 to 1978, fell to 25% in 1979 and plunged below 8% in both 1980 and 1981 (IMF Annual Report, 1982).

The growth of debt financing reflects growth of the recycling role of the international banking and capital markets after 1970 - a characteristic of the deployment of the oil exporting countries' surpluses (Bank of England, Quarterly Bulletin, June 1981). For the oil-importing countries, official reserves can provide at most only a temporary, or cyclical financing role. Consequently, the banking system has been required to transform its predominantly short term liabilities to oil-exporting countries into longer term loans to deficit countries (Bank of England, Quarterly Bulletin, June 1981).

1.2.1 Private versus Official Debt

Table 1.2 shows that the volume of all types of debt - private or official (except short-term debt) grew faster between 1975-79 compared to 1970-74. Total debt stocks grew by 212% between those two periods. Public and private long term debt each grew at 179% and 108% respectively. The growth of the use of IMF credit is highest at 392% in the period between 1970-74 and 1975-79. Between 1975-79 and 1980-82, i.e. the years after the second oil-shock and during the occurrence of the debt crisis, all types of debt, except short-term debt, continued to grow substantially, albeit at a lower rate than from 1970-74 to 1975-79. Short-term debt grew rapidly by 237%. Between 1980-82 and 1983-86, the growth of all types of debt were substantially lower than in the 1970s period. The growth of short term debt declined by 14.5% reflecting the refusal of banks to roll-over short term debts as they matured.

While reliance on loans as a form of financing had become greater, the source of credits had shifted from official and concessional loans to bank loans. Official loans on concessional terms accounted for over 46% and 36% of the outstanding long term debt in 1971 and 1975, respectively (OECD Survey, 1983). Bank loans were the source of only 14% and 32% of the total long term debt outstanding in the same period. By the end of 1982, however, bank loans were the single largest source of long term financing, accounting for about 48% of developing countries' financing

(OECD Survey, 1983). Concessional loans accounted only for 19.3% of the total long term debt (OECD 1983 Survey).

Table 1.2: Debt Figures for all Developing Countries (US $bn)

Year	Debt Stock	Long-term debt	Publ. & Publ. Guaranteed debt	Private non-guaranteed	Use of IMF credit	Short-term debt
1970-74	97.4	96	73	23	1.4	-
1975	304	252	204	48	6.9	45.1
1979	580	437	362	75	9.4	133
1980	673	503	407	95	15	155
1981	752	562	460	102	20.7	169
1983	815	645	533	111	30.9	140
1984	851	686	577	109	33.4	131
1985	962	793	690	103	37.6	131
1986	1053	894	800	93	40.2	119
1987	1169	996	905	90	40.2	133
1990	1518	1210	1010	200	35	274
1992	1662	1309	1100	190	38	316
1993	1770	1411	1200	210	39	321
% growth bet. 1970-74 and 1975-79	212	162	179	108	392	-
% growth bet. 1975-79 and 1980-82	119	98.6	100	88.9	118	237.7
% growth bet. 1980-82 and 1983-86	37	50.6	58.6	14.7	136	-14.5

Source: World Bank, World Debt Tables, various issues.

In 1983, official-concessional loans accounted for about 19% of total long term debt and private loans accounted for about 60% (World Economic Survey, 1989). In 1986, official-concessional loans were 20% of total long term debt and private loans 55%.

Bank loans for all developing countries were US$ 127.7 bn in December 1977 and have increased rapidly thereafter (see Table 1.3). By June 1982, bank loans outstanding reached US$ 343.5 bn before the 'debt crisis' finally slowed the growth of flow of funds. Yet loans to developing countries still reached US$ 362.7 bn by the end 1982. Argentina, Brazil, Chile, Mexico, the Philippines, South Korea and Venezuela accounted for most of this bank debt. Their share, which was at its lowest in 1978 at 51.5%, increased continuously to 62.7% in June 1982 and then fell to 61.7% by the end of 1982. Mexico and Brazil had the largest bank debts outstanding.

Table 1.3: Bank Loans To Developing Countries (in US$ bn).

Country	1977	1978	1979	1980	1981	1982
Developing Countries	128	174	235	279	327	362
Seven major developing countries	69	89	128	166	201	240
Argentina	4.9	6.7	13	19.9	24.8	25.7
Brazil	25	32	38.6	45.7	52.5	60.5
Chile	1.6	2.9	4.9	7.3	10.5	11.6
Mexico	20.3	23.3	30.9	42.5	57.1	62.9
Philippines	3.4	4.2	7.4	9.3	10.2	12.6
S.Korea	5.2	6.9	12	16.7	19.9	23
Venezuela	9.1	14	20.8	24.3	26.2	27.5
Proportion of all developing-country borrowing (percent)						
Seven major c'tries	54.4	51.5	54.3	59.3	61.6	61.7
Brazil	19.6	18.2	16.4	16.3	16.6	16.7
Mexico	15.9	13.3	13.1	15.2	17.5	17.3

Source: Bank For International Settlement, 1983.

Clearly banks have concentrated their 1980s lending in a small group of developing countries, despite the fact that banks lend to public or private sector borrowers from over 120 developing countries in Asia, Africa, Latin America and the Caribbean (Bank For International Settlement (BIS), 1983).

As it stands in 1989 and in 1990, bank credits to all developing countries are US$ 14.6 bn and US$ 13.4 bn respectively (World Debt Tables 1993). Lending are confined only to creditworthy borrowers who have not rescheduled. Main receivers are China and to a lesser extent the Philippines and Thailand. S.Korea and Indonesia reduced borrowings from banks. Latin America's access are limited, however, by contrast, it is the major borrower in the international bond market.

1.2.2 Fixed-interest versus Floating-interest Debt

The effect of interest rates on interest payments depends on the nature of debt, whether the debt is fixed-interest or floating-interest, and on the variability of interest rates themselves. Fixed interest rates have been lower than floating interest rates because fixed-interest loans have subsidised terms or are channelled through multinational lending institutions such as the World Bank. So, fixed interest rates tended to be official debt whereas floating rate is commercial debt. The total net floating-interest debt[1] of non-oil developing countries was US$ 49 bn in 1978 but increased to US$ 90 bn in 1980 and to US$ 166 bn in 1982 (OECD Survey, 1982).

Between end 1979 and end 1982, the fixed and floating interest rates rose (as shown in Table 1.4) which, together with the massive increase in borrowing over the same period, causing interest payments on long term loans to double from US$ 25 bn in 1979 to US$ 50 bn in 1982 for all developing countries. For non-oil developing countries, the interest payments rose from US$ 17 bn to US$ 35 bn. The annual increase in the interest bill was running at around US$ 8 bn on average for all developing countries. The bulk of this increase was accounted for by a few major borrowers having high floating interest debts. From Table 1.4, it can be seen that interest payments grew as much as amortization payments between 1980 and 1982 but registered a higher growth than amortization payments in 1983. This indicate the increase in interest rates payments was faster than the increase in total borrowings.

In 1983, interest payments fell slightly as compared to 1982 due to the fall in interest rates on floating-interest debt (OECD Survey, 1983). Interest arrears, however, did build up in 1983 more than in 1982 and the fall in interest payments recorded in 1983 reflects that there were arrears in interest payments together with a fall in interest rates.

Table 1.4: Total Long Term Debt Service During 1971-83 (US$ bn)

-	1971	1975	1979	1980	1982	1983	1986	1990
All Developing countries								
Total Debt Service	10.5	25	71	82	108	96	156	176
of which: Interest	3.2	8.8	25.5	35.2	50.3	48	74	76
Amortization	7.3	16.3	45.7	47	57.3	48	82	99
Non-oil dev'ping etries								
Total Debt Service	7.2	17.3	48	53.9	72.4	62.5		
of which: Interest	2	5.9	16.9	24.5	35.9	35	-	-
Amortization	5	11.4	31.3	29.4	36.5	27.4		

Source: OECD Survey, 1983 and World debt Tables, 1993.

1.2.3 Terms of Trade

The effect of changes in trade volumes and prices on trade performance of non-oil developing countries can be deduced from Table 1.5. The export earnings over the period 1974 to 1976 increased by 95.8% compared to the period 1971 to 1973. The movements of the unit value of exports index shows an increase from 38.2% in 1971 to 1973 to 63.4% in 1974 to 1976, i.e. showing an increase of 25.2%. The increase in export earnings in 1974 to 1976 as compared to 1971-73 thus reflect a 25.2% increase in the prices of exports. The remainder of the increase can be attributed to increased export volumes.

Although exports earnings grew, import bills grew even faster than the growth of export earnings in the years 1974-76 as compared to 1971-73, which tended to cause deficits in the trade account. The percentage growth is 110.2%. This largely reflects the increase in the import bills for oil.

On average, the change in the terms of trade, which is the price of exports over the price of imports, is negative (-3.2%) in 1974-76, showing a deterioration of 2.93% from that of 1971-73. The negative change naturally has an adverse effect on the average purchasing power of exports in 1974-76, since the purchasing power of exports is equals to the volume of exports multiplied by the terms of trade.

Table 1.5: Trade Indicators For Non-Oil Developing Countries

Trade Indicators	1971-73	1974-76	1978	1979	1980	1986-88
Export earnings (US$)	72.6	142.2	209.1	268.8	335.2	trade balance =213
Imports (US $)	89.6	188.4	263.4	327.9	424.7	
Export Unit Values (1980=100)	38.2	63.4	77	88.2	100	105.5
Import Unit Values (1980=100)	33.1	59.2	70.6	83.9	100	102.5
Terms of Trade (% change over previous year)	-0.27	-3.2	-4.3	-3.6	-4.9	2.3

Source: International Financial Statistics 1989.

Export earnings grew by 122% in 1979-81 as compared to 1974-76. This growth is higher than the growth of imports which is 112.7% in the same period. However, in all the years between 1979 to 1981, import expenditure well exceeded the export earnings, causing deficits in the trade balance.

Export unit values moved favourably until 1980 but declined in 1981, hence, constituting a growth of 48.6% in 1979-81 as compared to 1974-76. However, import unit values grew faster than export unit values in 1979-81 as compared to 1974-76, i.e. by 60.6%. The faster growth in the unit value of imports contributed to a negative growth in the terms of trade of 5.1% in 1979-81.

After the outbreak of the debt crisis in 1982, the growth of export earnings fell considerably by 12.1% in 1982-86 as compared to 1979-81 due to lower commodity prices in 1981-84. The growth of import bills fell by 0.52% between 1979-81 and

1982-86. The growth of unit value exports and the unit value of imports fell by 14% and 8% respectively in the same period. The terms of trade deteriorated by 0.04%. Given these conditions naturally the trade balance worsened during that period.

1.2.4 Debt Service Ratio

Debt service ratio refers to interest payments plus principal payments divided by exports earnings. Debt service ratio is increased when there is an increase in debt contracted which increases the interest and principal payments; an increase in interest rate which increases the interest payments; or a decrease in exports earnings. A country with a rising debt service ratio reduces its ability to import and increases its vulnerability to fluctuations in export earnings. A higher probability of rescheduling is thus anticipated. The debt service ratio for all developing countries rose from 8.0% in 1975 to 11.7% in 1980 and 20.2% in 1986 (World Debt Tables, 1988/89). Out of these figures, interest payments over exports of goods and services was 3% in 1975 rose to 5.3% in 1980 and 9.8% in 1986.

To summarize, from the analysis above it can be concluded that the emergence of debt financing started after the first oil-shock but grew substantially after the second oil shock. Debt financing was mainly used to finance interest repayments in the 1980s rather than expansion of imports, reducing their ability to increase the growth of output. The increased usage of debt-creating flows in the 1980s was also due to the increased availability of credits due to the expansion of the Euro-currency markets as well as availability of bank loans in general. Also the higher debt service burden was attributed to floating interest-debt contracted by major debtors. The poor trade performance in the 1980s caused partly by poor terms of trade also aggravated the debt problems.

In the assessment of debt burden that follows in section 1.4, our focus will be on regional-specific factors as well as general factors that are seen to affect the balance of payments and the emergence of debt and debt problems. In what follows in section 1.3, the price risks shall be discussed.

1.3. Financial and Commodity Price Risks Confronting Indebted Developing Countries.

Fluctuations in international interest rates, exchange rates and world commodity prices

can affect the financial situation of indebted developing countries through various channels which is explained in the respective sections below.

1.3.1 Interest Rate Variability

Since external bank debts of developing countries are often indexed to London Interbank Offer Rate (LIBOR), it is of interest to measure the fluctuations in the real and nominal LIBOR to show interest rate variability. A large portion of developing countries' international borrowing has been denominated in US dollars. Since 1972, there have been large fluctuations in both nominal and real international interest rates. Nominal interest rates are calculated as the average of the monthly interest rates observed over the preceding one or two years. Real interest rates are calculated by initially taking the percentage change in an index of the export prices over the preceding year, then adjusting LIBOR by this percentage change. From Chart 1 (Appendix 1), it can be seen that there are fluctuations in either nominal or real (with very large fluctuations in the real) interest rates in the 1970s and 1980s.

The interest payments on debts are affected by interest rate volatility, hence affecting the current account position. The interest payments portion of the debt service is affected through the increased real cost of loans especially during the period 1979-1982. Before the mid-1970s, interest rate volatility had little influence on the interest payments of developing countries because most debt contracted was at fixed rates and from official sources. After 1973, developing countries had become much more dependent on private external financing. The consequence was a marked shift from non-debt creating flows (official transfers and private direct investment) to debt--creating and interest sensitive borrowing in world capital markets. The cost of borrowing is vulnerable to the volatility of interest rates because it is tied to LIBOR or the US prime rate plus a margin or a spread. The spread over LIBOR or US prime rate will vary according to the perceived risks associated with lending to a particular country and with the degree of liquidity in international capital markets. Spreads often rise during periods of debt servicing difficulties because of loss of confidence by banks.

In the period between 1980-85, there was an adverse effect from the change in interest rates on the debt service ratio of 0.5% in the developing countries as a group. By continents, there were adverse effect in interest rates in Africa (-0.7%), Latin America (-24%), and ASEAN (-0.7%) during the same period (Gibson and Thirlwall, 1989). Between 1982 to 1985, interest rates, on the average, fell reducing the debt

service ratio, reflecting some form of debt relief.

Between the period 1980-1982, the effect of the change in interest rates caused a 1.1% increase in the debt service ratio in the Latin American region and 0.3% increase in the ASEAN region. In Africa, the effect of the change in interest rate decreased the debt service ratio by 0.2%. The fall in the nominal interest rate between 1983-1985 had its greatest effect in the Latin American region. A one percent change in the interest rate contributed to a 4.4% decrease in the debt service ratio (Gibson and Thirlwall, 1989).

This result reflects the fact that the greater proportion of Latin American debt is variable interest debt (i.e. about 48.2% of the public debt in Latin America). The African and the ASEAN regions experienced an increasing debt service ratio and did not benefited from the decline in the US interest rates. This is due to the smaller proportion of was at variable interest rate debt for these cases.

1.3.2 Exchange Rate Variability

Chart 2 (Appendix 1) represents a measure of volatility in the nominal and real effective exchange rate of the US dollar vis-a-vis other major currencies. Changes in key currency exchange rates are often associated with the increased variability in international interest rates. The exchange rate variability has been relatively high since 1973 which has affected the major currencies of the world. The large fluctuations in exchange rates leads to the move to generalized floating in 1973, and the chart shows continuous fluctuations in the 1980s.

Movements in the key currency exchange rates affect the real terms of trade of developing countries depending on the types of goods exported and imported. Dornbusch (1986) suggests that other things being equal, a percentage point depreciation of the US dollar against the currencies of other industrial countries would result in a similar percentage increase in the dollar prices of both non-fuel primary commodities and manufactures. He also suggests that the effect of dollar depreciation on relative prices of various traded goods could be larger at a more disaggregated level, since the relative importance of the major industrial countries in the world market varies across commodities and manufactured goods.

Exchange rate variability causes uncertainty about the future prices of exports and imports, thus causing difficulties in trade projections unless forward markets are used

to hedge against such variability. However, in most cases, the precautionary balances required are not available hence, causing the said problem. Since the debt of developing countries are denominated in US dollars, a rise in the value of the dollar increases repayment problems. Exchange rate movements also affect the terms of trade and the value of reserves of developing countries .

Dornbusch (1986) considers the role of exchange rates in stabilizing inflation. Four different settings are used to examine that role:

1. exchange rate overvaluation in the Southern cone.
2. exchange rate depreciation in transition from high to even higher inflation in Brazil.
3. exchange rate fixing and the resulting real appreciation during inflation stabilization in the 1920s.
4. real appreciation of the US $ from 1980-85.

The highlight of Dornbusch's argument is that exchange rate policy can make an important contribution to stabilization, but that it can also be misused and will then lead to persistent deviations from purchasing power parity (PPP), with devastatingly adverse effects.

In 1) above, he dealt with Latin America, drawing attention to the trade and capital account effects of exchange rate overvaluation. In 4), he dealt with disinflation, focusing on what the impact of exchange rate is on the prices of commodities and manufactures, analyzing the macroeconomic channels through which exchange rate movements affect relative prices and the inflation process.

Pertaining to the Latin American experience, in the late 1970s, Chile and Argentina, in an attempt to bring down the inflation rates, used fixed exchange rates, or reduced the rate of depreciation relative to the prevailing inflation rate. The result is that inflation was reduced but at the cost of destructive overvaluation.

In the Chilean case, exchange rate pegging (to the dollar) was thought to bring inflation under control through two channels:

i) international prices would exert an immediate tight discipline on domestic price increases. Trade liberalization had been underway at that time.

ii) exchange rate pegging would contribute to inflation stabilization by affecting expectations, particularly in sectors that are price setters rather than price takers. The recognition that the exchange rate would be fixed forever would shift expectations from an inflationary setting to a new regime of price stability.

The result was that inflation fell from 30% to 0% over a two-year period. But there was a disequilibrium: the problem was that wages were indexed backwards, i.e. each year's wage was determined by the preceding year's consumer inflation. Wage increases exceeded the current inflation rate, which had been held down by the fixed exchange rate in 1978-80. As a result, a purchasing power of wages increased sharply in terms of traded goods, causing a loss of competitiveness and a deterioration of the trade balance.

The mechanics of overvaluation as explained by Dornbusch (1989) are:

$$P_t = AW_t + (1\text{-}a)(E_t + P^*) \quad (1.1)$$

where,

P = the rate of consumer price inflation
W = Wage inflation
E = exchange rate depreciation
A = the share of labour in total costs.
P^* = world inflation

The indexing rule is $W_t = P_{t-1}$, and the exchange rate rule is $E_t = 0$.
Equation (1.1) becomes:

$$P_t = AP_{t-1} + (1 - A)\,P^* \quad (1.2)$$

This equation shows that the wage and exchange rate policies combine to yield a gradually declining inflation rate that ultimately converges on the world inflation rate, P^*. Thus, exchange rate policy can be used for disinflation and that the openness of the economy speeds up and reinforces the disinflation strategy.

The problem with the strategy is brought out by equation 3, which shows the rate of growth of real wage, $W_t - P_t$:

$$W_t - P_t = P_{t-1} - P_t = (1 + A)(P_{t-1} - P^*) \quad (1.3)$$

The real wage rises for as long as lagged inflation exceeds the international inflation rate. Home inflation gradually comes down but the real wage steadily increases with no correction at any stage for the cumulative overvaluation. Thus, there is a serious

problem of overvaluation. The trade balance deteriorates, and the loss of competitiveness exerts an increasingly adverse effect on employment and profitability.

Devaluation can be deflationary because it cuts the purchasing power of wages in terms of tradables. The same effect is at work in the opposite direction in periods of increasing overvaluation. The first impact is to raise the purchasing power of wages, and thus create a period of prosperity, which can last only as long as the central bank can put foreign exchange on sale. But the income effect of higher real wages comes to be dominated by classical substitution away from overpriced domestic labour, and this may happen even before the central bank reserves are depleted.

Substitution effects on the demand and supply sides lead to bankruptcy and unemployment, which is always the second stage of an overvaluation experiment. The third stage is that external debt has been incurred to finance the overvaluation and now needs to be serviced. This call for a trade surplus generated by austerity and sharp real depreciation. The adverse substitution effects are reinforced by real interest effects. The expectations of devaluation in Chile raises nominal interest rates on peso loans. But because the currency is fixed, real interest rates remain high, imposing difficulties and the creation of debt for industries.

The overvaluation, combined with trade liberalization, lowered the prices of imports in real terms to an unprecedented extent. Imports overshot in 1980-81. The overall consequences in the Chilean case are; devaluation in the end, inflation back to 20%, tariffs and quotas are back, the budget has deteriorated, the debt crisis is on, and unemployment has been at record levels for a few years.

In Argentina, the exchange rate was seen as an important instrument for stabilization by setting a declining rate of currency depreciation. Inflation however, did not decline. The large budget deficit explained it. A huge real appreciation took place between 1978 and 1980 and undermined the attempt at disinflation. The system of pre-set exchange rates broke down in early 1981 leading to hyperinflation in 1985.

The important difference between the Chilean and Argentinian cases as noted by Dornbusch, is the channel through which exchange rate speculation took place. In Chile, trade had been completely liberalized, so capital flight was into importables. In Argentina, the capital account had been completely opened, so capital flight was into foreign assets.

Dornbusch concluded that the Chilean and Argentine case teach the same lesson. If

rates of depreciation are to be set below the prevailing inflation rate for some period in order to achieve disinflation, at least three conditions are necessary for success: 1) the monetary and fiscal rules must be consistent with the exchange rate target; 2) effort must be maximise to have incomes policy consistent with the exchange rate policy and not relying on economic slack and expectations to influence the inflation rate; 3) speculation in durables or foreign assets must be controlled by the government to prevent losses of reserves. Dornbusch suggests that transitory taxes on durables can prevent the speculation that occurred in Chile under an open trading system; complete capital mobility should not have been a feature of the Argentine stabilization plan. Dornbusch concluded that there is not much of a case to be made for free capital outflows from a developing country at the best of times, and especially during a stabilization period.

1.3.3 Commodity Price Variability

Export receipts and the cost of imports fluctuates with the variability in commodity prices. Prices of primary commodities were highly volatile in response to shifts in both demand and supply factors during the decades of the 1970s and 1980s. The supply and demand for individual commodities differ, hence commodity prices have not always moved together. There are important differences in the behaviour and magnitude of swings between prices of different commodities and between these prices and the terms of trade of developing countries (see Chart 3, Appendix 1). In many cases, these movements have run counter to general inflationary trends in the major industrial countries.

Chart 3 shows commodity price volatility since the early 1960s, which shows an overall commodity price index, indices for various sub-groups of commodities and a number of individual commodity prices. Commodity price variability moderated in the early 1970s but worsened in the late 1970s and in the 1980s. Non-oil commodity prices have been affected on the demand side not only by industrial countries' exchange rates, but also by the level of economic activity and rates of inflation in industrial countries. From 1980 onwards, the sharp appreciation of the dollar caused import prices to fall absolutely while domestic prices kept rising. Non-oil commodity prices have declined by 46% since 1980 (Dornbusch 1986). The decline hinges on the fact, according to Dornbusch, that for commodities as opposed to manufactures, the law of one price holds strictly. Letting q and q^* be commodity prices in dollars and in foreign currency, the law of one price then requires that $q = Eq^*$, where E is the nominal exchange rate. But the law of one price does not apply to goods in general.

Defining P and P^* as the national price levels (measured by GNP deflators), the real exchange rate is $R=P/EP^*$. Dornbush's empirical finding shows that a 1% increase in world industrial production raises real commodity prices by 2%. On the supply side, the prices are affected by policies affecting levels of domestic production (particularly for agricultural commodities).

Table 1.6: Terms of Trade of Non-Oil Developing Countries (1971-1986)
(% change per annum)

YEAR	TOT	YEAR	TOT
1971	-5.8	1979	-3.6
1972	-0.6	1980	-4.9
1973	5.6	1981	-6.9
1974	-5.4	1982	-1.3
1975	-9.8	1983	-
1976	5.5	1984	4.1
1977	6.2	1985	-4.4
1978	-4.3	1986	1.4

Source: International Financial Statistics, 1988.

Variability in the commodity prices affects the terms of trades of developing countries and their trade balances, or alternatively, the purchasing power of their exports. The fluctuations in the trade balances cause uncertainties in their ability to repay interest on debts. The terms of trade of non-oil developing countries shown above, shows negative figures in the late 1970s and early 1980s during which the commodity price variability worsened.

Consistent with the expansion of demand in 1972-73 mentioned earlier, the terms of trade are positive in 1973. The period after the second oil shock showed deterioration in the terms of trade up until 1982.

1.4. Assessment of Debt Burden by Variables

The economies of low income sub-Saharan African region are qualitatively different from those of the middle income countries of Africa or low income countries of other regions. The group that we will analyse is the low income sub-Saharan African group. The typical African economy is smaller with very low per capita income and is more trade dependent, less urbanized and less socially stratified than its Latin American counterpart (Helleiner, 1987). In general, the African countries depend on non-oil primary commodities as a source of foreign exchange earnings and on external resources for consumption and investment. The debt problem in the sub-Saharan African countries predates the 1982 debt crisis in middle income countries. The early

emergence of debt problems are due to very poor export performance as a result of depressed commodity prices (Helleiner, 1987; World Debt Tables, 1988/89). More than half have had debt rescheduling or incurred arrears on debt service obligations since 1980.

In the Latin American region, debt crisis started in August 1982 when Mexico announced inability to repay its external debt, followed immediately by a ninety-day moratorium. It is by then the largest producer of oil in the region. A systematic debt stress soon extended to the whole of the Latin American region which had run up heavy liabilities on the interbank market (Thorp and Whitehead, 1987).

On the IMF estimates, thirty countries in the Western Hemisphere -in Latin American and the Caribbean- accounted for 42% of the total debt of all 123 indebted developing countries in 1984. Seven major borrowers -Argentina, Brazil, Venezuela, South Korea, Indonesia and the Philippines- accounted for 44% of the total debt of all the 123 developing countries (Table 1.7), the vast majority of it was owed to private banks (World Debt Tables, 1987/88).

Table 1.7: The External Debt of Seven Major Borrowers, March 1985 (US$ mns)

Countries	1985
Brazil	106,484
Mexico	96,875
South Korea	47,159
Argentina	49,324
Venezuela	34,693
Indonesia	35,999
Philippines	26,190
TOTAL	396,724
Total for all Developing Countries	US$ 949 bn.

Source: World Debt Tables 1988/89

Two of the ASEAN countries, South Korea and the Philippines are categorized as highly indebted countries. South Korea ranked the fourth largest debtor among all other developing countries after Mexico, Brazil and Argentina in 1982 (OECD Survey, 1982). In 1985, it again ranked fourth (see Table 1.7), having US$ 47.15 billion external debt. In 1990, Indonesia and the Philippines remain amongst the severely indebted developing countries' group together with Mexico, Brazil, etc.

The debt problem of some of the major Euro-currency market borrowers facing high interest costs are very different from those of the poorer developing countries holding mainly official or officially guaranteed debt and with low average interest cost.

Examples are the Latin American countries which belong to the former category and sub-Saharan African countries which belong to the latter category. Within each of those two main groups there exist major differences in the nature and causes of debt problems. Moreover, some developing countries do not have debt problems but alarmingly increased indebtedness, despite overall deterioration of the world economic and financial environment, for example, South Korea. In the 1980s the debt of the ASEAN region had a high yen component as opposed to the high dollar component of the Latin American and African debts (World Bank, World Debt Tables, 1987/88).

In what follows is an assessment of debt burden. What are the significance of the ratios? The external debt to GNP ratio matches the liability to the income of a country. The debt-service ratio is defined as principal plus interest payments divided by exports. Thus, earnings from exports help a country to repay past debt and allow it to borrow more to finance future growth. The interest to exports ratio shows the fixed obligation to repay interest out of exports earnings. The external debt stock to exports matches long-run liabilities to foreign exchange earnings through exports. The ratio of short term debt to total debt reflects maturity management, the lower the ratio the more liquid is the financial position because short term loan has to be paid in a very short period of time and is more costly and generate greater risk.

The variables to be analysed are the growth of output, trade indicators, the size and composition of debt, debt and non-debt creating flows financing of debt, debt indicators and floating versus fixed-interest debt. These variables are important to show how debt situation arises, how debt crisis develops and what the current debt situations are like in the developing countries. In some countries, the growth of output deteriorated with the growth of debt which shows unsustainable debt situation, while in others the relationship between the two is positive showing possibly profitable use of debt. Trade indicators show mainly how external shocks/factors affect debt and the balance of payments situations. Debt indicators - the size and composition of debt - show how debt grew and how heavy the debt burden is relative among countries. Floating or fixed-interest debt shows interest rates' risks and its contribution to debt burden.

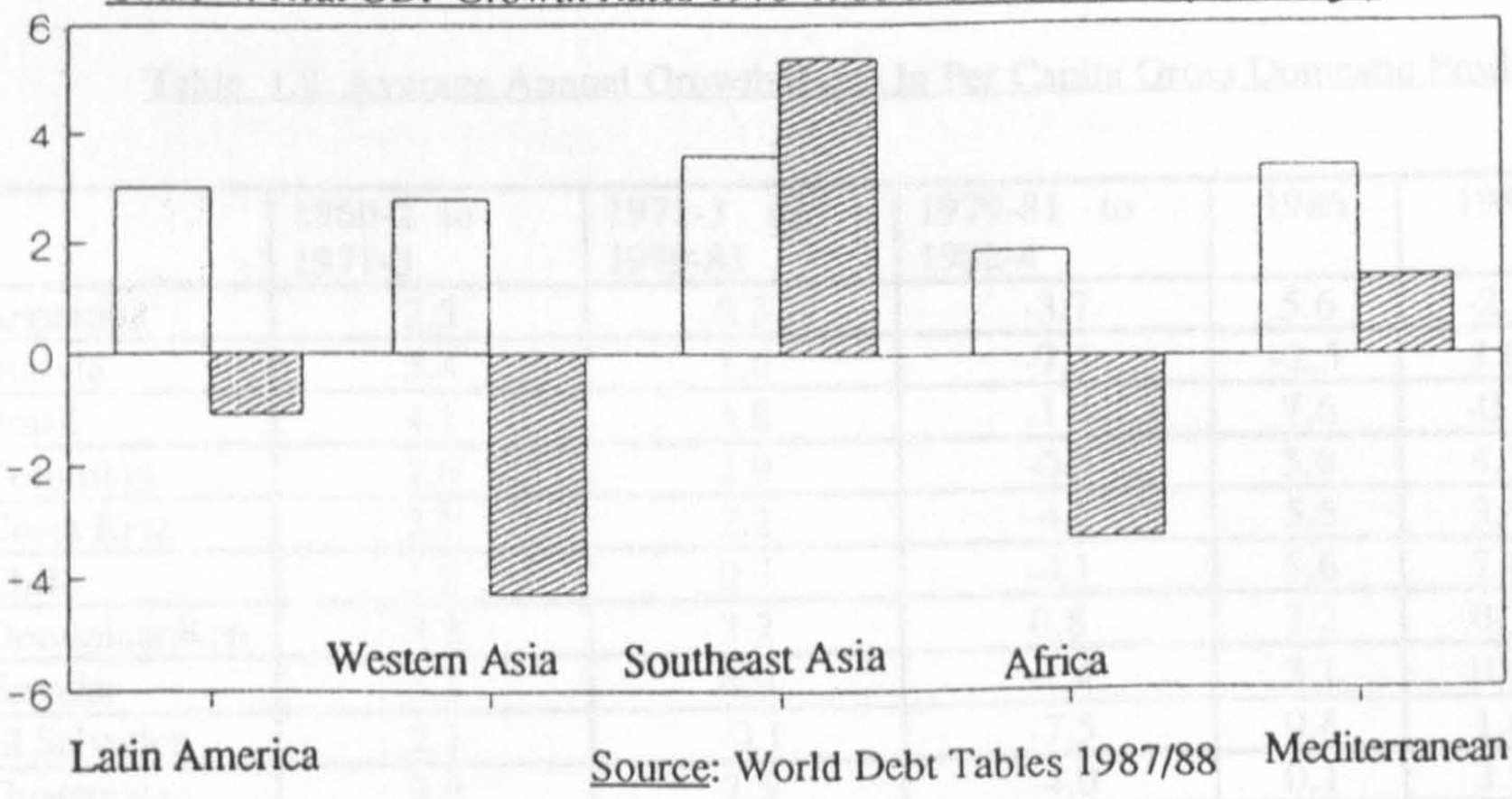
1.4.1 The Growth of Output

Between 1970 and 1979, fifteen of the forty-five sub-Saharan African countries experienced declining per capita income. Another nineteen registered per capita

income growth of under 1% per year during this period. On average, per capita income in Africa declined by 0.4% per year in the 1970s (World Bank, 1981). The volume of agricultural exports fell over the decade by 20%. The average growth of per capita GDP for Latin America during 1970-1980 was 3% (Chart 4). The South and East Asian countries have an average of 4% per capita GDP growth in the 1970s.

Between 1981 and 1988, real GDP grew at -3 % for sub-Saharan Africa (see chart 4). Between 1981-88, the growth rates for Latin America was -1.6% and for ASEAN, about 5% (chart 4b).

Chart 4: Real GDP Growth Rates 1970-1980 and 1980-1987 (% change)



Source: World Debt Tables 1987/88

Until 1981, several countries in the Latin American region managed to achieve reasonable growth rates in spite of the external shocks. Large volumes of debt were contracted to purchase more imports to maintain higher rates of growth than would otherwise have been possible. Lever and Huhne (1987) termed this "debt-led" growth. Table 1.8 shows positive annual growth of per capita Gross Domestic Product between the years 1971-73 to 1979-81. Brazil, Ecuador and Paraguay recorded average growth rates of 4.8, 4.9 and 5.5 respectively. Remarkable declines in per capita GDP are noted in Argentina, Bolivia, Costa Rica, Chile, El-Salvador, Guatemala, Honduras, Peru, Uruguay and Venezuela between the years 1979-81 to 1982-84.

The table below supports the view that the IMF's adjustment programmes in 1982 and 1983 resulted first and foremost in a cut in imports through a cut in aggregate demand in debtor countries (among others having this view are Sachs (1987) and Lever and Huhne (1987)). The effect is reducing their output. Average annual growth rates of per capita domestic products between 1979-81 and 1982-84 became negative for all Latin American countries except Panama, Paraguay and Dominican Republic. For

Latin America as a group, the cumulative drop in real per-capita Gross Domestic Product (GDP) between 1981 and 1984 was 8.9%.

Unlike the regions of Latin America and Africa which ran into debt problems at the latest immediately after the second oil shock, ASEAN countries continued to perform rather well between 1982 and 1984. Besides Singapore and South Korea, the other four countries depend heavily on exports of primary commodities: 90% for Indonesia, 74% for Malaysia, 62% for Thailand and 33% for the Philippines. On the imports side, more than 40% of the imports by these four countries consist of intermediate goods (World Development Report, 1985).

Table 1.8: Average Annual Growth Rates In Per Capita Gross Domestic Product.

	1960-2 to 1971-3	1971-3 to 1979-81	1979-81 to 1982-4	1986	1988
Argentina	2.5	0.3	-3.7	5.6	-2.5
Bolivia	3.4	1.6	-7.3	-2.5	3.0
Brazil	4.1	4.8	-1.8	7.6	-0.1
Colombia	2.6	2.9	-0.3	5.8	4.1
Costa Rica	3.7	2.2	-4.7	5.5	3.4
Chile	1.8	0.7	-4.1	5.6	7.4
DominicanRep.	3.3	3.2	0.8	3.2	0.7
Ecuador	3.1	4.9	-1.4	3.1	10.5
El Salvador	2.1	-0.1	-7.5	0.6	1.6
Guatemala	2.9	2.5	-4.0	0.1	3.9
Haiti	-0.9	2.0	-2.5	1.0	0.9
Honduras	2.0	1.1	-3.3	0.7	4.6
Mexico	3.7	3.5	-1.2	-3.7	-
Nicaragua	2.8	-2.9	-0.4	-1.0	-13.4
Panama	4.5	1.9	1.9	3.4	-15.6
Paraguay	2.2	5.5	0	-	6.4
Peru	1.7	0.4	-3.3	9.3	-8.2
Uruguay	0.4	3.3	-4.3	8.9	-
Venezuela	2.0	0.8	-4.2	6.3	6.2

Source: Alejandro C.D.,"The Development Crisis In Latin America", in Thorp and Whitehead, Latin American Debt and The Adjustment Crisis,1987.

Table 1.9 shows the performance of the ASEAN economy during the oil shock from 1978-81 and the subsequent global debt problems from 1982 onwards. The average annual growth rates of output in the 1970s were very promising with the exception of the Philippines which experienced debt difficulties in 1983 and restructured its debt in that year. The highest growth rate of GDP in the period between the two oil shocks seemed to be in countries with some oil content in their exports. Singapore had an average of 11% per year and Indonesia and Malaysia had an average of 8.6% each, per year. South Korea has a lower average annual growth rate of GDP of 6.8% per year. The ASEAN region registered a reduction of about 1.9% of the average annual

growth rate of GDP between 1982-84 as compared to 1979-81. However, the Philippines recorded a drop of about 4% to an average annual growth of 1.45%.

Table 1.9: Average Annual Growth Rates of GDP (%)

Countries	1971-73 to 1979-81	1979-81 to 1982-84
Malaysia	8.60	7.30
Philippines	5.70	1.45
Singapore	11.0	8.65
Thailand	6.20	5.65
Indonesia	8.60	6.10
South Korea	6.80	6.10

Source: Calculated from the International Financial Statistics, 1987/88.

1.4.2 Trade Indicators

After the oil shock of 1973, prices for a number of commodities produced by the sub-Saharan countries (cocoa, coffee, tea, sugar, phosphate and uranium) rose sharply and then dropped steeply (International Financial Statistics, 1988). The terms of trade in Table 1.10 show sharp increases in 1973 in eight of the countries. Six others have declining terms of trade in 1973.

In 1980, all except two of the countries have negative changes in their terms of trade. In addition, from Table 1.11, we can see that, generally, in the 1980s, there were declines in the terms of trade of the sub-Saharan African countries.

Table 1.10: Terms of Trade for African Countries (% change over previous year)

Countries	1973	1974	1975	1976	1980	1982	1986
Bernin	19.5	-3.1	-18.5	22.3	-17.4	-	-
Burkina Faso	2.9	17_2	-12.8	13.2	3.2	-5.3	-26.7
CoteD'Ivoire	22.7	4.5	-19.6	16.3	-2.8	-11.1	-3.6
Ethiopia	9.6	-3.2	-14.8	67.9	-13.9	-	-
Kenya	-3.4	-11.6	-8.9	16.2	-8.2	4.4	12.9
Libena	-2.9	-10.4	20.6	7.3	0.1	2.8	-6.5
Malawi	~.0	-6.1	-3.6	-2.4	-15.1	1.1	-12.9
Mauritius	-10.0	52.5	16.3	-26.9	-5.7	-10.5	30.6
Morocco	-3.6	41.9	7.0	-20.7	-	0.3	10.0
Niger	-9.3	15.0	21.1	4.9	-11.2	2.3	-
Senegal	4.0	32.9	-20.2	-7.2	-2A.7	-14.3	-3.2
Seychelles	23.8	7.4	-'~9.0	15.0	-20.2	-6.7	-
Tanzania	10.1	10.2	-16.3	21.9	1.5	-	-
Togo	4.5	95.0	-9.7	-35.0	-12.4	1.4	-
Zambia	31.4	-3.0	-49.1	8.0	-30.9	1.1	-

Source: International Financial Statistics 1988~89.

On average between 1980 and 1987, the terms of trade decline by 3% per year. Export volumes changed by an average of 2% per annum in the same period while import volumes changed by -0.03% on average during 1980-1987. This means the purchasing power of exports, on average, declined by 1% per year over the same period and left the current account balance change of -0.07% on the average over the period 1980 to 1987.

Table 1.11: Trade Indicators for Sub-Saharan Africa, 1969-1987 (Annual changes in %)

Indicator	1969-78	1979	1980	1981	1982	1983	1984	1985	1986	1987
Export vol	1.3	2.3	0.9	-2.6	3.5	1.4	4.8	1.1	9.5	3.1
Import vol	4.0	-3.4	5.3	0.2	-3.9	-8.3	-2.4	0.4	6.8	1.0
Terms of trade	0.3	0.5	-3.3	-4.7	-4.5	1.1	5.9	-1.6	-8.5	-8.9

Source: International Financial Statistics, 1988/89

Table 1.12a below shows the foreign trade indicators of countries in the Latin American region between 1971-73 and 1982-1984. The volume of merchandise exports did rise (most prominently in Brazil and Mexico with 10% and 14% average annual growth rates respectively), in most countries except Bolivia and Venezuela. Bolivia, Columbia, Ecuador, Mexico and Venezuela experienced gains in their terms of trade, while others suffered losses. The purchasing power of exports was higher in Ecuador, Mexico and Venezuela -the oil producing countries- even though volumes contracted.

The volume of merchandise imports, grew at a higher annual rate as compared to merchandise exports in Colombia, Ecuador, Haiti, Paraguay and Venezuela. Seven of the countries had average annual growth rate of the volume of imports greater than their purchasing power of exports implying negative trade balances. This situation also implies the need for external finance to pay for the excess of imports over exports.

Between the period 1979-81 and 1982-84 (Table 1.12b) several Latin American countries experienced severe terms of trade deteriorations. Only Bolivia and Venezuela escaped worsening terms of trade. Average annual growth of export volumes increased in Brazil, Chile, Mexico and Uruguay but decreased in Colombia, Bolivia, El-Salvador and Venezuela. The combined terms of trade and volume losses were severe in all countries except Brazil, Mexico and Uruguay. Declining terms of trade had greater effects on the purchasing power of exports than export volumes

Tablel 1.12a: Foreign Trade Indicators: AverageAnnual Growth Rates Between 1971-3 and 1982-4 (percent)

	Volume of merchandise exports	*Terms of trade*	*Purchasing power of merch -andise exports*	*Volume of merchandise imports*
Argentina	7	- 4	2	-1
Bolivia	- 2	5	3	0
Brazil	10	-5	4	1
Colombia	1	2	3	8
Costa Rica	2	-2	0	-2
Chile	9	-7	1	-1
Dominican Rep.	1	-2	-1	2
Ecuador	3	7	10	8
El Salvador	0	- 2	- 2	0
Guatemala	3	-3	1	2
Haiti	4	-1	3	6
Honduras	2	-1	1	3
Mexico	14	2	16	4
Nicaragua	0	- 5	- 5	0
Panama	0	-6	- 5	- 2
Paraguay	6	- 3	3	8
Peru	2	0	2	3
Uruguay	8	- 5	3	3
Venezuela	- 6	13	6	6

Table 1.12b: Foreign Trade Indicators; Average Annual Percentage Changes Between 1979-81 and 1982-84

	Terms of trade	*Purchasing power of merchan-dise exports*	*Volume of imports*
Argentina	-2.5	0.3	- 16.3
Bolivia	1 .6	- 5. 1	- 15.2
Brazil	- 6.4	3.7	- 9 9
Colombia	- 0.7	- 5.9	6.9
Costa Rica	- 8.1	- 8.6	- 14.4
Chile	- 8.6	- 3.4	- 14.8
Dominican Rep.	- 7.5	- 10.0	- 5.9
Ecuador	- 5.1	- 2.4	- 10.6
El Salvador	- 6.7	-14.9	- 8.2
Guatemala	- 10.2	- 11.0	- 13.1
Haiti	- 5.5	-1.8	-1.9
Honduras	- 4.9	- 7 1	- 9 0
Mexico	- 5.9	11. 1	-18.7
Nicaragua	- 8.9	- 12.9	- 2.1
Panama	- 8.0	- 10.5	- 5.4
IPaaraguay	- 7.1	- 5.9	- 6.1
Peru	- 8.6	- 9.1	- 3.7
Uruguay	- 3.4	2.8	- 16.8
Venezuela	0.8	- 5.4	- 6.8

.Source: Alejandro CD, "Some Aspects of the Development Crisis in Latin Amenca, 1987.

during this period. Import volumes declined sharply especially in Argentina, Bolivia, Brazil, Costa Rica, Chile, Ecuador, Guatemala, Mexico and Uruguay. Only Colombia had increased import volumes. Most countries had thus shown some adjustment to cut foreign exchange outflows via imports. The collapse of import volumes was sharp in 1982-84 which exceeded the purchasing power of exports, reflecting the reduction of net capital inflows and the repayments of huge interest payments (Diaz-Alejandro, 1987, in Thorp and Whitehead).

Between 1971-73 and 1982-84, the growth rates of import volume for most major debtors in the Latin American region were lower than the growth of the purchasing power of exports. The import volume actually expanded between 1971-73 and 1979-81 but dropped during 1982-84 far more than the purchasing power of exports.

A combination of external shocks and domestic influences via the foreign trade indicators that affects the ASEAN economies can be deduced from Table 1.13.

Table 1.13: Foreign Trade Indicators: Average Annual Growth Rates

Between 1971-73 and 1982-84 (%)

	Volume of export	Terms of trade	Purchasing power of export	Volume of import
Malaysia	3.0	-.02	1.0	na
Philippines	-0.9	-0.7	-1.6	-1.2
Singapore	6.7	na	na	3.5
Indonesia	6.3	na	na	na
Thailand	2.7	2.9	5.6	7.9
S.Korea	10.7	0.2	10.8	7.6

Source: Calculated from International Financial Statistics 1988/89.

Falling commodity prices in the early 1980s worsened the terms of trade of Malaysia and the Philippines. Between the years 1971-1973 and 1982-1984, the terms of trade on average deteriorated by -2.02% per annum in Malaysia and -0.65% per annum in the Philippines. Thailand's terms of trade improved and recorded an average annual growth of 2.9%.

Supply problems, such as bad harvest (on sugar cane plantations), prevented the Philippines expanding its exports volume (Naya S, 1984); instead it registered an annual average growth of -0.96% between 1971-1973 and 1982-1984; when commodity prices were higher due to high demand. Correspondingly, the world demand for primary products slowed in the late 1970s and early 1980s causing

commodity prices to fall. The volume of exports and terms of trade effects have resulted in the reduction of purchasing power of exports by 1.61% in the Philippines, but the reduction in imports fell slightly short of the reduction in the purchasing power of exports (a decrease of 1.13%). South Korea registered the highest export volume of 10.6%, hence achieving a very high increase in purchasing power of exports of 10.8% (despite very low terms of trade), which exceeded the import growth by 3.2%. Thailand's import volumes have higher than the purchasing power of exports by 2.3%.

1.4.3 Size and Composition of Debt

The size and composition of debt of the sub-Saharan region can be seen in Table 1.14 below. Between 1970 and 1980, their external debt rose by over 21% a year - more rapid than in Latin America.

Table 1.14: Debt Figures for Low-Income Africa* (US $ bn)

	1970	1974	1975	1979	1980	1981	1985	1986	1987
Total debts	4.1	9.0	11.0	28.4	33.1	36.9	51.8	59.4	69.6
Long-term debts	4.0	8.6	10.4	23.4	27.3	29.9	41.6	48.7	57.9
Public &Publ. guaranteed	3.8	8.1	9.8	22.5	26.1	28.9	40.6	47.7	56.7
Private non-guaranteed	0.2	0.5	0.6	0.9	1.2	1.0	1.0	1.0	1.2
Use of IMF credits	0.1	0.3	0.6	1.3	1.8	2.7	4.7	5.0	5.3
Short-term debt	-	na	na	3.6	4.0	4.2	5.4	5.6	6.3
Debt Service ratio	-	5.7	8.0	11.4	12.6	12.0	12.2	18.6	18.6
Debt service payment	0.3	-	0.8	-	-	1.2	1.9	2.5	2.6

Source: Calculated from World Bank, World Debt Tables, various issues.

*Countries included are: Benin, Burkina Faso, Burundi, Central African Republic, Chad, Comoros, Ethiopia, Ghana, Gambia, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Rwanda, Senegal, Sierra Leone, Somalia, Sudan, Togo, Zaire and Zambia.

The table indicates a substantial increase both in the stock of sub-Saharan debt and in the debt-service levels since 1970. Total external debt has grown from US$ 4.1 bn in 1970 to more than US$ 59 bn in 1986, more than a 140% increase. Over the same period their real Gross Domestic Product per capita has fallen by about 10% (International Financial Statistics, 1987/88). Total debt service payments on long term external debt for these countries are estimated to have grown from US$ 0.3 bn in 1970 to US$ 2.5 bn in 1986. The rise in total payments represents an increase in the debt service ratio from 5.7% in 1970 to 18.6 % in 1986.

The African countries qualify for a very limited amount from commercial bank lending, hence the sources of finance are mostly official and concessional (World Debt Tables 1987/1988). Net flows from the World Bank, IDA and IMF credits can be seen in Table 1.15 below.

Table 1.15: Net flows of World Bank /IDA/IMF Credit to sub-Saharan Africa, 1978-1979 to 1981-1982 (in mns of SDRs)

Source of credit	1978-79	1979-80	1980-81	1981-82
World Bank	355	285	-239	236
IDA	230	304	227	614
IMF	-131	350	591	1667

Source: Annual Report of the World Bank and IMF.

Table 1.16 shows that the accumulated current account deficits in 1970 to 1980 almost fit the amount of net debt at the end of 1980 in all countries except Mexico, Argentina and Venezuela. The latter three countries have their accumulated debt at the end of 1980 substantially higher than the current account deficits between 1970-1980. This may reflect an already significant net debt in 1970. A comparison between column (5) and column (6) in Table 1.16 shows the contrast between Argentina, Mexico and Venezuela and the rest of the region.

For most countries, the accumulated current account deficits between 1970 to 1984 were higher than the increase in gross debt at the end of 1984. For Argentina, Mexico, and Venezuela, the opposite is the case, by a large margin. The gap between gross debt and accumulated current account deficits suggest very large private capital outflows -the gap is about US$ 132 bn. During the same period, Brazil recorded a debt amount of US$ 101.8 bn, the largest amount among all other countries. Diaz Alejandro (1981) suggested that the growth of debt is accompanied by the accumulation of private assets abroad after 1976. In 1981 to 1984, net factor payments by Brazil and Mexico represented 44% of their total gross debt at the end of 1984. Diaz-Alejandro (1981), deduced that debt accumulation had partly become capital flight.

Table 1.16: Accumulated Current Account Deficits and Total Debt Figures

(Latin America, US $ bn).

	Accumulated current a/c deficits 1970-1980	Net debt, end of 1980	Accumulated current a/c deficits 1981-1984	Increase in gross debt, end 1980 to end of 1984	(1) plus (3)	Gross debt at the end of 1984
Argentina	2.93	17.87	11.65	20.84	14.58	48.00
Mexico	33.66	45.17	10.53	46.55	44.19	95.90
Venezuela	-5.32	13.15	-7.18	7.49	-12.50	34.00
Sub Total	31.27	76.9	15.00	74.88	46.27	177.90
Bolivia	1.14	1.67	1.04	1.67	2.19	3.20
Brazil	63.00	61.48	35.47	33.45	98.47	101.80
Colombia	0.37	-0.20	9.79	4.52	10.16	10.80
Costa Rica	2.90	2.99	1.36	0.87	4.26	4.05
Chile	6.63	6.96	10.22	7.36	16.85	18.44
Dominican R	2.31	1.56	1.56	1.01	3.87	2.85
Ecuador	3.06	3.40	2.67	2.21	5.73	6.86
El Salvador	0.51	0.79	1.11	1.12	1.63	2.30
Guatemala	0.99	0.30	1.41	0.86	2.39	1.91
Haiti	0.54	0.26	0.86	0.31	1.40	0.60
Honduras	1.35	1.35	1.07	0.74	2.43	2.25
Nicaragua	1.31	1.51	2.13	2.32	3.44	3.90
Panama	2.20	2.09	1.77	1.34	3.97	3.55
Paraguay	0.96	0.08	1.29	0.70	2.25	1.56
Peru	4.49	6.79	5.70	3.91	10.19	13.50
Uruguay	1.86	-0.25	0.82	2.54	2.69	4.70
Sub Total	93.62	90.78	78.27	64.93	171.92	182.27

Source: Alejandro C.D.,"The Development Crisis In Latin America", in Thorp and Whitehead, Latin American Debt and The Adjustment Crisis,1987.

Table 1.17 shows the accumulated current account deficits and debt at the end of 1974, 1980 and 1985 for the ASEAN countries. The table shows that, between 1970 to 1974, Malaysia, Singapore, Thailand and Indonesia appear to have used debt to finance the current account deficits. The Philippines and South Korea recorded surpluses, yet debt accumulation was far in excess of the amount of surplus, which implies capital flight or accumulation of private assets abroad. Between 1975 to 1980, Malaysia and South Korea accumulated current account surpluses and debts at the same time. Debt was partly used to finance international reserves (as indicated by an increase in reserves in the International Financial Statistics Yearbook, 1988), and partly presumably goes to purchases of foreign assets or capital flight.

Table 1.17: Accumulated Current Account Balance and Total Debt For the Years 1970-1974, 1975-1980 and 1981-1985 (US$ mn)

	Accumulated CA. Bal 1970-74	Debt at end 1974	Accumulated CA. Bal 1975-80	Debt at end 1980	Accumulated CA. Bal 1981-85	Debt at end 1985
Malaysia	-786	1119	1272	7198	-11949	21150
Philippines	220	2465	-7271	17390	-9295	26190
Singapore	-3331	788	-4198	2071	-3766	3406
Thailand	-610	1161	-7464	8258	-10143	17528
Indonesia	-894	8287	-1458	20888	-16007	35999
S.Korea	2366	5116	2659	29480	-11161	47159

Source: Calculated from World Debt Tables 1988/89.

Between 1981 to 1985, all countries recorded deficits with substantial debt accumulation by South Korea and Indonesia. It seems that Malaysia and Thailand had quite a late entry in the International Financial market because debt stock as at the end of 1974 (and late 1970s) are very low compared to the other countries in the region. Only in 1980 onwards that debt started to accumulate in these two countries.

1.4.4 Debt and Non-Debt Creating Flows Financing Deficit

The role of debt and non-debt creating flows in financing the current account deficits of the three different regions can be seen by looking at the flow figures in Table 1.18. In 1981 in sub-Saharan Africa, half of the current account deficits of US$ 12.3 bn was financed by debt creating flows and the other half by international reserves. Such high reserves financing was actually recorded by Nigeria because more than half of the current account deficits shown belong to Nigeria. The other low income sub-Saharan African countries had about US$ 6 bn current account deficit which was financed mainly by long term debt.

In 1982, the debt creating flows decreased by 30% to US$ 4.1 bn while the size of current account deficits remained the same as the previous year. International reserves and debt creating flows each financed about one-third of the current account deficits. Inadequate funds of about another one-third is reflected in the residual section

Table 1.18a: Financing the Current Account Deficits By Debt and Non-Debt Creating Flows (1981-1986) (Flow Figures)

	1981	1982	1983	1984	1985	1986	1981-86 TOT.
Current Account Balance							
Southeast Asia	-9175	-14381	-16015	-7264	-4193	-2464	-53492
Africa	-12359	-12536	-7713	-1557	1486	-2143	-34842
Latin America	-38660	-39127	-5233	2110	-1014	-13417	-95341
Debt Creating Flows	.	.	.	.	.	.	.
Southeast Asia	10285	13152	8586	5001	10561	15512	63097
Africa	5913	4108	6115	1957	9466	18595	46154
Latin America	47814	34863	24810	16238	9331	15970	148026
of which:	.	.	.	.	.	.	.
a) Long term loans	.	.	.	.	.	.	.
Southeast Asia	6452	9624	9587	4377	11864	18056	59960
Africa	3510	4771	4034	820	9826	16925	39886
Latin America	31124	27508	50019	23982	11551	27261	171445
b) Use of IMF credits	.	.	.	.	.	.	.
Southeast Asia	850	-76	815	-405	17	-24	1177
Africa	1163	724	847	202	784	118	3838
Latin America	103	1206	5607	2729	2854	1833	14329
c)Short term loans	.	.	.	.	.	.	.
Southeast Asia	2983	3604	-1816	1029	-1320	-2520	1960
Africa	1240	-1387	1234	935	-1144	1552	2430
Latin America	16587	6149	-30816	-10473	-5071	-13124	-36748
Non-Debt creating flows	.	.	.	.	.	.	.
Southeast Asia	4710	5284	4935	3632	3363	2492	24416
Africa	736	774	623	330	494	485	3442
Latin America	9497	8820	3059	2258	2244	1997	27875
Total Change in Reserves	.	.	.	.	.	.	.
(minus sign means increase)	.	.	.	.	.	.	.
Southeast Asia	-2082	960	-70	-5248	-1448	-258	8146
Africa	6806	3965	1962	31	-1152	-1076	10536
Latin America	-1224	11783	3558	-7598	3291	4329	14139
Residuals *	.	.	.	.	.	.	.
Southeast Asia	3737	5015	-2564	-3879	8283	12691	23283
Africa	1110	3687	899	748	10353	15747	31170
Latin America	17434	16345	26116	13008	13854	8883	96640

Source: Calculated from World Debt Tables 1988/89 and International Financial Statistics, 1988.

The bulk of the residuals consist of net errors and omission, very small constitute valuation changes.

Table 1.18b: Financing the Current Account Deficits By Debt and Non-Debt Creating Flows (1981-1986) for the ASEAN Countries(Flow Figures)

	1981	1982	1983	1984	1985	1986	1981-86 Total	1989
Current Account Balance								
Malaysia	-2485	-3603	-3498	-1672	-734	- 795	-12287	-2022
Philippines	-2125	-3213	-2754	-1257	26	1017	-8358	-2236
Singapore	-1378	-1206	-579	-366	-14	478	4021	-
Thailand	-2574	-1022	-2887	-2107	-1554	226	-9918	-4153
Indonesia	-613	-5337	-6297	-1862	-1865	-3895	-19869	-
Debt Creating Flows								
Malaysia	2346	4072	3280	1352	2020	1731	14801	-2280
Philippines	3360	3549	-175	235	1831	2664	11464	-515
Singapore	192	366	174	487	318	469	2006	-
Thailand	2552	1338	1669	1113	2904	1022	10598	1768
Indonesia	1835	3777	3638	1814	4~47	7040	22151	2079
of which : a) Long term loans								
Malaysia	2125	4019	3224	1424	2160	1849	14801	-2967
Philippines	1390	1770	1637	332	2455	5738	13322	-686
Singapore	148	342	185	537	264	463	1939	-
Thailand	1453	1229	1200	983	2669	1414	8948	845
Indonesia	1336	2264	3341	1101	4518	6006	18566	-
b) Use of IMF credits								
Malaysia	221	53	56	-72	-140	-118	0	0
Philippines	105	-125	109	-185	295	121	320	84
Singapore	0	0	0	0	0	0	0	-
Thailand	524	4	205	-116	-1 16	-32	577	-389
Indonesia	0	0	445	-32	-367	5	51	-
c)Short term loans								
Malaysia	0	0	0	0	0	0	0	678
Philippines	1865	1904	-1921	88	-919	-3195	-2178	88
Singapore	44	24	-11	-50	54	6	67	-
Thailand	575	163	264	246	-351	-360	537	1312
Indonesia	499	1513	-148	745	-104	1029	3534	-
Non-Debt creating flows								
Malaysia	2396	3201	2671	1800	1030	1153	12251	1161
Philippines	175	17	112	6	17	140	467	50
Singapore	1627	1269	1036	1059	984	441	6416	-
Thailand	332	~57	456	555	1057	232	2889	1733
Indonesia	180	540	660	212	275	526	2393	-
Total change in reserves (minus sign means increase)								
Malaysia	129	185	-141	-591	-686	-436	-1540	1926
Philippines	-318	479	1561	442	283	-1332	231	229
Singapore	-1579	-1327	-1242	-1882	-1086	1311	-5805	-
Thailand	-141	11	89	-571	35	-627	-1204	3396
Indonesia	-177	1612	-337	-1822	6	826	108	-
Residuals								
Malaysia	2386	3855	2312	889	1630	2153	13225	-
Philippines	1092	832	-1256	-1458	2105	2489	3804	-
Singapore	-1335	-898	-611	-642	0	0	-3486	-
Thailand	169	634	-673	-1010	2085	853	2058	-
Indonesia	1225	592	-2336	-1658	2463	4497	4783	-

Source: Calculated from World Debt Tables and International Financial Statistics, various issues.
The bulk of the residuals consist of net errors and omission, very small constitute valuation changes.

CHAPTER 2: DEBT AND DEFICITS ACCUMULATION IN ASEAN

2.1 Introduction

With the Latin American debt crisis the world system of development finance nearly collapsed in the 1980s. Although the world has stepped back from the brink the debt problem lingers on. Consequently the overall financial picture of the developing world is rather discouraging. Ever since then, a developing country-wide structural adjustment programme has been enforced by the World Bank. Within this picture, the ASEAN[1] region has appeared to be less affected by the debt crisis, but illiquidity persists and structural adjustments are enforced. The changing mood among the developed countries since the 1980s has also resulted in reduced commitments in both trade and finance with the developing countries. Though the fear had been that ASEAN might also fall into a vicious circle of slow growth and increasing debt, despite such concerns, ASEAN does offer a successful model compared to its Latin American counterpart, but the ray of hope is that the region should soon become an active centre of economic co-operation within the context of 'NICdom' and fulfil its existence.

Until the mid-1980s, the ASEAN countries continued to pursue an aggressive policy of developing their domestic economies and of financing trade deficits generated by developing foreign borrowing. Since then, the policy of economic development that relied excessively on foreign capital has been switched to stable growth aiming at price stability, the reduction of current account deficits and the improvement of external balances. Sustainable debt and deficits greatly depends on their ability to utilise borrowings effectively to strengthen their economic bases. The effect of the policy switch manifested itself at the end of 1980s. Improvements in prices, balance of payments and other areas of economic performance have resulted in less demand for foreign borrowings but at the same time an increase in the relative importance of private external financing in the form of investment.

This chapter is organised as follows. Firstly; we provide an overview of debt accumulation of ASEAN. We then decompose the net increase in debt and provide an analysis of the demand for foreign finance and the movements between debt and deficits. We then estimate the demand for long-term foreign finance since this constitutes the major portion of foreign finance. How the ASEAN countries financed their debt or deficit between 1977 and early 1990s is presented. This crosses the critical period of the 1980s during which they had to decide whether to borrow more in order to cushion themselves against external economic shocks, or to resort to adjustment policies that would dampen both their economic development and their demand for foreign finance. It is expected that there is a changing pattern of demand for and supply of foreign finance in the ASEAN countries in the late

1980s due to adjustments and reforms undertaken. We also estimate the supply of foreign finance and determine its general trend. We briefly give an overview of the how the ASEAN countries financed their government budget balance as well as a brief overview of the suppliers of finance in the region.

To judge the performance of each ASEAN country in controlling debt and attracting foreign finance, each element of debt and finance can be analysed using the decomposition framework of our modified "absorption approach". Three equations shown in the text are important to show the factors that compose a net change in debt; the break-down of demand for long-term finance and the supply of long term finance.

Since the 1970s, the ASEAN countries achieved generally impressive economic performances, despite rising oil prices, high inflation, mounting interest rates, world-wide recession, and rising protectionism. With the exception of the Philippines and certain unusual years, most ASEAN countries sustained growth rates of about 5 to 10 %, as shown in Table 1.1. Between 1985-87 however, many of them have either negative or very low growth rates due to recession, except S. Korea. ASEAN also suffered deficits in their trade and current accounts, leading to substantial increases in their external debt.

Table 1.1: Growth Rates of real GDP of ASEAN Countries

Year	S.Korea	S'pore	M'sia	Thai	Indo	Phil
1975-79	9.7	7.5	7.2	7.8	6.9	6.6
1980	-3.0	10.3	7.8	5.8	9.9	4.9
1981	6.9	9.9	7.1	6.3	7.9	3.8
1982	5.5	6.3	5.6	4.1	2.2	3.0
1983	9.3	7.9	5.9	5.8	4.2	1.0
1984	8.6	8.2	7.8	5.5	6.1	-6.0
1985	5.4	-1.8	-1.0	3.2	1.9	-4.4
1986	11.9	1.8	1.2	3.4	3.1	1.1
1987	12.1	8.0	2.0	6.1	3.2	4.9
1988	-	11.1	8.9	13.2	5.7	6.4
1989	-	9.2	9.2	12.0	7.4	5.9
1990	-	8.3	9.7	10.0	7.3	2.4
1991	-	6.7	8.7	7.5	6.5	-1.0
1992	-	5.5	8.5	6.5	5.5	2.8

Source: Economic and Social Survey of Asia and the Pacific, various eds.

Most of these countries attempted to deal with the problems of deficits and debt by adjusting their development policies in the period around 1980. Adjustment policies include the slowing down of active development plans which narrowed the investment-savings gap, the fiscal gap and, accordingly, the current account deficit. In order not to increase their future debt repayment burden, some countries also reduced their exchange reserves and tried to attract various non-debt finances.

In general, the main forms of structural adjustments in the ASEAN economies are: more aggressive export promotion, import liberalization, exchange rate mechanisms and financial sector reforms (mentioned in section 2.1.1), gradually taking effect ever since the global debt crisis. In export promotion, the move is towards diversification of exports in the manufacturing sector and giving more importance to the private sector's role in industrialization. This is especially true in Malaysia, Indonesia and Thailand. In Indonesia, for example, there has been less reliance on oil and natural gas as the main source of export revenue at the end of 1980s and increasing manufacturing export revenues. Malaysia's aggressive privatisation and industrialisation policies since mid-1980s diversified its exports base from petroleum and commodity exports to exports of manufactured goods.

In the import liberalization context, all ASEAN countries have acceded to the General Agreement on Tariffs and Trade (GATT) since 1982 and have participated constructively to improve the multilateral trading system. In Thailand, for example, a major programme on tariff reduction was implemented in 1982 at a time when tariffs were an important source of government revenue. However, due to persistent budget deficits, tariffs were increased again in 1985 by 5 percentage points for raw materials and 10 percentage points for manufactured goods. As a result, effective tariff protection to the manufacturing sector increased sharply. Since 1988, when the government budget has been in surplus, applied tariffs on many items have been reduced. The average applied tariff was reduced from 13 % in 1986 to 11.4 % in 1990. Some import bans were also lifted (Thailand: GATT Trade Policy Review, 1993).

Pertaining to exchange rate management, Thailand underwent an appreciation of the nominal effective exchange rate in the early 1980s. Consequently, the Thai baht was devalued in November 1984 by 15% against the U.S. dollar and since then Thailand has switched to a more flexible exchange rate regime. The depreciation lasted until 1988. As a whole, in the 1980s, the nominal effective exchange rate depreciated by about 26%. The real effective exchange rate had a bigger fall due to relatively low inflation. The depreciation has contributed to price competitiveness of Thai's exports in the late 1980s. In the Philippines, the peso had been floating since

the 1970s. In 1983 to 1985, it depreciated against the U.S. dollar as a consequence of the balance of payments crisis. It appreciated sharply against the U.S. dollar in 1991 and continued on until 1992. Since 1984, the exchange rate has been determined freely in the foreign exchange market. Exchange rate management, it has been claimed, has failed to support its trade policy reforms (The Philippines: GATT Trade Policy Review, 1993). The details of the exchange rate management for each ASEAN country will be discussed in chapter seven.

Deregulation of the financial sector is further enhanced, for example in Thailand, with the launching of offshore banking facilities in early 1990, the Bangkok International Banking Facility (BIBF) which will make Thailand as the financial centre of Indo-China and eventually compete with Singapore and Hong Kong as a regional banking centre. In the Philippines, illquidity is still a big problem - IMF standby facility of US $ 800 million is secured due to shortfall in government revenues. Infrastructure projects for the purpose of facilitating export-oriented growth is the main concern. In Malaysia, privatisation policies lead to a financial deepening in the capital market with new share issues and other instruments in the stock exchange.

The East Asian NICs and the other ASEAN countries succeeded in attracting foreign direct investments in the later years of the 1980s. Capital flight, a serious problem in Latin American countries, was of relatively little concern in most of the ASEAN countries because of comparatively low inflation rates and overall economic stability. The interesting question, however, is how were these ASEAN economies able to weather the seemingly cataclysmic storm of the early 1980s while their Latin American counterparts were nearly destroyed.

2.1.1 Why ASEAN?

Whilst there is a substantial literature on the Latin American debt in the mid-to-late 1980s, no study has been done on the debt and deficits situation in ASEAN even though the situation in ASEAN is no different in terms of debt and deficits incurred. The only difference is that debt is perhaps more controllable. Recollect, (see Chapter 1) for example, that South Korea ranked fourth in the category of the world's heavily indebted developing countries in 1985 - after Brazil, Mexico and Argentina. The situation is not much different in the other ASEAN countries where Indonesia, the Philippines and Thailand are among the top ten in the list of heavily indebted developing countries in 1985 (and probably Malaysia as well, had short-

term loans been reported for that year). Illiquidity was persistent and as a response to the debt burden of the early 1980s, the ASEAN countries resorted to a more diverse structural adjustments in the real and financial sector thereafter. The existence of the Plaza Agreement in 1985 facilitated development in the industrial and trading structures of the economies. As a consequence, such developments have led to significant changes in the financial structure, notably the accumulation of financial assets in the private sector, an expanded volume of financial transactions, and changes in the flow of fund patterns. The recent tide of financial reform in ASEAN is an effort to overcome the deficiencies in the traditional financial system which lacks responsiveness to interest rates. Financial reform cover a wide spectrum of changes in the financial system such as interest rate deregulation; stimulating competition among financial institutions; fostering capital markets; exchange rate adjustments and the relaxation of foreign exchange control; the contraction of informal finance; and, the improved supervision and regulation of financial institutions. Taking a country specific example, Thailand, being an importer of oil, was very much affected by the oil-price hike of 1979. Adverse economic conditions persisted. Stabilisation policies took effect immediately. Fiscal and monetary disciplines were imposed, large devaluation took effect in 1984 to promote export, policy of enhancing competitiveness (rather than protection) and enhancing enterprises were given priority. However, the decline in interest rates and oil prices in 1985 and an increase in some commodities' prices helped Thailand's economy to recuperate.

The lack of concern about debt and deficits in ASEAN leads us to question whether there is a profitable use of debt in ASEAN? If so, then the question of profitable loanable funds are neglected and that the world has focused too much on the debt crisis! After all, the U.K. was a very large debtor nation in the 1930 but eventually, consistent with economic development, became a creditor nation in 1940 (Eichengreen 1986). The challenge is then to turn debt as a cost to debt that brings in profit! This necessitates the linkage between debt, deficits and the growth of output to be examined carefully to understand the said process. Could ASEAN then, synchronize its movements from being major debtor countries to major creditor countries simultaneously along with its movement towards 'NICdom' or towards a 'high-growth' region - this question should be of major concern.

2.2 The Demand for Foreign Finance: Deficits and Debt Creation

The amount demanded for foreign finance reflects the size of the external gap or the current account deficits. The means of financing the deficit can be of debt or non-

debt creating flows, whereby non-debt creating flows are exogenously determined. A country has a control over the amount of debt it demands, hence, endogenously determined, but whether the demand is fully fulfilled depends on the amount creditors are willing to supply.

In this section, we match, ex post, the net change in debt and deficits annually. Specifically, we look at the change in net debt as the amount of financing needed less the financing already available, as will be shown in sub-section 2.2.2. The exercise shows either debt and deficits matches, or debt could be greater than deficits in some years and lesser in other years. The current account deficits is also shown in relation to of the fiscal and private sector deficits. In the next sub-section, we provide an overview of the ASEAN debt accumulation since early 1980s.

2.2.1 Overview of the External Debt Situation

As the demand for foreign funds increased the absolute amount of the external debt of ASEAN countries grew substantially, reaching a significantly large amount around 1980. The figures are shown in Table 2.2. In highlighting the important features of Table 2.2, consider the year 1982 when the debt crisis first started. The ASEAN debt is significantly large, in absolute terms, ranging from US$ 12 bn to US$ 37 bn (excluding Singapore which has very little debt and Malaysia where figures do not include short-term loans). These figures, in comparison to the Latin American standards are not really large (see Table 2.2a) but the debt to GNP ratio, as shown in Table 2.3, ranges from 30 to 60 %, an indication of illiquidity persisting.

Table 2.2: External Debt Stock of ASEAN (US $ mn)

Year	S.Korea	S'pore	M'sia	Thai	Indo	P'pines
1978	17314	1377	3356	5029	17976	10817
1979	22886	1730	4024	6625	18526	13307
1980	29480	2071	5198	8258	20888	17390
1981	32989	2263	7323	10809	22723	20750
1982	37329	2629	11343	12198	26500	24299
1983	40419	2803	14566	13868	30138	24124
1984	42098	3290	15991	14981	31952	24358
1985	47159	3406	18150	17528	35999	26190
1986	46728	3875	19999	18549	43039	28853
1987	40459	4491	21675	20710	49738	29962
1988	35716	na	18567	21664	51415	29023
1989	32799	na	16278	23432	53494	28508
1990	34988	na	16063	28208	67011	30424
1991	39634	na	17780	35828	76110	32224
1992	42999	na	19837	39424	84385	32589

Source: World Bank, World Debt Tables, various issues.

One year after the debt crisis, in 1983-84, debt increases were dramatic, ranging from over 30 % to 45 % respectively. The external debt in absolute terms at the end of 1985 is as follows; S.Korea had US$ 47 bn, followed by Indonesia (US$ 36 bn), the Philippines (US$ 26 bn), Malaysia (US$ 18 bn) and Thailand (US$ 17 bn). In the world context, the S. Korean debt represented about half that of the Mexican or Brazilian debt stock (refer to Table 2.2a). Although the absolute amounts were smaller than those of the seriously debt-ridden countries of Latin America, the ratios of external debt to GNP ranged from over 36 to 77 %.

Table 2. 2a: External Debt Stock of Latin American Countries (US$ mn)

Year	Mexico	Brazil	Argentina	Venezuela
1980	57378	71012	27157	29344
1981	92966	98269	-	-
1982	94822	105254	-	-
1983	96867	105966	-	-
1984	100881	113550	-	-
1985	109460	123121	50946	35334
1986	100881	113705	52450	34340
1987	109460	123837	58458	34570
1988	99204	115711	58741	34738
1989	93817	111374	65257	32377
1990	105958	116417	62233	33170
1991	115291	117350	65397	34046
1992	113378	121110	67569	37193

Source: World Bank, World Debt Tables, various issues.

By 1987, debt stock did not ease in all ASEAN but increased as compared to 1983. In fact, debt to GNP ratio surged to over 70 % in Malaysia, Indonesia and the Philippines, whereas, South Korea noted a slight decline in the ratio. Table 2.3 also shows (with the exception of the Philippines) both the ratios of total debt service to exports and total external debt to exports were smaller than the debt-riddened Latin American countries.

In the Philippines and South Korea in the early to mid-1980s, the ratio of short term debt to total debt was high - ranging from above 25 to over 40 %, reflecting illiquidity position, hence, short-term loans were needed to service the long-term loans. The ratio of concessional debt to long term debt decreased from more than 30 % in 1975 to about 10 % in 1984 in ASEAN as a group.

With regard to debt-service ratio, they are comparatively low on average as compared to the Latin American countries. On the average it was about 13 % in 1982 but increased to an average of about 20 % in 1987. The highest debt-service

Table 2.3: Debt Indicators for ASEAN

Coutry	Year	ED/GNP	DSR	I/X	ED/X	SD/TD
S.Korea	1979	-	-	-	-	-
	1980	48.8	12.3	5.7	130.6	35.8
	1981	4.9	12.9	6.1	121.0	30.9
	1982	53.8	13.6	6.8	131.6	33.3
	1983	53.2	13.8	6.2	133.0	29.9
	1984	51.1	13.6	6.0	125.1	27.1
	1985	56.3	15.3	6.4	142.4	22.7
	1986	49.1	16.9	5.4	111.4	19.8
	1987	34.3	21.9	3.3	71.9	22.9
	1988	20.7	14.8	4.2	50.5	27.4
	1989	15.5	11.8	3.8	44.3	29.9
	1990	14.4	10.7	3.4	45.2	30.9
	1991	14.1	7.1	3.1	46.6	28.3
	1992	14.6	7.4	3.0	47.1	27.7
Singapore	1980	18.3	1.0	0.4	8.2	10.7
	1981	17.0	0.8	0.4	7.7	10.8
	1982	17.8	0.8	0.4	8.7	10.2
	1983	16.2	1.3	0.4	9.0	9.2
	1984	17.2	1.0	0.4	10.3	6.3
	1985	18.6	2.4	0.5	11.5	7.6
	1986	21.3	1.4	0.6	13.1	6.9
	1987	21.9	1.4	0.5	12.1	7.3
	1988	na	na	na	na	na
	1989	na	na	na	na	na
	1990	na	na	na	na	na
	1991	na	na	na	na	na
	1992	na	na	na	na	na
Malaysia	1979	-	-	-	-	-
	1980	27.8	2.5	1.7	44.2	20.7
	1981	37.9	3.5	2.5	66.0	17.7
	1982	52.2	5.6	3.8	93.3	12.9
	1983	63.8	6.4	4.3	110.5	16.9
	1984	59.3	8.5	5.6	111	13.5
	1985	72.3	30.4	9.0	114	12.8
	1986	87.8	21.8	9.3	135.2	12.8
	1987	77.1	21.2	7.9	108.8	10.3
	1988	56.7	24.8	6.7	75.9	8.6
	1989	45.6	15.0	4.6	56.4	14.0
	1990	39.3	10.3	3.5	46.2	11.9
	1991	39.6	7.6	3.1	44.5	11.7
	1992	36.1	6.6	2.4	42.3	18.3
Thailand	1979	-	-	-	-	-
	1980	25.9	5.0	3.1	96.3	-
	1981	31.5	6.8	4.3	116.8	26.6
	1982	34.8	8.5	5.2	129.7	24.9
	1983	35.3	10.2	5.7	150.3	23.8
	1984	36.8	12.0	5.4	143.8	23.7
	1985	47.8	31.9	13.3	171.4	18.3
	1986	45.3	30.1	11.0	153.2	15.3
	1987	44.2	22.0	8.4	128.8	13.1
	1988	35.7	20.2	7.1	99.7	22.2
	1989	32.9	16.3	6.0	87.2	26.1
	1990	33.5	17.0	6.5	90.2	29.5
	1991	37.0	13.1	7.0	94.9	34.9
	1992	36.3	-	-	-	37.4

Coutry	Year	ED/GNP	DSR	I/X	ED/X	SD/TD
Indonesia	1979	-	-	-	-	-
	1980	27.9	7.9	3.7	94.1	13.3
	1981	25.4	8.2	4.0	91.3	13.3
	1982	29.4	10.6	5.4	124.6	18.1
	1983	39.0	12.8	6.3	151.6	15.4
	1984	39.5	14.6	7.3	143.9	16.9
	1985	44.1	19.8	8.1	178.2	14.7
	1986	60.2	27.3	12.7	268.3	14.7
	1987	79.7	27.9	12.0	270.2	12.3
	1988	64.1	40.2	15.6	239	7.9
	1989	59.5	35.4	13.9	209	9.9
	1990	66.4	31.0	12.5	224	16.7
	1991	69.0	32.6	13.1	231	18.9
	1992	67.4	32.1	11.7	231	21.6
P'ppines	1979	-	-	-	-	-
	1980	49.4	7.1	4.5	212.0	43.4
	1981	54.0	9.7	5.9	234.8	43.4
	1982	61.9	12.3	6.4	294.8	46.6
	1983	70.8	14.4	7.9	290.2	38.9
	1984	77.1	13.7	9.7	301.6	38.9
	1985	81.9	31.6	9.9	326.2	32.7
	1986	95.0	33.6	18.7	328.0	18.6
	1987	91.1	35.7	19.5	317.8	16.5
	1988	77.0	30.8	18.2	262	13.3
	1989	67.8	25.5	16.9	223	13.9
	1990	68.8	27.0	13.3	229	14.5
	1991	70.4	23.0	10.9	218	15.3
	1992	60.7	27.7	8.3	185	13.7
Mexico	1979	-	-	-	-	-
	1980	30.5	49.5	27.4	259	28.2
	1981	-	-	-	-	-
	1982	-	-	-	-	-
	1983	66.6	51.7	34.8	324	10.9
	1984	57.3	52.1	34.7	291	6.8
	1985	55.2	51.5	34.4	326	5.6
	1986	82.9	54.2	35.1	423	5.8
	1987	82.1	40.1	27.7	363	5.3
	1988	60.3	48.0	27.0	308	7.9
	1989	47.3	41.3	24.7	249	9.2
	1990	44.8	26.3	17.1	243	15.2
	1991	41.2	30.2	18.4	254	19.0
	1992	35.2	44.4	16.3	243	21.6
Brazil	1979	-	-	-	-	-
	1980	31.3	63.1	33.7	305	19.1
	1981	-	-	-	-	-
	1982	-	-	-	-	-
	1983	50.6	55.1	39.8	403.7	14.6
	1984	52.3	46.3	31.3	348.4	10.6
	1985	50.3	38.6	31.5	362	9.1
	1986	44.4	47.0	31.4	452	8.5
	1987	43.8	41.9	26.3	431	11.0
	1988	36.5	48.1	36.0	314	9.4
	1989	25.6	39.9	14.7	287	16.7
	1990	24.9	24.2	6.6	320	20.8
	1991	29.7	24.4	9.8	327	23.0
	1992	31.3	24.4	9.7	311	17.4

Country	Year	ED/GNP	DSR	I/X	ED/X	SD/TD
Argentina	1980	35.6	37.3	20.8	242	38.2
	1981	-	-	-	-	-
	1982	-	-	-	-	-
	1983	-	-	-	-	-
	1984		-	-	-	-
	1985	61.1	58.9	49.1	493	13.2
	1986	51.9	76.2	48.7	593	8.4
	1987	56.3	74.3	48.3	695	6.0
	1988	48.4	44.2	27.3	517	9.7
	1989	92.9	36.2	17.7	542	13.1
	1990	46.0	40.8	18.0	412	16.8
	1991	35.6	37.6	19.8	443	20.7
	1992	30.1	34.9	19.0	453	23.9

Source: World Bank, World Debt Tables, various issues.
Note:
ED = external debt
DSR = debt service ratio
I/X = interest payments over exports
ED/X = external debt over exports
SD/TD= short term debt over total debt

ratio being that of Indonesia reaching 28 % in 1987. As for the Latin America, debt service ratio averaged about 30% in 1980 and increased to an average of 60% in 1987.

The ratio of interest payments to exports averaged about 6 % in 1983 in ASEAN as a whole, but rose to about over 12 % in Indonesia and the Philippines in the late 1980s. In Latin America, it was 20% in 1980 and rose to about 35% in 1987, on average.

The Philippines' external debt stabilized in 1983, but only as a consequence of a unilateral declaration of moratorium on debt service payments. Borrowings from international banks did not increase. Debt service became unsustainable and rescheduling took place in that year.

The external debt burden was very high in 1984, debt service was 14 %, interest to exports ratio was 9.5 % and the outstanding debt was three times the level of annual export earnings and nearly 8 % of GNP. More than 30 % of the debt is short term and 90 % of the long term borrowing is on non-concessional terms. Negotiating relief on the Philippines' debt was inevitable and necessary for economic recovery.

In short, when interest rates hit historically high levels in the early 1980s and the world recession simultaneously reduced exports world-wide, the condition of ASEAN debt was naturally affected and deteriorated.

At the end of 1986, S.Korea was the largest ASEAN debtor with a debt of US$ 46.7 bn, according to World Bank data. However, it managed in reducing its debt in recent years through prepayment and restraining new borrowing. The country's external debt decreased by about US$ 2 bn in 1986 and US$ 8 bn in 1987. Although it relied heavily on foreign savings for its investment in the past, for the last three years it has been a net foreign investor and is no longer the largest debtor in Asia (Lee et. al, 1989) or one of the most heavily indebted countries in the world.

Indonesia's outstanding debt reached US$ 43 bn by the end of 1986. The external debt situation; as indicated by several debt indicators, deteriorated in 1986. For example, the debt service ratio rose to 34.9 % in 1986 from 25.1 % in 1985. The ratio of outstanding debt to exports increased to 278 % in 1986 from 178 % in 1985. The outstanding external debt increased rapidly in recent years partly due to Indonesia's increasing current account deficit associated with the decline in the value of oil exports and partly due to the currency composition of its debt. About 60 % of its debt was denominated in non-US dollars, hence increasing the dollar value of debt and debt service when dollar depreciated. Indonesia became the largest debtor in ASEAN in 1987. Since then it aims to minimize short term commercial borrowing.

Malaysia's external debt increased rapidly in the 1980s, reaching US$ 20 bn by 1987. The ratio of external debt outstanding to GNP continued to increase from 22 % in 1980 to 76 % in 1986, which was the second largest, after the Philippines, among the ASEAN countries. However, the ratio of external debt outstanding to exports was lower and the debt service ratio was not particularly high. Malaysia continued to refinance its debt in 1986 and 1987 in order to reduce its future debt-servicing burden and reduced new borrowings. About US$ 1 bn worth of external debt in 1987 was paid in advance before reaching maturity.

The Philippines was the only ASEAN country which resorted to debt rescheduling in the 1980s. Debt burden, as indicated by the debt indicators, seemed unsustainable. External debt burden since 1982 was more than three times its exports. In 1986, external debt was about 94 % of GDP the highest among the ASEAN countries. In 1987, the Philippines reached an agreement with commercial banks for a second rescheduling agreement for its external debt. For the purpose of converting the country's foreign liability to equity, the Philippines approved a debt/equity swap programme during the year. More than 130 debt-equity conversions totaling US$ 456 million were approved in 1987.

Thailand's external debt increased gradually in 1986. Overall, its debt situation had generally improved. The ratio of debt outstanding to exports declined to 154 % in

1986 from 170 % in 1985, and the ratio of debt outstanding to GNP decreased over the same period to 45 % from 47 %. However, in 1986 the debt service ratio increased slightly to 26 % from 25 % in 1985. The external debt situation improved further in 1987 as Thailand's merchandise exports increased by more than 30 %.

In conclusion, in the late 1980s, debt situation in Indonesia deteriorated significantly due to a decline in the value of oil exports, and in the Philippines, debt situation remained a heavy burden. Debt burden eased slightly as evidenced by; debt/GNP, debt-service and debt/exports ratios; for the rest of the ASEAN countries but debt stock remained at very high levels. Much of the high growth of the ASEAN countries has been financed by their exports to the United States and Japan. In 1985, the United States imported 35.4 % of S.Korea's total exports and 21.2 % of Singapore's. In contrast, Japan's shares of these countries' exports during the same period were 15.5 % and 9.4 %, respectively. Japan has been a more significant importer of other ASEAN countries' goods especially from Indonesia; in 1984 it amounted to almost 50 %, compared to the U.S. share of 20 % (Direction of Trade Statistics, 1987).

2.2.2 The Composition of ASEAN Debt

The net annual increase in debt for a country, ΔD, can be decomposed into several elements, based on equation 2.1.

The balance of payments identity can be rewritten as:

$$(M\text{-}X) + dR + NEO \equiv \Delta D + DI + ODA + IMF \qquad (2.1)$$

where,

(M-X) = the current account balance

ΔR = change in reserves

NEO = net errors and ommissions (including capital flights and valuation changes)

ΔD = change in foreign debt

ODA = total ODA loans and grants

DI = direct investment

IMF = IMF funds

The l.h.s. of equation (2.1) is the amount of foreign finance needed and the r.h.s. is the form of financing the deficits. From (2.1), the composition of the net increase in debt can be obtained as:

$$\Delta D = \{(M-X) + \Delta R + NEO\} - \{DI + ODA + IMF\} \quad (2.2)$$

or, ΔD can also be calculated as:

$$\Delta D = (LTD + STD)_t - (LTD + STD)_{t-1} \quad (2.3)$$

where,

LTD = long-term debt

STD = short-term debt

Evidence on debt increases is given in Table 2.4. In most ASEAN countries, debt increased around 1980 in association with an expansion of the current account deficit *(M-X)*, which in turn is related to the expansion of the investment-savings gap *(I-S)* and the fiscal deficit *(G-T)* according to the national income identity:

$$(M-X) \equiv (I-S) + (G-T) \quad (2.4)$$

Attributes of Table 2.4 are, therefore;

i) movements between debt and deficits)
ii) movements between external and fiscal deficits) discussed in this section
iii) financing the external deficits) discussed in section 2.2.4
iv) other debt-reducing factors)

By 1979, both S.Korea and Singapore were in need of foreign finance as evidenced by the current account deficits. An important difference, however, is that the government of Singapore confined its activity to a comparatively low level compared to S.Korea, which was associated with a growing fiscal surplus for the former and a sizeable fiscal deficit for the latter. This trend was typical of the early 1980s.

Likewise, the other ASEAN countries were in need of foreign finance in the early 1980s as evidenced by the current account deficits, with substantial amount in all ASEAN. Large fiscal deficits prevailed in Malaysia and Indonesia in 1979-84 in connection with the second oil-boom reflecting greater government and private sectors' expenditure associated with the greater income generated from oil revenue. The fiscal deficit was reduced with the decline in oil prices after 1983. The fiscal

Table 2.4: Deficits in Trade, Capital and Fiscal Account

DEICITS IN TRADE, CAPITAL AND FISCAL ACCOUNT										Debt reducing factors			
COUNTRY	YEAR	ΔD	(M-X)	TB	NTB	PTRS	OTHS	(I-S)	(G-T)	ΔR	CFL	DI	ODA	IMF
S.KOREA	1979	3500	4151	4195	195	-199	-40	3026	1125	771	-1244	1	40	138
	1980	8144	5321	4184	1386	-399	-50	3923	1398	863	2477	-208	42	683
	1981	4338	4646	3628	1519	-422	-79	2319	2327	316	916	261	33	1246
	1982	4098	2650	2594	555	-447	-52	385	2265	96	2769	107	51	1259
	1983	1957	1606	1763	435	-566	-26	752	854	-77	1750	-62	30	1354
	1984	2454	1372	1036	876	-516	-25	328	1044	740	2186	246	32	1567
	1985	5120	887	19	1446	-555	1133	1810	-923	158	-	1182	-	1508
	1986	-471	-4617	-4206	628	-1028	2067	-1180	-3437	165	6138	626	-17	1549
	1987	-5244	-9854	-7659	977	-1199	4371	-5830	-4024	2263	3188	305	11	525
	1988	-2778	-14161	-11445	1268	-1404	5388	-10100	-4061	3684	7946	238	10	0
	1989	-2917	-5056	-	-	-	-	-6100	-	2864	-	-382	-27	0
	1990	2189	-2172							-426		562	-53	0
	1991	4646	-8726							-1107		749	-46	0
S'PORE	1979	-	716	3050	-2349	31	4	771	-35	516	-	355	570	0
	1980	-	1507	4200	-2716	46	5	1553	-46	748	-	570	19	0
	1981	42	1378	6123	-4859	50	12	1726	-357	982	-1316	980	23	0
	1982	166	1206	6762	-5631	101	13	1679	-473	931	-1668	280	21	0
	1983	44	819	5821	-5161	170	14	1225	-436	784	-1121	418	21	0
	1984	346	727	4071	-3594	193	13	1706	-979	1152	-	-	-	-
	1985	116	4	2829	-3038	205	-530	-490	494	2431	-	984	-	-
	1986	469	-542	2065	-2798	172	-363	-1120	578	92	-	411	29	-
	1987	616	-553	2636	-3381	170	-362	-930	377	2288	-	1260	23	-
	1988	-	-1660	2345	-4237	209	-441	-1590	-70	1846	-	1201	22	-
	1989	-	-	-	-	-	-	-1480	-	1958	-	2490	-32	-
	1990									1701		2617	-24	
	1991									1124		1518		
MALAYSIA	1979	329	-929	-3157	2220	36	-28	-2612	1683	672	723	77	60	0
	1980	1018	285	-2406	2607	43	-23	-2941	3226	472	499	177	61	0
	1981	1733	2486	105	2347	55	-21	-2295	4781	-289	66	252	58	221
	1982	2466	3601	753	2816	53	-21	-1182	4783	-330	-900	-429	60	274
	1983	2718	3379	-471	3841	35	-26	-577	3956	16	-48	234	64	330
	1984	1082	1696	-2739	4397	63	-25	-1323	3019	-61	-112	90	93	258
	1985	2313	613	-3577	4185	46	-51	640	2093	1204	-	1030	-	-
	1986	1577	122	-3245	3405	19	19	330	-518	1027	1708	1088	192	0
	1987	741	-2633	-5839	3344	-69	69	-1930	-2963	1419	1793	-525	363	0
	1988	-2139	-1875	-5559	3344	-69	-271	-1230	55	-907	429	-317	103	0
	1989	-2289	145	-3779	3993	25	44	-140	285	1250	-	1691	140	-
	1990	-215	1630							1926			202	
	1991	1717	4530							1058			116	

Country	Year	ΔD	(M-X)	TB	NTB	PTRS	OTHS	(I-S)	(G-T)	ΔR	CFL	DI	ODA	IMF
THAILAND	1979	-	2086	1550	782	-23	-224	1442	644	-166	-	38	147	240
	1980	-	2070	1902	760	-75	-518	817	1253	-283	-	217	178	182
	1981	1997	2569	2029	1185	-50	-595	1590	979	172	371	219	190	706
	1982	1393	1003	731	1074	-75	-726	-785	1788	-194	1600	128	186	702
	1983	1467	2874	2861	1136	-153	-870	1882	992	69	-159	200	210	907
	1984	1524	2100	1930	1226	-59	-996	682	1418	314	470	322	248	791
	1985	2320	1537	1332	370	-47	212	2180	-643	239	-	1060	-	1122
	1986	1053	-247	-388	366	-64	289	1150	-1397	952	2117	232	496	1069
	1987	2235	365	424	166	-100	325	2400	-2035	1276	40	528	503	972
	1988	133	1654	2087	196	-47	676	3370	-1716	2516	-	1612	563	662
	1989	1768	2498	-	-	-	-	-	-	3396	-	1406	272	273
	1990	4776	7282							3750		1583	373	1
	1991	7620	7565							4135		872	310	0
INDONESIA	1979	-	-980	-5909	4959	0	-30	-1236	256	1436	-	-383	147	240
	1980	-	-2864	-9170	6361	0	-55	-4616	1752	1330	-	280	296	0
	1981	1835	566	-6806	7622	0	250	-689	1255	-378	4554	2584	324	0
	1982	3779	5324	-1893	7351	0	134	3189	2135	-1870	1177	537	315	0
	1983	3672	6338	-963	7405	0	-104	5192	1146	574	-2176	303	317	445
	1984	2306	2114	-5500	7728	0	-144	1630	484	1055	299	423	326	413
	1985	4414	1923	-5822	7833	-61	199	1860	63	568	-	275	-	46
	1986	7053	3911	-2458	6628	-71	330	4010	-99	-928	5457	626	710	-51
	1987	8877	2098	-4674	7029	-86	343	1910	188	876	8222	358	1245	716
	1988	25	1397	-5678	7329	-99	353	1370	27	-451	1777	444	1631	623
	1989	2079	1368	-6413	8078	-125	422	-	-	377	-	1418	1252	608
	1990	13517	2988							1958		517	1057	494
	1991	9099	4080							1701		833	1160	166
PHILS	1979	-	1496	1541	310	-229	-126	1449	451	487	-	330	112	668
	1980	-	1917	1939	412	-299	-148	1466	451	597	-	125	123	853
	1981	3629	2096	2224	344	-325	-182	558	1538	-780	3172	115	146	958
	1982	3527	3212	2646	1040	-322	-164	1524	1688	-1778	2615	126	163	833
	1983	-404	2351	2485	738	-237	-235	2079	672	-141	-1981	-168	259	942
	1984	697	1268	679	958	-118	-268	679	589	-145	716	130	256	757
	1985	2875	35	482	-68	-172	207	370	-335	37	-	17	-	1168
	1986	1624	-954	202	-715	-235	206	-410	-1364	1336	3603	140	955	1266
	1987	1087	444	1017	0	-376	949	-640	1084	-96	3035	326	770	1200
	1988	-437	390	1085	80	-500	1275	-710	1100	1000	1086	986	223	1073
	1989	-	1465	2598	-303	-473	1303	-30	1495	462	-	379	255	1177
	1990	1916	2695							-362		320	671	912
	1991	1800	1034							2400		146	427	1086

deficits and investment-savings gap in Thailand and the Philippines (and to a certain extent Indonesia) fluctuated in the period 1979-84.

In many developing countries excess demand for foreign finance may have increased as a result of an outflow of foreign exchange in the form of capital flight. There are many causes of capital flight, including expectation of currency devaluation and a loss of confidence in the economic and political structure. From equation (2.1), net errors and omission (NEO) figures are obtained and they are substantial, where part of it is capital flight.

The following discusses the changing patterns of financial flows in the late 1980s. Domestic savings are a primary source of economic growth; the gap between gross domestic investment and gross domestic saving needs to be filled using foreign capital inflows. Table 2.4 shows improvement in debt demand and its decomposition in Singapore, South Korea and Malaysia, in the late 1980s as compared to the early 1980s. In general, demand for debt decreased at the end of the decade in all ASEAN countries. Decrease in debt demand in those three ASEAN countries is the result of improvements in the current account balance *(M-X)* which reflects saving-investment surpluses and a contraction of fiscal deficits. There was a sharp drop in the debt of South Korea in the late 1980s due to prepayments made possible by surpluses incured in the current account *(M-X)*, matched by surpluses incurred in savings over investment and in the fiscal account. Singapore also incurred surpluses in the current account in the same period further matched by the surpluses in savings over investment throughout the late 1980s, although the surpluses are lesser compared to that of S.Korea. Malaysia incurred surpluses in the current account in 1987-88 and paid in advance some of its debt in 1988.

As for the rest of the ASEAN countries, their debt were reduced in 1988 relative to that in 1985-86, although debt demanded remained substantial in the Philippines during 1985-86 and in Indonesia during 1985-87. The increase in debt was due to the expansion of these countries' current account deficits. A general increase in reserves in all ASEAN countries also played a role in increasing their debt because reserves has to be financed either by current account surplus or debt, except in S.Korea, where the increase is financed by current account surplus. Private transfers were still of great importance in the ASEAN region, especially in S.Korea, the Philippines and Indonesia.

2.2.3 Estimates of Demand for Long-Term Foreign Finance

The annual increment of external debt *(ΔD)* in Table 2.4, is not expected to be equivalent to the demand for long-term finance *(ΔLT)* because *(ΔD)* contains other types of loans such as short-term loans. The demand for long-term debt is important for long-run financing of deficits and maturity management, i.e. matching loan maturity with revenue in the long-run so that short term loan is not used to finance long-term loan. As equation 2.5 shows, the demand for long-term foreign finance can be estimated by adding amortization, *A*, to the annual increment of debt and subtracting short-term finance. In principle, short-term finance should not be matched with current account deficits which are long-run obligations otherwise short-term loans keep rolling and incur a greater cost than long-term loans. So, the change in long-term loan is:

$$\Delta(LT) = \Delta D - \Delta STD + A \qquad (2.5)$$

Assume that the change in debt demand, *(ΔD)*, is known ex-ante, based on past deficits and hence determined exogenously. The amount of amortization for long-term debt is predetermined by creditors according to loan terms and conditions. The changes in short term debt are predetermined by debtors as means of bridging any financing gap.

or, since $\Delta D = \Delta STD + \Delta LTD$;

$$\Delta(LT) = \Delta LTD + A \qquad (2.6)$$

where,

$\Delta(LT)$ = demand for long-term debt
ΔLTD = change in long-term debt
A = amortization
ΔSTD = change in short-term debt

The estimates are shown in Table 2.5. While amortization obligations of most ASEAN countries' were fulfilled in the period 1981-84, Singapore and the Philippines (due to rescheduling for the Philippines) reduced theirs in 1984. Although the level of short-term foreign finance fluctuated and was negative in S.Korea and Singapore in 1983 and 1984, the demand for long-term foreign finance by these countries appeared to have steadily increased, reflecting their burden of

Table 2.5: The Demand for Long-term Finance

Country	Years	Demand for Long-term finance(LTF)	Amortization (A) A/LTF		Short-term foreign STF/LTF finance(STF)	
S.Korea	1981	-	998	-	2500	-
	1982	3929	1829	46.6	1998	50.9
	1983	5511	2097	38.0	-1457	-26.4
	1984	5542	2488	44.9	-600	-10.8
	1985	-	5465	-	10732	-
	1986	9940	8935	89	9256	93
	1987	9025	14305	158	9291	103
	1988	3322	6581	198	9780	294
	1989	1540	5605	363	9800	636
Singapore	1981	105	107	101.7	44	41.8
	1982	263	121	46.1	24	9.1
	1983	346	292	84.2	-11	-3.2
	1984	584	188	32.2	-50.0	-8.6
	1985	-	-	-	-	-
	1986	-	-	-	-	-
	1987	-	-	-	--	-
	1988	-	-	-	-	-
Malaysia	1981	-	144	-	-	-
	1982	-	256	-	-	-
	1983	-	285	-	-	-
	1984	-	514	-	-	-
	1985	-	3826	-	2685	-
	1986	4108	2229	54	2413	58.7
	1987	4234	3106	73	2026	47.8
	1988	6121	3908	64	2100	34
	1989	209	2813	1345	2738	1310
Thailand	1981	1649	227	13.8	575	34.9
	1982	1538	308	20.0	163	10.6
	1983	1620	417	25.8	264	16.3
	1984	1967	688	35.0	246	12.5
	1985	-	2247	-	3200	-
	1986	4121	2682	65	2840	69
	1987	4723	2297	49	2664	56.4
	1988	2313	2480	107	2964	128
	1989	2822	2645	94	6112	217
Indonesia	1981	2389	226.9	13.8	575	34.9
	1982	3367	308.1	20.0	183	10.6
	1983	5114	417.5	25.8	264	16.3
	1984	3188	688.5	35.0	246	12.5
	1985	-	3491	-	6049	-
	1986	8968	2867	32	6310	71
	1987	12567	3788	30	6417	51
	1988	5833	5713	98	6322	108
	1989	5280	5102	97	7026	133
P'ppines	1981	1730	326	18.8	1865	107.8
	1982	2134	511	24.0	1904	89.2
	1983	2131	613	28.8	-1921	-90.1
	1984	963	354	36.8	88	9.1
	1985	-	852	-	9092	-
	1986	6607	1412	22	5486	83
	1987	5200	1778	34	3792	73
	1988	983	1516	154	3888	396
	1989	488	1181	242	3951	809

Source: World bank, World debt Tables, various issues

amortization. Thailand's short term foreign finance was relatively stable, reflecting a well-balanced control of long-term foreign finance, though increasing steadily.

Table 2.5 also shows that demand for long-term foreign finance increased in all ASEAN countries in the late 1980s but decreased gradually in 1988-89 (except Thailand and Indonesia). The amortization rate, however, increased in all countries by 1989 - reflecting priority given to the policy of repaying debt. The ratio of short-term foreign finance to long-term foreign finance increased significantly in all ASEAN countries, especially in South Korea and the Philippines in 1989, indicating illiquidity problems.

The following sections, analyses in detail factors that increase or reduce external debt and the demand for foreign finance.

2.2.4 Financing the Deficit by Non-Debt Items (or Debt Reducing Factors).

Equation 2.1 and Table 2.5 give an indication of the factors that help reduce or match the demand for foreign finance without creating debt. The analysis divides the situation in the early 1980s and that of the late 1980s. In the early 1980s, the following non-debt items play their roles in providing foreign funds to the ASEAN countries.

Firstly, private unrequited-transfers were quite important sources of income to Thailand, South Korea and the Philippines, as can be seen in column 7 from Table 2.4. When oil prices were high, the Middle-East absorbed a large number of workers from these countries who contributed to unrequited transfers. With the decline in the price of oil and the slowdown of the Middle-Eastern economies this source of income declined.

Secondly, official unrequited transfers in the form of Official Development Assistance (ODA) played an important role in Indonesia. South Korea received a relatively constant, though small, amount in the 1980s.

Thirdly, assets in the form of foreign exchange reserves. A decision to increase the foreign exchange reserves of a country can lead to an increase in demand for foreign finance, and vice-versa. While the East Asian NICs increased their foreign exchange reserves between the period 1979-84, Table 2.4 illustrates that the other ASEAN countries used up their reserves during the adjustment period, while the Philippines continued to reduce its reserves throughout 1984.

Fourthly, IMF credits are regarded as a 'last resort short-term finance'. During the early 1980s, South Korea, the Philippines, Thailand, Malaysia and Indonesia, surprisingly, used IMF credits to meet their balance-of-payments needs. Such borrowings were completed through the sale of domestic currency to the IMF in return for other countries' currencies or Special Drawing Rights (SDR). The repayment must be made over a period of time according to the conditions established under the particular borrowing arrangement. If a country's balance of payments improves sufficiently, it is expected to repurchase its own currency from the IMF earlier than scheduled. The credits are, however, subject to IMF conditions, example, the imposition of certain economic adjustment policies on the borrowing country. In general, since conditions attached to IMF credits are often rigid, the IMF funds are used only as a last resort once ability to raise private credit is exhausted. Substantial amounts were used by South Korea and the Philippines as a result of the financial strains experienced in the 1980s.

Fifth, non-debt (equity) financing of securities allows a country to raise non-debt creating foreign funds while limiting foreign economic intervention at the same time. However, only an economy that holds the potential for future profit can attract such financial flows. Although stock market deregulation in many ASEAN countries has made it easier for foreigners to acquire stocks listed on domestic exchanges, a rapid ASEAN-wide growth of foreign-portfolio equity investment is not expected. This is partly due to difficulties in obtaining ample and reliable credit information on individual companies by foreign investors.

Sixth, foreign direct investment not only help meet the demand for foreign funds, it also brings in technology and provides access to foreign markets. However, foreign direct investment may also use up valuable foreign exchange through remittances and transfer pricing, although such payments, in principle, usually occur only when businesses are earning profits (which may fluctuate with the economic conditions of the host country). Table 2.4 reveals a sharp contrast between high levels of foreign direct investment in some ASEAN countries as compared to the rest. Examples of high investment areas are Singapore and Indonesia in the early 1980s. The source of foreign direct investment came mainly from the U.S. and Japan, however, of late, they are declining.

An important feature of private flows to ASEAN in the late 1980s was the rapid increase in direct investment, mainly from Japan and other newly industrialising economies (NIEs) of the east. In the years 1985-89, foreign direct investment played a very important role in financing economic development, particularly in the developing ASEAN economies. Between the mid-1980s and late 1980s, foreign

direct investment decreased in S.Korea and Indonesia, increased in Thailand and the Philippines, increased in Malaysia except in 1987-88. The prospects for direct investment are brighter due to strong economic and geographic advantages these economies have; the incentives for foreign investment such as low-waged labour, land at low cost, infrastructure and management skills; and the need to recycle the current account surpluses by Japan and the NIEs.

In the early 1990s, Malaysia, Thailand and Indonesia are the largest recipient of foreign direct investment in Asia, together accounting for 38 % of all flows into that region in 1992. As it stands in 1992, overall foreign direct investment in developing countries is concentrated in five countries - China, Mexico, Argentina, Malaysia and Thailand - together they account for 59 % of flows. And in Asia, China and Malaysia accounts for almost three-quarters of all inflows into the region (World Bank, World Debt Tables 1993-94). Privatization is the most important channel of foreign direct investment entries which allows direct foreign equity participation.

The NICs are increasingly becoming capital exporting countries as they continue to have current account surpluses. For example, S.Korea itself became an ODA donor in 1989! As for the other ASEAN countries, ODA inflows continue to increase. In the mid-1980s, Indonesia and the Philippines relied on ODA as a means of financing development due to its concessional nature. IMF funds are heavily used in the Philippines, Thailand and Indonesia, while its use in the rest of the ASEAN countries shows a decreasing trend.

To conclude, the pattern and composition of financial flows are influenced by the stage of economic development in each country. Lower income countries tend to rely more heavily on concessional official flows (such as ODA) as a result of limited servicing capacity. High income countries rely more on non-concessional private flows - being more creditworthy, they have easier access to funds and can obtain more competitive financing from commercial sources. Moreover, they have greater scope for joint ventures with developed country firms, hence greater potential for attracting foreign direct investment. As a country moves further towards a higher stage of economic development, it may become a capital exporter. The NICs are good examples of being at the higher stage of development and have become capital exporters in recent years. The other ASEAN countries are still at the stage of attracting more flows of private investment.

2.3 The Supply of Long-Term Foreign Finance

In the previous section, we examined the creation of external debt and the demand for long term foreign finance for the ASEAN countries. In financing debt, factors such as foreign exchange reserves, direct investment and short-term finance play important roles in financing debt without creating debt-burden. In this section, we will discuss the supply of finance pertaining to ODA loans, other official flows and debt-creating private funds. The supply of finance thus comes from either the international credit markets or other official sources.

2.3.1 Major Trends in Long-Term Foreign Finance

The major trends in long-term foreign finance are summarized in Table 2.6. The total long term foreign finance is derived by identifying all possible sources of funds for the ASEAN countries based on the "Geographical Distribution of Financial Flows to Developing Countries (1985)," prepared by OECD. These estimates of the total long-term foreign finance are consistent with the increment in debt shown in Table 2.4.

Table 2.6 provides two important observations. Firstly, a pattern emerges in the total inflows that reflects economic changes in these countries, especially continued investment-savings surpluses and increased fiscal deficits. For most of the ASEAN countries, total inflows increase in 1981 and decline after 1981 until 1983. This reflects the extent to which the global debt problems in 1981 affect the ASEAN economies and a decrease in demand for foreign funds in these countries as a consequence of adjustment policies. In 1984, the total inflows to ASEAN return to previous levels (except in the case of the Philippines), reflecting a revival of active development policies in these countries which is accelerated by low oil prices and the recovery of the U.S. economy, being one of the major trading partners.

Secondly, Table 2.6 reveals sharp differences in the long-term financial structures of ASEAN countries. In the NICs, net inflows of ODA loans became mostly negative, reflecting the fact that these countries began to act as suppliers of these funds rather than users. The shares of net inflows of Other Official Flows (OOF), as part of total inflows to the ASEAN countries also decreased. The share of OOF in S.Korea, for example, declined from over 60 % in 1983 to less than 25 % in 1984, while the share of private finance and portfolio investment increased.

Table 2.6: Supply of Long-term Foreign Finance in ASEAN

1 Ctry	2 Year	3 Total (4+9)	4 C"tual Lend (5+6+8)	5 ODA loans	6 Net OOF	7 OXC	8 PXC	9 Private Fin.	10 Portfo-lio Inv.	11 Direct Inv.
S.Kor	1979	2336	1064	94	669	233	301	1272	466	1.2
	1980	1874	1042	97	448	335	497	832	-53	-208
	1981	3113	1028	297	540	184	191	2085	210	261
	1982	2339	991	-16	1096	443	-90	1348	368	107
	1983	1499	469	-22	922	456	-431	1030	863	-62
	1984	2614	427	-68	634	200	-183	2186	1298	246
	1986	1262	684	-64	-176	na	924	578	114	370
	1987	-1925	-892	-57	-1415	na	580	-1013	-1673	828
	1988	-1436	-586	-64	-1066	na	544	-850	-1705	754
	1989	-598	-555	-30	-735	260	210	-43	-60	339
	1990	1015	-552	-53	-543	48	48	1567	1436	557
	1991	2771	-340	-50	-340	53	52	3111	2516	749
	1992	2835	-159	-46	-313	212	200	2994	3193	37
Spore	1979	171	170	-7.4	89	96	89	-	-	-11
	1980	387	66	-5	29	28	41	321	18	570
	1981	228	228	-1.5	-11	-4.3	239	-	-	154
	1982	323	323	-2	2.6	5.7	322	-	-	288
	1983	-148	-148	-6.6	-45	-42	-97	-	-	-99
	1984	82	82	13	46	57	23	-	-	339
	1986	131	51	-7	-218	na	276	80	-511	602
	1987	1015	66	-8.4	-61	na	135	950	371	930
	1988	1738	56	-9.3	-46	na	111	1682	1	1678
	1989	2247	150	66	-31	na	115	2097	428	1688
	1990			-32	155	na	56	2605	643	2006
	1991	-	-	-	-	-	-	-	-	-
Mal	1979	587	516	65	87	1	363	71	65	77
	1980	507	365	75	82	-4.6	209	142	22	176
	1981	2011	571	85	115	-5.6	371	1440	110	252
	1982	2591	531	75	130	-5.3	326	2060	671	-43
	1983	1989	524	113	182	71	229	1465	973	234
	1984	2139	474	234	127	66	113	1665	625	90
	1986	4	159	3	19	na	138	-155	-41	-32
	1987	340	345	230	31	na	84	-5	-278	384
	1988	526	-32	-39	-34	na	41	558	-54	674
	1989	524	-80	7	-172	114	85	604	19	612
	1990	1108	317	55	70	56	95	791	-182	1038
	1991	1643	200	-32	114	118	118	1443	643	1518
	1992	1742	34	-24	-11	71	69	1708	84	1578
Thai	1979	955	556	246	245	89	65	399	205	38
	1980	973	683	240	313	89	130	245	35	217
	1981	1402	995	216	375	52	404	407	159	219
	1982	968	846	204	433	9	209	122	79	128
	1983	766	755	222	599	131	-66	111	112	200
	1984	1358	569	227	393	38	-52	789	306	322
	1986	336	344	188	87	na	69	-8	133	-5
	1987	838	343	181	-80	na	242	495	117	441
	1988	300	-51	235	-569	na	283	351	-167	513
	1989	2133	736	289	51	516	396	1397	-90	1296
	1990	2481	1084	380	308	867	571	1618	-135	1512
	1991	2639	1021	310	328	681	383	2619	-51	1797
	1992	3224	482	355	-355	566	571	2742	163	1748

1	2	3	4	5	6	7	8	9	10	11
Indo	1979	266	634	439	186	-22	9	-368	-103	-383
	1980	1096	1127	653	372	22	102	-31	57	280
	1981	1831	1253	652	261	-94	340	578	386	2584
	1982	3587	1595	592	673	37	331	1992	423	537
	1983	2021	1808	434	775	233	599	1013	692	303
	1984	3037	2475	347	1163	226	965	562	47	423
	1986	1970	1876	332	747	na	797	94	551	-581
	1987	3387	3663	766	2171	na	726	-276	429	-570
	1988	2958	3363	1083	2001	na	279	-405	-68	-14
	1989	2479	3496	1252	1884	na	360	1017	-110	1320
	1990	3159	2901	1034	1551	604	317	249	195	600
	1991	3004	2901	1057	1527	639	317	103	195	517
	1992	5868	4134	1161	2097	1280	876	1734	744	833
Phil	1979	634	465	156	338	91	-28	169	246	329
	1980	1151	600	176	230	-33	282	462	32	125
	1981	1512	1015	230	404	-23	301	497	-32	115
	1982	1191	523	170	200	13	65	667	132	125
	1983	1922	1110	170	854	162	94	804	334	-168
	1984	298	663	141	383	47	140	-365	-142	130
	1986	623	663	440	176	46	na	-40	188	60
	1987	433	659	309	304	46	na	-226	-169	78
	1988	904	883	452	434	-4	na	22	37	215
	1989	707	922	275	545	102	110	-215	-448	332
	1990	1651	1733	675	904	154	154	-82	-337	312
	1991	1256	1191	427	626	186	138	65	55	146
	1992	2034	1899	1042	721	169	136	135	76	70

Source: OECD, Geographical Distribution of Financial Flows to Developing Countries, variou issues.

Some of the ASEAN countries had been dependent on ODA loans, although the ratio of ODA loans to total net inflows, with the exception of the Philippines, decreased between 1979 and 1984. In Thailand, Indonesia and Malaysia, the ratios of ODA loans to total net inflows in 1984 were approximately 17 %, 11% and 11 % respectively. Net ODA loans amounted to 47 % of the Philippine's total inflows in 1984, from 15 % in the early 1980s.

In the case of Other Official Flows, the experiences of these countries were diverse. Malaysia reduced its dependence on OOF from almost 15 % in 1979 to under 6 % in 1984. Indonesia's and Thailand's shares of the OOF were generally around 30 % to 40 % for the same period. The Philippine's OOF grew to 128.63 % of its total net inflow of long-term foreign finance, reflecting the debt problems in the country.

Turning to the role of private export credit, in Malaysia, it declined from nearly 62 % of total long-term foreign finance in 1977 to less than 6 % in 1984. Indonesia experienced the opposite; its private export credit as a percentage of long term foreign finance increased from around 3 % in 1979 to over 31 % in 1984. In Thailand, private export credit declined and became negative in 1983 and 1984. In the Philippines, the share of private export credit fluctuated greatly from nearly 25 % in 1980 to less than 5 % in 1983, and increased again to over 46 % in 1984. Export credit is a form of assistance developed countries can extend to developing countries which explains the increase in the Philippines and Indonesia.

In summary, the data in Table 2.6 reveals important trends. Firstly, private finance plays an increasingly important role in the economic development of ASEAN. Secondly, it shows the beginning of securitization. The percentage of long term foreign finance that is private has been increasing steadily in the first half of the 1980s as compared the 1970s in S.Korea, Malaysia, Thailand and the Philippines. In Indonesia, the percentage of private finance fluctuated but remained substantial in 1984 at over 18 %. Private finance in the Philippines reached a high level of over 56 % of long-term foreign finance in 1982 but became negative (over -120 %) in 1984 due to the extraordinary financing required as a result of its debt problem.

The evidence demonstrates clearly how the NICs have "graduated" from their dependence on official flows. Among developing ASEAN countries, Malaysia appeared comparatively less dependent on official flows, while the Philippines and Indonesia continued to rely relatively more on ODA and OOF. It can be deduced from Table 2.6 that for the East Asian NICs, net inflows of official finance in

1984 accounted for only 0.48 % and 0.75 % of the GNP of Singapore and South Korea, respectively. But in the developing ASEAN countries, such inflows accounted for 4.42 %, 2.42 %, 2.09 % and 1.51 % of the GNP of the Philippines, Indonesia, Thailand and Malaysia.

The situation in the late 1980s, reveals three important points. Firstly, a very interesting development is the negative supply (and demand) of total long-term foreign finance in S.Korea since 1987. This reflects the higher stage of economic development that S.Korea has been undergoing. In addition, the prepayment of loans has been taking place, thus avoiding the incidence of short term debt financing long-term debt. It reflects the net supplier of official finance and net foreign investment.

The supply of total long-term foreign finance has been slightly reduced in countries with non-reliance on official loans, but remains substantial in Indonesia and the Philippines.

Secondly, private finance is more important in Singapore, Malaysia and Thailand, which reflects the importance of direct investment as a supply of long-term foreign finance. There is a reduction in private finance in South Korea (since it is moving towards being a net foreign investor), and in the Philippines mainly due to political instability. Thirdly, private export credit remain an important source of finance in most ASEAN countries.

In the early 1990s, foreign direct investment plays the most important role as a form of financing (apart from debt) development of the ASEAN countries. In early 1993, Malaysia, Thailand and Indonesia agreed to establish a growth triangle (with a combined population of 21 mn) to promote economic development by encouraging trade and investment flows. Together, these three countries account for 38 % of all flows into Asia in 1992. Similar growth triangle with similar objective has been established by Malaysia, Singapore and Indonesia in 1989.

2.3.2 Overview of the Suppliers of Finance.

According to Table 2.7, Japan supplied 87 % of total bilateral flows to the developing ASEAN economies in 1987. The Asian Development Bank (ADB) provided about 27 % of total multilateral flows, while the World Bank supplied most of the remaining multilateral flows. Tables 2.7a and 2.7b show the different types of flows, in aggregate form, to ASEAN from 1970 to 1987. There is a big increase in

Table 2.7a: Financial Flows to the Developing ASEAN Economies (in US$ mn)

-	1970	1980	1981	1985	1986	1987	(%)
Official Flows	729	2803	3159	3414	3382	4763	(96)
ODA grants	213	658	718	949	1392	1396	(28)
ODA loans	399	1148	1184	850	963	1494	(30)
Other OOF	118	996	1257	963	1028	1873	(38)
Private Flows	407	1754	5208	148	-140	198	(4)
Direct Invest.	196	887	3169	-519	-588	355	(7)
Port. Invest.	56	145	623	506	831	99	(2)
Export credit	156	722	1416	161	-382	-257	(-5)
TOTAL	1137	4557	8336	3652	3243	4961	(100)
Bilateral Flows	1049	3338	6789	2055	2024	3312	(67)
Japan	420	1246	3172	1342	1049	2878	(87)
USA	312	627	1161	-468	322	-379	(11)
Europe	281	1251	2236	1008	460	341	(10)
Multilateral Flows	86	1218	1576	1507	1219	1649	(33)
ADB	4	238	276	346	376	443	(27)
IBRD	45	530	1034	935	629	1013	(61)
IDA	3	46	92	53	24	18	(1)

Source: OECD Geographical Distribution of Financial Flows to Developing Countries, various issues.

Table 2. 7b: Financial Flows to the Newly Industrialising ASEAN Economies (in US$ mn)

-	1970	1980	1981	1985	1986	1987
Official Flows	535	1050	1154	-192	-699	-3364
ODA grants	153	74	65	84	102	120
ODA loans	161	86	304	-58	-82	-67
Other OOF	221	890	784	-218	-720	-3417
Private Flows	357	1875	4230	-207	-897	4784
Direct Invest.	80	979	2417	389	2236	5142
Port. Invest.	-32	-338	626	-499	-2921	-468
Export credit	308	1234	1157	-97	-212	109
TOTAL	892	2925	5384	-399	-1597	1420
Bilateral Flows	813	2674	5030	-530	-1471	2006
Japan	470	628	1372	1173	1561	1602
USA	153	609	2149	-2493	-4418	-344
Europe	184	1260	1359	934	1363	550
Multilateral Flows	78	251	355	131	-125	-587
ADB	6	70	103	41	-1	-165
IBRD	52	170	243	81	-140	-433
IDA	1	-1	-1	-2	-2	-2

Source: OECD Geographical Distribution of Financial Flows to Developing Countries, various issues.

the supply from Japan in 1987 as compared to 1981, when Japan's contribution was only 21%. The ECs contribution was greater in 1981 at about 30 %, but decreased in 1987 to 10 %. As for the NIEs, the United States contributed the highest bilateral flows in 1981 at 44 % but the supply has become negative since 1985. The supply from the EC has also decreased since 1985. The supply from Japan has showed an increasing trend, i.e. 28 % in 1981 and 80 % in 1987.

As the East Asian countries need to recycle their surpluses, direct foreign investment becomes increasingly an important source of finance for ASEAN. After declining in 1984 and 1985, Japan's direct investment rises again in 1986-87 (Lee et. al, 1989). S.Korea and Indonesia are the largest recipients of Japan's direct investment, receiving US$ 647 mn and US$ 545 mn respectively, or 11.2 % and 13.3 % of total Japanese investment to ASEAN. Investors have been shifting their investment increasingly to ASEAN, reducing their formerly heavy investments in Latin America.

The World Bank estimates over 80 % of cumulative investment outflows in the past 20 years took place in 1985. Developing countries account for a small share of 5 % of the world-wide investment outflows, which is a recent phenomena. In the 1990s, most of these outflows come from China, Korea and Brazil (World Bank, World Debt Tables 1993-94).

2.4 Financing the Government Budget Deficits

The general trend in the ASEAN countries is moving towards greater reliance on private sector development and industrialization. Government investment has been declining since the late 1980s due to tightening of fiscal policy. The declining government budget deficits (or improvements in government budget balance) released domestic resources for use by the private sector between 1988 to early 1990s. In Thailand, for example, the level of public investment remains the same in 1990 as that of the 1985 level, and public sector external borrowings has an annual ceiling level of US$ 1.5 bn, hence contributing to budget surplus since 1988 (Thailand: GATT Trade Policy Review, 1991). The release of public sector resources however, is not enough to meet the demand by the private sector, thus, the gap between private investment and savings increased rapidly, which further contribute to sharp increases in current account deficit since 1987. In Malaysia, the government has been following broadly a balanced-budget policy since 1988. Thus, in the early 1990s, borrowing requirements are small and the source is from domestic market.

The early 1990s observes a financial deepening in the capital market which become an increasingly important source of funds. In the Philippines, the situation is rather different than the rest of the ASEAN. Chronic fiscal deficits existed throughout the late 1980s to the early 1990s with government expenditure persistently above revenues. The government budget deficit is 3.5 % of GNP in 1990. Efforts are made to increase tax collection efficiency. Tax revenues made up the major portion of total revenue - accounting about 82 % and 84 % of total revenue in 1986 and 1990 respectively (Treasury Economic Report, Malaysia, 1992/3).

Trade taxes are important in financing the government budget balances of the ASEAN countries. In Thailand, both import and export taxes' revenues decline over the years but import taxes still play an important role. The share of export and import tax out of total tax revenues, in 1963, made up 35 % and 15 % respectively; in 1970 - 30 % and 7 % of total tax revenues respectively; in 1980 - 22 % and 4 % of total tax revenues respectively; and in 1990 - 25 % and zero % respectively (Thailand: GATT Trade Policy Review, 1991). In the Philippines, out of total tax revenue, import tax and taxes on income and profits are most important - making up 25.5 and 24.7 % respectively, in 1990 (Philippines: GATT Trade Policy Review, 1991). In Malaysia, import tax is still an important source of tax revenue accounting for about 10 % of total tax revenue in 1990. Income tax account for about 40 % of total tax revenue in the same year (Treasury Economic Report, Malaysia, 1992/3). In S. Korea, the export tax had been zero since the mid-1980s.

Money creation or seigniorage is another form of financing government budget balance. In Malaysia, the money supply increased slowly since the late 1980s. In 1989 onwards, the Central Bank took a step to reduce excess liquidity due to the financial deepening in the capital market. The monetary aggregate, M2, grow at an average of 14 % annually in the early 1990s. The broader aggregate, M3, grows at about 15 % in the same period, the growth mainly comes from the external sector and lending to the private sector while the government takes a contractionary policy. M3 is expected to remain strong due to inflows of foreign capital. Narrow money, M1, which include currency in circulation and demand deposits of the private sector rises sharply by 6.2 % in 1993 compared to a growth of 1.7 % in 1992 due to the bullish stock market (Malaysia: Treasury Economic Report, 1993/94).

2.5 Conclusion

The debt stock of ASEAN remain very high in recent years indicating financing of privatisation and securitisation is through increased indebtedness while the

economies continue growing. Due to the growth of output, the debt burden has eased however (see debt/GNP ratios in Table 2.3 for example). rendering the debt more sustainable. ASEAN did also move towards yen credit from the mid-1980s, hence, helping in easing the illiquidity.

As the world economic growth becomes increasingly centred in the ASEAN region, (partly reflecting its comparative advantage from low-waged labour and availability of raw materials), in order to meet this international challenge, economic co-operation among countries in the region within ASEAN and within East Asia should be strenghthened. This is to take advantage of not only abundant labour supply but also to make full use of the surplus that has to be recycled by the surplus countries to the counttries with heavy debt such as Indonesia and the Philippines. Intra-ASEAN or Intra-East Asian trade will also be enhanced and comparative advantage in raw materials will also be exploited. With the move towards privatization and securitization, ASEAN opens a large door to the inflow of foreign private funds, hence, improving the attractiveness of their capital markets. At the same time, the industrialised neighbouring countries should also facilitate the flow of private funds through measures such as a liberalizing their own capital markets.

Diversion in the source of finance is noted in ASEAN with Japan and other NICs playing a quantitatively increasing role in the development of ASEAN in the late 1980s.

Project financing is becoming more important, however, in the Philippines, political instability had a tremendous effect on adverse economic growth. More attention should therefore be paid to how official finance can benefit the majority of the people and thus contribute to the social and political stability of the region.

High interest rates in the U.S. and the high value of the dollar in the first half of the 1980s left the ASEAN countries with increasing liabilities, but world recession in the 1980s was cushioned by a temporary recovery of the U.S. economy in 1984 and 1985. Devaluations of the currencies of many of the countries against the U.S. dollar has stimulated exports. In 1985 when protectionism in the U.S. gained momentum and world primary commodity prices, including oil, fell with uncertain prospects had adversely affected all of the ASEAN countries, forcing the ASEAN region to have a more aggressive economic cooperation among themselves.

The developing ASEAN countries such as Malaysia, Thailand and Indonesia, had been inflicted because of their relatively heavy dependence on exports of primary

products in the early 1980s, while the East Asian NICs, being resource poor, seemed to have gained in their manufacturing exports. Thailand which has no oil, suffered from lower prices of major agricultural exports but gained from lower oil prices.

Any appreciation of the yen against the U.S. dollar leads to two effects on the ASEAN economies - increased competitiveness of their manufactured exports against Japanese exports; and, higher cost of yen credits. Both effects were experienced in 1985. The late 1980s and early 1990s divert ASEAN's market to concentrate more within the Pacific region.

In March 1986, interest rates fell worldwide, easing the liquidity position of the ASEAN countries. As a result, profits and profit expectations in these countries increased. In turn, this attracted an increased flow of private funds. Bank loans connected with syndicated loans became more important, and access to private finance became greater.

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1 The selected ASEAN countries in the study consist of Singapore, Malaysia, S.Korea, Thailand, Indonesia and the Philippines. Although South Korea is not actually an ASEAN member, it is included in the study because of its unique debt experience (in the East) which could be a model for the other ASEANs. With the inclusion of S.Korea, the term NIC's or NIE's in this study refers to Singapore and S.Korea, unless otherwise stated.

PART II : MACROECONOMIC MODELLING OF DEBT

CHAPTER 3: THE TWIN DEFICITS AND DEBT LITERATURE

3. TWIN DEFICITS AND DEBT

Our findings from the ASEAN countries in chapter two suggest some co-movements between government budget deficits and private sector spending, with current account deficits and increased indebtedness. There are similar movements too in many other highly indebted developing countries (see Chapter 1 where there are co-movements in debt and deficits in the Latin American countries). In the US, the notion of the twin deficits has been given a new importance. The increase in both the fiscal and trade deficits to unprecedented levels in the United States in the 1980s sparked debates on their causal linkage. Economists' analyses of the deficits problem focused upon two broad intellectual divisions. One school of thought gives new importance to the twin deficits notion, typically associated with Keynes: This holds that budget deficit-financed tax cuts raise disposable income thereby stimulating aggregate demand. As a result , the budget deficit leads to higher real interest rates and crowds out private investment. Gordon (1990) revived this issue. The other school of thought holds that taxpayers see through the intertemporal veil and realize that taxes depend only on government spending, not on the timing of these taxes. The budget deficits, therefore, do not stimulate aggregate demand and have no real effects. This is associated with Ricardo as revived by Barro (1974).

On international debt issues, there is a large literature that points to a general consensus that the international debt crisis was caused partly by declining export prices for the indebted countries, high world interest rates, the second oil-price shock and sluggish growth in the industrial countries (Eaton and Gersovitz, 1986; Thorpe and Whitehead, 1987; Warner 1989; Solomon 1991). There is however, less attention paid to domestic policies or internal issues that might have some influence on increased indebtedness. We, therefore, aim to investigate the details of the linkages between the government budget deficit and private sector spending with current account deficits and increased indebtedness. This necesitates a systematic evaluation of the factors mentioned.

A standard analysis to the macroeconomic effects of a budget deficit was brought about by the Keynesian revolution (Easterly and Fischer, 1990). The presumption was that the budget should be balanced during peacetime, or generate surpluses to pay-off government debt during wartime. The Keynesian framework emphasizes fiscal policy and the deficit as components of aggregate demand. There was no need to balance the budget during recession and the norm for fiscal behaviour follows the business cycle, i.e. surplus during booms and deficit during recessions.

Easterly and Fischer (1990) theorized on the means of financing the changes in debt to control debt dynamics. A formal empirical work by Enders and Lee (1990) relates government financing policy to switches from taxes to debt, and concludes there is no effect on the trade balance deficit. Warner, (1988) investigates whether the debt crises causes the crowding-out of investment and shows that it is not debt crisis that crowds-out investment but the world economic situation, i.e. it is the terms of trade and the world real interest rates that cause investment decline in the developing countries.

In this chapter, firstly, we present the twin deficits notion as a central concept of our thesis, and then review the conceptual aspects as revived by Gordon (1990). Secondly, we present critically two alternative schools of thought on the twin deficits concept. In the third sub-section we present studies on debt issues that have relevance to our hypothesis of the linkages between debt and deficits.

3.1 The Twin-Deficits Literature: Theoretical Aspects

Gordon (1990) theorized the twin deficits as follows: expansionary fiscal policy or increased government deficits raise real interest rates which induce capital inflows and force the real exchange rate to appreciate. The consequence of appreciating the exchange rate is crowding out of net exports and enlarging the trade deficit. Hence, the budget deficit interacts with trade deficit through the interest rate and foreign exchange rate. Since the mid-1980s, many U.S. economists have believed that increased government deficits are the primary cause of the massive trade deficits experienced in the 1980s and early 1990s. Studies that have relevance to the twin deficits include those by Feldstein (1986), Evans (1987), Abell (1990), Enders and Lee (1990), and Rosensweig and Tallman (1993). Though the twin deficit notion has been given new importance the posited causal relationship does not gain universal acceptance.

Gordon (1990) reviews the accounting links of $(G - T) = S - I + (M\text{-}X)$, i.e., government budget balance is equal to the excess of private savings over private and foreign investments, and ".....after puting in figures (in US $ bn) to the definition above, learned that the U.S. government budget deficit is financed very differently in 1989 (a year typical of the 1980s) and 1992....." (Gordon, 1990).

1989: $\mathbf{1.6}\ (G - T) \equiv \mathbf{15.8}\ (S) - \mathbf{16.0}\ (I) - (\mathbf{-1.8})\ (M\text{-}X)$

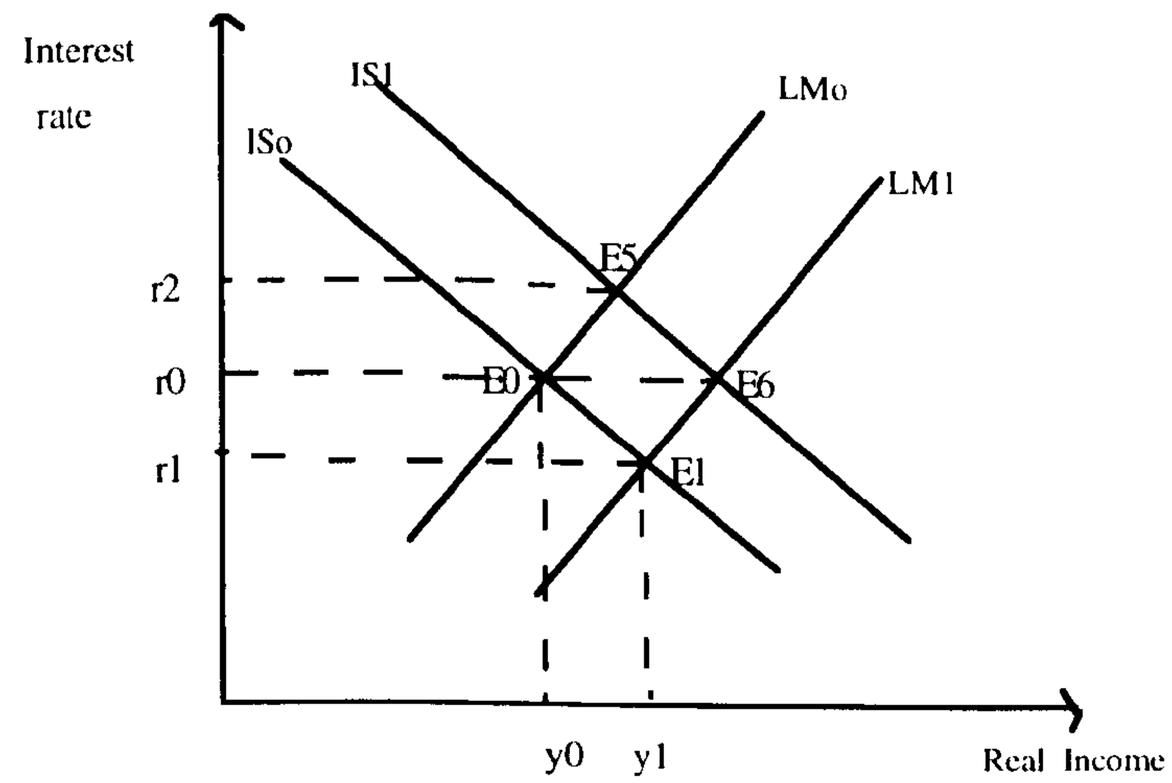
1992: $\mathbf{3.0}\ (G - T) \equiv \mathbf{15.6}\ (S) - \mathbf{12.4}\ (I) - (\mathbf{0.2})\ (M\text{-}X)$

He concludes that in 1989, savings almost equals investment leaving the deficit to be financed by foreigners (foreign trade deficits or foreign borrowings). In 1992, however, the larger government deficit is financed not by trade deficits but by a decrease in domestic investment. Thus, international crowding out in the 1980s is replaced by domestic crowding out in 1992.

The budget deficit is caused by two factors; the effect of a business cycle and the effect of a discretionary fiscal policy, that is, changes in real income and changes in government spending or tax rates. Crowding out of net exports by expansionary fiscal policy is one of the leading macroeconomic issues in the 1980s in many countries in the world. In the U.S., Gordon argues that rising expenditure combined with reductions in some tax rates created a substantial increase in the federal government deficit, crowding out of net exports occur when higher interest rates pushed up the value of the foreign exchange rate between 1980 and 1985.

The second aspect conceptualised by Gordon is the link between the government budget deficit and foreign trade deficit which is determined by the impact of discretionary fiscal policy actions on interest rates. In a closed economy, the normal effects of a fiscal stimulus are higher interest rates and a crowding out effect and he illustrated these effects using the IS-LM framework. If there is no change in money supply and the price level is held fixed, the LM curve remains stationary while the IS curve moves rightwards. If government expenditure increases, the IS curve shifts rightwards as shown below:

Fig. 3.1: The Effects of a Fiscal Stimulus



Source: Gordon, 1990

Two approaches can be used to analyse the effect of a fiscal policy stimulus, i) fix the interest rate and control the money supply and, ii) coordinate monetary and fiscal policy hence the interest rate becomes a policy instrument to maintain actual output at the level of natural output. In the first case, the money supply changes whenever there is a shift in the IS curve. The LM curve shifts rightwards and the equilibrium is now at E_6. There is no increase in the interest rate so there is no crowding out.

Since in a government stabilization policy, the main objective is to dampen the business cycle by maintaining the level of actual real GNP (real income) equal to natural real GNP, actual real GNP can be raised to make it equal to the natural real GNP by expansionary monetary and fiscal policy. Increasing the money supply (expansionary monetary policy) will shift the LM curve rightwards; equilibrium shifts from E_0 to E_1. An increase in government expenditure will shift the equilibrium from point E_0 to E_5. The interest rate increases as a result of the expansionary fiscal policy but decreases with expansionary monetary policy.

Point E_5 has a lower real money supply and a higher interest rate in order to keep money demand equal to money supply. This is described as `tight money, easy fiscal' position. Point $E_1$ is the `easy money, tight fiscal' position, with a higher real money supply and a lower interest rate to stimulate a demand for money equal to the supply of money. The higher interest rate at point E_5 cuts planned private autonomous spending, both investment and consumption, below that at point E_1, to make room for the government spending. Induced consumption is the same at both E_1 and E_5.

At point E_1, investment is higher, thus, the economy's rate of productivity growth is likely to be higher which will benefit society in future years. At point E5, government spending is higher than at point E_1. Government purchases may be currently consumed government services (such as national defence, health, etc) or government investment (highways, etc.). The choice is between faster output growth at point E_1 or a higher level of public services of point E5, depending partly on society's preference for public versus private goods and partly on its taste for present goods and services versus those deferred to the future.

Expansionary fiscal policy by itself without accommodating monetary policy raises the interest rate and `crowds out' domestic spending that is interest-sensitive, particularly private domestic investment. In an open economy, the international crowding out effect occurs when an economy is open and operates under a system of flexible rather than fixed exchange rates. One of the major determinants of the

foreign trade deficit is the foreign exchange rate of domestic currency. An appreciation makes a country's exports more expensive in terms of foreign currency and makes imports cheaper. Thus, an appreciation cuts net exports while depreciation boosts net exports. Gordon concerns himself with the role of fiscal and monetary policy in causing the changes in the exchange rate which has a further effect on net exports and the foreign trade deficit through the following model. Fluctuations in net exports cause fluctuations in income and vice-versa, through the national income identity:

$$Y = C + I + G + (X - M) \tag{3.1}$$

The determinants of the fluctuations in net exports are real income *(Y)* and the exchange rate *(e)*;

$$(X - M) = f(Y, e) \tag{3.2}$$

The effect of real income is through the equation below:

$$(X - M) = (X - M)_a - mY \tag{3.3}$$

where,

$(X - M)_a$ = autonomous component of net exports

m = a parameter reflecting a fraction of the change in real income spent on imports

Taking into account the effect of the exchange rate, the equation above is rewritten as:

$$(X - M) = (X - M)_a - mY - \mu e \tag{4}$$

where μ is a parameter and e is exchange rate (Gordon, 1990, pp 138).

Gordon explains that "the connection between the interest rate and the real exchange rate establishes a link between fiscal policy and the value of domestic currency. When the real money supply is held constant, a fiscal policy stimulus (for example, increase in government expenditure) raises both real income and the interest rate. Higher interest rates will attract foreigners to buy domestic securities, increasing the value of domestic currency. Another factor that can cause the appreciation of domestic currency is restrictive monetary policy which shifts the LM curve to the left as the real money supply is reduced" (Gordon, 1990, pp 139).

A sharp appreciation of domestic currency would then accompany a shift in the policy mix from `tight fiscal, easy money' at point $E_1$, to `easy fiscal, tight money' at point E_5.

Gordon concludes that an increase in the domestic interest rate should cause an appreciation of the domestic currency, and a decrease in the interest rate causes a depreciation. He gave evidence that the real exchange rate and real interest rate in the US during the years 1970 to 1989 shows 'close' relationship between the two variables.

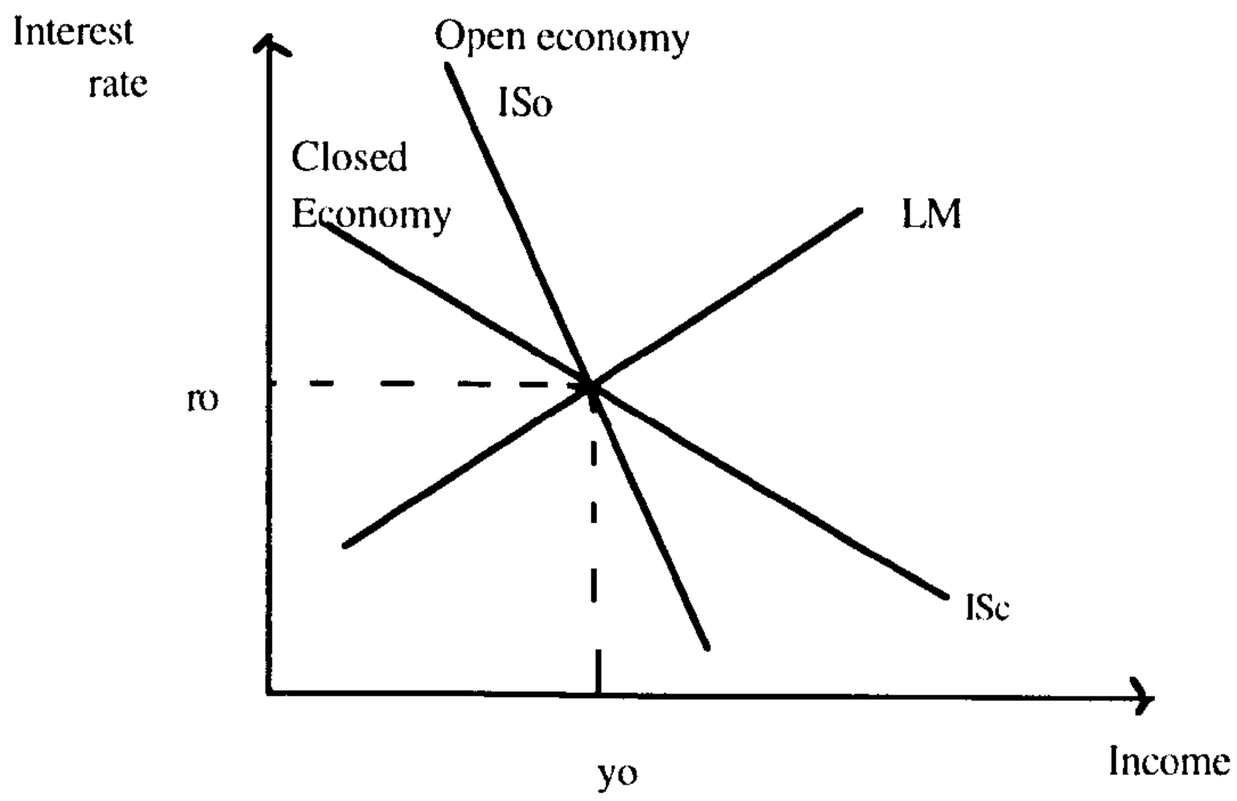
3.1.1 International Crowding Out in the IS-LM Model

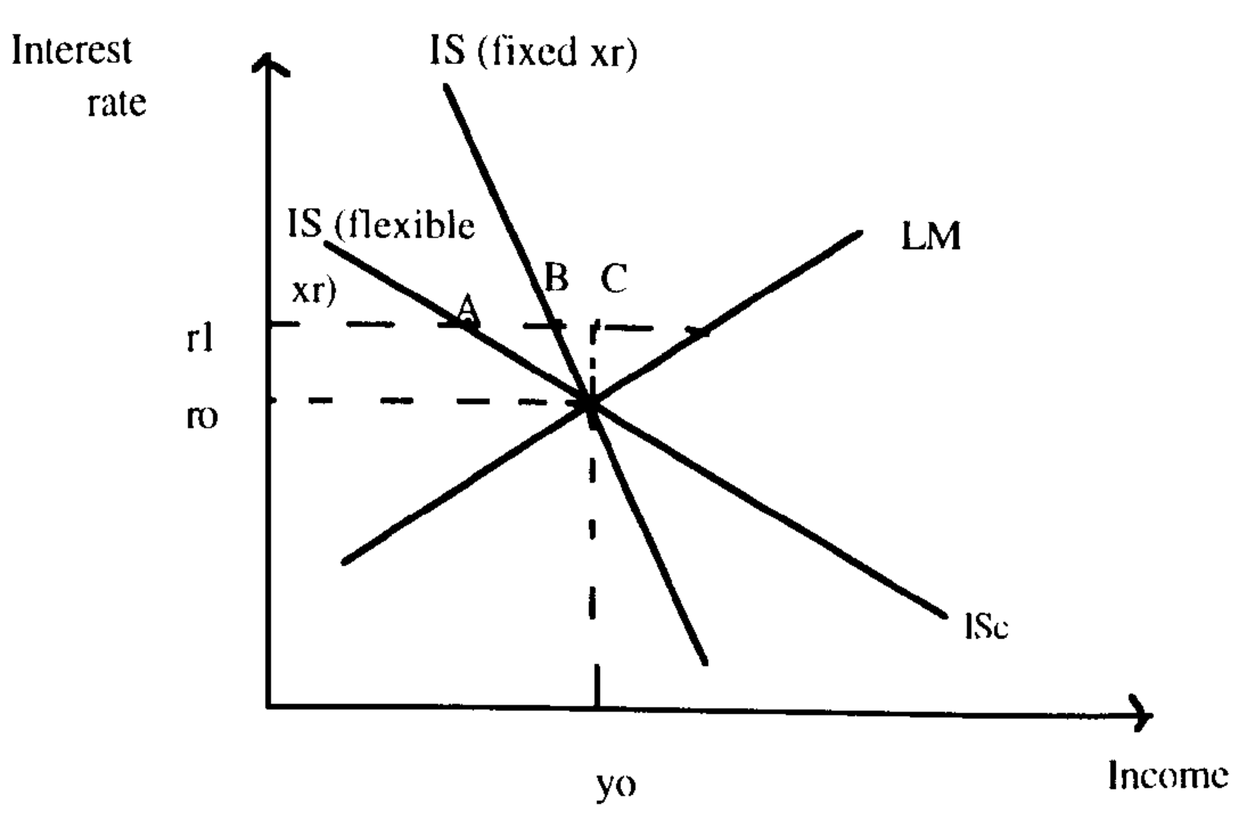
Assuming that the LM curve is unaffected by the openness of the economy and by the exchange rate regime, the slope of the IS curve depends on the multiplier (k, the inverse of the marginal leakage rate) and on the interest responsiveness of planned autonomous spending. In a closed economy, the marginal leakage rate is the after-tax marginal propensity to save [s(1- t) + (t)], where t is the income-tax rate. In an open economy, the marginal leakage rate adds an additional fraction; [s(1-t) + (t) + (x)], where (x) is a fraction of GNP spent on imports. Thus, in an open economy with a fixed exchange rate, the IS curve is steeper, the crowding out effect is smaller and the fiscal policy multiplier is larger than in a closed economy.

When an open economy shifts from a fixed exchange rate system to a flexible exchange rate system, the opposite effect occurs. A fiscal policy stimulus creates both domestic and international crowding out effects as shown in the diagram below. Assuming an increase in the interest rates the crowding out effect can be examined along the new IS curve:

The distance B to C denotes the crowding out effect resulting from an increase in the interest rate from r_0 to r_1, with a fixed exchange rate. BC indicates the response of private autonomous spending as a result of higher interest rate. With a flexible

Fig 3.2: The IS curve in an open economy with fixed and flexible exchange rates.





Source: Gordon, 1990.

exchange rate, a higher interest rate also causes an appreciation of the exchange rate and a reduction in net exports. This impact on net exports is shown by the distance AB.

3.1.2 Observations on the Conventional Twin Deficits Notion

The first and most fundamental point is that Gordon asserts causality and exogeneity too soon - data plugged into the accounting identity (1) shows crowding out of domestic investment as well as net exports. While the accounting identity holds, it does not provide any theoretical underpining/explanations as to causality and exogeneity, at best it only shows that the deficits are linked. Beneath the identity, there could be a host of variables that determine its existence. A more systematic evaluation of causality and exogeneity is needed.

The second point has relevance to the first. After postulating causality, Gordon theorized that in a closed economy, real income and interest rates are the determinants of the budget deficits while exchange rates and real income are the determinants of foreign trade deficits. Having these variables as the determinants, Gordon posit causal linkage between interest rates and exchange rates. Thus, the variables taken are rather ad-hoc and the causality posed is rather simplified.

There are deeper theoretical explanations for any accounting identity and this has to be investigated systematically to build a full structural model. However, we do not deny the importance of the role of the exchange rate and interest rates in determining the twin deficits. They could be two of the many other variables affecting the deficits, hence, forming a basis to start the twin deficits story. With this argument, we can't be sure that interest rates is the factor that crowds out domestic private investment and exchange rate crowds out net exports as yet.

An obvious development is to use the IS-LM model after postulating interest rates, exchange rates and income as the determinants. Some assumptions have been made pertaining to the money supply, thus, the crowding out effects are based on that assumption. However, the assumption falls short of money balances analysis because the inflation consequences are likely to differ as between the different equilibrium points between E_1 and E_5 in Fig. 3.1 - no account of this has been made.

One of Gordon's views is that having a policy mix of tax cuts and tight money achieves a higher interest rate at point E_5 in Fig. 3.1, which would stimulate private consumption but crowd out private investment. Presumably private investment is crowded out due to the rise in interest rates. However, had savings been considered, then foreign savings may be raised through the credit market, counteracting the domestic crowding out effects. Also at point E_5 government

expenditure is not clearly distinguished, should it be government investment , if so of what is the nature of investment - should it also include government consumption, if so of which type? If Gordon's hypothesis is crowding out of private investment, then the implicit assumption at point E5 is that the government expenditure takes the form of investment that substitutes for private investment and not investment which is infrastructural or complementary in nature.

Regarding the foreign trade deficit, Gordon suggests that the foreign exchange rate is the most important determinant whereby appreciation crowds out net exports while depreciation boosts net exports. We are concerned with the effects on export revenues which we feel are ambiguous because of the presence of price efects and quantity effects on revenues, and it is revenues that are relevant for the deficits.

Finally, a close relationship between the movements of interest rates and exchange rates are noted but how close it is or the correlation between them is not clear. It is also worth noting that the corresponding effect of high interest rates and exchange rates is a rising burden on debt repayments for indebted developing countries during those years since debts are denominated in U.S. currency. The fundamental point is what is the size and magnitude of the effect of interest rate differentials on the exchange rates?

Notwithstanding these points, Gordon's theory of the twin deficits nevertheless forms a good basis for further formal investigation into causality and exogeneity and the determinants of the twin deficits' relationship. It is hoped that a more extensive analysis is done in this exercise while postulating our own thesis about debt and twin deficits.

In the following section we review competing theories on the twin deficits issue and discuss opposing views of the twin deficits notion.

3.2 Competing Schools of Thoughts on the Twin Deficits

There are two alternative schools of thoughts on the twin deficits notion:

(i) the Mundell-Flemming framework which provides some theoretical justification to the twin-deficits relationship.

(ii) the Ricardian Equivalence hypothesis which expects no causality running from government budget deficits to trade deficits.

The Mundell-Fleming framework implies that an increase in the government deficit via for example, a tax cut, raises aggregate demand - essentially implying that a fiscal shock is not fully offset by an increase in private savings. The increased demand forces the domestic real interest rate to rise which further induces net foreign capital inflows resulting in an appreciation of the domestic currency's real foreign exchange value. The real appreciation stems from an appreciation in the nominal exchange rate in a flexible exchange rate regime, and from an increased domestic price level under a fixed exchange rate regime. The appreciation relies on an assumption that there is sufficient capital mobility to outweigh direct domestic demand effects worsening the current account. The relatively more expensive domestic currency pushes the trade balance towards deficit. Thus, this model implies that increased government deficits ultimately widen the trade deficits, under both flexible and fixed exchange regimes although the transmission mechanisms differ. Under a fixed exchange regime, the trade deficit deteriorates because of an income effect as well as the real appreciation.

3.2.1 The Mundell-Flemming Framework

On the problem of achieving internal stability and balance of payments (b.o.p) equilibrium with the assumptions made are that the exchange rate is fixed and there are no trade controls, Mundell suggests that monetary policy ought to be aimed at external objectives and fiscal policy at internal objectives. The theory implies that when stabilization measures are limited to monetary policy and fiscal policy , a surplus country experiencing inflationary pressure should ease monetary conditions and raise taxes (or reduce government spending), and a deficit country suffering from unemployment should tighten interest rates and lower taxes (or increased government spending).

In the Mundell framework, the conditions for equilibrium are:

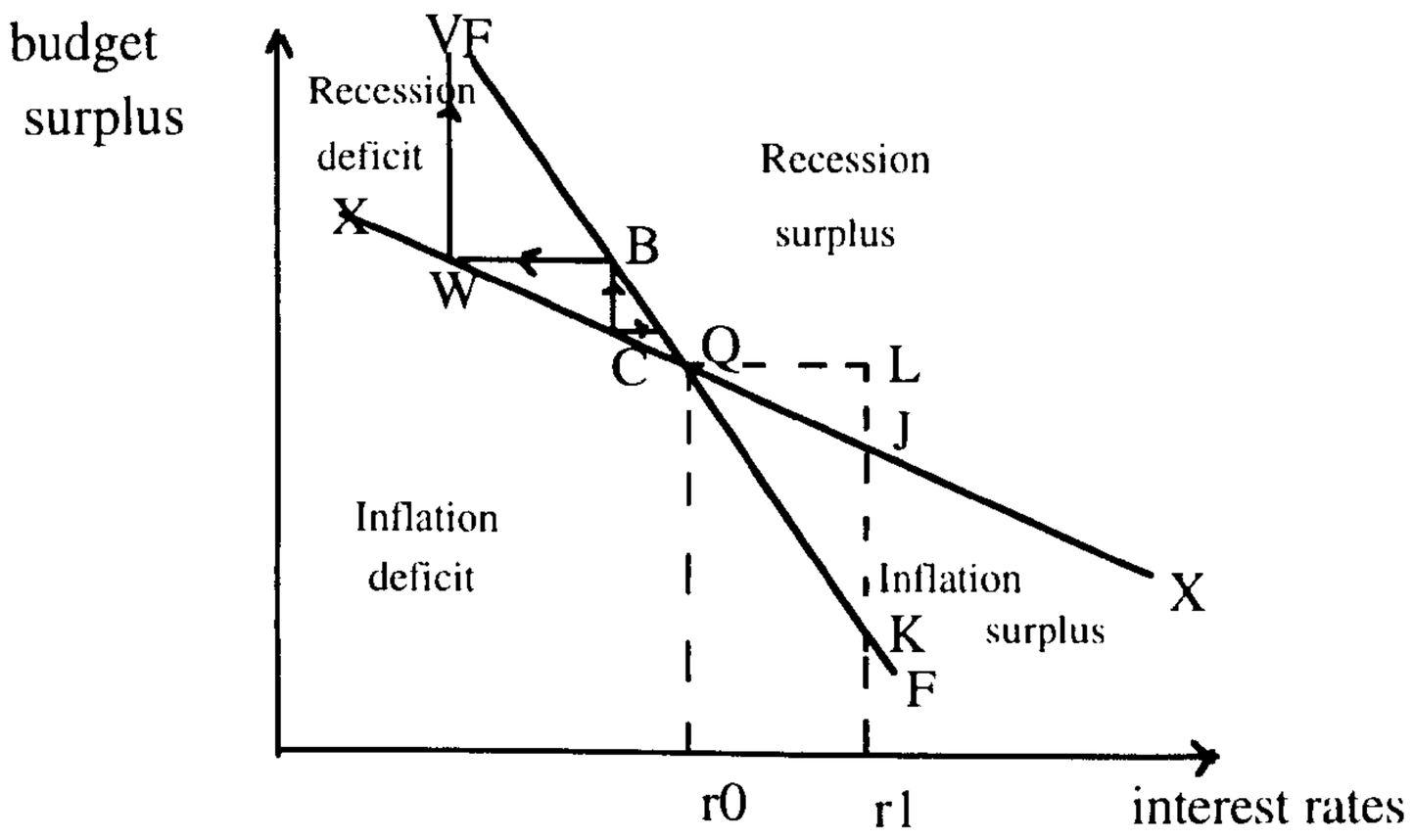
1) Internal balance requires that aggregate demand for domestic output be equal to aggregate supply at full employment. During transitory disequilibrium periods, it is assumed that inventories are either running down or accumulating in excess of desired changes, according to whether the disequilibrium reflects a state of inflationary or recessionary potential.

2) External balance implies that the balance of trade equals (net) capital exports at the fixed exchange parity. If the balance of trade exceeds capital exports, there will be a balance of payments surplus and a tendency for the exchange rate to appreciate, which the central bank restrains by accumulating stocks of foreign exchange. And

likewise, if the balance of trade falls short of capital exports, there will be a balance of payments deficit and a tendency for the exchange rate to depreciate, which the central bank prevents by dispensing with stocks of foreign exchange.

The following assumptions are made; all foreign policies and export demand are given; the balance of trade worsens as the level of domestic expenditure increases; and, capital flows are responsive to interest-rate differentials. Then, domestic expenditure is assumed to depend only on fiscal policy (the budget surplus) and monetary policy (the interest rate) at the full-employment level of output. The complete system is summarised in the diagram below.

Fig. 3.3: Equilibrium in the internal balance and the balance of payments



Source: Mundell, 1968

The foreign balance schedule, *FF*, shows the combinations of interest rates and budget surpluses (at a given income level with full employment) along which the external balance is in equilibrium. An increase in the interest rate, by reducing capital exports and lowering domestic expenditure and hence imports improves the external balance, so the negative slope. An increase in the budget surplus, by raising domestic expenditure and hence imports worsens the balance of payments. Thus, in any point on the schedule an increase in the rate of interest would cause an external surplus, which has to be compensated by a reduction in the budget surplus to restore equilibrium. Points above and to the right of the schedule refer to balance of payments surplus, while points below and to the left of the schedule represent balance of payments deficits.

The internal balance schedule XX, shows the combinations of interest rate and budget surpluses where full employment equilibrium in the market for goods and services continues. Along the schedule, full employment output is equal to aggregate demand for output, or in another sense, home demand for domestic goods is equal to full employment output less exports. The negative slope implies a negative relationship between interest rates and the budget surplus so as to maintain domestic expenditure constant.

The above analysis is not appropriate when the exchange rate is flexible because equilibrium in the balance of payments is automatically maintained by variations in the foreign exchange rate. For an open economy to be in equilibrium, two conditions must be met: the demand for goods and services must equal the supply of goods and services, and there must be equilibrium in the balance of payments. The first condition necessitates output to be equal the sum of domestic expenditure and the trade balance, and the second condition necessitates the trade balance deficit equal net capital imports.

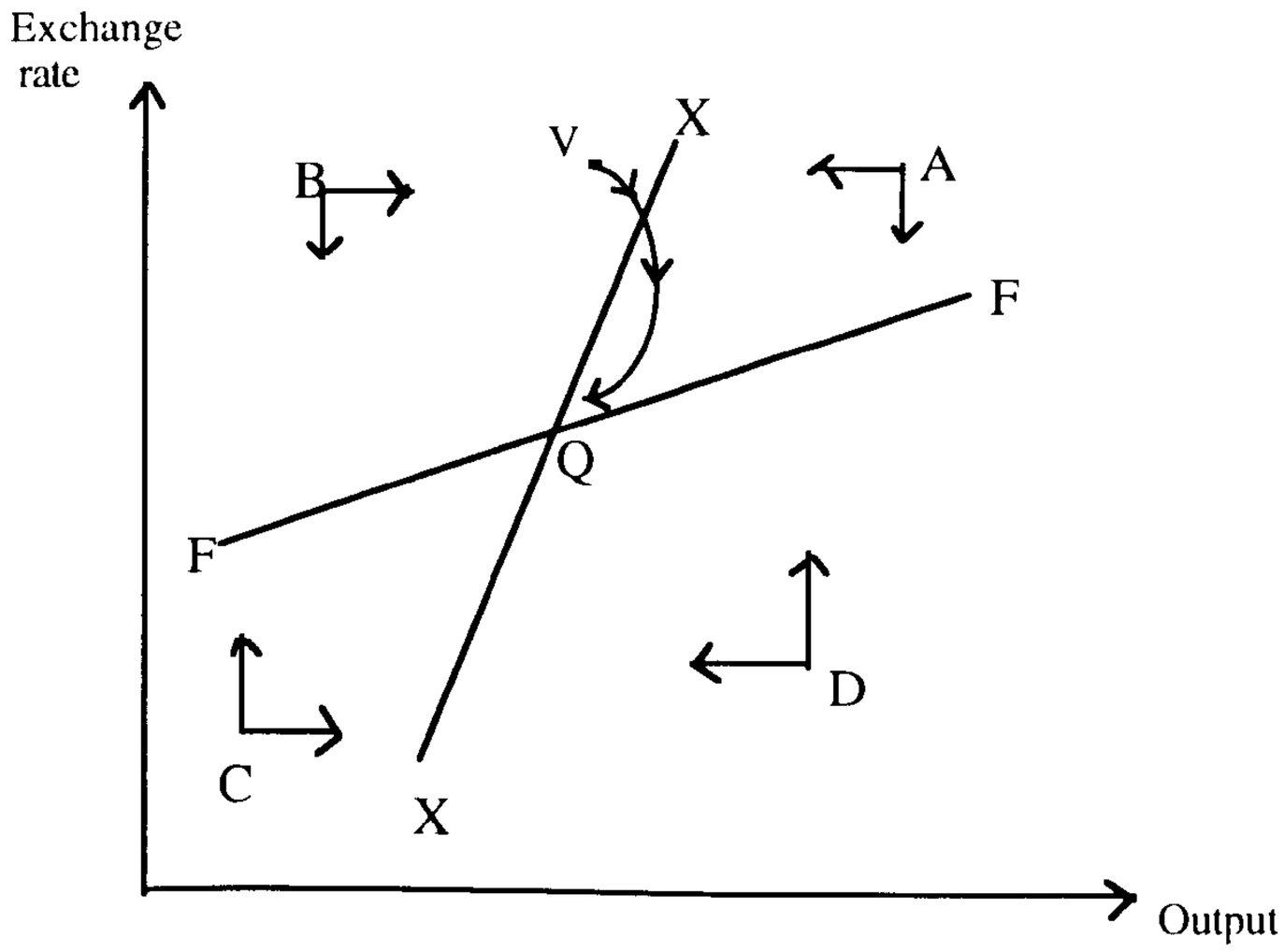
The set of assumptions made are capital imports and exports depend on interest rates at home and abroad (monetary policy); that foreign incomes are given in the period under consideration; and that output at home is perfectly elastic up to the point of full employment. With these assumptions Mundell reduces the system to two equlibrium conditions in two variables - the level of output and the exchange rate.

The XX curve below traces the combinations of exchange rates and output. Along XX the demand for goods and services is equal to the supply of goods and services. Mundell argues that an increase in output must be associated with an increase in the price of foreign exchange for equilibrium to be maintained. This is because an increase in output gives rise to an excess supply of goods and services, whereas an increase in the price of foreign exchange gives rise to an excess demand for foreign goods, hence the positive slope.

The FF schedule traces the points between exchange rates and output, and FF achieves equilibrium in the balance of payments. This curve also has a positive slope because an increase in the price of foreign exchange improves the balance of payments, while an increase in income worsens it, hence equilibrium position requires an increase in the price of foreign exchange to be accompanied by an increase in output.

The relative steepness of the two slopes is determined by considering the conditions of dynamic stability. It follows that income rises or falls depending on whether there is excess demand or excess supply in the market for goods and services, and that the price of foreign exchange rises or falls depending on whether there is a deficit or surplus in the balance of payments. The slope of the internal balance schedule exceeds the slope of the foreign balance schedule for stability in the system.

Fig. 3.4: Stable Internal-External Equilibrium

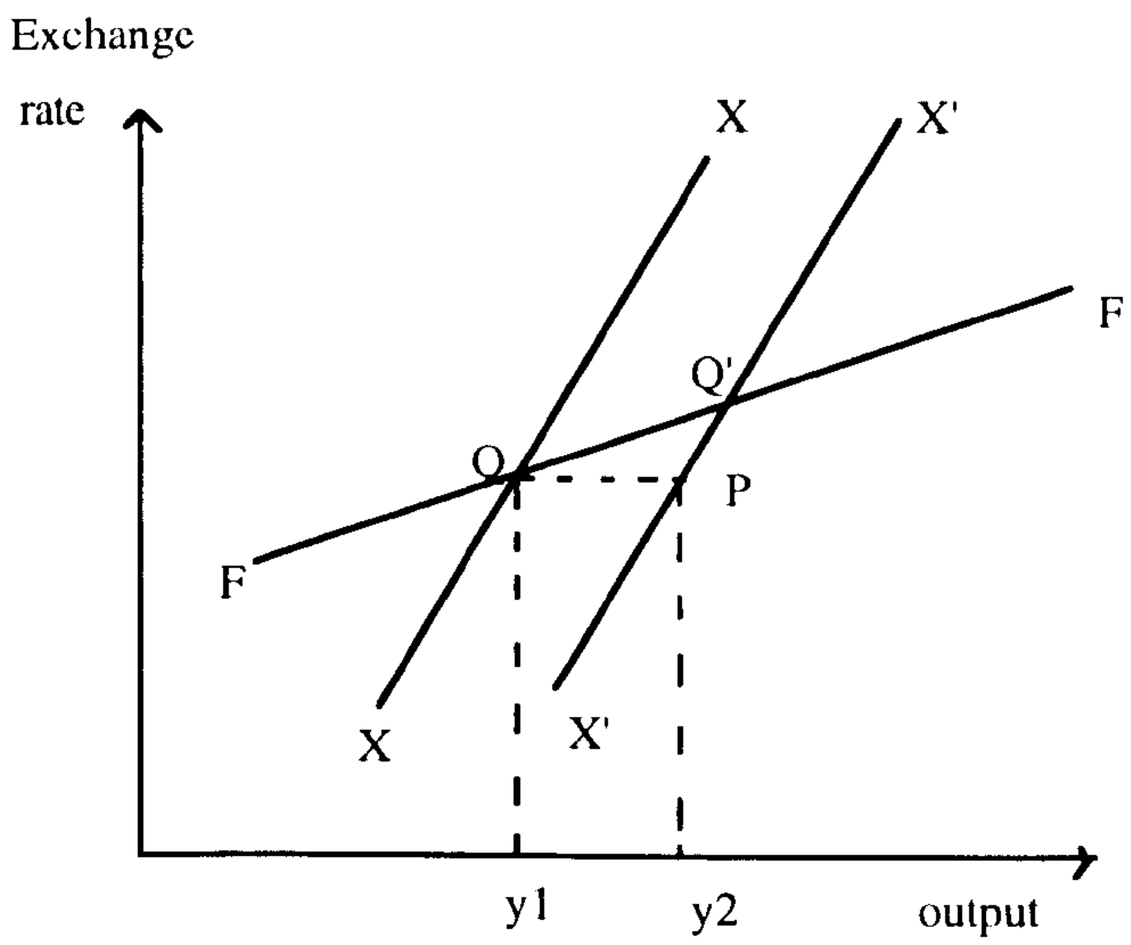


Source: Mundell, 1968

The four quadrants denote different conditions of excess demand or supply in the goods and foreign exchange market. Quadrant *B* has excess demand in the goods market and a balance of payments surplus; quadrant *D* has excess supply in the goods market and a balance of payments deficit. The exhange rate and the level of output to move in the directions indicated by the arrows in each quadrant. A necessary condition for stability is the slope of *XX* exceed the slope of *FF*. Mundell describes that fiscal policy will significantly affect only the position of the internal balance schedule.

At the initial exchange rate and level of output, a budget deficit will not change the balance of payments, but will create an excess demand for goods and services. To correct the excess demand, the level of output must increase or the exchange rate must fall. The *XX* schedule thus shifts to the right, achieving a new equilibrium at a higher level of output and an increased foreign exchange rate.

Fig. 3.5: The Effect of Fiscal Policy on Employment.



Source: Mundell, 1968

The change in output given by the multiplier is $y1y2$ which is the increase in income necessary to eliminate the excess demand caused by the change in spending at a constant exchange rate. But at the point P there is a deficit in the balance of payments. Since Mundell had argued that the variations in exchange rate ensures an automatic balance of payment's equilibrium, under the flexible exchange rate system, the deficit will be eliminated by a depreciation. Excess demand in the goods market is created and thus inducing successive rounds of income increases and exchange rate changes until point Q' is reached.

Mundell concludes that a budget deficit mainly affecting spending on home goods will create an expansion of output equal to that indicated by the Keynesian foreign trade multiplier plus an additional amount due to the elimination of the foreign imbalances by the depreciation of the exchange rate. Fiscal policy is therefore, more effective in improving employment under a system of flexible exchange rates than under a system of fixed exchange rates, under the assumption of capital immobility. In the case of capital mobility, fiscal policy would be more effective under the fixed exchange rate regime.

3.2.1.1 Comments on Mundell's Framework

Like the twin deficits notion revived by Gordon, Mundell's work implies interest rates and exchange rates as the main linking pins between the deficits and that

aggregate demand is raised by fiscal expansion. However, the essence of Mundell's work is to have a stability in the internal and the external balances. In a flexible exchange rate regime, the exchange rates and output adjust to maintain an equilibrium in the external balance as well as the internal balance. The relevant assumptions made on interest rates, foreign incomes and output are as on page 15.

We, however, have some reservations with regard to Mundell's hypothesis that a change in the price of foreign exchange improves the balance of payments automatically. There are two effects of a change in the price of foreign exchange - price and quantity effects. Assuming that an appreciation of the exchange rates decreases the price of imports and increases the price of exports, or simply the terms of trade improves, then the balance of trade also improves. If, however, an appreciation reduces the quantity of exports relative to quantity of imports, then there will be a worsening of the balance of trade. If the quantity of exports does not change relative to imports, the balance of trade will improve.

Though it can be concluded that the existing (we term them conventional from now) twin deficit literature is quite rich theoretically, there exists two fundamental loopholes. For one thing, there still exists a controversy on the link between government deficits and exchange rates making the Mundell-Fleming type model not universally accepted by some other existing literature. Branson (1988) suggests that increased U.S. government deficits are the prime determinant of the the dollar's appreciation. Feldstein (1986) also supports the link whereby increased government deficits appreciate the dollar. Conversely, Evans (1986) finds evidence that increased deficits depreciate the dollar. Enders and Lee (1990) suggest, empirically, the twin deficits are not even "distant cousins"! The other aspect is as had been discussed in section 3.1.3, no study had touched on a full structural model ever before, and we intend to investigate systematically the twin deficits notion to build a full structural model which we will give the term 'new twin deficits' model.

3.2.2 The Revival of the Ricardian Equivalence Hypothesis

Unlike the Mundell-Fleming model, a model incorporating Ricardian Equivalence suggests that a substitution of debt for taxes by the government increases the fiscal deficit, but the increase would be offset by an increase in private savings, rather than an increase in net foreign borrowing (trade deficit). However, changes in

temporary government spending behaviour can affect trade deficits in this framework.

Barro (1974) revived the Ricardian Equivalence Hypothesis (REH) in that government expenditure financed by tax is is no different than if financed by bonds because bonds represent a future tax liability. We have noted that the conventional wisdom view an increase in tax directly reduces the budget deficit and induces a reduction in private sector spending. The REH implies that raising tax to retire government debt without changing the level of government spending will not affect private spending or the current account balance; changing the means of financing its expenditures does not affect private sector spending. However, increases in government spending, regardless of the means of finance can be expected to induce a current account deficit.

Barro argues that the view whereby expansionary fiscal policy increases aggregate demand hinges on the assumption that government bonds are perceived as net wealth by the private sector. This assumption is important in demonstrating the real effects of shifts in the stock of public debt and establishing non-neutrality of changes in the stock of money, thus, the assumption plays an important role in theoretical analyses of monetary and fiscal effects. The assumption that government debt issues, at least in part, leads to an increase in the typical household's conception of its net wealth is crucial for demonstrating a positive effect on aggregate demand of "expansionary" fiscal policy, which is defined as a substitution of debt for tax finance in Barro's case, for a given level of government expenditure. In a full employment, the basic argument according to Barro, follows Modigliani (1961) where an increase in government debt implies an increase in perceived household wealth; hence, an increase in desired consumption (a component of aggregate demand) relative to saving; further, an increase in interest rates; and finally, a decline in the fraction of output which goes to capital accumulation. In a non-full employment context it remains true that the effect of public debt issue on aggregate demand (and hence, on output and employment) hinges on the assumed increase in perceived household wealth.

The first part of his paper deals with the effect of government bond issue on the calculus of individual wealth in an overlapping-generations economy with physical capital and where individuals have finite lives. The key result is that, so long as there is an operative intergenerational transfer, there will be no net-wealth effect and, hence, no effect on aggregate demand or on interest rates of a marginal change in government debt.

The second part of his paper deals with the existence of imperfect private capital markets. It is shown, to the extent that public debt issue entails a loan from low-discount-rate to high-discount-rate individuals, a positive net-wealth effect results if the government is more efficient than the private market in carrying out this kind of loan. If the government is more efficient only over a certain range, and if the public choice process determines the amount of government debt issue in accord with efficiency criteria, it is again true at the margin that net wealth effect of government bond issue is nil.

Barro's observations on the aabove issues are that if the government is really more efficient than the private market in the lending process (presumably because of economies of scale and the ability to coerce outweigh the problems of government incentive and control), it may limit the loan recipients to high-discount-rate individuals. Secondly, if the government is more efficient than the private market only over a certain range with a sufficiently large value of government debt, the net wealth effect of government bonds at the margiin would be zero despite the continued existence of "imperfect private capital markets."

In summary the paper focuses on the question of whether an increase in government debt constitutes an increase in perceived household wealth. The effect of finite lives is examined within the context of an overlapping generations model of the economy. It is shown that households would act as though they are infinitely lived, and hence, there would be no marginal net wealth effect of government bonds so long as there exists an operative chain of intergenerational transfers which connect current to future generations.

The basic conclusion is that there is no persuasive theoretical case for treating government debt, at the margin, as a net component of perceived household wealth. If in fact, the marginal net-wealth effect are negligible, the implications for monetary and fiscal analysis would be far reaching. In particular, in the case where the marginal net-wealth effect of government bonds is close to zero Barro argues that, "(1) the Metzler-type argument for non-neutrality of changes in the stock of outside money would be valid, (2) a change in the stock of government debt would have no effect on capital formation, and, more generally, (3) fiscal effects involving changes in the relative amounts of tax and debt finance for a given amount of public expenditure would have no effect on aggregate demand, interest rates and capital formation" (Barro, 1974)

3.2.2.1 Comments on the REH

The intergenerational issue concerns a long-run aspect of fiscal policy, hence, a deficit policy may have effects on long-run capital accumulation/stock. As to the question of increase in perceived household wealth, it is true only in the short-run even in a non-full employment context (as opposed to Barro's view as to non-full employment case see page 19). In chapter 1 we argue that debt allows a temporary acquisition of higher standard of living than could have otherwise been, but debt has to be repayed in accordance with the contracts agreed or at least be settled before the maturity date expires. Hence, the short-run applicability of increased perceived net wealth and in the long-run, debt has to be repaid, hence, the applicability of future tax libility, even in the case of non-full employment.

Bernheim (1987) evaluates the Ricardian Equivalence in detail (which are mostly not relevant for our purpose) pertaining to issues such as inter-generational transfers, redistribution effects, and permanent postponement effects, having mostly negative criticism on all these aspects; rather than evaluating on those aspects where the REH may and may not hold in real life (see Bernheim 1987 for details). Basically, he argues in favour of changes in consumption patterns if tax is postponed and replaced with debt financing, hence, changes in aggregate demand follows. For example, he considers the issue of redistribution policies with respect to postponing of taxes which may alter the tax incidence; thus, suggesting that real debt effects mostly arise from this kind of redistributions. Another example is when the distribution of future taxes is not known. If consumers save more as a precautionary motive, deficits may actually crowd-in investment, though he agrees that this is difficult to assess.

3.3 Comparing and Contrasting Both Theories

The contribution of both studies has to be addressed firstly; both provide a good basis for a formal investigation into the twin deficits story and it's applicability in the developing countries which no study had been done on it ever before. The departure of the REH from the conventional wisdom opens another important issue which happens in reality in the 1980s. Had the developing countries been RE, in the first place, debt would not have been accumulated.

We believe that the validity of any conclusive policy issues depend on whether one is concerned with short-run or long-run issues. In the short-run, stimulation of aggregate demand within a standard Keynesian setting is undoubtedly correct. Whereas, in the long-run, intergenerational issues do play a dominant role, especially on capital accumulation and capital stocks, hence, the REH forms a basis for a policy course of action. The focus should be on investigating the nature and magnitude of the economy's departure from the idealized REH model.

The Mundell-Flemming framework is quite rich conceptually relative to Gordon's work, though the backbone runs from interest rate to exchange rate mechanisms of transmission which is the standard conventional twin deficits notion. The external deficit is explicitly related to the internal balance through exchange rate and income changes after having made some assumptions about interest rates, still being able to consider the monetary policy aspect (refer to graph 4, for example), whereas it is implicit in Gordon's work. The output and exchange rate changes affecting both balnces would be useful in our context later in chapter 5.

Both frameworks, however, did not systematically investigate the many variables that affect the linkages, instead, considering variables as had already been theorized which are hypothesised to be the most important determinants. As had been said, they are rather taken ad hoc. The following reviews the empirical literature on the two competing theories.

3.4. The Empirical Literature

The followings discusses the empirical literature on the Mundell-Fleming type of analysis followed by the literature on the Ricardian Equivalence Hypothesis.

3.4.1. The Mundell-Flemming Type

In investigating the popular debate on whether increased government deficits cause dollar appreciation, and whether fiscal deficits lead to higher trade deficits, Tallman and Rosensweig (1993) include a measure of federal government purchases to distinguish between government purchases and government balances as the potential sources of the twin deficits correlation. Using U.S. quarterly data (1961: I to 1989:IV), they employ five variables namely government purchases, government balance, trade balance, real interest rates and real exchange rates in their non-structured model. They estimate the model using vector autoregression techniques

(VAR). They specify causal ordering that runs from the trade balance to exchange rate to interest rates to government balance and finally to government purchases.

The results suggest that government balance innovations are associated with the trade balance variance at 90 percent posterior probability which is well above the 10 percent required using the Bayesian approach. This is consistent with the twin deficits notion implying a significant effect of fiscal balance on the trade balance. An innovation of the trade balance explains a low 8 percent of the variance in the government balance. The direction of causality is concluded to be running from the government fiscal balance to the trade balance as evidenced by the low percentage of association between them.

An impulse response function shows the dynamic pattern and signs of effects of significant variables whereas a variance decomposition does not indicate these features except indicating causality. It is shown that a positive shock to the federal government balance to GNP ratio leads to an unambiguous increase in the trade balance to GNP ratio. Thus, the impulse response and variance decomposition results provide strong support for the twin deficits relationship. Also it is shown that the budget deficits are associated with an appreciating real currency which is consistent with the twin deficit story on the link between trade balances and the dollar in the U.S.

We view the study by Rosensweig and Tallman as a stereotype of the twin deficits notion theorized by Gordon. The choice of variables is therefore favours towards the twin deficits notion although an effort is made to include government purchases which is the only variable that is supposed to show a different story - the Ricardian story. As such, the empirical literature too, seems to lose sight of the twin deficits identity that includes the private sector's role. However, this is not surprising because of the choice of variables taken are according to 'theory'.

The interest rate effects on exchange rates is not clear and had not been discussed in their empirical findings. Presumably, it follows as what had been theorized as well.

Also, the use of aggregates in estimation to measure the effects of deficits may be misleading. Studies using aggregate time-series data almost uniformly support the view that deficits significantly stimulate aggregate demand in the short-run, yet they often fail to identify systematic short-run relationship between deficits and either

interest rates, prices or other nominal variables. Few (if any) studies have attempted to measure long-run effects directly.

Other studies which support the twin deficits notion are Abell (1990) and Evans (1986). Abell uses a multivariate time-series to examine the linkages between the U.S. federal budget deficits and merchandise trade deficits. Using a vector-autoregressive model, he found support for the notion that budget deficits influence trade deficits indirectly rather than directly. Evidence is obtained through causality testing and impulse response functions that the twin deficits are connected through the transmission mechanism of interest rates and exchange rates. Abell argues the model indicates that reducing the size of the budget deficit proves to be as effective as exchange rate intervention for the purpose of reducing the size of merchandise trade.

Feldstein (1986) found that the rise in expected future deficits in the budget of the U.S. government had a powerful effect on the exchange rate between the dollar and the German mark in the period 1980 to early 1985 .

We conclude that the empirical literature that emphasizes the twin deficits relationship relies upon the interest rate-exchange rate mechanisms of transmission. The budget deficits cause changes in the value of the dollar through the interest rate linkage and budget deficits cause changes in the trade deficits through the exchange rate linkage. However, these studies are short-run studies covering the period when deficits and value of the dollar surged in the U.S.

3.4.2 The REH Type

The following studies assess the REH. Enders and Lee (1990) outline the "orthodox view" - that government expenditures financed by tax collections affect the economy in distinctively different ways than government expenditures financed by bond issues. The view of the "conventional wisdom" presumes that budget deficits are responsible for the current account deficits in the U.S. The standard policy prescription is to increase taxes; which will then reduce the budget deficit and induce a reduction in private sector spending. The expenditure reduction, i.e. reducing imports and increasing the net supply of goods for exports, will improve the current account deficit.

Enders and Lee then develop a two-country micro-theoretic model consistent with the REH. It implies that raising taxes without changing the level of government spending will not affect the current account deficit, and thus, the means of financing the government expenditures will not affect private sector spending. Given the levels of public and private spending, a tax increase reduces the budget deficit but the external deficit is unaltered.

Their model is highly aggregative in that they assume there is a single commodity which can be used for private or government consumption. The formulation of the hypothesis considers the maximisation of a utility function of a U.S. resident - the expected utility being conditioned on real private consumption and real government purchases set at time t. In their equation, there is an inclusion of measures of the degree of relative risk aversion, the discount rate, and a "share" parameter measuring the degree to which real government spending contributes to the individual's utility.

In highlighting the REH, the budget constraint faced by the individual is based on the assumption that government debt is the only "store" of value. One unit of bonds is issued to pay for one unit of output. The individual's budget constraint is the sum of the following; the discounted dollar value (real) of U.S. one-period bond purchased at time t; the discounted foreign currency value (real) of foreign issued one-period bond purchased at time t; the real private consumption and the real lump-sum taxes. The sum of these must not exceed the sum of real output, domestic and foreign bonds.

The individuals optimization problem in each period t is to choose real consumption and the sum of domestic and foreign bonds so as to maximize his utility subject to the budget constraint. The government's budget constraint comprises net government purchases (government purchases less taxes) which is equal to the discounted values of the sum of the real domestic bonds and the real quantity of foreign purchases of US government bonds less the values of the two bonds in the previous period.

They then incorporated the REH by substituting the government's budget constraint into the individual's budget constraint and obtain the discounted values of the sum of consumption and government purchases less output which must be equal to foreign bonds of previous period less foreign purchases of U.S. bonds of previous period. The resulting equation is the hallmark of the Ricardian Equivalence Hypothesis for an open economy, that is, the discounted value of the U.S. consumption stream must be

financed from the income stream plus U.S. net claims on foreigners less the discounted value of U.S. government spending.

Given that the main concern of the study is the issue of debt versus taxes and the individual's lifetime budget constraint does not include taxes, Enders and Lee suggest that real interest rates be introduced through a foreign optimization behaviour to explain the determinants of interest rates. They assume that the foreign optimal consumption programme is the same as in the U.S. It comprises foreign discounted expenditure stream (consumption plus government purchases less output) not exceeding foreign domestic bonds less foreign bonds, both from the previous period, then satisfy the lifetime budget constraints of foreign governments combined with the private sector. Enders and Lee conclude that given the real interest rates and foreign governments expenditure stream, substituting foreign taxes for foreign debt will not alter consumption possibilities. Real interest rates are determined by the condition that world output equals world demand as in equation (3.4).

Agents are assumed to form rational expectations concerning output and government purchases. Consumption depends on the existing level of net U.S. claims on foreigners and on expectations concerning the sequence of real discount factors. The real interest rate is thus determined independently of government budget balance.

$$y_t + y_t^* = c_t() + c_t^*() + g_t + g_t^* \qquad (3.4)$$

where; y = output; $c()$ = consumption function; (g) = government purchase and with the asterisks are the corresponding world variables. The direct implication, according to Enders and Lee is that the so-called 'twin deficits' are not even 'distant relatives' as evidenced by their equation for net export (nx), where, net export is equals to output (y) less the consumption functions $(c()$ less government purchases (g), all at time t.

$$nx_t = y_t - c_t() - g_t \qquad (3.5)$$

Given output and government purchases at time t and the invariance of the consumption functions to debt issue, they argue that the balance of goods and services deficit cannot be caused by the federal government budget's deficit. However, a temporary increase in government spending can be associated with an external deficit.

The vector autoregression technique (VAR) is used to examine the relationships between government purchases, tax or debt policies, real consumption, the current account balance, exchange rate and the real interest rate. The technique does not require exogeneity restriction *a priori*. Variables included are in accordance with the theoretical model set. They use quarterly US data over the sample period 1947:III to 1987:I. What the VAR does is to forecast error variance of a variable that is attributable to every variable in the system.

Their first result without any restrictions shows: i) innovations in government expenditure explain 15.9% of the balance of goods and services and 8.5% of consumption, consistent with the interpretation that government spending changes are temporary; ii) innovation in debt shows an increase in debt explains 12.9% of the variance in trade balance. It explains a small fraction of the variance in consumption (5.2%) and the real interest rate (5.5%). The unrestricted VAR seems to show inconsistency with the REH and is consistent with the conventional wisdom. That is, an increase in the outstanding stock of government bonds and a comensurate decline in taxes should not have any real effects on the current account, real consumption or interest rate. Enders and Lee argue that this is due to a set of constraints has to be imposed on the data. The innovation in interest rates explains less than 4% of the forecast error variance of any of the variable in the system. This is consistent with their contention that the inclusion of nominal exchange rate does not affect the behaviour of the real variables.

The REH is again tested by imposing the optimal consumption rules on the data, if the optimal consumption rule cannot be rejected, then REH cannot be rejected. The condition for an interior solution requires the expected discounted expenditure streams to be equals to $\frac{1}{\beta}$ where β measures the discount rate. The expenditure streams consisting of consumption in the next period divided by consumption now plus government purchases for the next perod divided by government purchases now, and both variables have restrictions in terms of relative risk and a share parameter (their relative shares in the equation). They take the rate of change of the variables (except net exports and the interest rate), and their logarithmic form.

Their null hypothesis requires the expected discounted expenditure stream to be equal to $-\ln\beta - \frac{\sigma^2}{2}$, where σ^2 denotes the variance of the expenditure stream. The assumption derived is that individuals can borrow and lend unlimited amounts at the given real interest rate. It is shown that the government spending can affect

consumption behaviour to the extent that private and social spending are substitutes. A borrower faces liquidity constraints if the capital market is imperfect so consumption is equals to output less domestic and foreign borrowings as well as the limit set on borrowings.

Given the values of output, domestic and foreign borrowings, an increase in current taxes must induce a reduction in current consumption regardless of the use of tax revenue. If the null hypothesis cannot be rejected, then the empirical importance of the liquidity constraint should be rejected. Enders and Lee tested the restrictions embodied in their new equations using the generalized method of moments (GMM) procedure developed by Hansen (1992).

Their estimated results shows that the restrictions are binding and the null hypothesis cannot be rejected at the 10% level of significance indicating that the REH is consistent with the U.S. experience. The point estimates of the parameters of the utility function are consistent with the theoretical restrictions and it indicates that government purchases are poor substitutes for private sector spending.

To conclude, the direct implication of the result is that substitution of taxes for government debt issues does not result in a current account deficit. The data are consistent with the REH. Equation (3.5) clearly shows that the external balance or net export is determined by output less consumption and government purchases, which is independent of government budget balance.

Enders and Lee admitted that there are some limitations to their study; in that, there might be some other variables which could significantly explain some portion of consumption variability like alternative measures of government debt and all foreign country variables. Also, they avoid estimating a full structural model of the current account to avoid the difficult issue of obtaining reasonable measures for the "rest of the world's" variables. Their behavioural assumption of purchasing power parity could be questionable.

3.4.2.1. Comments on Enders and Lee's work

An interesting finding from Enders and Lee's work is that when the restrictions are not imposed in their equations, the result seems to be consistent with the conventional wisdom that government spending causes an increase in the trade balance deficits. This findings seems to be valid in the short run, however in the long run the result

does not hold. Also with the restriction imposed their result are consistent with the REH.

Interest rates and net exports are considered endogenous variables in Enders and Lee's work, which is a step away from theory.

One puzzle with the study is that what happens to the foreign variables are not discussed. Presumably they are used only for the purpose of showing how interest rates enter the model; it is not exogenous and determined by fiscal policy but determined by world output and demand.

Aschauer (1985) investigates the effects of fiscal policy on private consumption and aggregate demand within an explicit intertemporal optimization framework. The following 'familiar' questions are investigated: Whether consumption is sensitive to the choice of tax versus debt financing of current government expenditure and to what extent, if any, does government spending directly substitute for private consumer expenditure. His approach exploits restrictions placed on data by the first order necessary conditions for intertemporal optimization in consumption. The consideration of the choice of consumption in the adjacent periods t, $t+1$ leads to an Euler equation. It states for the individual to choose an optimal (interior) time path for effective consumption, it must be the case that he cannot improve his welfare standing by reducing effective consumption in one period and increasing in another.

Variables used are consumption, defined as per capita consumer expenditure on non-durables and services; and per capita net deficit of the total government sector, in a two equation system - one for private consumption and the other for government consumpion. He uses FIML to estimate the equations. A cross equation restriction is imposed to mark the rational expectation approach and restricts the way in which past government expenditure and past government deficits may influence present consumption expenditure.

Aschauer failed to mention which dataset he is using apart from mentioning data are quarterly. The empirical evidence supports the hypothesis of rational expectations and Ricardian equivalence as well as of the proposition that goverment spending substitutes poorly for private consumption in utility. Holding the level of government spending fixed, private consumption expenditure follows a random walk process. The finding that government spending substitutes poorly for private consumption implies that increases in government purchases of goods and services

will have important expansionary effects on aggregate demand. Rises in government spending will only induce a partial *ex ante* crowding out of private consumption. The temporary effect of government spending on output arise from the attempt by economic agents to smooth effective consumption levels over time. This attempt will induce reallocation of resources from other periods to the present which, in turn, will increase rates of return and cause an intertemporal substitution of work effort and a contemporaneous expansion of output.

3.3 Comparing and Contrasting the Empirical Literature

The empirical literature has a clear divide, either following the twin-deficit notion or the REH, hence, standard variables belonging to either type of the hypothesis are used. Standard variables in the twin deficit context are government deficit, interest rates, exchange rates and external deficits. Standard variables for the REH are all of the four variables just menationed and government debt. Departure from the standard REH variables is found in Enders and Lee's study; they endogenise interest rates and net exports, and foreign borrowings enter the model through a foreigner's budget constraint.

All of the empirical work involves short-run analysis is consistent with the theoretical underpinings. No attempt has been made to include changes in capital stock in an intergenerational framework.

3.4 Debt Literature

The work of Easterly and Fischer suggest that there are well known refinements to the Keynesian concept. They belief that, for a given deficit, an equal increase in government spending and revenue increases aggregate demand, that is, the deficit does measure the effects of fiscal policy on aggregate demand. Also, the budget deficit is itself endogenous, affected by and affecting the economy.

Easterly and Fischer focus attention on the effect of fiscal policy on the components of demand rather than on level of aggregate demand, given by the saving-investment identity, or the resource constraint facing the economy:

Budget deficit = (private saving - private investment)
+ current account deficit. (3.6)

The national income accounts budget deficit identity highlights association between the deficit on domestic savings, investment and the current account. It is assumed that the economy is at full employment and given the savings rate, the equation implies a crowding-out problem; an increase in the budget deficit will be associated with either a decrease in investment or an increase in the current account deficit.

Easterly and Fischer argue that it is wrong to say the link between budget deficit and trade deficit is one to one because of the fact that there are two terms on the right-hand side of the budget identity. They also point out that Balassa (1988) finds a high correlation between the budget deficit and trade deficit in the industrial countries but not in the developing countries. Another example taken is the U.K. case in 1988-89, where trade deficit was large but a strong fiscal position was maintained.

A more sophisticated model of saving behaviour, according to Easterly and Fischer, is the one that emerges from the life-cycle and permanent income theories of consumption of Franco Modigliani and Milton Friedman. Easterly and Fischers' argument centers around the link between the budget deficit and saving; that no focus has been made on the link, and that, the standard Keynesian analysis takes saving rates as determined by the level of disposable income. Whereas the life-cycle and permanent income theories both relate current consumption to a measure of permanent or lifetime disposable income. Therefore, a temporary change in taxes other things remain equal, does not change or reduce current consumption. Hence, temporary tax changes have smaller effects on consumption than permanent tax changes. The implication is that expectations about the permanence of the budget deficit influences spending behaviour.

Easterly and Fischer postulates four ways of financing the budget deficit and term it as debt dynamic (equation 7), which serves as a long-run constraint on fiscal policy. The macroeconomic imbalances associated with each are: printing money excessively gives rise to inflation, excessive use of foreign reserves causes balance of payments crises, excessive foreign borrowings cause debt crises and too much domestic borrowing increases real interest rate leading to crowding out of private investment.

Budget deficit = money printing + (foreign reserves use
+ foreign borrowing) + domestic borrowing. (3.7)

Printing of money greater than its demand at current price level increases the price level. Initially, a stock of real money may reduce the interest rate. Historical records show an average rate of seignorage of about 1% of GNP for industrial countries and less than 2.5% of GNP for developing countries for the government to maximise revenue. Reliance on seignorage revenue can lead to hyperinflation. An example given is Bolivia in 1984-85 where inflation reached 11,000% in 1985 although revenue from currency creation fell to 8% in 1985 from 14% of GDP in 1984.

The use of foreign exchange reserves ameliorates inflationary effects, however, slowing down inflation so as to slow down exchange rate depreciation is not viable unless fiscal policy is made compatible with the lower inflation. Expectation of reserves draining may shift private sector's behaviour in investing their assets overseas, thus creating capital flight since exhaustion of reserves is associated with depreciation of the currency.

The use of foreign borrowing tends to cause appreciation of the exchange rate, 'damaging' exports and encouraging imports. Excessive reliance on external borrowing to finance the budget deficit and of having large budget deficits are illustrated by the debt crises. Most of the countries that developed debt-servicing difficulties run huge public deficits so that past over-borrowing and the perception that they are not credit-worthy have resulted in credit rationing.

Easterly and Fischer noted that the budget deficit and the trade deficit are not necessarily linked. Budget deficits can be financed by printing money and by domestic borrowing. But they believe in some developing countries where the domestic capital markets are thin and domestic borrowing possibilities are limited, the connection between the budget deficit and external borrowing is more likely to be close. Fiscal adjustments through cutbacks in expenditure has substantially reduced the current account deficit. Or, in other words, a decrease in external financing forces either fiscal contraction or inflation in some debtor countries.

Domestic borrowing is used to avoid inflation and external crises. But if excessively used, the danger is that government borrowing will reduce availability of credits to the private sector, hence pushing the inflation higher. Examples are Colombia and Turkey. In 1987, real domestic lending reached 50% in Turkey. Domestic borrowing leads to credit rationing and crowding-out of private sector investment. Government borrowing domestically tends to push private sector borrowings abroad. The link between fiscal and external deficits will also be especially close when the "capital account is highly open."

Easterly and Fischer examine the long-run effects of running deficits using the identity in equation (3.8). The debt factor is now taken as a ratio to GNP *(d)* and includes both domestic and external debt:

$$\begin{aligned} \textit{Change in } d \;=\; & \textit{(primary deficit/GNP) - (seignorage/GNP)} \\ & + \textit{(real interest rate - growth rate)} * d \end{aligned} \tag{3.8}$$

Equation (3.8) shows that the change in debt ratio *(d)* is equal to the non-interest or primary deficit of the total public sector, minus the part that is financed by printing money, plus the current debt ratio *(d)* times the average real interest rate on the debt minus the growth rate of GNP. This means that the non-interest deficit in excess of the amount of money created by the central bank has to be financed with new debt. Nominal interest expenditure has to be financed with new debt, too. The debt ratio will fall if inflation rises or if real GNP grows in the absence of borrowing since the denominator is nominal GNP.

The difference between the real interest rate and the growth rate of GNP affects debt dynamics and the sustainability of deficits. If the real interest rate on debt exceeds the growth rate of GNP, the government cannot run a primary deficit larger than the amount of seignorage, otherwise, the debt to GNP ratio will continue to rise without limit. This is presumably for long-run sustainability. The deficit will have to be reduced when the public recognizes that the government's fiscal policy is unsustainable, and that is the starting point when the government will not be able to sell its debt. We observe one interesting implication of the debt dynamic in equation (3.8) as pointed out by Sargent and Wallace (1981); that if government tightens monetary policy by reducing the rate of printing of money but increases its debt increases current and future inflation rates. When debt increases, in future the deficits will be higher or more printing of money has to be carried out. If deficits are to be held constant in future, then the printing of money raises inflation in future, and expectations of future inflation raises current inflation.

Easterly and Fischer suggest if the condition is such that the real interest rate is lower than the growth rate of GNP, debt will be eroded through growth through time, so that primary deficits in excess of seignorage are sustainable. Real interest rates are very low when the inflation rates are very high.

They also suggest that the sustainability of the budget deficit depends on its size and the rate of growth of the economy. A higher rate of growth will enable the

government to earn more revenue by printing money and reduce the last term of equation (3.8). Rapid growth therefore permits a larger deficit. Examples cited by Easterly and Fischer are countries like India, Malaysia, Pakistan and Thailand, who have growth rates at 5 % or above in 1980-86 had been able to run sizable deficits, while inflation was in single digits. Whereas Brazil and Argentina had no growth, they had inflation adjusted deficits and four-digit inflation rates.

Easterly and Fischer suggest a method of determining whether a given fiscal policy is sustainable by looking at projections of the future course of the debt/GNP ratio, through equation (3.8). However, assumptions are needed as to the demand function for money, the desired inflation rate, the real interest rate and the growth rate of the economy. It is suggested that if the analysis shows a continous raising of the debt/GNP ratio, fiscal policy has to be changed. This is quite a loose argument in the sense a single ratio cannot translate the intensity of the 1980s debt problem, a combination of debt ratios that indicate debt burden is preferable. Also, what fiscal policy has to change has to be outlined.

In sum, Easterly and Fischer argue that the microeconomics of fiscal deficits has an impact on the macroeconomics of the deficits. Having excessive budget deficits are associated with the following problems: inflation, exchange rate crises, external debt crises and high real interest rates, with implications for the real exchange rate, the trade account and investment. None of the links are automatic for there are choices in the methods of financing and lags in the effect of money printing and borrowing on inflation and interest rates.

Small deficits can be financed without creating excessive inflation, exchange crises or an excessive build-up of debt. If the interest rate is greater that the rate of growth of GNP, any primary deficit smaller than the maximum amount of seignorage revenue the government can obtain is sustainable. Sustainability depends on debt to GNP ratio projections. 'Sustainable' does not mean it is optimal. A fiscal deficit may crowd-out private investment and it may well be desirable to reduce debt/GNP ratio to crowd-in private investment. Similarly, it may not be optimal to collect the maximum possible revenue from seignorage.

3.4.1 General Comments on Easterly and Fischer's work

While specific comments have been dealt with as we discussed the literature, some general points are relevant. Easterly and Fischer have made a contribution on the financing aspect of the deficits. The link between the budget deficit and saving has

been neglected and that, the standard Keynesian analysis takes saving rates as determined by the level of disposable income. The life-cycle and permanent income theories both relate current consumption to a measure of permanent or lifetime disposable income. Easterly and Fischer suggest, therefore, a temporary change in taxes, ceteris paribus, does not change or reduce current consumption. Hence, temporary tax change have smaller effects on consumption than permanent tax changes. This thought which is associated with Friedman's permanent income hypothesis gives support for the REH.

However, equation (3.8) reflects government budget deficit financing (primary deficit refers to the public sector's) and not total economy-wide deficit financing. As such, one should not expect a total reflection of debt and deficits in the model. Equation (3.7) can include asset revaluation as a means of financing debt or deficits, for example, privatisation - the popular, somewhat standard, policy prescription by the World Bank to middle-income countries during the illiquidity situation of the 1980s.

Buiter (1988) analyses the role of fiscal policy in stabilisation and structural adjustment, and the focus is on developing and new industrialising countries. The external transfer (or changes in the current account balance) is associated with the internal fiscal and real resource transfer (internal reallocation of real resources). They use the concepts of national and public sector solvency to evaluate the consistency and feasibility between fiscal, financial and monetary plans. Some attention is given to the links between the fiscal deficit and inflation and the inflation tax.

In analysing fiscal policy in stabilisation and structural adjustment, Buiter uses what he term as "economy-wide financial balance identity" of private savings-investment gap plus public savings-investment gap that equals the current account balance:

$$S^{P} - I^{P} + S^{G} - I^{G} = CA \qquad (3.9)$$

From there, he distinguishes between private and public external debt through the private savings and public savings equations:

$$S^{P} = Q - J - T + i\frac{B}{P} - i^{*}\frac{ED^{*P}}{P} - C^{P} \qquad (3.10a)$$

$$S^{G} = J + T + \frac{EA^{*}}{P} - i\frac{B}{P} - i^{*}\frac{E}{P}(D^{*G} - R^{*}) - C^{G} \qquad (3.10b)$$

where,

Q = income
J = cash return on public capital stock
i = nominal interest rate
i^{*} = foreign nominal interest rate
T = net taxes
C^{P} = private consumption
C^{G} = public sector consumption
D^{*P} = private external debt
D^{*G} = public external debt
E = nominal exchange rate
A^{*} = net foreign aid
P = GDP deflator
R^{*} = foreign exchange reserves

Buiter argues that the distinction between the private debt and the public debt is important and that "the debt crisis since 1982 has been a recent reminder of the fact that many *de jure* or formally private liabilities are *de facto* publicly guaranteed" (Buiter, 1988, pp 5). This fact has bearings that private liabilities or assets often escape fiscal considerations. Probably this is why studies on the twin deficits missed out on the role of the private sector in determining the external deficits? Another consequence is that the tax base beomes narrower. Buiter argues that this implies the need for higher tax rates on the remaining tax base, increased recourse to seigniorage (the inflation tax) or increased borrowings.

Buiter went on to use the trade balance *(TB)* identity in his analysis. Eventually, the final equations point to the determinants of the current account *(CA)* and the balance of payments:

$$CA = Q + \frac{EA^{*}}{P} - i^{*}\frac{E}{P}(D^{*} - R^{*}) - (C^{P} + I^{P} + C^{G} + I^{G}) \qquad (3.11a)$$

$$TB = Q - (C^{P} + I^{P} + C^{G} + I^{G}) \qquad (3.11b)$$

From (3.10) and (3.11), Buiter concludes that an improvement in the current account balance requires an increased in both public and private sector "financial surpluses" or equivalently, an increase in national income relative to domestic absorption. This serves as Buiter's central argument that underlines the link between the fiscal dimension and the current account dimension.

Buiter assumes that public revenue increases or spending cuts do not lead to an increase in private capital formation, fiscal tightening reduces national absorption relative to national income. Equation (3.11a) shows that income increases are desired to achieve a current account improvement rather than reduction in absorption. Buiter forwards three channels potentially available for this: (a) increased domestic output (b) increased foreign aid (c) a reduction in foreign interest obligations. Equation (3.11a) also emphasises a reduction in absorption, be it public or private spending.

The fiscal dimension of a current account improvement, according to Buiter, requires intertemporal reallocation of resources. Intertemporal relative prices such as the interest rate, rate of return on other assets and, in repressed financial systems with widespread credit rationing, both the cost and availability of credit; will play a central role in the transmission mechanism between the policies. When the domestic financial market is not well intergrated in the international financial market, bond-financed fiscal tightening will lower domestic real interest rate or less severe credit rationing.

In the short run, given the foreign interest rate, the net stock of external debt and the aid flow, a current account improvement is the same as trade balance improvement which requires changes in the exchange rate. If the country has international market power, it also requires the improvement in the terms of trade. In short, at the given initial interest rate, a fiscal tightening would reduce aggregate demand, barring debt neutrality, some of which falls on non-traded goods.

Buiter emphasises the effects of fiscal policies on non-traded goods whereby the quantity of non-traded goods produced is a decreasing function of the real exchange rate and the quantity of traded goods produced is an increasing function. Private consumption is also an increasing function of the real exchange rate. Fiscal contraction shifts resources out of the non-traded goods sector into the traded sector thus, increasing production of tradeables.

The solvency of the public sector is also given emphasis on the justification that the external transfer is mediated through the public sector. It requires the value of future streams of trade balance surplus plus other net inflows be equal to the current net external debt, and this is termed as the primary surplus. The primary surplus is the excess of domestic income over national absorption. In this process the exchange rate is corrected for inflation. More specifically, it involves a

consideration on the budget identity, which in its reduced form, refers to the public sector's net debt to GDP ratio, being expressed as four components; the first is the basic public primary (non-interest) current deficit; the second is the real interest payments on debt corrected for the growth of real GDP, as a proportion of GDP; the third is any additional interest losses; and, the fourth is real seigniorage (or the increase in nominal high-powered money stock over GDP). These four components determine the size and magnitude of net debt to GDP ratio. His argument on the solvency constraint of a nation and the public sector implies that fiscal tightening now requires fiscal relaxation in future.

The effect of seigniorage, briefly, can be divided into two components: the growth in nominal money demand due to inflation at a given velocity; and the increase in real money demand due to a declining velocity. Higher actual inflation increases the growth in nominal money demand and higher interest rates or higher expected inflation tends to increase the velocity. Both leads to an increase in seigniorage revenue. Or seigniorage can be decomposed into an inflation tax rate and an inflation tax base. A higher inflation tax rate, given the tax base, will raise seigniorage revenue. If the expected inflation is raised then the velocity also rises and reduce the tax base, revenue decreases.

3.4.2 Comments on Buiter's work

Many issues pertaining to debt are discussed, the basic line of argument focuses on the internal-external transfer issue or simply, in the twin deficits context, issues running from the government budget to the external balance,paying attention to the private sector's role. The latter is expressed in terms of private savings function that contains private debt as one of the determinants. The internal resource transfer reallocation involves mainly the switch from non-tradables to tradables to raise revenue. Siegniorage as a source of revenue is also considered, as an inflation tax. All these issues are relevant to the study of the linkages between the deficits and debt. However, in Buiter's own words, the paper is a non-systematic perusal of the key issues. Future studies can focus on these key issues and examine each issue more systematically.

At one point, Buiter barred the debt neutrality issue hence deducing the conventinal wisdom of increasing aggregate demand as a result of fiscal tightening. All in all, his analysis of the deficits is more towards the conventional wisdom but with a deeper insight into the debt issue.

3.6 Conclusion

Some fundamental points can be drawn from this literature review. One important lesson is to combine both the schools of thoughts and make use of relevant hypotheses, while incorporating aspects of debt issue, in our aim to develope a systematic full-fledged twin deficits thesis (and not excerpts of it like all the other studies in the sense of choosing variables on a rather ad hoc basis). The basis to start is naturally the accounting identity, with systematic evaluation of each of the expressions in the identity.

Another lesson to be drawn is the issue of government borrowing or more specifically public and publicly guarateed debt (as categorised by the World Bank), is possibly reflected in the government account and then reflected in the current deficits. The question as to who uses and eventually who benefits from the borrowings should be carefully scrutinised so as to exert identity between the deficits, because, as Buiter (1988) argues formally private liabilities are *de facto* publicly guaranteed. Then policy targets should be aimed at causing changes to the specific sector. The following are our general comments on the literature as a whole.

The 'conventional-wisdom' empirical literature suggests that causality runs from government budget deficits to interest rate to exchange rate and eventually is reflected in the external deficit, so the deficits are called twins. While we avoid repeating comments on the variables chosen, we feel consideration should at least be given as to whether the link is temporary (or short-run) or a long-run situation. Considering the period understudy is a section of the 1980s decade, it may be the case that this link holds in the short run. There may be other factors than that postulated that affects the linkage in the short-run. In the long run, there may be some form of changes, for example adjustments in income, that may render the relationship postulated not true.

The consideration of inter-generational transfer at least gives an alternative for a long run issue between debt and deficits to be considered although the REH world is a perfect world on the basis of the assumptions made. Above all, debt could bring wealth effects if and only if debt contracted is profitable, (profitability as measured by the streams of discounted rates of return on its usage exceeding its streams of discounted cost). This requires either the government or the private sectors efficient usage of capital.

because the residuals comprise of the balance of the current account deficits that are not being financed by debt creating flows, non-debt creating flows and reserves taken together.

During the period 1981 to 1982, non-debt creating inflows made up only about 6% of the total financing. In 1984, the current account decreased sharply by six-times the amount in 1983. Debt creating flows also decreased substantially to an amount just enough to cover the current account deficits. The simultaneous substantial reduction in the current account deficits and the debt creating flows could possibly reflect some form of debt relief, either in the form of rescheduling, when the interest repayments are postponed; or debt forgiveness whereby the interest repayments are written off. The reduction in interest payments causes the current account deficits to be reduced.

Non-debt creating flows were reduced by half the previous year's amount. A current account surplus was recorded in 1985, (which comes from the oil exporters of Algeria and Nigeria), at the same time debt creating flows increased by 4.8 times the amount in 1984 to US$ 9.5 bn. The reserves build-up contributed about 10% of the debt. Residuals increased by thirteen times in 1985 to US$ 10.3 bn, showing an excess of financing by debt creating flows, non-debt creating flows and reserves taken together, of that amount. Debt creating flows were higher in 1986 (US$ 18.6 bn) which is almost twice the amount of 1985.

From Table 1.18, the role of debt and non-debt creating flows in financing the deficits for the Latin American region can also be deduced. The current account deficits for this region were massive in 1981 and 1982, at the outbreak of the debt crisis. On average, current account deficits were US$ 39 bn for that period. The amount of debt creating flows of US$ 47.8 bn were able to offset the deficits in 1981, and reserves increased to US$ 1.2 bn. Non debt creating flows comprised 24% of the deficits in 1981. Net errors and omissions appear to be massive recording an amount of US$ 17.43 bn. This may be indicative of capital flight that is said to have taken place in 1981 to 1984 (Alejandro, 1987)[2]. Alejandro estimated that the surplus net factor payments were excessive in Argentina, Colombia, and Mexico (with 19%, 46% and 40% of their current account deficits) which indicates net real resources outflows between 1981-1984.

In 1982, debt creating flows were slightly less than the deficits incurred. Non-debt creating flows remained at US$ 9 bn; while the usage of reserves was enormous - an amount of US$ 11.7 bn. In 1983, the current account deficits decreased drastically, by more than five times the 1982 figure. Capital inflows decreased by 24% of the

previous year's amount; reflecting a cutting-off of credit supplies by creditors. The current account balance moved towards a surplus of US$ 2 bn, more likely due to the reduction in import expenditure. Between 1985 and 1986, the current account deficits enlarged again due to a decrease in export earnings. After 1984 credit was greatly reduced due to a lack of confidence by creditors.

Non-debt creating inflows decreased from 1983 onwards due to panic in the banking system. The region as a whole managed to build international reserves in 1984 but they fell in the following years. As had been mentioned earlier, capital flight indicated by the large amount of net errors and omissions were extensive up till 1985.

The pattern of capital flows and their role in financing the current account deficits for the ASEAN region can be also seen in Table 1.18. The current account deficits grew between 1981 and 1983 as a result of deterioration in the terms of trade and in export volume. The average deficit was US$ 13.2 bn. Debt creating flows averaged approximately US$ 10.7 bn, which is about 81% of the current account deficits. The gap between the deficits and debt creating flows was bridged by 3% of international reserves and 38% of non-debt creating flows. This leaves a residual of 15% of the current account deficits, which comprised of positive residuals in 1981 to 1982 and an inadequate financing in 1983 when the Philippines ran into debt problems. Between 1985 to 1986, the current account deficits decreased due to improvements in export prices and reduction of imports as an adjustment measure by Indonesia and the Philippines.

Debt creating flows soared because of increased confidence by creditors. Non-debt creating flows decreased by 41% from 1981 to 1983 . Reserves built up by US$ 853 mn between 1985 to 1986 and residuals increased to US$ 12.7 bn in 1986.

1.4.5 Debt Indicators

As for the sub-Saharan African countries, at the end of 1970, debt represented 14% of their GNP and 60% of their export earnings. Between 1980 to 1985, the debt burden was heavier, which made up about 40% of their GNP (World Debt Tables, 1987/88). At the same time, debt service obligations more than doubled, reflecting both the debt incurred in the second half of 1970s and continued borrowing since then. In 1987 the debt service ratio represented about 19% of export of goods and services. However, rising interest rates in the early 1980s had less effect on the sub-Saharan

debt repayments due to the predominantly official character of their debts.

Table 1.19: Interest Payments as a percentage of Export of Goods and Services

	1979-80	1981-82	1983-84	end 1992
Argentina	17	43	55	19
Bolivia	21	40	53	15
Brazil	33	49	40	10
Colombia	12	23	22	12
Costa Rica	15	30	37	4
Chile	18	42	43	-
Dominican Republic	15	17	24	12
Ecuador	16	27	29	5
El Salvador	6	10	15	9
Guatemala	4	8	6	-
Haiti	3	3	5	-
Honduras	10	19	18	16
Mexico	24	34	37	16
Nicaragua	13	24	19	13
Paraguay	13	15	22	16
Peru	15	23	33	11
Uruguay	10	18	30	12
Venezuela	8	17	23	12

Source: World Debt Tables 1987/88 and 1993

Table 1.19 shows interest payments as a percentage of exports for the Latin American countries. The percentage does not seem threatening in 1979 to 1980 but soared between 1980-1981 and 1983-1984. During this period, the percentages were more than double the 1979-1980 figures, especially in Argentina, Bolivia, Costa Rica, Chile, El Salvador, Peru, Uruguay and Venezuela.

Table 1.20: Interest Payments as Percentage of Export

	1979-80	1981-82	1983-84	1985-86	1992
Malaysia	2.50	4.40	6.39	8.48	2
Philippines	7.26	10.13	11.30	13.49	8
Singapore	0.05	0.06	0.07	0.09	-
Thailand	5.19	7.60	8.11	8.69	-
Indonesia	5.91	6.50	8.42	11.81	12
S.Korea	6.55	8.03	7.48	7.51	3

Source: World Debt Tables 1988/89 and 1993.

Interest payments, which are fixed obligation out of export earnings for the ASEAN region, is shown in Table 1.20. The general trend is an increasing ratio of interest payments to export earnings from 1979 through 1986, which is consistent with the increased indebtedness. South Korea and the Philippines have higher interest to export percentage in 1981-1982 following the increase in LIBOR.

As noted earlier, a 1% increase in LIBOR will lead to an increase of US$ 155 million of net interest payments at the end of 1982, because South Korea had US$ 15.5 millions of floating-interest debt in 1982. In short, the trend of interest to exports ratio in all countries follows the trend in LIBOR in 1982, with a greater effect on the countries having floating-interest debt. Between 1983 to 1986, the ratio of interest to exports fell slightly in South Korea, consistent with the slight fell in LIBOR during that period, and the ratio in other countries increased. The increasing trend in other countries is consistent with the increased borrowings, not with changes in LIBOR.

1.4.6 Floating vs Fixed Interest Debt

Since the effect of rising interest rates manifests itself essentially on the net floating -interest debt, increases in LIBOR rates during 1978 to 1982 dramatically hit Argentina, Brazil, Mexico, Chile and Nicaragua. These countries had the largest amounts of floating interest debt. Table 1.21 below shows very sharp increases in floating-interest debt and permits sensitivity analysis of changes in the LIBOR. For example, in 1982 the estimated net floating-interest debt of non-oil developing countries is US$ 166 bn. A one percent change in the LIBOR would have increased net interest payments by US$ 1.66 bn (which are US$ 593 millions for Mexico, US$ 455 millions for Brazil and US$ 205 millions for Argentina). The net floating -interest debt to total net debt shows the relative vulnerability of individual developing countries to LIBOR changes. This ratio which amounted to 41% in 1982 in non-OPEC, non-OECD developing countries, was the major contributor to the rise in net interest payments. Mexico, Chile, Argentina and Brazil had ratios of 78%, 74%, 66% and 62% respectively in 1982 (Table 1.21, column I).

Table 1.21: Estimated Total Net Floating-Interest Debt of Non-oil Developing Countries as a Percentage

	1978			1980			1982		
	Total US$ bn	I %	II %	Total US$ bn	I %	II %	Total US$ bn	I %	II %
Non-OECD LDCs	49.2	23.5	5	90	32	7	166	41	9
of which:									
Argentina	0.8	12	1	9.4	58	7	20.5	66	10
Brazil	18.5	50	10	30.9	57	13	45.5	62	18
Chile	1.5	31	10	3.8	54	14	9.9	74	29
S.Korea	1.2	11	3	6.1	36	11	15.5	55	17
Mexico	19.9	60	22	32.3	70	20	59.3	78	23
Peru	2.3	35	20	1.0	18	6	4.4	42	17
Philippines	2.0	32	8	2.7	32	7	5.6	43	11
Others	3.0	na	na	3.8	na	na	5.3	na	na

Source: OECD, External Debt of Developing Countries, 1982 Survey.
na = not available

By knowing the net floating-interest debt to GNP ratio enables estimation of the changes of GNP as a result of a percentage change in LIBOR. For example, in 1982, a 1% increase in LIBOR would have caused a 0.09% increase in the net-floating - interest debt in terms of GNP in non-oil developing countries; with the impact being 0.29% for Chile, 0.23% for Mexico, 0.18% for Brazil and 0.17% for South Korea and Peru.

The increase in the volume of floating interest-debt together with the sharp rise in its cost, largely explains the major increase in interest payments in some of the countries in the ASEAN region. Between (end) 1978 and (end) 1982, South Korea's net floating-interest debt increased from US$ 1.2 billion to US$ 15.5 billion (refer to Table 1.18).

Net interest to total net debt had increased from 11% to 55% while net interest to GNP increased from 3% to 17% during the period 1978 to 1982. The net floating interest debt in the Philippines increased from US$ 2 billion to US$ 5.6 billion during the same period. Net floating interest debt to total net debt increased from 32% to 43% while net floating interest debt to GNP increased from 8% to 11% (Table 1.21).

By 1982, the major borrowers had their net floating-interest debt amounting to more than 40% of their total net debt. The World Bank estimated that only a quarter of the debt owed by the Latin American countries was still at fixed interest rates in 1980.

In summary, the above analysis suggests that the sub-Saharan African balance of

payments will deteriorate further and growth of GDP decline further if no financing on concessional terms or aid is forthcoming. The current account deficits can be reduced by halting the outflow of foreign exchange in the form of interest payments on debts -and this is possible only by writing-off debts by the creditors. Due to the insufficient export earnings, imports would need to be financed by aid or concessional loans to help the economy to grow. An alternative is to increase the prices of exports of primary commodities by the importers. Given the need for real import growth to allow a recovery in real output per capita, the ratio of total debt to exports of 292% in 1987 (World Debt Tables 1988/89) suggests that the region as a whole is far from being able to meet forthcoming debt service obligations without continuing debt relief on a more massive scale.

All the indicators for the Latin American region showed clearly that this region was suffering a "debt crisis". This reflects over-borrowing after the second oil shock and excessive lending by banks. The effects of debt financing was higher growth in the mid 1970s till 1981, higher current account deficits (due to higher interest payments), negative net transfers (due to principal and interest payments), massive capital flights prior to and after the debt crisis and a draining of reserves in 1980s.

By 1982, the process of financing development had become unhealthily dependent on the debtors ability to obtain new loans to service the old. This means borrowing used will not generate income or growth. During that period, the creditors reacted by applying credit rationing to the region.

1.5 Comparison on Financing the Current Account Deficits Among Regions (1980-1985).

The African and Latin American regions had their highest current account deficits between 1981 and 1982, while the ASEAN countries had their highest between 1982 and 1983 (see Table 1.18). The terms of trade effects and interest rate effects seem to have a slower impact on the ASEAN region. Improvements in the current account in Latin American and the African countries were registered in 1984 and 1985 but worsened in 1986. In the ASEAN region, improvement took effect gradually from 1984 through 1986. The cumulative current account deficits were highest in the Latin American region, followed by the ASEAN and the African region through the years under study.

Debt creating flows had an increasing trend in the African region because of official support from World Bank, IMF and other bilateral government agencies in financing imports and attempts at smoothing consumption. The Latin American region experienced a decreasing trend instead because of credit rationing. The ASEAN region experienced high debt creating flows in 1981 to 1982, lower flows between 1983 and 1984, which increased again between 1985 and 1986. The 'trough' in 1983 and 1984 was probably due to moratoriums and rescheduling undertaken by the Philippines, soon after it ran into debt problems. The 'peak' between 1985 and 1986 shows perceived creditworthiness by creditors and marked the beginning of new lendings in Malaysia, Indonesia, South Korea and Thailand, especially from yen credit. Debt creating flows remained the main form of financing the current account deficits in all of the three regions. The African and the Latin American region had total reliance on debt financing from 1981 through 1986. Debt financing became more relied upon by the ASEAN region after 1985. The cumulative debt creating flows are in excess of cumulative current account deficits in all regions, with the greatest excess in the Latin American region (which is 1.56 times the deficits figure).

Out of debt creating flows, long term loans played the most important role as a means of financing in all regions. Apparently, there was a sudden reduction in 1984. Latin America had the highest proportion of cumulative long term loans out of cumulative total debt creating flows , i.e. 115% (cumulative total debt is lower because cumulative short term loan is negative), ASEAN had 95% and sub-Saharan Africa had 86%. The use of IMF credits are greatest in the Latin American region and the African region, which accounted for 9.6% and 8.3% of total cumulative debt creating flows, respectively. The cumulative short term loans was highest in the African region (5.3%), whereas an outflow of 24.6% was observed in the Latin American region between the years 1981 and 1986.

From 1981-86, non-debt creating flows formed quite a high proportion of financing current account deficits in the ASEAN region, which was 46% of the current account deficits. The Latin American region had 29% and the African region had 9.8% of non-debt creating flows financing their current account deficits.

The ASEAN region recorded reserves accumulation of 15% of cumulative current account deficits or 12.9% of the cumulative debt creating flows from 1981 through 1986. The other regions recorded usage of reserves, the highest being in Africa who used all reserves enough to finance only 30% of the current account deficits.

The cumulative residuals were very high in all regions, the highest being in the Latin

American region which had one to one ratio with the current account deficits. In Africa and ASEAN, the ratios were about 0.72% and 0.43%, respectively. A substantial portion of the residuals consist of net errors and omissions which may reflect the high amount of capital flight.

1.6 Conclusion

It can be concluded that debts incurred in the 1970s was mainly used to finance imports for the growth of output. In the 1980s it was mainly used for repayment of interest and principal payments falling due, at the same time imports were curtailed hence, growth was unsustained. It can also be concluded from the regional analysis that the nature of debt problems vary according to regions. Debt problems in the Latin American countries emerged because of over-borrowing from commercial sources at high floating interest rates and depressed export markets. Debt problems in the African region were more a consequence of commodity dependence, with very sluggish growth and low export earnings. The debt of this region is mainly from official sources on concessional terms and the amounts are minor in world terms. As for the ASEAN region, debt in general does not pose a major constraint to growth and development, except in the Philippines, in which debt problems arose due to the political turmoil in 1983.

Unlike the Latin American region where debt has a very high dollar component, the debt of the ASEAN region has a high component of yen, especially from 1985 (World Debt Tables 1987/88). The Latin American countries, the Philippines and Nigeria had converted substantial private debt to public debt, as liabilities were taken over by the government through the rescheduling processes. Private non-guaranteed debt fell as a whole in developing countries from US$ 101.2 bn to US$ 90.3 bn in 1986 (World Debt Tables, 1987/88). Net repayments were greatest in ASEAN and Latin America.

Clearly the `debt crisis' has been about the inability of debtors to maintain the rapidly mounting interest payments in conditions characterised by high real interest rates, falling terms of trade and stagnating world trade, against a background of massive borrowing in the same period, and in some cases, significant capital flight.
Debt problem thus posed three issues; liquidity, equity and solvency. Illiquidity arises when current assets exceeds current liability (strictly an accounting sense); in the case of a country, it means inability to service debt now as scheduled and in full amount. And clearly there was a problem of illiquidity in the 1980s. Equity refers to

who should bear the burden of debt - debtors or creditors; and the generation now or the future generation. Solvency means the liability of a country exceeds its ability to pay at any time. Eaton and Gersovitz (1987) believe that a country will not go insolvent while Dornbusch (1987) believes that it involves depressing economic activity and living standards to get out of insolvency.

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[1] Total net floating-interest debt is defined as short term plus long-term floating-interest liabilities minus floating-interest asset (OECD Survey, 1982).

[2] Different writers often use different concepts when discussing capital flight. According to one definition, capital flight would consists of all short-term private capital outflow plus "net errors and omission" item in the balance of payments account, that is, the item that cannot be otherwise accounted for (Khan and Ul Haque in Finance and Development, March 1987).

CHAPTER 4: A SURVEY OF THE LITERATURE ON THE MACROECONOMIC AGGREGATES

4. 1 Introduction

Inspired by our findings in Part 1 - the background chapters - that debt and deficits seem to have some co-movements, we reviewed the literature on twin deficits and debt-deficits related issues. We found the gist of the twin deficits notion is a posited causal linkage that links government budget deficits to external deficits via the interest rates and the exchange rates mechanism of transmission. Debt versus taxes and financing of deficits by four sources of finance are other related issues that has connection with the issue of increased indebtedness. The debt-deficits related literature follows somewhat the twin deficits line of argument, though in a slightly different context whereby the analysis uses the term external and internal transfers.

Our main aim in Part 2 of the thesis is to establish a thesis on debt and twin deficits. Specifically, we try to link internal policy issues to the external sector and eventually to increased indebtedness. However, there are some problems in establishing the applicability of the literature on domestic policies that might have some influence in enhancing trade deficits and increased indebtedness to our framework of linkages between them. Our framework of the linkages involves three aspects:

(1) the linkages between twin deficits and increased indebtedness.

(2) the details of internal policies that have effects on the twin-deficits and increased indebtedness.

(3) the linkages between debt, twin-deficits and growth.

In the absence of a satisfactory guideline for our analysis of all the said linkages, we sought to analyse variable by variable from the macro-economic identity below:

$$(M - X) = (G - T) + (I - S) \tag{4.1}$$

Our main purpose is to clarify the determinants of each variable, then establish cause and effect relationships between them so as to be able to answer the questions we posed. The following is a survey of the literature on the macroeconomic aggregates of equation (4.1).

4. 2. Investment Determinants

There are many competing specifications on the determinants of private investment in developed countries. There had also been an increasing interest in the

determinants of investment for developing countries. Adopting the specifications used for developed countries has now become a common practice, however, for these specifications to be applicable in the developing countries some specific factors in the developing countries must be considered. Basically, there are two mainstream investment models; one is the income accelerator that considers the changes in aggregate demand and the other, profitability which considers the role of the relative prices of capital and labour.

Based on his survey of studies of investment determination as applied to the developing countries, Rama (1990) suggested four other variables relevant to the developing countries should be considered. These specific factors are; financial repression, foreign exchange gap, lack of infrastructure and economic instability. The economic instabilities so far investigated are exchange rate fluctuations, credit availability and aggregate demand. Rama, however, did not try to take into consideration a debt variable to address the possibilities that debt might be associated with private investment. The inclusion of the economic instability variable normally takes the form of a dummy variable, which we feel is too general a specification.

Investment models generally have the objective function of maximizing the increase in the market value of products. There are two constraints to the maximization problem - technological and economic. The technological constraints refer to the changes in capital stock and production function whereas the economic constraint refer to the structure of the market and the use of direct foreign exchange allocation. The structure of the market refers to monopolistic competition, perfect competition (the 'true' neoclassical case), effective demand (neoclassical model), credit rationing and foreign exchange shortage. Each of these has its own model and apart from these, there is also Tobin's q model (see Appendix 1 for the models listed).

There are adjustments made to the models including the inclusion of time lags and, aggregation factors, i.e. the optimization problem of a single firm, and economic instability characterizing most developing countries. Rama's survey of the twenty-five recent studies that deal with private investment determinants in developing countries shows there is a general consensus that private investment is determined by aggregate demand. Pure neo-classical models in which there is no income accelerator may not be appropriate to the developing countries. Conclusions on the role of public investment suggest that public investment crowds out private investment. Out of the twenty-five studies, only one-fifth suggests that public investment provides an externality to private investment. Relative factor prices, are

often not taken into consideration, but if they are, according to Rama, they are either not defined properly or large varieties of proxies are being used. Rama suggests that this may be due to the structure of the goods market whereby the variety of goods available are low and goods are weak substitutes. Credit availability seems to be one of the determinants for private investment in many developing countries. Foreign exchange availability is taken into account in only five of the studies. This variable is significant in the determination of private investment. Only six studies include dummy variables reflecting economic policy changes or uncertainties. In all cases, these are significant.

Rama (1990) concludes that the determinants of private investment in the developing countries are not necessarily the same as in developed countries. Some key exogenous variables such as the user cost of capitals are measured in a misleading way.

Bleijer and Khan (1984) develop a model which is a variant of the flexible accelerator framework and consider the issue of what variables systematically affect private investment in developing countries. Their model establishes a relationship between government policy; that is, variations in bank credit and government expenditures; and private capital formation. Sundarajan and Thakur (1990), derive a private investment function by modifying the neo-classical theory of investment, hence, incorporating some of the channels through which public investment influences private investment. The neoclassical theory suggests that private investment is positively related to the expected output level and negatively related to the relative price of capital, that is, the user cost of capital relative to the wage rate. Both models therefore, emphasize the response of output to the capital stock; and Sundarajan and Thakur make use of the neoclassical principle that an optimal set of inputs is dependent on their relative prices. Public investment is treated as exogenous so the focus is on public investment multipliers.

Bleijer and Khan (1984) conducted a study for twenty-four developing countries for 1971 to 1979. They consider resource constraints, both financial and physical, faced by private investors in developing countries, and at the same time, incorporate an explicit role for monetary and fiscal policies. In their long-run representation of the accelerator model, the desired capital stock is assumed to be proportional to expected output. The assumption is that the underlying production function has fixed proportions among factor inputs, hence, factor prices do not enter into the specification. Incorporating lags, that is; time to plan, build and install new capital, necessitating capital stock in the previous period to adjust to the desired capital in

period *t*. The model is for net private investment, whereas data on investment are available only in gross terms, including depreciation. They transform the model into gross investment terms, defined as equal to net investment plus depreciation of the previous capital stock, which also permits the elimination of the private capital stock variable from the specification. The advantage of the model is that it does not require information on net investment or on the stock of capital, making it readily applicable to available gross investment data in developing countries.

The response of private investment to the gap between desired and actual investment, as measured by a coefficient, β, assumed to vary systematically with economic factors that influence the ability of private investors to achieve the desired level of investment. They hypothesise that the response of private investors depends on three main factors; the stage of the business cycle, the availability of financing and the level of public sector investment. The phenomenon of crowding out is captured through the speed of adjustment rather than through directly changing the desired level of real private investment. Private investors are expected to respond more rapidly to changes in desired investment during the expansionary phase of the system where demand conditions are more buoyant. If public and private investments are substitutes (crowding out), the coefficient of adjustment of private investment is expected to be smaller as the rate of public investment increases. The trend level of real public sector investment represents the long-term or infrastructural component and the variable should have a positive effect on gross real private investment. Deviations of real public sector investment from trend are assumed to correspond to non-infrastructural investment.

Sundarajan and Thakur (1990) believe that public investment provides a significant stimulus to private investment, hence, serving as a powerful instrument of stabilization and growth policy. In this context, they examine the relationship between public and private investment in developing countries by postulating a dynamic model of investment, savings and growth for two countries - South Korea and India. The role of interest rate policy is also examined and its effect on investment and economic growth is determined. The framework used is a growth model designed to highlight the role of public investment. The model consists of relationships explaining the behaviour of private investment, savings, and growth, incorporating several channels through which public investment influences private investment. Firstly, where they compete for scarce physical and financial resources, in the short-run, government investment exerts a negative influence on private investment. Secondly, if government investment complements private investment, private investment requirements per unit produced are reduced. Thirdly, increased

public investment raises the demand for output in the private sector, thereby influencing output expectations and investment requirements of the private sector. Finally, public investment raises aggregate output and savings, supplementing the economy's physical and financial resources, thus offsetting at least a part of any initial crowding-out effects on private investment.

Also, excess demand for investment in these countries exists, stemming widely from widespread financial repression, therefore, actual investment in fixed capital is constrained by the availability of savings. These features are built into the model by specifying a separate aggregate domestic savings function and by postulating a direct linkage between savings and the speed of adjustment of the fixed capital stock to the desired level.

Sundarajan and Thakur also consider that the effect of public investment is crowding-out in the financial market and the market for real resources. According to them, in most developing countries, crowding-out of private investment occurs through non-price rationing mechanisms rather than through the price mechanism. The immediate crowding out effect of private investment by public investment is measured by the coefficient of the variable S - IG/PI. This variable, which measures the resources available to the private sector, is the difference in real terms between aggregate savings and total public sector investment. Its coefficient measures the effect of resource availability on the speed of adjustment of the actual capital stock to the desired level.

Bleijer and Khan take into account the clear consensus that one of the principal constraints on investment in developing countries is the quantity, rather than the cost, of financial resources. The amount of investment by private investors is limited by available bank financing. Any effect exerted by the rate of interest on private investment is not direct within this rationing framework, but occurs via the channel of financial savings. The capital markets in the developing countries are normally sluggish, limiting the financing of private investment to the use of retained profits, bank credit and foreign borrowing. The effects of bank credit and foreign borrowing is to increase investment because of increased savings. The principal instrument of monetary policy in developing countries is usually to control total bank credit through varying the composition of credit between the public and private sectors. In this way the government can affect the speed and ability of private investors to respond to achieve their desired levels of investment. Monetary policy can thus have a desired influence on the rate of private investment. In a similar way, private investment can be influenced by interest rate and exchange rate policies that cause

changes in private capital flows, which augment or reduce financial resources available to the private sector.

The change in bank credit to the private sector and net private capital flows have positive and significant effects indicating, for a given overall quantity of financial resources, that any attempt by the government to increase its share of either domestic or foreign financing at the expense of the private sector would lead to crowding out and a decline in private investment. Since the control over the credit of the banking system remains the principal tool of monetary policy, the results show some importance for the broader issue of real sector's response to changes in monetary policy in the developing countries. Their estimates indicate that about one-quarter of any change in real credit to the private sector shows up in changes in real private investment in the short run. Similarly, they presume that interest rate and exchange rate policy can also have a significant influence on private investment through their effects on private capital flows.

The principal conclusion in Bleijer and Khan's study is the direct empirical link established between government policy variables and private capital formation. Private investment in developing countries is constrained by the availability of financing, and the fact that monetary policy can directly change private investment decisions by varying the flow of credit to private sector.

As the basic equation is expanded, the results show that the level of public sector investment has a positive effect on private investment, whereas the change in government investment has a negative effect. On the basis of this particular result, they argued that it is not the level of public investment that crowds out private sector investment, rather, it is the change in public investment that appears to have a strong crowding-out effect.

The effect of public sector investment on private capital formation depends on whether public investment is infrastructural or long-term in nature or short-term investment. Public infrastructural investment seems to complement private investment and short-term public investment tends to be a substitute for private investment. The policy implications suggested about monetary policy is that tightening it would have an adverse effect on the level of private investment, hence leading to a reduction in economic growth. If the public sector absorbs a larger share of domestic financial resources it tends to crowd out private investment. If the total supply of foreign financing is limited, and if public sector borrowing increases thus limiting the available credit to the private sector, crowding out will also occur.

However, this type of crowding out is said not be quantitatively large as compared to domestic financial crowding out. In broad terms, they believe public investment crowds out private sector investment if it uses the scarce physical and financial resources that would otherwise be available to the private sector, or if it produces goods that compete with private sector output. Financing public sector investment through taxes, debt or inflation reduces the resources available to the private sector, thus reducing private investment. Public investment in infrastructure and the provision of public goods can be complementary to private investment, raising the productivity of capital, increasing demand for output due to the increased demand for inputs and augmenting resources available by expanding aggregate output and savings.

Bleijer and Khan claimed that the results obtained are most interesting from the point of view of the empirical relationship between public and private investment in developing countries. Their estimates indicate that the trend component of real public investment exerts a positive influence on the level of real private investment, whereas deviations from the trend have the opposite effect. Their results are consistent with the maintained hypothesis that public infrastructural investment is complementary to private investment, whereas other kinds of public investment tended to be substitutes for private investment. Provided that its trend level were not affected, an increase in real public investment would lead to a fall in real private investment in the short run, but the degree of substitutability is by no means perfect because the coefficient is significantly less than unity.

Concerning private investment and output, Sundarajan and Thakur's results show that the major determinants of output are the capital stock and the rental-wage ratio. The rental-wage ratio, which measures the relative price of capital and labour, has a significant impact on capital-output ratios in both countries. Private investment is significantly influenced by output (which is a proxy for output expectations), the resources available to the private sector, and the initial private sector capital. The rental wage ratio has a strong negative influence on investment in India but not in Korea.

It is shown in the Sundarajan and Thakur study that (through the variable S-IG/PI) a larger proportion of the increase in the resources available to the private sector has a greater influence in fixed capital formation in India than in Korea. This has the implication of an immediate crowding out effect which is stronger in India than in Korea. However, the existence of a net crowding out effect cannot be determined on the basis of this coefficient alone, since public sector investment also has a positive

effect on output, output expectations, and savings, and these effects may offset the immediate crowding out effect operating through the resource constraint variable. It is suggested that a complete analysis of the effect of public investment on private investment requires the computation of impact and dynamic multipliers of public sector investment.

A test of the neoclassical principle is provided by the rental-wage ratio which has a significant negative substitution effect on investment and significant efficiency effect on output. The relative price effects occurred with a lag, suggesting that an increase in the interest rate and hence, the rental price of capital, tends to depress investment demand, reflecting the substitution of capital for labour. The coefficient for the rental wage ratio in the production function is significant, supporting the hypothesis that an increase in interest rates and hence, the rental price of capital increases the overall efficiency of capital. Though the public sector capital stock are not significant, it is retained for simulation.

The general conclusion on the simulation result is that, in India, the long-run multiplier effect of increased public investment is weak. The effect on overall investment is weak because there is a crowding out effect. The effect on overall GDP is weak because the greater incremental-capital output ratio in the public sector than in the private sector implies increases in public sector output are not enough to offset the loss in private sector output in a considerable length of time. In Korea, the result is different. There is a negative crowding out effect so the long-run multiplier of increased public investment is strong. The difference between the capital-output ratios of the public and private sectors is not a significant factor.

Different savings behaviour is noted in the two countries. In India, the real interest rate had a significantly positive direct effect on total savings (average propensity to save increases) while in Korea, the direct effect of the real interest rate was not significant. However, interest rate has a strong positive multiplier effect. This shows the higher interest rate raises the efficiency of capital and thereby stimulates economic growth which, in turn, stimulates savings. Hence, the channels through which it affects savings is different. Savings are related to permanent income in India while it is related to both permanent and transitory income in Korea.

4.3 Export Demand Function

Income and price elasticities for exports of developing countries play an important role in the determination of policy response to deteriorating export earnings and

increased indebtedness. The conventional way of specifying export supply and export demand functions is by a single equation incorporating the variables representing foreign demand (the real GDP of a foreign country) and the competitive position of a country's exports (the ratio of unit labour costs in a country relative to that in other countries) is used. Single equation estimation is appropriate in the case where the results are affected only by changes in foreign demand but assumed not to be affected by domestic supply.

According to Goldstein and Khan (1985), there are two general models of trade that have dominated the empirical literature, that is, the imperfect substitutes and the perfect substitutes model. The two are seen as competing specifications due to aggregation in exports (imports) in trade studies. Goldstein and Khan see the possibility of the two specifications being complements to each other once disaggregation is admitted. We make use of the imperfect substitute argument in this chapter, while details of the trade equations are covered in Chapter 7. The imperfect substitute model assumes neither exports nor imports are perfect substitute for domestic goods; it follows the law of one price does not hold either within a country or across countries. The structure of exports and import specifications takes the form of simultaneous equations which is necessary for indicating changes in the prices and the volume of exports in response to changes in the exchange rate.

For the ASEAN countries, many of them may influence the prices of their exports. Therefore, both the domestic price elasticity of export supply and the foreign price elasticity of export demand will be relevant. However, we assume that ASEAN countries at this stage (although in Chapter 7 we relax this assumption) are not able to influence the prices of the goods they export; the responsiveness of these exports to changes in the exchange rate will be determined by the foreign price elasticity of export demand.

For industrial countries, the long-run price elasticities for both export and import demand typically exceed one signifying that relative prices play a strong role in the demand for total imports and exports. The estimates by Balassa et.al (1987), are between 1.8 and 2.3 for Greece and Korea and 5 for Hong Kong. It implies a strong potential contribution of expenditure-switching policy instruments (exchange rates, tariffs and subsidies) to trade balance adjustments. Short-run price elasticities are smaller.

Income elasticities of demand for both exports and imports fall in the range of 1 to 2 for a representative industrial country which implies a rising share of imports and

exports to GNP over time, in the absence of a secular increase in the relative price of imports.

The supply price elasticity for total exports for a representative industrial country ranges from 1 to 4. However, there is no conclusive implications from the figure given because different countries have different supply elasticity responses to different trade policies such as subsidies, degree of openness, size of GNP, etc.

In Latifah and Ariff (1992), an export supply and export demand function using a simultaneous equation, details as shown in Chapter 7, are estimated simultaneously so as to eliminate any bias arising from a two-way relationship between export quantities and export prices. Latifah and Ariff's estimates of the domestic price elasticity of export supply for the ASEAN countries ranges from +1.27 to +3.98. The estimated coefficient of the export demand function is positive and significantly different from zero in all countries, implying a positively sloped supply function for exports.

The estimated price elasticity of export demand for the ASEAN countries points to the important role of relative prices in determining the world demand for these countries' exports. Singapore and South Korea have estimated price elasticities exceeding unity which implies a fairly large response of exports to changes in relative prices.

Goldstein and Khan (1978) include lag effects of export demand and allow for adjustments, whereby exports are assumed to adjust to the difference between demand for exports in period t and the actual flow in the previous period $t-1$. Starting at a disequilibrium level where exports this period adjust to the unfulfilled demand of last period:

$$\Delta log\, X_t = \gamma [logX_t^{\,d} - logX_{t-1}] \qquad (4.2)$$

where, γ is the coefficient of adjustment (assumed positive) and Δ is the first difference operator, $\Delta log\, X_t = logX_t - logX_{t-1}$.

Equation (4) is an adjustment of the quantity of exports, when there is an excess demand in the rest of the world then the price of exports is determined in the exporting countries. In the export supply function, the price of exports adjusts to excess supply:

$$\Delta log\ PX_t = \lambda\ [logX_t - logX_t^{\ s}],\qquad \lambda > 0 \tag{4.3}$$

where, λ is the coefficient of adjustment. An increase in excess supply lowers the price of exports and vice-versa.

Using the Full-Information Maximum Likelihood (FIML) method of estimation, it is shown that in six of the eight countries under study have an estimated price elasticity of export demand greater than unity. This implies a fairly large response of exports to changes in relative prices. Conclusive evidence points to the important role of prices in determining the world demand for these countries' exports.

The short-run price elasticities of demand are significant and smaller than the equilibrium income elasticities. The coefficient on lagged exports is significant implying a degree of dynamic adjustment for six of the eight countries. The average time lag for exports to adjust ranges from one to five quarters.

In the disequilibrium export supply results, the coefficients for exports are significant in all eight cases. Domestic prices have a positive and significant effect on export prices in six countries. Productive capacity has a significantly negative effect in all countries. The coefficient of lagged export prices is quite large and highly significant in all equations suggesting that this variable is capturing a good part of the dynamics of changes in export prices.

The estimates of the price elasticity of supply ranges from -0.1 to +3.9. In two of the countries, the supply price elasticities are higher in the disequilibrium model than in the equilibrium model. The estimates for the other countries have the opposite values.

Goldstein and Khan's overall assessment of the model is that they are not clear as to which model is more superior. From the point of view of conventional statistical grounds they justify that the models seem to be equally well specified as the R^2 are similar.

4.3 Import Demand Function

In the simple import demand function, the quantity of imports depends on the ratio of import prices to domestic prices and the level of income (see for example, Houthakker and Magee (1969), Khan (1974), Goldstein and Khan (1976), Goldstein,

Khan and Officer (1980), Melo and Vogt(1984) and Arize (1991)). The underlying assumption is that domestic goods are imperfect substitutes for foreign goods. Consistent with the conventional demand theory, the consumer is postulated to maximize utility subject to a budget constraint. In the simple model, only current income matters for import demand and no distinction is made between secular or cyclical income movements or between transitory and permanent income. The simple equation takes the form:

$$Log\ M_t^{\ d} = a_0 + a_1\ LogP_t + a_2\ LogY_t + \xi_t \qquad (4.4)$$

where,

$M^{\ d}$ = quantity of import demanded

P = ratio of import prices to domestic prices (Pm /Pd)

Y = level of gross national product in constant prices.

ξ = error term.

a_1 and a_2 are the relative price and the real income elasticities of imports.

$a_1 \leq 0, \quad a_2 > 0$.

Other models include lagged values of either the dependent or independent variables. Including the lagged value of the dependent variable implies a geometric time path of adjustment and restricts adjustment to previous income and price changes to be identical. Such specifications are used by Khan (1974) for example. The model takes the form:

$$\Delta Log\ M_t = g\ [LogM_t^{\ d} - logM_{t-1}^{\ d}\ ] \qquad (4.5)$$

where $0 < g < 1$.

This type of adjustment implies that the price of imports relative to the domestic price level is exogenous to the importing country, usually being determined in the overseas market, with quantities being adjusted domestically. Substituting equation (4.5) into (4.4) yields:

$$LogM_t^{\ d} = ga_0 + ga_1\ LogP_t + ga_2\ LogY_t + (1 - g\ )LogM_{t-1} + g\xi_t \qquad (4.6)$$

where, ga_1 and ga_2 are the short-run price and income elasticities, respectively. Goldstein and Khan (1976) estimated the average lag in import demand to be between two and four quarters for a group of seven industrial countries.

Houthakker and Magee (1969) specified the model to include lagged values of both the dependent and independent variables.

$$LogM_t^{\,d} = ga_0 + ga_1\,(LogP_t - LogP_{t-1}) + ga_2\,(LogY_t + LogY_{t-1}) + (1-g)LogM_{t-1} + g\xi_t \qquad (4.7)$$

Still other models include only the lagged values of the independent variables.

There can be two basic differences in the models: one splits income into its cyclical and trend components, the precise formulation used being that of Goldstein, Khan and Officer (1980), which includes trend income and income relative to trend. The other relaxes the implied assumption of other models that demand is homogenous of degree zero in income and prices.

With regards to the trend and cyclical income, Goldstein and Khan (1985) postulated that when trend (or potential) real income and cyclical real income are included in the import demand equation at the same time, both usually appear positive and statistically significant; the same applies when real income and capacity utilization appear jointly. There is some tendency that the cyclical elasticities exceed the secular elasticities, but there are exceptions.

Modern consumption theory distinguishes between current income and "permanent or life-cycle" income but little attention has been given in the specification of the aggregate import demand function. Goldstein and Khan feels there is a potential in its application in the import demand function. The fact that the greater slope of the long-run consumption function found in the U.S. compared to the short-run function and the fact that most trade studies find a higher income elasticity for imports from cyclical income than from trend (potential) income, suggests that cyclical non-price rationing effects predominate over permanent/transitory consumption differences.

With regard to simultaneity bias in the single equation models, i.e. simultaneity between quantities and prices whereby the estimates of the price elasticities of demand and supply can be weighted averages of the "true" demand and supply elasticities, hence biased downwards, the problem seems more serious with export demand and supply functions rather than import demand function. Presumably the price variable in the import demand equation can be treated as exogenous. Thursby and Thursby (1984) tested the reliability of simple single equation specifications of import demand using the technique RESET (regression specification error test) and concluded that the single equations which include dynamic behaviour through lagged

values of the dependent variable proves to be more acceptable than models without lagged adjustments. As to the simultaneous equation model, techniques of estimation such as the full-information maximum-likelihood and the two-stage least square methods were used (see Khan, 1974, for example).

As to the simple equation estimates, four broad conclusions stand out as indicated by Goldstein and Khan (1985). Firstly, the sum of the long-run price elasticities of demand for imports exceed one. The estimates suggest that relative prices play a powerful role in the demand for total imports leading to a suggestion by Goldstein and Khan that the expenditure-switching policy instruments to trade balance adjustment seem strong. Secondly, short-run price elasticities of demand for imports are considerably smaller than the long-run elasticities. Goldstein and Khan suggested that this difference carries two policy implications: one is that devaluation leads to a J-curve response of the trade balance. The trade balance worsens in the short-run as a result of devaluation because of low short-run price elasticities of demand and the tendency for import prices to rise more rapidly in local currency terms than export prices. In the long-run, export prices will catch-up with the import prices reducing the deterioration in the trade balance. Another implication of the low short-run price elasticities is that the short-run changes in a country's trade balance will be dominated by real domestic and foreign income movements. For a period up to one year in length, the sum of income elasticities for imports and exports is between two to four times larger than the respective sum of price elasticities.

The third aspect suggested by Goldstein and Khan is that income elasticities of import demand for a representative industrial country fall in the range of one to two. The implication is that in the absence of secular increases in the relative price of imports, the share of imports and exports are expected to be rising over time. Another implication is that if the income elasticity of demand for imports is significantly larger than the income elasticity for exports, the choice a country has to make is whether to grow at the same rate as its trading partner and accept a secular deterioration in its trade balance or to have an external balance and accept a slower growth rate than its trading partners.

The fourth broad conclusion by Goldstein and Khan concerns the inter-commodity differences in income and price elasticities which implies the differences in the commodity structure of trade can lead both to differences across countries in price and income elasticities for their total imports (and exports) and to differences in elasticities between the exports and imports of a single country.

Studies on the import demand function in the developing countries show that the estimated price elasticities are generally high, hence indicating that relative prices have a significant effect on the imports of developing countries. The estimates by Khan (1974) using the simultaneous equation method show the price elasticities range from -0.8 to -2.7. The same study shows that the income elasticities are generally very low. Arize (1987), by using the simultaneous equation method, obtains estimates for the African countries that generally show import prices do have a significant effect on the quantity of imports demanded. Our estimates by the simple single equation method (in a later chapter) shows the estimated income elasticities fall in the range of 1.07 to 1.35 in Singapore, Malaysia and South Korea. The income elasticity of demand for the Philippines and Thailand are relatively low (approximately 0.15 and 0.90 respectively). As a comparison, the income elasticities of demand for a representative industrial country fall in the range of 1 to 2 on both import and export sides (Goldstein and Khan, 1985).

4.4 Savings

The survey by Mikesell and Zinser (1974), show that the absolute income hypothesis of the Keynesian savings function is specified as:

$$S = a_0 + a_1 Y \tag{4.8}$$

where S is gross domestic savings, Y is gross national product, a_1 is the constant marginal propensity to save (MPS). $a_0 < 0$ and $0 < a_1 < 1$ so that the average propensity to save (APS) rises as income rises.

Improvements to the above absolute income hypothesis had been;

$$S = b_0 + b_1 LnY \tag{4.9}$$

and,

$$LnS = c_0 + c_1 LnY \tag{4.10}$$

where b_1 is increasing at a decreasing rate $(b_1 > 0)$ and c_1 is the constant income elasticity of national saving.

Still other studies in the Keynesian tradition, according to the survey, show that the average saving rate tends to be proportional to per capita income under conditions of steady growth but the saving rate is positively associated with the rate of growth of GNP. Deaton (1989) points out that at best there is only a very weak relation between

saving and growth perhaps because it is the productivity of investment that is crucial, not its volume (given that there is a high correlation between saving and investment so that the link between growth and either saving or investment would not be any different if either parameter is used).

The non-Keynesian saving function have taken three alternatives:
a) the Dusenberry "Relative Income" hypothesis
b) the Friedman "Permanent Income" hypothesis
c) the Modigliani-Brumberg-Ando (MBA) "Life Cycle" hypothesis.

Whilst there is no support for the first hypothesis (Mikesell and Zinser 1974), at least for the developing countries, many studies have been in the permanent income hypothesis tradition. The simplest form for the permanent income hypothesis is:

$$S = a_0 + a_1 Y_P + a_2 Y_T \qquad (4.11)$$

where Y_P is permanent income and Y_T transitory income which is further being developed to the asset adjustment model and the growth rate of income model. Permanent income is defined in terms of a long-run expectation over a planning period, and transitory income is the difference between actual income in any period, and permanent income.

Friedman's hypothesis is that individuals consume virtually no transitory income (MPST=1). This implies a heavy reliance on past behaviour as a determinant of consumption spending; but changes in transitory income will immediately lead to changes in the level of saving. Most studies of this kind support the hypothesis.

The life-cycle income hypothesis states that the individuals plan their life-time consumption by accumulating enough savings during their earning years to maintain consumption during retirement years. The model implies stationary population and income, there is no aggregate net savings since the dis-savings by the retired are exactly offset by the savings of the employed. However, in a growing population and growing per capita income, aggregate net personal saving is positive, and the larger the current per capita income, the higher will be the savings since the individual seeks to equalize consumption over his remaining life span. The life-cycle theory thus relates aggregate saving with the rates of population and income growth.

Deaton (1989) approaches the study of savings in the developing countries by developing a model of households, with no borrowings, who attempt to smooth their

consumption to face volatility in income, rather than using the approach of the relation between saving and growth. The analysis is within the framework of the standard life-cycle permanent income model but delivers the result that is far from the standard "consumption equals permanent income" of the literature. Deaton uses the maximization of a utility function of the household subjected to a budget constraint, which in turn yields an Euler equation when dynamic programming is applied to the two functions. Deaton (1989) and Summers and Carroll (1989) challenge the life-cycle theory; that whatever produces the positive correlation between saving and growth cannot be life-cycle saving. They point out that the life-cycle explanation assumes common preferences across countries, but differences in economic growth generate differences in the relative lifetime economic standing of young and old in different countries. Lahiri (1989), using the life-cycle approach and taking into consideration rational expectations - permanent income hypothesis, found much of the diversity in savings behaviour in eight countries in Asia (over time) is explained by two important determinants - growth and demography. Lahiri further argues that inflation and adverse movements in the terms of trade are two additional factors that depress the propensity to save. His specification of private consumption behaviour takes the form:

$$\Delta c_t = \beta_0 + \beta_1 c_{t-1} + \beta_2 y_t + \beta_3 y_{t-1} + \beta_4 PR_t$$
$$+\beta_5 \Delta PR_t + \beta_6 \pi_t + \beta_7 \Delta T_t + \beta_8 x_t + \xi_t \qquad (4.12)$$

where,

c and y = the natural logarithms of per capita real consumption and income

PR and ΔPR = the percentage of population aged 15-64 and the change in that percentage respectively,

π = the rate of inflation,

ΔT = the change in terms of trade,

x = the ratio of exports to GNP.

With regards to the effects of foreign capital on domestic savings, Landau (1969) and Chenery and Eckstein (1970) found that net capital inflow are negatively correlated to savings rate. The relevant regression equations include:

$$S = b_0 + b_1 Y + b_2 F \qquad (4.13)$$
$$S/Y = d_0 + d_1 Log(Y/Pop) + d_2 (F/Y) \qquad (4.14)$$

where F is the ratio of net capital imports to gross national product. Areskoug (1969) argues that since foreign borrowing finances domestic consumption and investment, future savings might not be able to counterbalance amortization payments. Mikesell and Zinser (1974) conclude that net capital imports reduce gross domestic savings if there is no simultaneous increase in gross investment. This is due to the fact that in the national product accounts, gross domestic saving is equal to gross domestic investment less capital imports.

Studies of the effect of taxation on saving have reported mixed results. Some studies, according to Mikesell and Zinser, found that taxation causes an increase in government saving and more than offset the decrease in private saving, while others found a decrease in private but an increase in public consumption.

In a detailed investigation of the effect of interest rates on saving Brown (1971) on the Korean monetary reform shows average private saving rates having the highest degree of correlation with interest rates. The financial repression literature implies that low interest rates keep down the cost of domestic borrowing and enable governments to monopolise the sale of financial securities since there is a lack of alternative borrowers. Low interest rates and lack of investment opportunities are then held responsible for low domestic saving (Deaton, 1989). This view stresses that financial liberalization is crucial to raise saving ratios and growth. There is a substantial agreement that saving is positively associated with exports (Mikesell and Zinser, 1974).

4. 5 Taxation and Development.

Our main aim is to trace how taxation relates to development, in particular, how taxation plays a part as a source of revenue in an economy. This requires a knowledge of tax structures; tax buoyancy and elasticity; and tax 'effort' and tax 'capacity'. In Gemmell's survey of the literature (1987), tax buoyancy is defined as "the realized increase in tax revenues in association with an increase in GDP. Whereas tax elasticity measures the 'automatic' change in revenue for a given tax base as GDP rises". Gemmell suggests that tax elasticity could be decomposed into: (1) the elasticity of tax revenue with respect to the relevant tax base, and (2) the elasticity of the tax base with respect to GDP. This can help to identify the extent to which the overall tax elasticity can be attributed to structural changes in the economy affecting the base-to-GDP elasticity, or to the properties of the tax schedule which

affect the tax-to-base elasticity. Elastic taxes imply that additional revenue can be raised more readily. Tax 'effort' and tax 'capacity' refers to an assessment of how successfully countries are tapping available tax resources.

Past studies surveyed (see surveys by Gemmell (1987), Ahmad and Stern (1987), Burgess and Stern (1992)) reveal that developing countries tend to rely on domestic taxes on goods and services, foreign trade taxes and income taxes, in that order of importance, as opposed to the developed countries whereby the reverse order of importance applies. In Gemmell's survey of the literature, the general picture given of income taxation in developing countries is that they have complicated structure, 'schedular' in nature - having a variety of thresholds and rates, complicated in definitions, measurement, and assessment of income as well as administration of tax collection. Thus, indirect taxes (domestic and trade) are more greatly relied upon. Ahmad and Stern (1987) suggest that the relatively small role for the income tax in developing countries can be attributed to costs of administration rather than data non-availability and difficulty in assessment of the incidence of changes in income taxes. The most important reason for the prominent role of corporate taxes according to Ahmad and Stern (1987) is as a means of taxes on personal income, especially where domestic personal income taxation is weak and easily evaded. As for indirect taxes such as sales taxes, there are more complex set of consumption and commodity-specific taxes, the presence of subsidies has to be considered and some developing countries do follow a VAT system (Gemmell, 1987).

To study how the changes in tax structure relate to development (as normally measured by per capita income levels), Gemmell (1987) postulates two areas of particular concern: 1) to identify whether total and individual tax revenues as a proportion of GDP rise as per capita income increases; (2) to investigate how the shares of tax components in total revenue change with per capita income. Gemmell further points out that tax 'buoyancy' and 'elasticity' account for the two aspects above. Previous studies identifying a simple relationship between tax ratios and per capita income point to the conclusion that there is clear evidence that trade or indirect taxes are related to increases in per capita income (Chelliah et al. 1975, Tait et al. 1979, and Greenaway 1980, 1984), but there is no clear evidence on the relationship between tax revenue shares of GDP and per capita income.

Per capita income is not particularly good in explaining the level of taxation (Burgess and Stern, 1992). Tanzi (1991b) identified the the share of imports in GDP and the share of foreign debt in GDP as having a positive impact on tax levels, and the share of agriculture as having a negative impact.

Tax effort, i.e., the extent to which tax authorities have exploited available tax capacity, is taken as the difference between the predicted tax ratios as obtained from the result of a regression equation (see Chelliah et al. 1971, 1975 and Tait et al. 1979) and the actual tax ratios of a particular country. Strong tax performance is associated with high tax effort index.

In Chelliah et al. (1971, 1975) it was hypothesised that the average level of income, the degree of openness of the economy, and the composition of GDP would each have a bearing on the taxable capacity of a country. The study noted that tax ratios for developing countries have an increasing trend, for 1969-71, the average tax ratio was 15.1% compared to 13.6% for 1966-68. Tait et al. (1979) confirms that the trend also continue for the period 1972-76 whereby the average tax ratio was 16.1%. In fact, the increase was more pronounced in that period and hold the 1974-75 world recession responsible. The five regression equations used in Chelliah et al.(1971, 1975) - of various combination of factors - take the form:

$$T/Y = a + Y_p + F/Y \tag{4.15a}$$

$$T/Y = a + (Y_p - X_p) + NY + X'Y \tag{4.15b}$$

$$T/Y = a + (Y_p - X_p) + XY \tag{4.15c}$$

$$T/Y = a + Ny - Ay + XY \tag{4.15d}$$

$$T/Y = a + Ny - Ay \tag{4.15e}$$

where;

T/Y = tax ratio (excluding social security contributions)
Y_p = per capita GNP in US dollars
F/Y = the ratio of imports plus exports to GNP
$(Y_p - X_p)$ = per capita non-export income in US dollars
Ny = the share of mining in GDP
Ay = the share of agriculture in GDP
Xy = the export ratio
$X'y$ = the export ratio excluding mineral exports

The results in Chelliah et al. (1975) and later, Tait et. al (1979) concluded that:

1) in general, countries that have about 15 percentage points (above average) of tax ratios have tax effort indices that are above unity and vice-versa.
2) the share of mining emerges as an important determinant of tax ratios.

3) the share of agriculture is very important in determining tax capacity and the willingness to tax. It is said that many developing countries found it politically difficult to tax the agricultural sector.

Chelliah et al. (1975) justify that tax effort indices are useful information in judging the scope for more taxes if considered together with other relevant factors such as the existing level of taxation, the buoyancy of the tax system in the recent period, the content of increases in public expenditure, etc.

The relative decline in the importance of foreign trade taxes and the increase in importance of domestic indirect taxes with economic development is a well established finding (see Greenaway (1980, 1984), Gemmell (1990), and Tanzi, (1991)). Using a cross section data for 70 countries, Greenaway's results show:

1) There is an inverse relationship between dependence on trade taxes and economic development for an aggregate sample of 70 countries. Proxies of economic development used are either nominal income per head, real income per head, share of agriculture in GDP and share of manufacturing in GDP. It is found that the relationship holds irrespective of which parameter is being used as the proxy.
2) For sub-samples, the said relationship in (1) holds only for middle-income countries but not for low and high income sub-groups. Greenaway argues that there are economic reasons for this. In the case of low-income countries, although there is clearly a greater 'absolute dependence' on trade taxes, the first best source of tax revenue is the share of agriculture in GNP which serves as the best proxy for economic development. As for the industrialized countries, there are no administrative constraints to resort to the first best source of tax revenue after a certain stage of development has been passed.
3) When trade taxes are divided into import and export taxes, the inverse relationship holds stronger for import taxes denoting the decline in importance of the revenue motive as development proceeds.
4) The time-series analysis of individual countries suggest a large number of developed and developing countries have become less reliant on trade taxes as a source of revenue.

With regard to tax elasticity and buoyancy in developing countries, Gemmell (1987) concluded on previous studies that:

"- the typical estimates of tax buoyancies exceed elasticity estimates denoting the presence of discretionary tax increases and/or improvements in collection, administration, etc.
- income and domestic consumption tax elasticities tend to be higher than trade elasticities.

- indirect tax elasticities can be highly variable across commodities, indicating opportunities to raise revenue by taxing 'elastic' commodities more.
- income tax elasticities tend to fall in association with income increases.
- particularly for indirect taxes, base-to-income elasticities may be high relative to tax-to-base elasticities, so that automatic revenue increases result mainly from structural changes such as the changing composition of domestically produced goods and imports in consumption. Low tax-to-base elasticities for imports result from shifts towards low-rated intermediate imports from high-rated consumer goods (Gemmell, 1987)."

4.6 Government Expenditure

In a macromodel, government expenditure is taken as comprising two components: government investment and government consumption.

$$G = I_G + C_G$$

While government investment $(\bar{I_G})$ is assumed to be fixed/predetermined, government consumption has a fixed component $(\bar{C_G})$ and a component which varies proportionately with income, $(c\,\Delta Y)$, where c is the marginal propensity to consume and rD is the interest repayments on past government debt stock.

$$I_G = \bar{I_G}$$

$$C_G = \bar{C_G} + c\,\Delta Y + rD \qquad \text{where} \qquad D = \sum_{j=0}^{t-1}(G - T)_j$$

Hence, the interest repayments feed through future government deficits. In the short-run, government investment and consumption are assumed to be exogenous:

Let $G = \bar{I_G} + \bar{C_G} + rD$ (4.16)

If government expenditure is comprised of investment expenditures such as infrastructure, education, defence, hospitals, etc., these generate a future rate of return. The return might not take the form of monetary benefit but benefits to society now and in the future created by the projects. If government expenditure is for consumption goods, there will be no future rate of return, instead government has to finance the consumption goods either by issuing bonds or borrowing externally

which in both cases creates interest payments on debt. On the other hand, if government financed its consumption by seigniorage at a given level of the government deficit, the inflation rate will rise.

The absorption of resources by the public sector means that the opportunity cost of these public expenditures is the forgone output of other sectors. These argument underlie the crowding-out debate. If government expenditure is financed by bonds, at less than full employment, ceteris paribus, this will cause an increase in interest rates unless there is an accommodating monetary policy. If private sector investment is interest elastic then a bond-financed increase in public expenditure may crowd out private sector activities via its impact on capital market.

In the long-run, government expenditure behaviour over time may be observed. Brown and Jackson (1990) examine three models that categorize the time pattern of public expenditure. First, the development model of public expenditure growth; secondly, the model based on Wagner's law of expanding state activities; and third, Peacock and Wiseman's classic model of public expenditure growth. Gemmell (1993) outlines Wagner's Law and the Musgrave hypothesis and assess problems of interpretation and testing. Both studies suggest one most important point, that all three models have one thing in common, although the underlying reasons are different - that public expenditure does vary with GNP or income over the long-run.

Development models of public expenditure growth are best represented by Musgrave and Rostow. In the early stages of economic growth and development, public sector investment as a proportion of the total investment of the economy is found to be high. The public sector is seen as providing social infrastructure, law and order, etc and human capital investments necessary for take off stage. In the middle stages of growth, the government continues to supply investment goods but these are complementary to the growth of private investment. Along the way government is expected to deal with market failures.

Musgrave argues that over the development period, if the ratio of total investment to GNP rises, the relative share of public investment falls. Rostow argues that at the maturity stage, government expenditure concentrates on education, health and welfare rather than being infrastructural. These are generalized approaches to development.

Wagners' Law concerns with the share of public sector to GNP. Growth of the relative size of the public sector and state activities are considered as fiscal expansion. But expansion is constrained by revenue. However, in the long-run this constraint can be overcome somehow. It gives insight to the idea of market failure and externality. As industrialization progresses, Wagner recognizes that markets become more complex, necessitating public sector intervention and regulation. Public sector services will rise. Public expenditure grows further with the provision of education, health, welfare etc.; the growth is explained in terms of income elasticity of demand. As real income in the economy rises, public expenditure on these services rise more than proportionately, thus resulting in a higher proportion of public expenditure out of GNP. However, Wagner's law is not a well articulated theory on public choice and has drawbacks. One of which is that the growth of income results in the growth of public sector which negates the theory of public choice. The growth of income may also be associated with a shrinkage in public sector if the choice is to have more private goods via privatisation for example.

The Peacock and Wiseman Analysis is one of the best known analyses on the time pattern of public expenditure. The foundation of theory is a political theory of public expenditure determination that recognises government likes to spend, that citizens do not like to be taxed, therefore, government should give consideration to citizen's wishes. The solution to the analysis of public expenditure is voting. When decoding on the expenditure keeps a close watch over electorates reactions to the implied taxation. Some level of taxation acts as a constraint for government expenditure.

As the economy and thus income grow, tax revenue, at constant tax rates, would rise, thereby enabling public expenditure to grow in line with GNP. In normal times, therefore, public expenditure will show a gradual upward trend, even though within the economy there might be a divergence between what people regarded as being a desirable level of public expenditure and a desirable level of taxation. During periods of social upheaval, however, this gradual upward trend in public expenditure would be disturbed, instead it requires a rapid increase in public expenditure. Taxation is seen as acceptable to be raised during this period.

Government expenditure as a whole has an effect of raising interest rates as well as aggregate demand. In most developing economies, government expenditure in the form of transfers such as social securities and medicare are minimal. Government expenditures on national defence and grants and subsidies are also at low levels

compared to the developed countries. However, due to the effects of accumulated debt expenditure, interest payments are at historically high levels in the 1980s.

To simplify the analysis a little, in the foregoing work we assume that government expenditure is exogenous. In a later section we address the issue of the variation of government expenditure with respect to income.

4.7 Conclusion

Based on the above survey of the literature, we summarize some important issues relevant to building stylized facts about each macroeconomic aggregates for the purpose of modelling our twin deficits and debt in the next chapter. Our aim is to build the simplest model for each aggregate.

CHAPTER 5 : DEBT AND TWIN DEFICITS MODELLING FOR ASEAN

5.1. A Simple Model of Debt and Twin Deficits

Having outlined our main aim in Part II in the previous chapter and recognising that there are two sides to the right hand-side of the macroeconomic identity of (4.1) from chapter 4, we concern ourselves in investigating causality and exogeneity between debt and deficits. The three linkages outlined are important issues in developing countries, especially in ASEAN, given the active role of the private sectors in development towards 'NICdom', debt and deficits should be 'sustainable' and not increasing proportionately with the growth of output. Instead, output, in a given time frame, should eliminate debt and deficits simultaneously turning them into profitable investments.

The major contribution in Part II is our model for debt and twin deficits for ASEAN specifically, and is applicable to all developing countries in general. We name our model the 'new twin deficits' model.

5.1.1 The National Income Identity

Rewriting the simple national income accounting identity of (4.1);

$$(M - X) = (G - T) + (I - S) \tag{4.1}$$

in other words, the current account imbalance will be equal to the sum of any private sector surplus or deficit, and any fiscal surplus or deficit. Thus, if government follows a balanced budget policy, (ex post) any private sector deficit or surplus will be reflected in a current account deficit or surplus. Alternatively, if the private sector is in balance, any government surplus or deficit will match the current account surplus or deficit.

Suppose we think of the change in the current account deficit as equivalent to the change in net foreign indebtedness.

$$(M - X) = \Delta D' \tag{5.1}$$

Can we then construct a simple model which yields insights into the economic relationship between these macroeconomic aggregates? This is an important issue since, as it stands, equation (4.1) is an identity which tells us nothing about the mechanics of

the underlying relationships. In investigating this, our approach is to draw on the empirical literature on the determinants of $I, S, X, M, T \text{ and } G$ in developing countries to develop a stylized model. In this section, we evaluate the determinants of each in turn, then use this to investigate the inter-relationships between the aggregates.

5.1.2 Determinants of the Macroeconomic Aggregates: A Review of the Literature

To inform the construction of an estimating model, we firstly review the literature on imports, savings, investments, exports, taxes and government expenditure.

5.1.2.a) Government Expenditure

In our macromodel, government expenditure is taken as consisting two components; government investment and government consumption.

$$G = I_G + C_G$$

Government investment (I_G) is assumed to be fixed/predetermined. Government consumption has a fixed component $(\bar{C}_G)$, a component which varies positively with expected income $n_1 Y^e$ and another component with current income $n_2 Y_t$, where n is the marginal propensity to consume, and rD, which is the interest repayments on past government debt stock that feeds through future budget deficits. The purpose of varying the components for the two types of income is to have a counter cyclical policy. It has the effects of maintaining basic government expenditures in normal times following an upward trend, while allowing for adjustments in its movement such as a decrease in expenditure in times of high growth to allow for private sector's participation and increase expenditure during recessionary periods. Hence, we have the following formulation:

$$I_G = \bar{I_G}$$

$$C_G = n_1 Y^e + n_2 Y_t + \mu_1 rD \qquad \text{where} \qquad D = \sum_{j=0}^{t-1} (G - T)_j$$

In the short-run, government investment and consumption is assumed to be exogenous:

Let $$G = \bar{I_G} + n_1 Y^e + n_2 Y_t + \mu_1 rD \qquad (5.2)$$

Equation (5.2) assumes that future government deficits are financed by debt and that the interest repayments on debt feeds through the deficits. Crowding out via the effect of higher interest rates on interest-sensitive components of aggregate demand such as investment. If interest rates have negative correlation with inflation, then raising inflation either through devaluation or through higher money growth, is likely to be associated with lower interest rates. Then, this implies inflation may be the channel out of debt accumulation (Dornbusch, 1987).

If government expenditure is comprised of investment expenditures such as infrastructures, they generate a future rate of return which may not take the form of monetary benefits but benefits to society now and in the future created by the projects. If government expenditure is for consumption goods, there will be no future rate of return, instead government has to finance the consumption goods either by issuing bonds or borrowing internally or externally which, in both cases create interest payments on debt. On the other hand, if government financed its consumption by seigniorage at a given level of government deficit, the inflation rate will rise.

The absorption of resources by the public sector means that the opportunity cost of these public expenditures is the forgone output of other sectors. These argument underlie the crowding-out debate. If government expenditure is financed by bond, at less than full employment will, ceteris paribus, cause an increase in interest rates unless there is an accommodating monetary policy. If private sector investment is interest elastic, then a bond-financed increase in public expenditure may crowd out private sector activities via its impact on capital market.

In the long-run, government expenditure behaviour over time shows variation with income. Brown and Jackson (1990) examine three models that categorize time pattern of public expenditure. First, the development model of public expenditure growth; second, the model based on Wagner's law of expanding state activities; and third, Peacock and Wiseman's classic model of public expenditure growth. All three confirms that public expenditure does vary with GNP or income over the long-run. In the short run, it is taken as exogenous.

5.1.2.b) Private Investment

Part (a) of Table 5.1 summarizes the theoretical models on the determinants of private investment which are monopolistic competition, neoclassical model, keynsian model, Tobin's Q model and models using credit rationing or foreign exchange shortages (Rama 1990).

A general consensus with regards to the determinants of private investment points to changes in aggregate demand as being very important. It follows that models with no inclusion of an income accelerator may not be appropriate for developing countries which leads us to adopt the income accelerator specification. However, Rama (1990) cautioned the interpretation on the income accelerator less aggregate output may merely act as a time trend in empirical work. Although there is no study that attempts to overcome this problem by separating trend output and cyclical output thus far, we shall make the distinction between them in our investment model.

Following the flexible accelerator model we construct a simple investment function for developing countries. Assuming I_t is net investment at time t, I_t is a function of capital stock.

$$I_t = f(K^*) \tag{5.3a}$$

Since it is generally impossible to obtain capital stock data in developing countries, we assume that the desired capital stock is equivalent to output this period and expected output in the long-run;

$$K^* = f(Y_t, Y^e) \tag{5.3b}$$

And,

$$Y^e = \sum_{j=0}^{t-1} \beta_j Y_{t-j} \tag{5.3c}$$

Substitute for Y^e,

$$I_t = f(Y_t, \sum_{j=0}^{t-1} \beta_j Y_{t-j}) \tag{5.3d}$$

Private capital formation is affected by public sector investment depending on whether the public investment is infrastructural (long-term investment) or short-term investment. it can complement or substitute private investment. If infrastructural, public investment can raise its marginal productivity. If the public sector absorbs a larger

Table 5.1: A Summary of Theoretical and Empirical Studies

PART (a)

INVESTMENT Models						
Var\Models	Monopolistic competition	Neoclassical	Keynes-ian	Tobin's q	Credit ration	Foreign x -short
Private Inv.	*	*	*	*	*	*
discounted av. productivity of capital (Y)	*		*			
Govt. Inv.	*	*	*			
Gen. price level (P)					*	
shadow price of capital/replacement cost				*		
nom. wage/P	*	*				
nom. user cost of capital/P	*	*				
fin. resource available to private sector					*	
foreign currency availavle to pvt. sector						*
nom. user cost of capital/nom. wages			*	*		

SAVINGS						
Var/Models	Keynes-ian	Perma-nent Income	Life Cycle	Capital Inflow	Savings -Interest	Exports and S
Savings	*	*		*	*	*
Income	*			*	*	
Permanent Income		*				
Trend Income		*				
S/Population			*			
Income/Pop			*			
Capital				*		
Interest rate					*	

PART (b)

EXPORT DEMAND				
Vars/Models	Houthakker and Magee (1951-66) Annual data	Khan	Goldstein & Khan (1955-70) Qtrly data	Bahmani-Oskoee (1965-80) Qtrly data
Export Quantity	*	*	*	*
World Trend Income	*	*		
World Cyclical Income	*	*		
Price X/ Px	*		*	
World price	*		*	
X_{t-1}	*	*		*
Px/WP		*		*
World Income			*	*

IMPORT DEMAND FUNCTION								
Vars./Modelss	1	2	3	4	5	6	7	9
Qty Import (M)	*	*	*	*	*	*		
P(PM/Pd)	*	*	*	*	*	*	*	*
Income (Y)	*	*	*	*	*	*	*	*
Q_{t-1}			*	*	*	*		
P_{t-1}			*				*	
Y_{t-1}			*				*	
P_2 (other goods)				*	*			*
Y/Y trend					*	*		

Note * means variables included

share of domestic financial resources private investment tends to crowd out if there is no insulation from foreign finance.

If the total supply of foreign financing is limited as may be generally expected, and if public sector borrowing increases, thus limiting the credit available to the private sector, crowding out will also occur. However, it should be noted that publicly guaranteed borrowings are normally for private sector usage in developing countries since sovereign borrowing seems to be generally preferred by creditors rather than borrowing without government's surety/guarantee.

We take the variable government investment $\bar{I_G}$ as a proxy for crowding-in or crowding-out of private investment.

Interest rates affect investment directly. In developing countries, interest rates are often characterized by administered rates which are set at "low" levels with consequent direct credit allocation for the benefit of some sectors of production (Rama 1990). Such a policy choice which characterizes financial repression is due to the weakness of capital markets, which restrain firm's access to additional equity capital. Our approach is to treat ASEAN countries as having undergone financial liberalization. Interest rates had been liberalised since the 1970s in most ASEAN countries. The variable r denotes the interest rate.

Private investment is influenced by interest rate changes which cause changes in private capital flows, which augment or reduce financial resources available (credit availability) to the private sector.

The financing of private investment is normally through the use of retained profits, bank credit and foreign borrowing because domestic capital markets are restrained. We assume that there is no credit constraint in the ASEAN economies because capital markets are quite developed (and developing). Spillover effects from neighbouring surplus countries also contribute towards inflow of investment in the region. The effects of bank credit and foreign borrowing increases investment because of increased savings. There is also no credit rationing as far as international credit markets are concerned.

In summary, we have the following specification for private investment in a general form:

$$I_t = f\left(\overset{+}{Y_t},\quad \sum_{j=0}^{t-1} \beta_j \overset{+}{Y}_{t-j},\quad \overset{\pm}{I_{G_t}},\quad \overset{-}{r}\right) \qquad (5.3)$$

where,

I = private investment

$\bar{I}_G$ = government investment representing crowding-in or crowding-out variable.

r = domestic interest rate, where $r = r_f$ if there is financial repression

$\sum_{j=0}^{t-1} Y_{t-j}$ = weighted average of past output

Y_t = output at time t .

From now on and on equations (5.2), (5.3), (5.4), (5.5) and (5.6), the positive or negative signs on top of the independent variables mean the independent variable is either positively or negatively related to the dependant variable. For example, in the above equation, income is positively related to investment. If there are positive as well as negative signs appearing together, it means the relationship can either be positive or negative depending on the arguments about each of the independent variables.

Interest rates in our simple investment equation plays the role of influencing the level of investment and, if applied in a general case (not specific to ASEAN), would reflect credit rationing if interest rates are controlled at a certain level.

If the availability of credit rather than its cost imposes a constraint on investment in developing countries, then investment should be equal to or less than the credit that is available and be formulated as follows:

$$I_t \leq \bar{F}_t \qquad (5.3c)$$

where F_t represents the sum of internal financing available to firms, net credit and additional equity-capital available. In our case we treat domestic interest rates as a sufficient alternative indicator for credit availability. If the interest rate is repressed it only reflects a credit constraint in the internal market.

5.1.2.c) Private Savings

Evidence of previous studies suggests that the decision to save (or to consume) depends mainly on income, though diversity in savings are also attributable to the growth of output, population growth, etc. Inflation and adverse movements of the terms of trade depress the propensity to save.

The Keynesian tradition relates savings to income in its simplest form as shown in part (a) Table 5.1 (part (a) shows the theoretical models). The permanent income hypothesis states that consumption depends on permanent income and not current disposable income. Permanent income can then be thought of as the expected income which is a summation of past income. Only if people believe that a rise in today's income is likely to be sustained as a higher future income stream will they believe that their permanent income has significantly increased. Only then would a large rise in current income be matched by a large rise in consumption. If the rise in current income is believed to have no significant effect in raising future permanent incomes, people will save most or all of what is perceived as temporary extra income to smooth future consumption.

The life-cycle hypothesis states that individuals plan their life-time consumption by accumulating enough savings during their peak earning years to maintain consumption during retirement years. In a growing population and with rising per capita income, aggregate net personal saving is positive, and the larger the current per capita income, the higher will be the savings since the individual seeks to smooth consumption over his remaining life span. Thus, the life-cycle theory relates aggregate saving with the rates of population and income growth. Both of these are 'normal' income theories which emphasize the importance of deviations from trend, and smoothing. The basic idea enjoys a great deal of support in the empirical literature, and we shall follow this approach by separating trend income and cyclical income.

The interest rate is also taken as a determinant for savings because of the presence of some correlation between savings and interest rates. Low and administered interest rates reduces savings whereas high real interest rates leads to an increase in savings (Mikesell and Zinser, 1974). This raises the question as to whether the savings rate increases with interest rate liberalization in most of the ASEAN countries.

In a study by Brown (1971) on the Korean monetary reform, he uses three forms of national saving (private, household and domestic), three average saving rates with

GNP as the denominator, three average saving rates with disposable income as the denominator and three marginal saving rates as dependent variables. He included two income measures, GNP and disposable income, and the real rate of interest payable on long-term time as independent variables. With the exception of the marginal saving rate equations, the results were statistically significant, and average saving rates show the highest degree of positive correlation with interest rates.

In the Malaysian case, a study by Lin See Yan (1992) shows that household savings increased with increases in interest rates in certain years, but with the stock market becoming well developed with privatisation of government projects encourages investment from households, leading to a decrease in household savings.

On the basis of the above arguments our simple savings function takes the form:

$$S_t = f\left(\overset{+}{Y_t},\ \sum_{j=0}^{t-1} \alpha_j \overset{+}{Y}_{t-j},\ \overset{+}{r}\right) \qquad (5.4)$$

where,

S = savings

r = domestic interest rates, (r) if liberalised or (r_r) if repressed (If r is unusually high it denotes financial deepening).

Y_t = income at time t.

$\sum_{j=0}^{t-1} \alpha_j \overset{+}{Y}_{t-j}$ is a weighted average of past output.

5.1.2.d) Tax Revenue

The average level of income, the degree of openness of an economy and the composition of GDP each have a bearing on the taxable capacity of a country (Chelliah et. al. 1971, 1975). Gemmell (1987), Ahmad and Stern (1987) and Burgess and Stern (1992) seem to have a consensus in their view on the sources of developing countries' tax revenue which is mainly from domestic taxes on goods and services, secondly from foreign trade taxes and finally, income taxes. The first kind of tax refers mainly to sales taxes comprising consumption and commodity-specific excises. Our approach in modelling these is to take taxation as a function of income, τY_t. .

It should, however, be noted that there is a relative decline in the importance of trade taxes and an increase in importance in domestic indirect taxes with economic development (Greenaway 1980, 1984, Gemmell 1990 and Tanzi 1991). Gemmell (1987) concludes that income and domestic consumption tax elasticities tend to be higher than trade tax elasticities, and that income tax elasticities tend to fall as income increases. Greenaway (1984) suggests that the time-series analysis of individual countries shows less reliance on trade taxes as a source of revenue. Indirect tax elasticities are highly variable across commodities, indicating opportunities to raise revenue by taxing 'elastic' commodities more.

Evidence shows that trade taxes, which comprise export and import taxes, are related to changes in income (Chelliah et. al. 1975, Tait et. al. 1979 and Greenaway 1980) . In its simplest form export taxes are determined by export tax earnings. Exchange rate affects tax revenue in domestic currency terms. This means that an appreciation (depreciation) of the exchange rate reduces revenue for export taxes at a given export tax rate but increases import tax expenditure at a given import tax rate.

Like export tax revenue, import tax revenue is also determined by its tax rate, exchange rate as well as import expenditure. The tax rates for income, exports and imports are obviously policy variables, i.e. at government's discretion. Higher fiscal deficits must result from changes in some combination of those exogenous and policy variables.

Our equation for tax revenue is then taken as a function of tax rates, income, exports, and imports, and exchange rate affects tax revenue through its effects on exports and imports as follows:

$$T_t = f\left(\tau_Y \overset{+}{Y_t} + \tau_X \overset{\pm}{X}.e + \tau_M \overset{\pm}{M}.e\right) \qquad i = Y,\ X,\ M. \tag{5.5}$$

where,

τ_i = tax rate (for the respective tax base i)

Y_t = income at time t

X = exports

M = imports

T = total tax revenue

e = exchange rate whereby for exports it will be local for foreign rates whereas for imports, foreign for local rates apply.

For empirical purposes, wherever tax rates are known, τ_i will be used, otherwise a linear form of tax rate will be approximated using the formula $\tau_i = \lambda_0 + \lambda_1 (i)$ where i is the respective tax bases of $Y, X \text{ and } M$. The coefficients for both should be the same so that it is implicit that income tax rates in developing countries are either fixed or change very slowly with changes in income and it is the change in income that constitutes major changes in income tax revenue.

For middle-income countries, there is an inverse relationship between dependence on trade taxes and economic development, whereas for low-income countries, the first best source of tax revenue is still the share of agriculture in GNP. Import taxes denoted a decline in importance as a source of revenue as compared to export taxes (Greenaway 1984).

5.1.2.e) Exports

Income and price elasticities for exports of developing countries play an important role in the determination of policy responses to deteriorating export earnings and increased indebtedness. Estimates on the basis of a single equation assume that supply price elasticities are at least large if not infinite (see for example, Houthhakker and Magee (1969) and Bahmani-Oskoee (1984)). Khan (1974) and Goldstein and Khan (1978) suggest the use of a simultaneous equation model to estimate the price elasticities. In small open economies such as the ASEAN countries, prices of exports are taken as set by the world market, thus enabling a simple single equation of the export demand function to be used.

Table 5.1 (part b) shows the variables used in standard log-linear disequilibrium specifications of demand for exports and in a supply model for the simultaneous specification. There appears not to have been a major change in the size of elasticities of exports (or imports) over the years as revealed by the results of estimation using the single equation method in the studies by Houthakker and Magee (1969), Hickman and Lau (1975) and Goldstein and Khan (1978).

World income is a measure of effective world purchasing power, taken to be the average of income of the major trading partners of a country. The imperfect substitute hypothesis that says domestically produced goods are imperfect substitutes for goods produced in other countries shall be maintained, requiring the price of exports for domestically produced goods relative to the world price of exports be used.

We specify our export function as below, relating the world demand for an individual country's exports to the relative price of exports to the price of world exports, the real income of the world economy and the exchange rate:

$$X = f(\bar{P_X}, \overset{+}{P_X}^{W}, \bar{e}, \overset{+}{Y}^{W}) \qquad (5.6)$$

And, $P_X = P_X^{W}(1 + S)$

where,

X = quantity of exports demanded
P_X = price of exports
P_X^{W} = average export prices of the country's trading partners
Y^{W} = world income
e = foreign exchange rate
S = subsidy

The price of exports of country i, P_X, relative to the prices of exports of its major trading partners which proxies the world price of exports, P_X^{W}, is an important determinant of export demand. One difference between the two prices is due to export tariffs. There is conclusive evidence that points to the importance of the role of prices in determining the world demand for a country's exports - the estimation results by Goldstein and Khan (1978) for example, show many countries have estimated price elasticity of export demand greater than unity. This means that a percentage point increase in the relative price (P_X / P_X^{W}) raises the export volume by more than one percentage point

The exchange rate plays a role in affecting P_X^{W} in domestic currency terms. An appreciation of the exchange rate of country i makes the world price of exports more expensive in domestic currency terms, hence reducing the ratio of relative price of exports of country i to world price of exports and eventually raising the volume of exports of country i. The reverse situation happens when depreciation of the exchange rate occurs.

5.1.2.f) Imports

In small open economies, the simple single equation import demand function that relates quantity of imports to price of imports and income gives satisfactory estimation of price and income elasticities of imports (Houthakker and Magee, 1969 and Goldstein and Khan, 1978). The usefulness of price elasticity of import (or export) demand is to see whether relative prices do play a role in the demand for total imports (or exports). If they do, the potential contribution of expenditure-switching policy instruments (the exchange rate, tariffs and subsidies) to trade balance adjustment would be significant.

The income elasticities of demand for imports (exports) carry two implications. In the absence of secular increases in the relative price of imports, the share of imports and exports in GNP (in real terms) could rise as income rises if the income elasticity exceeds 1, or falls if less than 1. The second implication is that if the income elasticity of demand for a country's import is larger than that for its exports, in the absence of relative price adjustments, then the country is faced with a choice: either grow at the same rate as its trading partners and accept a secular deterioration in its external balance, or opt for external balance and accept a slower growth rate than its trading partners. In its simplest form and consistent with economic theory is a specification that relates the quantity of imports demanded to the price of imports relative to the price of all other domestically produced goods and an income or activity variable. In Table 5.1 (part b) nine variants of such specification from previous studies is presented.

Model 1 is the simplest form of specification. All other models introduce dynamic behaviour by including lagged values of either the dependent or independent variables. Models 2 and 4-6 include the value of the dependent variable lagged one period. This implies a geometric time path of adjustment and restricts adjustment to previous income and price changes to be identical. Models 5 and 7-9 are less restrictive in this regard. Model 5 is the Houthakker-Magee specification which includes lagged values of both the dependent and independent variables. Models 7-9 include only lagged values of the independent variables. There are two other differences in the models. Models 5 and 6 split income into its cyclical and trend components, as in Goldstein, Khan and Officer (1980). Models 4, 5 and 9 relax the implied assumption of the other models that demand is homogenous of degree zero in income and prices.

An area which has been given little emphasis in the trade equations according to Goldstein and Khan (1978), is the modern consumption theory that distinguishes between current and permanent or life-cycle income. Our specification considers this

issue. The relative price of imports to domestic prices implies that domestic goods are imperfect substitutes for imported goods, thus creating a price differential between those goods, and hence plays a crucial role in determining the quantity of imports demanded. Exchange rates influence imported prices in domestic currency terms. An appreciation of the exchange rate of country i increases the purchasing power of that country, ceteris paribus, makes imported goods relatively cheaper, hence raising the import volumes.

In its simplest form, our import demand function is:

$$M = f(\overline{P}_M, \overset{+}{P}_D, \overset{-}{e}, \overset{+}{Y}) \tag{5.7}$$

And, $P_M = P_M{}^W (1 + T)$

where,

Y = actual income
M = quantity of imports demanded
$P_M{}^W$ = world price of imported goods
P_M = price of imported goods
P_D = price for domestically produced goods
e = local exchange rate
T = tariff rate

The import demand function above not only captures the time series behaviour of quantities and prices of merchandise imports and focuses on the role played by income and prices in the determination of the trade variables, it also portrays the impact of expenditure-switching policy of exchange rate changes on a country's trade balance.

5.2 Our Model

Using a simple linear form to represent the above equations (5.2), (5.3), (5.4), (5.5), (5.6) and (5.7), in summary, what we have then is:

$$G_t = \{\bar{I_G} + n_1 \sum_{j=0}^{t-1} n_j \overset{+}{Y}_{t-j} + n_2 \overset{+}{Y_t} + \mu_1 \, r \overset{+}{D_t}\} \tag{5.2'}$$

$$I_t = \beta_1 \overset{+}{Y_t} + \beta_2 \sum_{j=0}^{t-1} \beta_j \overset{+}{Y}_{t-j} + \beta_3 \overset{\pm}{I_G} + \beta_4 \, \bar{r} \tag{5.3'}$$

$$S_t = \alpha_1 \overset{+}{Y_t} + \alpha_2 \sum_{j=0}^{t-1} \alpha_j \overset{+}{Y}_{t-j} + \alpha_3 \overset{+}{r} \tag{5.4'}$$

$$T_t = \tau_Y \overset{+}{Y_t} + \tau_X \overset{\pm}{X} .e + \tau_M \overset{\pm}{M} .e \tag{5.5'}$$

$$X_t = \sigma_1 \, (P_{X_t} / \overset{\pm}{P}{}^{W}_{X_t} .e) + \sigma_2 \overset{+}{Y_t}{}^{W} \tag{5.6'}$$

$$M_t = \gamma_1 \, (P_{M_t}^{W} .e \overset{\pm}{/} P_{D_t}) + \gamma_2 \overset{+}{Y_t} \tag{5.7'}$$

The above equations are demand functions and government investment is assumed to be exogenous. To answer the question on the movements of the deficits and indebtedness, we need to further substitute the equations into a deficit system, and introduce an external debt variable to show its role in affecting the different sectors. Ideally, incorporation of a supply function completes the system of equations. Following substitution, we shall discuss on the response of the supply-side and substitute the supply function into the deficit system of equations rather than the single equations above. This is mainly due to interest in the deficits and debt which shall be reflected in the deficit system.

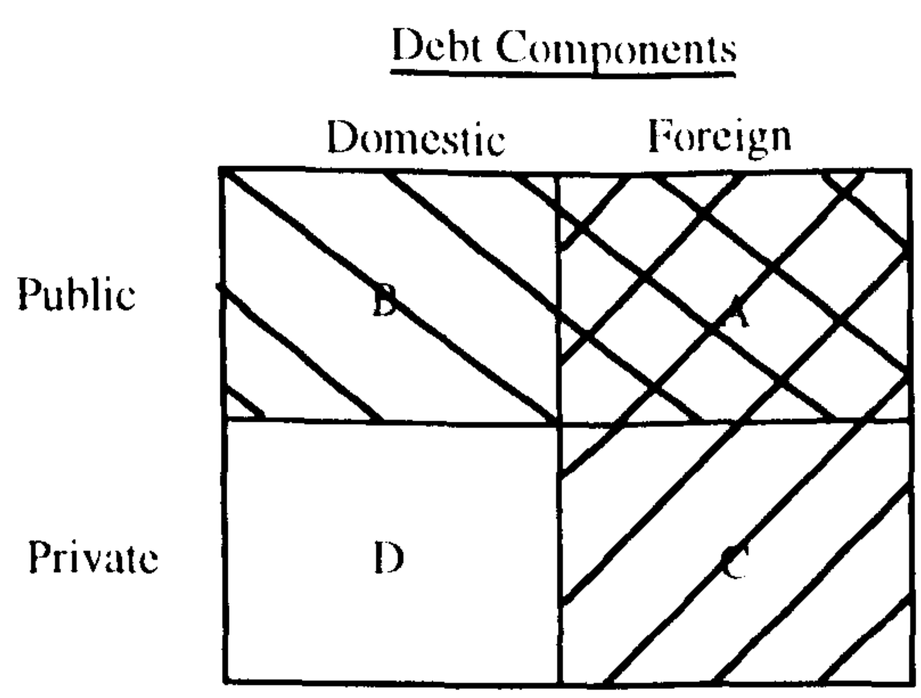
Drawing the stylized facts about the determinants of the macroeconomic aggregates shows that each aggregate may have many variables as its determinants. Hence, the presence of similar sized deficits in the national income identity does not imply that the movement in one deficit causes commensurate changes in the other deficit because each macroeconomic aggregate can move or change in different directions and magnitudes. Also, simply looking at the identity tells us that there are two terms on the right hand side which naturally, both may have some kind of influence on the external deficit. The twin deficits theory that gained new importance in the U.S. due to huge fiscal deficits and increased debt to an unprecedented level shows only exchange rate and interest rate as the linkage between the two deficits - trade and fiscal (Gordon, 1990), which we shall further argue is rather an over-simplification, in the later part of this section.

Substituting equations (5.2') to (5.7') into the three separate expressions in the national income identity results in a system of deficit equations which clearly shows that the

three expressions are linked in one way or another, by one or more common variables apart from exchange rate and interest rate. The suggestions that two of the deficits are twin may not be true because of the presence of the third expression. However, to answer the questions of whether the foreign trade deficit and fiscal deficit are twin or whether there are three of them, the question as to how the deficits are linked together and eventually the question of cause and effect between the three deficits and international indebtedness could be determined following discussions after the substitution.

The purpose of this exercise is to find causal relationships embodied in the popular twin-deficit theory. Another major concern in this exercise is the relationship between internal policy matters and increased indebtedness, hence, extending the twin-deficits theory to its linkages with increased indebtedness. Whilst a lot had been said about the external factors/shocks that are alleged to be the cause of increased indebtedness in developing countries in the 1980s, very few studies are concerned with the issue we address. Unsustainable external deficits tend to be associated with (both statistically and causally by previous studies on the US data) an unsustainable public sector deficit. Enders and Lee (1990) suggest a reduction of the external deficit requires a reduction of public sector deficit, which can be achieved either through cuts in public spending or through an increase in public sector current revenues: taxes, income from tariffs, public sector fees and charges. Our examination of the determinants of each of the macroeconomic aggregates suggests there are more variables that affect each aggregate.

In order to understand the linkages between the twin deficits and debt, we firstly present how we should account for indebtedness in our system of deficit equations. How we model the two debt components is important so as to show their role in the deficits system. Debt has four components as shown in the diagram below.



Public domestic and public foreign debt (quadrants A & B) appear jointly as a determinant for public sector deficit, however, public foreign debt also appear jointly with private foreign debt (quadrants A & C) in determining the external sector deficit. In order to avoid duplication of the role of public foreign debt and also to be consistent in the thesis which, in general, focuses more on foreign debt, we treat all foreign debt in aggregate i.e. public and private sectors' foreign debt (quadrants A & C) taken together as (N) affecting the external deficit (equation 5.10' below). This is because in a deficit systems of equation, the interest repayments on past external debt appears in the invisible imports, thus it is part of the deficit equation (see also page 17 for further information). This is also consistent with the fact that publicly guaranteed foreign debt are mostly for private sectors' usage given the active role of private sector in the region. This is in fact the characteristics of debt contracted by many developing countries in the 1980s.

Quadrant B enters our model as (D) in equation (5.8). If governments of ASEAN financed their deficits mainly through the domestic private market (quadrant D), hence competing with the private sector, then the magnitude and sign of β_3 , the crowding in - crowding out variable in equation (5.3') or (5.9') becomes important. If there is no competition between the sectors whereby private sector is financed mainly through quadrant C, β_3 would have a positive sign, i.e. no crowding-out may occur and vice-versa.

Substituting equations (5.2') to (5.7') into our macroeconomic framework will show the key variables and how these variables affect the external, fiscal and private sector deficits simultaneously. Whether the three expressions are behaviourally independent of each other will also be revealed.

Substituting equations (5.2') and (5.5') into $(G - T)$ we get equation (5.8) for our fiscal (government budget) balance:

$$(G - T)_t = \{\bar{I_{G_t}} + \bar{C_{G_t}} + \mu_1 rD_t\} - \{\tau_Y Y_t + \tau_X X_t.e + \tau_M M_t.e\}$$

Substituting for equations (5.6') and (5.7') to replace $M \text{ and } X$ gives equation (5.8'), and including the variable component for government consumption:

$$(G - T)_t = \{\bar{I}_{G_t} + n_1 \sum_{j=0}^{t-1} n_j \, Y^{+}_{t-j} + n_2 \, Y_t + \mu_1 \, rD_t\} - \{\tau_Y \, Y_t + \tau_X \, \sigma_1 \left(\frac{P_{X_t}}{P_{X_t}^{W} \cdot e}\right) + \tau_X \, \sigma_2 \, Y_t^{W} + \tau_M \, \gamma_1 \left(\frac{P_{M_t}^{W} \cdot e}{P_{D_t}}\right) + \tau_M \, \gamma_2 \, Y_t\}$$

$$(G - T)_t = \{\bar{I}_{G_t} + n_1 \sum_{j=0}^{t-1} n_j \, Y_{t-j} + \mu_1 \, rD_t + (n_2 - (\tau_Y + \tau_M \, \gamma_2)) Y_t\} - \{\tau_X \, \sigma_1 \left(\frac{P_{X_t}}{P_{X_t}^{W} \cdot e}\right) + \tau_X \, \sigma_2 \, Y_t^{W} + \tau_M \, \gamma_1 \left(\frac{P_{M_t}^{W} \cdot e}{P_{D_t}}\right)\} \quad (5.8')$$

Substituting equations (5.3') and (5.4') into $(I - S)$ gives equation (5.9') which is the savings-investment gap or the private sector balance:

$$(I - S)_t = \{\beta_1 \, Y_t + \beta_2 \sum_{j=0}^{t-1} \beta_j \, Y_{t-j} + \beta_3 \, \bar{I}_{G_t} + \beta_4 \, r\} - \{\alpha_1 \, Y_t + \alpha_2 \sum_{j=0}^{t-1} \alpha_j \, Y_{t-j} + \alpha_3 \, r\}$$

$$= (\beta_1 - \alpha_1) Y_t + (\beta_2 - \alpha_2) \sum_{j=0}^{t-1} (\beta - \alpha)_j \, Y_{t-j} + \beta_3 \, \bar{I}_{G_t} + (\beta_4 - \alpha_3) r \quad (5.9')$$

Finally, substituting equations (5.6') and (5.7') into $(M - X)$ we get the external deficit equation (or the current account balance).

$$(M - X)_t = \{\gamma_1 \left(\frac{P_{M_t}^{W} \cdot e}{P_{D_t}}\right) + \gamma_2 \, Y_t\} - \{\sigma_1 \left(\frac{P_{X_t}}{P_{X_t}^{W} \cdot e}\right) + \sigma_2 \, Y_t^{W}\} \quad (5.10)$$

Note that the definition of $(G - T)$, $(M - X)$ *and* $(I - S)$ are the current account balances on government account, external account and private sector account. In the current account balance, interest repayments appear as part of the current expenditure. While we had allow interest repayments on public domestic debt as part of government expenditure in the government equation (5.2'), we have to account for interest repayments for external debt in the external account. Interest repayments on past foreign debt stock is a component of invisible imports in the external account hence, it should be accounted for in the deficit equation for the external account. As such it affects the current account of the external sector balance and therefore, is a

determinant of the external account and it should be introduced in equation (5.10) as $r^{*}N$ as follows:

$$(M - X)_t = \{\gamma_1 \left(\frac{P_{M_t}{}^{W}.e}{P_{D_t}}\right) + \gamma_2 Y_t\} - \{\sigma_1 \left(\frac{P_{X_t}}{P_{X_t}{}^{W}.e}\right) + \sigma_2 Y_t{}^{W}\} + r^{*}N \qquad (5.10')$$

As for equation (5.10'), the first term on the r.h.s explains the determinants of imports, the second term explains the determinants of exports, and, the third term is the interest repayments on past debt stock, where N, is defined as past external debt stock $N_t = \sum_{j=0}^{t-1} (M - X)_j$. r^{*} is the international interest rate on debt depending on where the debt is contracted, for example, if it is contracted in the euro-currency market, then LIBOR is applicable, if in yen credit market as the case with ASEAN, then the Japanese prime rate is applicable.

The identity as in equation (4.1) (rewritten as (5.1') below), serves as a constraint so that fluctuations in either the right-hand side or the left-hand side variables of equations (5.8'), (5.9') and (5.10') will result in zero residual when either sides are added together.

$$(M - X) = (G - T) + (I - S) \qquad (5.1')$$

The model becomes deterministic because of the fact that the identity hold all l.h.s. as well as r.h.s. variables to sum to zero.

The constraint says that if the government budget is in balance, the private sector balance will be reflected in the external account. Similarly, if the private sector's budget is in balance, the government account balance will be reflected in the external account.

5.2.1 Properties of the model

The model is essentially a long-run equilibrium model, achieving equilibrium at all points through time as indicated by the constraint in equation (5.1'). Given that the central issue of our thesis is indebtedness, we model the effect of the past stock of public debt through the variable rD_t in the government account, that is, past debt stock feeds through future government deficits. While all external debt enters the model

through $r^{*}N$ in the external account, that is, past external debt feeds through future external deficits.

The model which comprises a simultaneous system of deficit equations of (5.8'), (5.9'), and (5.10') taken altogether is essentially a form of aggregate demand function having an implicit assumption that prices are fixed, i.e. it implies a flat long-run aggregate supply curve. This issue will be addressed in the following sub-section.

There are two variables to the left-hand side so that any changes in any of the variables or combination of variables to the right-hand side of equations (5.8'), (5.9') and (5.10') should affect both of them unless some assumptions are made that either of them do not change.

One r.h.s. variable which we need to recognise may not be fully exogenous is Y_t . Its presence in all three expressions may cause cyclical effects in the system, where for example, $Y_t = f(G)$, $or\ G = f(Y_t)$, $Y_t = f(T)$, $or\ T = f(Y_t)$, etc. However, we shall model Y_t to address the supply-side response and to eliminate remaining endogeneity in the next sub-section. There are also several exogenous variables appearing together in the three theoretical expressions, which will be dealt with in the role of the demand-side sub-section.

We address the most important property of the model which is the endogeneity of Y_t in the immediate sub-section that follows while the rest of the properties will be dealt with in sub-section 5.2.3 and 5.4.

5.2.2 Supply-side Response

We address the supply-side response to solve the problem of endogeneity in the system of deficit equations that signifies the aggregate demand function.

We specify a linear production function, adopting the specification by Frenkel and Raizin (1987) who linked the initial output to output in period one (in a two period framework) as $Y_1 = \bar{Y}_1 + F(I_0)$. Unlike Frenkel and Razin, we formulate the production function for multi-periods, and we assume the economy has an initial sequence of endowments, $\bar{Y}_{t-1}$ and $\bar{Y}_t$, in corresponding periods. This initial endowment may be consumed or invested. Investment will alter inter-temporal

outputs. Output in period one, Y_t , is linked to the initial endowment in the last period, $\bar{Y}_{t-1}$, through the production function:

$$Y_t = \bar{Y}_t + F(I_{t-1}) \tag{5.11a}$$

where,

$\bar{Y}_t$ = initial endowment for period t already taking into account $\bar{Y}_{t-1}$

Y_t = output in period t

I_{t-1} = private investment in the last period.

Equation (5.11a) states that output this period constitutes an initial endowment for this period (which has taken into account initial endowment for the last period) plus the impact of investment from the last period. The assumption of the function above is that it exhibits positive and diminishing marginal product and in the absence of investment output cannot be augmented, $F(0) = 0$.

We formulate an investment function for the last period and substitute it in the equation (5.11a). Following the flexible accelerator investment function specified in the last section (equation (5.3)), the investment function for the last period is:

$$I_{t-1} = \beta_5 \overset{+}{Y}_{t-1} + \beta_6 \sum_{j=1}^{t-2} \beta_j \overset{+}{Y}_{t-j} + \beta_7 \overset{\pm}{I}_{G_{t-1}} + \beta_8 \bar{r}_{t-1} \tag{5.12a}$$

Investment in the last period is a function of last period's output, a weighted average sum of past outputs, a depreciation of output lagged two periods, government investment in the last period and interest rate in the last period. The first term which is output in the last period can be put together in the sum of past outputs so that equation (5.12) is more applicable:

$$I_{t-1} = \beta_6 \sum_{j=0}^{t-1} \beta_j \overset{+}{Y}_{t-j} + \beta_7 \overset{\pm}{I}_{G_{t-1}} + \beta_8 \bar{r}_{t-1} \tag{5.12}$$

Substituting (5.12) into Y_t :

$$Y_t = \bar{Y}_t + \Phi_1 \sum_{j=0}^{t-1} \Phi_j Y_{t-j} + \Phi_2 \bar{I}_{G_{t-1}} + \Phi_3 r_{t-1} \qquad (5.11)$$

Output in period one is a function of an initial given output or endowment in that period, a weighted average of the sum of past outputs, depreciation lagged two periods, government investment last period and interest rate last period.

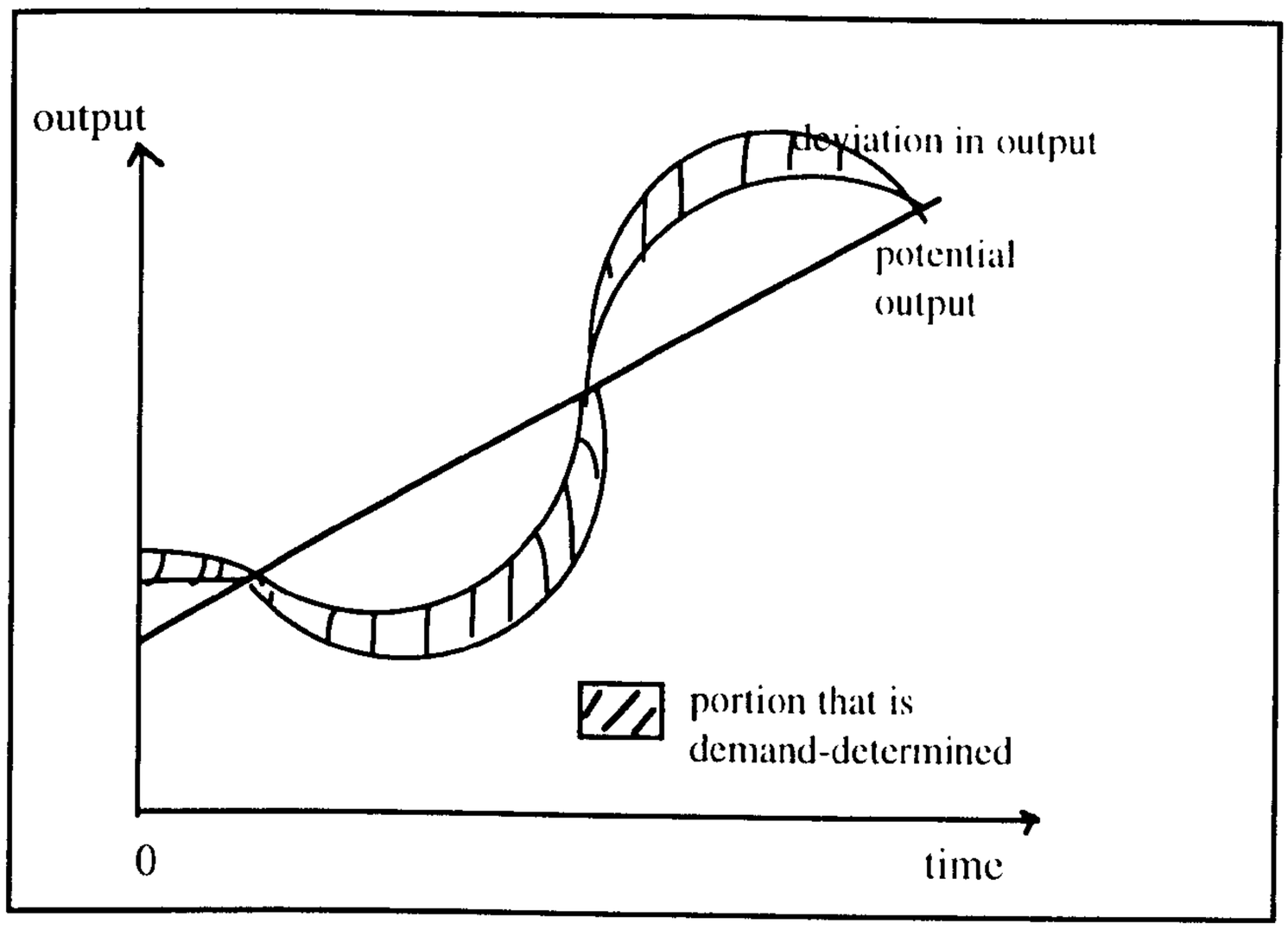
5.2.3. The Role of Aggregate Demand and Aggregate Supply

The aggregate demand side may comprise either all six demand equations on page 5.13 or our system of three deficit equations of (5.8'), (5.9') and (5.10'). Equation (5.11) addresses the supply-side function and equations (5.8"), (5.9") and (5.10") on page 5. 23 are the complete system of aggregate demand and aggregate supply equations. Equation (5.1) as a constraint closes the system of equations.

Consider the demand-side equations firstly. Prices are initially rigid or slow to adjust, aggregate demand shifts leftwards or rightwards depending on the movements of either $(M - X)$ or $(G - T)$ and $(I - S)$ - increasing or decreasing, but the implied supply curve is flat which means supply merely accommodate demand changes.

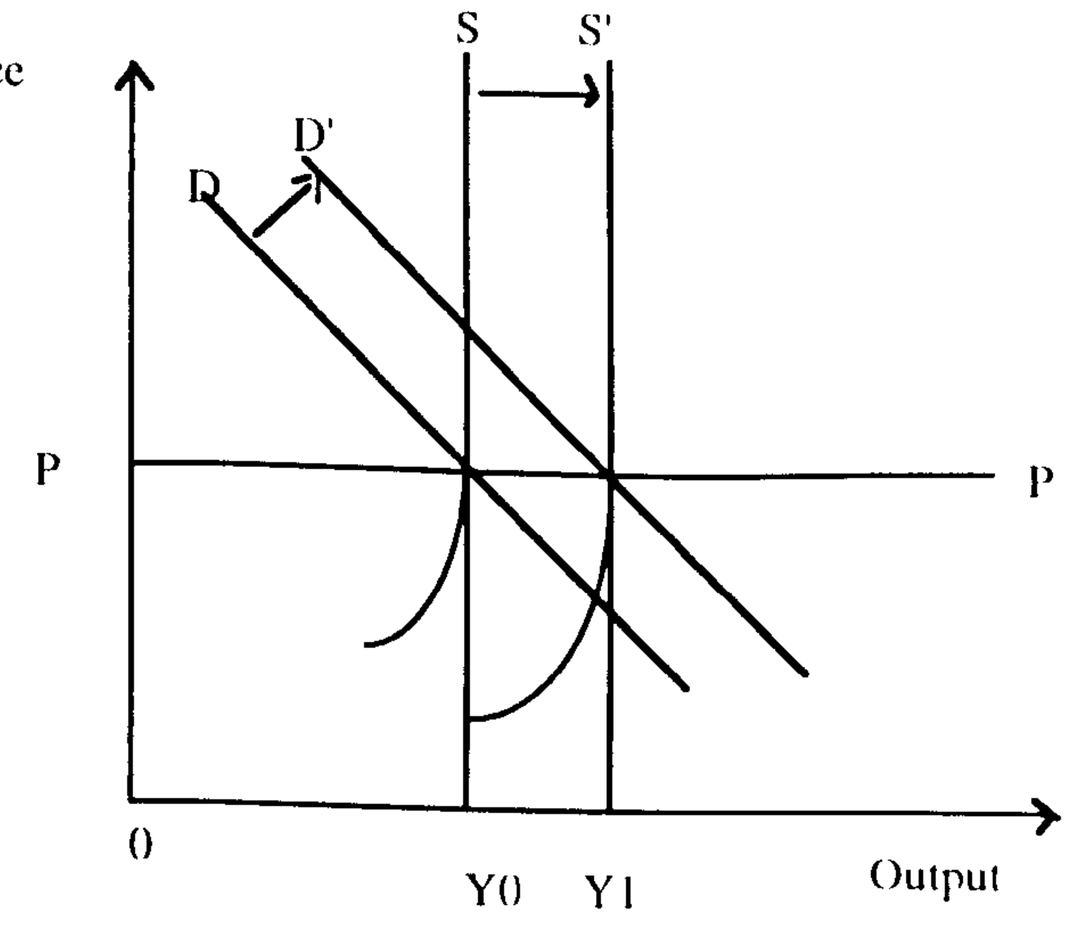
Consider the supply-side (equation 5.11) only. Output is a dynamic function of investment in the previous period added to an initial endowment. By virtue of past period's investment, output has adjusted to a distributed lag of past outputs, government investment in the previous year and interest rates in the previous year. All theta coefficients are actually coefficients of adjustments. With the inclusion of (5.11), it implies output adjusts to the shifts in aggregate demand, hence, shifting (a vertical) short-run supply curve leftwards or rightwards. However, total output can be considered as composed of a potential output component and a small component that deviates from the potential output in the short run and fluctuates. We illustrate it as Fig. 5.1a.

Fig. 5.1a: Components of output



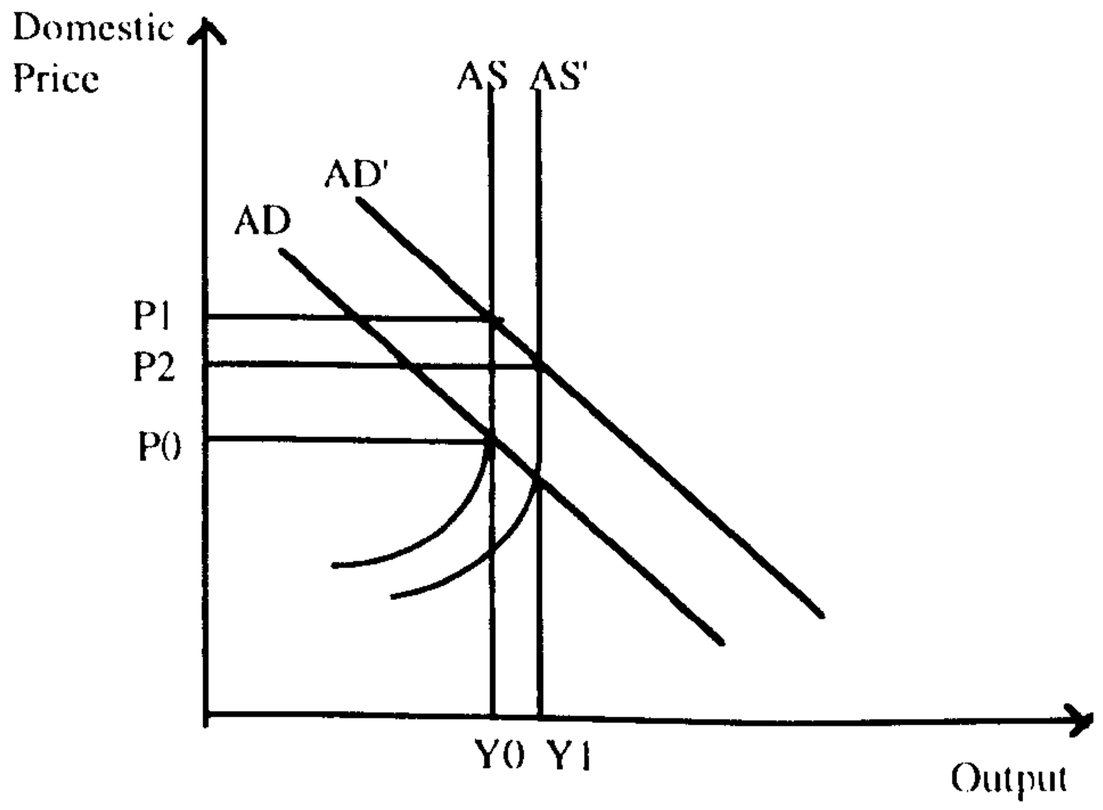
Dornbusch (1990) believes that the short-run component out of total output that fluctuates is demand-determined. The new classical economists believe however that further, out of the short-run output that fluctuates, a certain portion is the potential output itself that fluctuates along with the short-run fluctuations. As such, Dornbusch suggested that a more sophisticated theory is to combine these two effects, that a small component of the potential output is also fluctuating and demand-determined. The result is we allow for a slightly kinked aggregate supply curve in the short-run as shown below. Fig. 5.1 below illustrates the short-run aggregate demand and aggregate supply curves.

Fig. 5.1: The Implied Aggregate Demand and Supply Curves.(Fixed prices)



In the following, we analyses the situations if, in a short-run period, prices adjust and allow for some adjustments in the aggregate demand and aggregate supply curves. This is possible by virtue of evidence showing that prices appear as common variables in either of the three balances, thus causing co-movement in the balances (Table 5.2 page 5.33). Such adjustments may come from various sources. Firstly, what happens if prices of domestically produced goods vary, contributed by higher inflation rates. The effect would then be on the government balance and the external balance. Increase in prices of domestically produced goods is induced by an increase in domestic expenditure - example, increase in government expenditure, we show this in Fig. 5.2a. An increase in government expenditure shifts the aggregate demand curve from AD to AD', equilibrium achieved at a higher price P_1. In a longer run period, the supply curve response to the increase in price and shift rightwards, denoting an increase in output. Hence, price is reduced to P_2. The higher domestic prices leads to an excess supply and a reduction in output demanded. It also reduces the price of imports, relatively, hence improving the terms of trade, *ceteris paribus*, and the external balance.

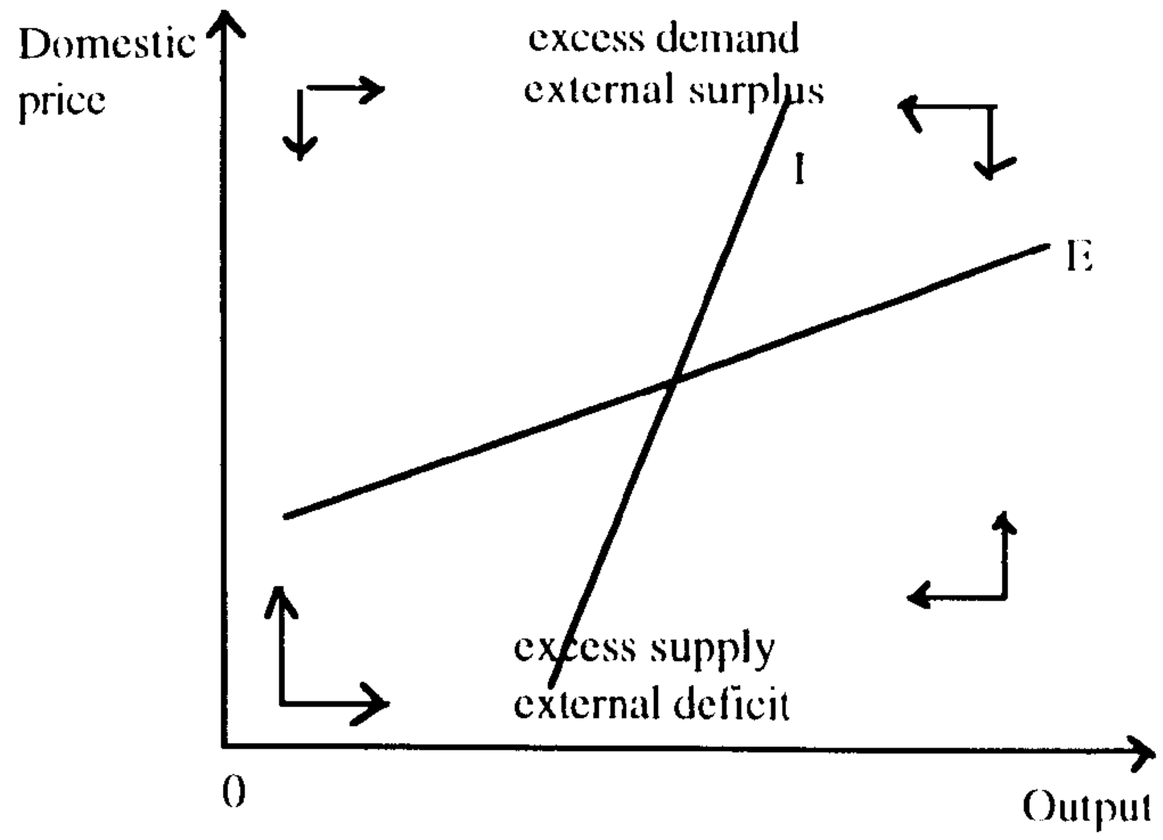
Fig. 5.2a: The effect of variable domestic prices on aggregate supply and aggregate demand



We show the effects of variable domestic prices in terms of the internal *(I)* and external *(E)* balances in Fig. 5.2b below. The *I* curve refers to internal balance and traces the locus of domestic prices and output where the aggregate supply equals aggregate demand. It has a positive slope because an increase in domestic price results in an increase in demand for foreign goods at a cheaper import price, and an increase in output induces excess supply. The *E* curve traces the locus of domestic prices and output along which the external balance is in equilibrium. It also has a positive

slope because an increase in domestic prices makes the import price relatively cheaper hence improving the external balance. The arrows show movements towards stable position.

Fig. 5.2b: The effect of variable domestic prices on the internal and external balances



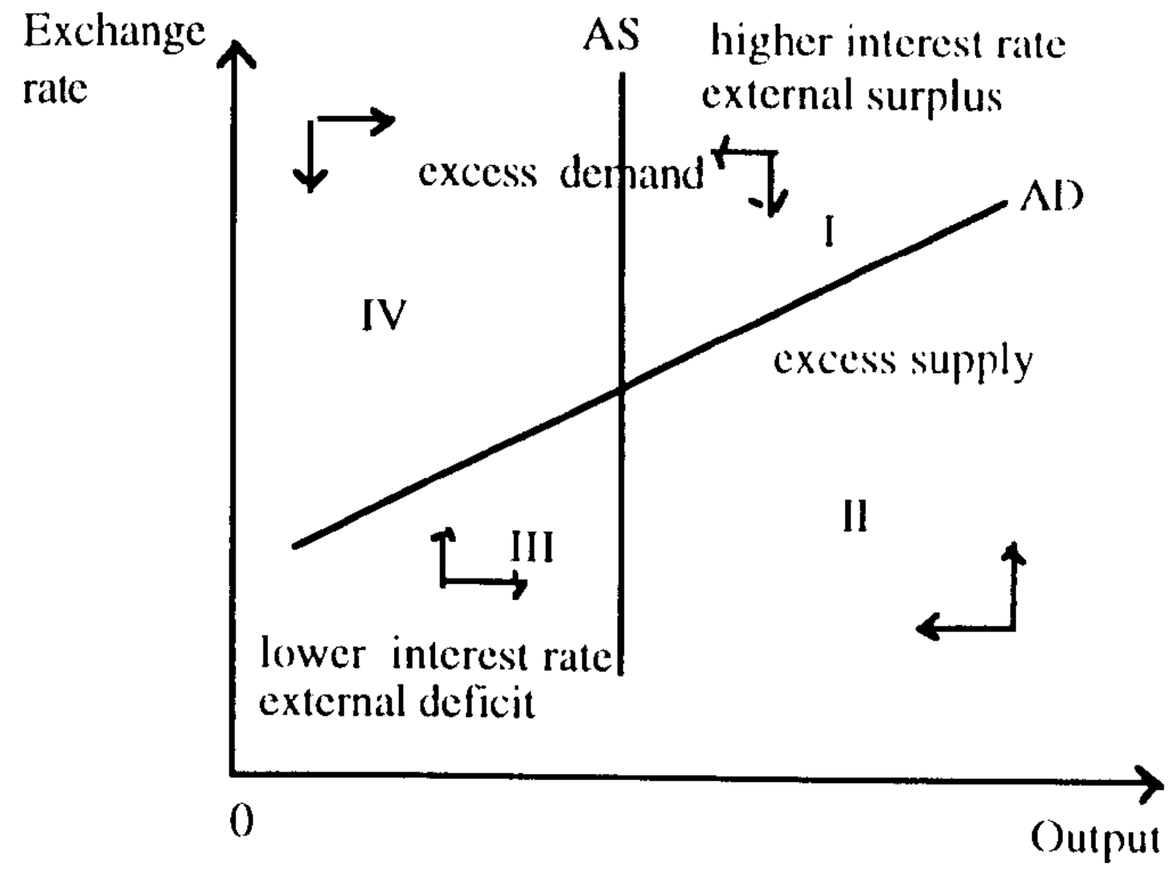
Source: Adapted from Mundell, 1968, as per Chapter 3.

Secondly, the exchange rate fluctuates according to market-clearing conditions and inducing some adjustments in the export and import prices, further, inducing changes in relative prices and eventually, import and export earnings Hence, exchange rate adjusts and allow for adjustments in not only the savings-investment function, but also in the other two functions. Figure 3.5 in Chapter 3 explains the dynamics of these adjustments in graphical presentation, so we do not deal with it in this section.

Thirdly, domestic interest rates can adjust to bring savings and investment to their desired levels since domestic interest rates are determined by market-clearing conditions. The government budget balance can also adjust in response to adjustments in interest rates. Domestic interest rates appear in both the private and the government equations. The response of government balance to interest rates is embodied in the conventional twin deficits literature. Figure 3.4 in Chapter 3 is thus applicable in terms of graphical presentation of budget balance, interest rates, external sector and internal sector at a fixed exchange rate. If exchange rate is flexible and allows for adjustments in the external as well as the government sectors, hence, the existence of inter-link between interest rates, exchange rates, government sector and external sector hypothesised by the conventional twin deficits notion. In this case, Figure 3.5 in Chapter 3 is applicable. However, in terms of aggregate demand and aggregate supply, the diagram can be shown as below:

Figure 5.2: The Implied Aggregate Demand and Aggregate Supply Curves.

(Achieving equilibrium at variable exchange and interest rates)



A higher interest rate is associated with higher exchange rate. An increase in interest rate reduces expenditure in the form of capital export and domestic expenditure which may improve external balance (Quad I). An increase in output creates an excess supply of goods and services (Quad I and II) and an increase in exchange rate creates an excess demand (Quad I and IV) for foreign goods. Therefore, an increase in output must be accompanied by an increase in the exchange rate to eliminate any excess demand and to achieve equilibrium (hence, the negative slope for AD). The condition for stability requires output and exchange rate to move in the direction of the arrows shown.

Now consider the system of equations (5.8"), (5.9") and (5.10"). All of the above adjustments are applicable. With the inclusion of the production function in the system of equations, aggregate demand generates a dynamic process because the output and investment adjust to changes in capital stock.

In the long-run, the dynamics of the system lies in its ability to adjust to changes in capital stock and changes in labour. In the longer-run, relative prices of exports to world price of exports and the relative prices of world imports to prices of domestically produced goods adjust inducing responses from the external balance and the government balance. There will also be adjustments in the individual macroeconomic aggregates, for example, savings adjust to its desired level and exports adjust to the difference between demand for exports in period t and the actual flow in the previous

period *t-1* (see Goldstein and Khan, 1978). More important government expenditure also adjusts in the long-run; equations (5.8') and (5.8") show the inclusion of a variable signifying the change of government consumption with respect to income. Government investment can either increase or decrease through time; Musgrave (1974) suggested that government investment decreases with a higher stage of economic development, while the Wagner's law suggested that public investment varies in association with GNP and economic and political situation.

The resulting effects would be a dynamic system of long-run aggregate demand and aggregate supply which adjust to adjustments in output and full employment as well as to prices.

Further analysis in the variables that contribute to the role of aggregate demand and supply are discussed later in sub-section 5.5.

5.2.4 The Aggregate Demand and Aggregate Supply System of Equations

Substituting (5.11) into the deficit equations system of (5.8'), (5.9') and (5.10'):

$$(G - T)_t = \{\bar{I}_{G_t} + n_1 \sum_{j=0}^{t-1} n_j Y_{t-j} + \mu_1 nD_t + (n_2 - (\tau_Y + \tau_M \gamma_2)) [\bar{Y}_t + \Phi_1 \sum_{j=0}^{t-1} \Phi_j Y_{t-j} + \Phi_2 \bar{I}_{G_{t-1}} + \Phi_3 r_{t-1}]\} - \{\tau_X \sigma_1 (\frac{P_{X_t}}{P_{X_t}^{W} .e}) + \tau_X \sigma_2 Y_t^{W} + \tau_M \gamma_1 (\frac{P_{M_t}^{W} .e}{P_{D_t}})\} \quad (5.8")$$

$$(I - S)_t = (\beta_1 - \alpha_1)[\bar{Y}_t + \Phi_1 \sum_{j=0}^{t-1} \Phi_j Y_{t-j} + \Phi_2 \bar{I}_{G_{t-1}} + \Phi_3 r_{t-1}] + (\beta_2 - \alpha_2) \sum_{j=0}^{t-1} (\beta - \alpha)_j Y_{t-j} + \beta_3 \bar{I}_{G_t} + (\beta_4 - \alpha_3) r \quad (5.9")$$

$$(M - X)_t = \{\gamma_1 (\frac{P_{M_t}^{W} .e}{P_{D_t}}) + \gamma_2 [\bar{Y}_t + \Phi_1 \sum_{j=0}^{t-1} \Phi_j Y_{t-j} + \Phi_2 \bar{I}_{G_{t-1}} + \Phi_3 r_{t-1}]\} - \{\sigma_1 (\frac{P_{X_t}}{P_{X_t}^{W} .e}) + \sigma_2 Y_t^{W}\} + \mu_2 r^{*} N \quad (5.10")$$

$$(M - X) = (G - T) + (I - S) \quad (5.1)$$

5.2.3.a A Summary of the Variables

The following categorises the variables of the system. There are 4 endogenous and 11 exogenous (including 3 predetermined) variables.

1. Endogenous variables:

$(M - X)_t$ = current account balance on external account
$(G - T)_t$ = current account balance on government account
$(I - S)_t$ = investment-savings gap
Y_t = output

2a. Exogenous variables:

$(P_{Mt}^{W} .e / P_{Dt})$ = relative price of imports with respect to price of domestic goods
$(P_{Xt} / P_{x}^{W} .e)$ = relative price of exports with respect world price of exports
Y^{W} = world income (income of major trading partners)
$r^{*}N_t$ = interest repayments on external debt stock
rD_t = interest debt repayments on government debt stock
r_t = domestic interest rate, where $r = r_t$ if there is financial repression.
I_{t-1} = gross private investment last period
$\sum_{j=0}^{t-1} \beta_j Y_{t-j}$ = a weighted average of the sum of past outputs

2b. Predetermined variables:

$\bar{I}_{G_t}$ = government investment
$\bar{C}_{G_t}$ = government consumption
$\bar{Y}$ = initial endowment (output)

5.3 Description of the Model

In discussing the role of the demand side of our model, we need to identify signs and magnitude of each of the coefficients so as to identify their influences on the twin deficit and debt. In describing the magnitude and signs of each coefficient, an assumption has to be made with regard to which of the variables on the l.h.s. that each coefficient affects because there are two variables on the l.h.s. and both change as the

l.h.s. variables change. The signs and magnitudes of variables in the aggregate demand model (5.8'), (5.9') and (5.10') are discussed and considering the effects of output and investment adjustments in the full aggregate demand-aggregate supply model (5.8"), (5.9") and (5.10").

5.3.1 Fiscal Balance

Consider equation (5.8'). Expansion of the expression shows that the fiscal balance is the difference between a predetermined government expenditure and a sum of tax earnings as government's revenue. Equation (5.8') takes government expenditure I_{G_t} *and* C_{G_t} as exogenous and predetermined, in order to simplify the analysis a little, i.e., in the short-run..

We saw earlier that total expenditure comprises of government investment and consumption and repayment of interest on past governments' public debt. Past government debt stock is defined as $D_t = \sum_{j=0}^{t=1} (G - T)_j$ which enters our model through equation (5.8) or (5.8').

Government revenue comprises of collections from direct taxes on income and indirect taxes on tradables. The sources of tax earnings are from: income, exports (export tax rates multiplied by the export demand function), imports (import tax rates multiplied by the import demand function) and exchange rate which affects import tax and export tax, hence, indirectly affecting tax revenue.

Taking each variable at a time and holding all other variables on the r.h.s. constant from now on, we analyse each variable to determine its effect on fiscal deficits. The analysis is made simpler in this section because government expenditure is predetermined, hence can be regarded as constant throughout the analysis. The effect of changes on the r.h.s. variables are on government revenues only.

An increase in interest repayments on past debt stock will have a direct effect on increasing government expenditure and at the same time reducing government revenue so that a fiscal deficit is either created or enlarged.

Increases in income or output has a direct effect in raising the tax revenue and reducing the fiscal deficit thus having a negative relationship with the fiscal deficit. If

government expenditure increases at the same time as increases in revenue, the net effect is ambiguous, the fiscal deficit can either rise, fall or does not change at all.

Tax rates and government expenditure are policy variables, hence are predetermined. Government can influence its budget balance by using these policy variables if the other variables on the right hand side do not change. A tax cut on income for example, ceteris paribus, creates a fiscal deficit. Likewise, an increase in government spending, ceteris paribus, will raise the fiscal deficit. However, taking those two variables as predetermined, there are four other variables in the equation that can cause changes in the government deficits, namely, P_{Xt} / P_{Xt}^{W} , P_{Mt} / P_{Dt} , Y_t^{W} , and e_t .

The exchange rate could also be a policy variable if it is fixed by the government rather than according to market clearing conditions. In the case of most of the ASEAN countries exchange rates are pegged against a composite basket comprising the currencies of major trading partners, as is the case with Malaysia, (Bank Negara Malaysia, Annual Report 1990). Therefore, these are not policy variables but are market-determined. Exchange rate changes have two types of effects - price and quantity effects. It has direct effects on import and export tax revenues, and an indirect effects on tax revenue in total, through its price effects and a direct effect on exports and imports through its quantity effects. An appreciation of the exchange rate causes the relative price of exports to fall, increasing tax revenue because exports are relatively cheaper hence reducing the fiscal deficit. On the other hand, quantity of exports might fall leaving an ambiguous net effect (can either be positive, negative or having no change). A depreciation causes the relative price of exports to rise, however, export tax revenue increases in domestic currency terms if quantity of exports does not change, thus, reducing fiscal deficit. The coefficient $\tau_X \sigma_I$ can be either positive or negative.

By contrast, an appreciation of the exchange rate causes import prices to be relatively cheaper, reducing the relative price of imports to prices of domestic goods simultaneously increasing the quantity of imports, hence, resulting in increasing import tax revenue in domestic currency terms. The net effect of the elasticity of import tax revenue, $\tau_M \gamma_I$, is to reduce the fiscal deficit. A depreciation causes import tax revenue to decline because relative prices and quantity of imports adjust, however, the value of import tax in domestic currency terms rises, the net effect being to increase the fiscal deficit.

Based on the above discussions, we can conclude that the expected signs and magnitudes of the coefficients are:

$$(\tau_Y + \tau_M \gamma_2) < 0; \quad \tau_X \sigma_1 \geq 0; \quad \tau_X \sigma_2 \geq 0; \quad \tau_M \gamma_1 < 0; \quad \mu_1 > 0.$$

5.3.1.a Output and Investment Effects

Consider the full equation as in (5.8"). The effects of initial output, past output and past investment operate through the elasticity of import and income tax revenues and income elasticity of imports.

There are two output variables that affect fiscal deficits. Both should have a positive relationship with tax revenue as well as raising imports. They both reduce the fiscal deficits.

Past investment also affects revenue in a positive manner through the elasticity of tax revenues for imports and income as well as through the income elasticity of imports.

5.2.2 Saving-Investment Gap

Equation (5.9') states that the private sector balance is a function of the determinants of investment and savings which comprise income at time t and a sum of past income with weights declining exponentially, government expenditure and interest rates. Government investment is predetermined, as in (5.8'). Both income at time t and past weighted average income and interest rates appear as common variables in private investment as well as private savings. An increase in income raises both investment and savings; the strength of β_1 versus α_1 (or vice versa for the case of past output) will determine whether investment rises faster than savings (or vice-versa), either reducing or enlarging the savings-investment gap.

An increase in interest rates causes a reduction in private investment. Whereas savings would increase with an increase in interest rates. The overall effect on private sector balance is not clear - whether the rise in savings offsets, worsens or improves the saving-investment gap. This clearly depends upon the relative magnitudes of β_4 and α_3, i.e. the relative interest sensitivity of savings and investment.

The variable $\bar{I_G}$ proxies the competing credit availability between the public and the private sector; the sign for β_3 depends on whether public investment crowds-out or crowds-in private investment. If β_3 is positive and significant, it signifies crowding-in of private investment, if it is negative and significant, it signifies crowding-out of private investment.

The coefficients are therefore, expected to have the following signs:

$$0 \leq (\beta_1 - \alpha_1) < 1; \quad 0 \leq (\beta_2 - \alpha_2) < 1; \quad \beta_3 < 0; \quad (\beta_4 - \alpha_3) < 0.$$

5.3.2.a Output and Investment Effects

Initial output, output in the previous periods and investment in the previous period all have their effects on the savings-investment gap through β_1 *and* α_1 . The effect of each of these variables depends on the relative sensitivity of savings and investment towards them.

5.3.3 External Balance

Equation (5.10') shows the external balance is determined by the determinants of export and import demand functions as well as interest repayments on past external debt stock. The relative domestic price of exports to the world price (proxied by the export prices of major trading partners), exchange rate and the world income (also proxied by income of major trading partners) determine the export demand function. Whereas the relative price of imports to prices of domestically produced import substitutes, the exchange rate and permanent and transitory income of the importing countries determines the import demand function. These two functions in fact appear in equation (5.8') which exhibits similar properties between the fiscal and the external balances. Incorporating the role of interest rates on foreign debts, however, results in great differences between the two deficits. Firstly, the interest rates on foreign debt is the world interest rate and secondly, interest repayments are in the form of foreign exchange as opposed to internal interest rate and interest repayments in domestic currency terms as shown by domestic interest repayments in the fiscal balance.

As discussed earlier, an increase in the ratio of the relative price of exports either as a result of a decrease in world export prices or a depreciation in the exchange rate leads to a decrease in export volume and reduces the net exports. The effect of an increase in world income is to increase export volumes, hence increasing net exports. An increase in the relative import price ratio reduces import volume leading to an increase in net exports. An increase in income raises the import volume and reduces the net export balance. An increase in interest repayments on past external debt will reduce net exports.

5.3.3.a Output and Investment Effects

Adjustments in initial output, weighted average of the sum of past outputs and investment in the previous period operate through the income elasticity of import demand, which is unambiguously positive.

The estimated coefficients are expected to have the following signs:

$$\gamma_1 \geq 0; \quad \gamma_2 < 0; \quad \gamma_3 < 0; \quad \sigma_1 < 0; \quad \sigma_2 \geq 0; \quad \mu_2 > 0.$$

5.4 A Discussion on the Model

The following highlights several important points about the three theoretical expressions which have various exogenous variables appearing together:

(a). The presence of Y_t in all three aggregate demand equations causes cyclical effects in the system, where $Y_t = f(G)$, $or\ G = f(Y_t)$, $Y_t = f(T)$, $or\ T = f(Y_t)$. However, if Y_t is treated as supply-determined (as discussed earlier), so endogeneity of Y_t may not be a serious problem.

(b). As a result of (a) above, Y_t is replaced by all determinants affecting it. Such are initial output, a weighted average of the sum of past outputs, government investment in the previous year and domestic interest rate in the previous year which naturally appear in all three equations making-up a system of aggregate demand and aggregate supply equations. The effects of these variables had been discussed earlier but further insights into the role of output to reduce deficits and debt need to be addressed in more detail in a later sub-section.

(c). In two of the expressions - the fiscal balance $(G - T)$ and the external balance $(X - M)$, $P_{X_t} / P_X{}^W$, $P_{M_t}{}^W / P_{D_t}$, $Y_t{}^W$, *and* e_t are common variables. It is thus expected that there are forces tending towards some common movement between the two balances.

(d). There are no other common variables present between the private sector balance $(I - S)$ and the external sector $(X - M)$ balance.

(e). Interest rates r and government investment $\bar{I_{G_t}}$ appear in both $(I - S)$ and $(G - T)$.

Table 5.2: Common variables (in *)

Identity / Variable	$(M - X)$	$(G - T)$	$(I - S)$
$\bar{Y_t}$	*	*	*
$\sum_{j=0}^{t-1} Y_{t-j}$	*	*	*
$P_X / P_X{}^W$	*	*	
$P_M{}^W / P_D$	*	*	
Y^W	*	*	
$I_{G_{t-1}}$	*	*	*
$\bar{I_G}$		*	*
e	*	*	
r		*	*
r_{t-1}	*	*	*

(f). The interest rate r appears in both I *and* S.

The role of prices and exchange rate in (c) and the role of interest rates in (f) above in terms of adjustments had been discussed in sub-section 5.2.3 earlier. Table 5.2 summarizes the details of common variables.

5.4.1 Implications of the model

Several implications can be drawn from the properties of the model as discussed below:

5.4.1.a Channels of Transmission

(i) The most important channel of transmission between fiscal deficits and external deficits is through output and determinants of output.

(ii) The four variables mentioned in (c) above, i.e. $P_{X_t} / P_X{}^W$, $P_{M_t}{}^W / P_{D_t}$, $Y_t{}^W$, *and* e_t are the channels of transmission between the government budget balance and the external balance, thus there is a tendency for co-movements in the two balances.

(iii) The variable $\bar{I_G}$ links the private and the public sectors' balances and may cause co-movements in these two balances.

(iv) Between savings and investment themselves, there appears to be a correlation due to interest rates.

(v) Differentiating some of the variables give further insight into the relationship between the three deficits.

5.4.1.b Further Insights into the Aggregate Demand Model

Differentiating (5.8'), (5.9') and (5.10') with respect to $\bar{Y_t}$ is essentially finding the response of the endogenous variables to a change in output. The following reflects inter-temporal changes in the deficits with respect to changes in output, where output is defined as in equation (5.11). The following analysis only holds if, by assumption $X = \bar{X}, Y = \bar{Y}, G = \bar{G}$, where a bar means constant.

$$\delta(G - T)/\delta\bar{Y}_t = (\tau_Y + \overset{+}{\tau}_M \gamma_2) \quad (5.13)$$

$$\delta(I - S)/\delta\bar{Y}_t = (\overset{+}{\beta}_I - \overset{+}{\alpha}_I) \quad (5.14)$$

$$\delta(M - X)/\delta\bar{Y}_t = \overset{+}{\gamma_2} \quad (5.15)$$

Assuming τ_Y *and* τ_M are constants since they are policy variables taken as given. Equation (5.13) gives a coefficient for the marginal effect of a change in income to a change in the fiscal deficit. Equation (5.14) gives a coefficient for the marginal propensity to save or the marginal effect of a change in income to a change in the private sector deficit, and equation (5.15) gives a coefficient for the marginal propensity to import or the marginal effect of a change in income to a change in the external deficit. Rewriting the meanings of the coefficients as follows:

τ_Y = marginal effect of income tax revenue on total tax
τ_M = marginal effect of import tax revenue on total tax
γ_2 = marginal effect of income on import demand
β_I = marginal effect of income on investment
α_I = marginal effect of income on savings

Equation (5.15) is quite straight forward to interpret, that is, if income rises imports will also rise hence, γ_2 is unambiguously positive. This also means that exports rise at a slower rate or remain at the same level.

As for equation (5.13), $(\tau_Y + \tau_M \gamma_2)$ taken together constitute the marginal effect of income on the fiscal deficit, or a unit change in income will cause a $(\tau_Y + \tau_M \gamma_2)$ change in fiscal deficit. The sign is unambiguously positive but the magnitude of $(\tau_Y + \tau_M \gamma_2)$ depends on the magnitude of γ_2 . If τ_Y *and* τ_M are left to be variable, the marginal effects of income tax and import tax revenues is negative on the fiscal deficit as income increases because of increased income tax and import tax revenues. Given that $(\tau_Y + \tau_M \gamma_2)$ is positive, this means that government spending $(G = \bar{I}_G + \bar{C}_G + \bar{r}D)$ (with the assumption that government consumption is fixed) is rising at a faster rate than the rise in total tax revenue, as income increases.

The coefficient in equation (5.14) affects both sides of the private sector balance identity. While β_I affects private investment decisions, α_I affects private savings decision. As income rises, both the marginal effect of income on investment and the marginal effect of income on savings have positive effects on the private sector deficit, i.e. they move together. Hence, a unit increase in income will raise investment of β_I

unit and at the same time raises savings with α_I unit. Individually both β_I and α_I rises, but whether the overall effect on the fiscal deficit is positive depends on the strength of β_I versus α_I. If $\beta_I > \alpha_I$, the overall effect would be positive, i.e. the fiscal deficit or savings-investment will enlarge as income rises; if on the other hand $\beta_I < \alpha_I$, the overall effect would be negative, i.e. the savings-investment gap will narrowed as income rises.

But ex-post, $$\delta(M - X)/\delta\bar{Y}_t = \delta(G - T)/\delta\bar{Y}_t + \delta(I - S)/\delta\bar{Y}_t$$

So $$(\gamma_2) = (\tau_Y + \tau_M \gamma_2) + (\beta_I - \alpha_I)$$

or $$(\tau_Y + \tau_M \gamma_2) = \alpha_I - \beta_I + \gamma_2 \qquad (5.16)$$

Ex-post, the marginal change in the external sector balance equals both the marginal changes in the government budget plus the private sector balances, all with respect to changes in income, so the result is equation (5.16). It demonstrates the behavioural interdependence between tax revenue with savings-investment gap in which both have interdependence, though in a different manner, with imports entering through the marginal propensity to import. If the assumption on government consumption is relaxed and the variable component is considered in the government balance, then equation (5.16) will be $(n_2 - (\tau_Y + \tau_M \gamma_2)) = \alpha_I - \beta_I + \gamma_2$, demonstrating the interdependence between government consumption and tax revenue.

The r.h.s. of equation (5.16) demonstrates the compatibility of net import behaviour with savings behaviour through the magnitude and signs of the marginal propensity to import and the marginal propensity to save. This highlights the compatibility of the behaviour of the external sector and the private sector balances. The l.h.s. shows import tax revenue dependence on the marginal propensity to import, the bigger the marginal propensity the bigger will the import tax revenue be because import tax revenue gets bigger. The government sector balance is thus behaviourally interdependent with the external sector too. Both tax revenues move together to affect the identity with the movement of savings and net imports.

The relationship between the three identities in terms of signs and magnitudes according to equation (5.16) depends mainly on the strength of the marginal effect of income on saving versus the marginal effect of income on investment. If $\alpha_I > \beta_I$, the three derivatives would have the same sign (positive), i.e., rising together with the increase in income. If however, $\alpha_I \leq \beta_I$, the government sector balance would increase together with the external balance, but the private sector balance will decrease instead.

This is the situation whereby the external deficits and the fiscal deficits seem like 'twins'.

Where the case of the coefficients of the three deficits having the same positive signs, increased indebtedness (i.e. the external deficit rising) is associated with a rising fiscal deficit and private sector deficit. In the second case where the external deficit moves in the same direction as the fiscal deficit, increased indebtedness would then be a result of increase in the external deficit which is caused by the increased in fiscal deficit, though the private sector deficit decreases.

The magnitude of marginal effects of income changes on tax revenue can actually be obtained only by estimating the values of $\alpha_1 - \beta_1 + \gamma_2$, and with these values further, the inter-relationship between the three deficits can then be determined according to equation (5.16).

Similarly, differentiating equations (5.8') and (5.10') with respect to $P_{X1} / P_{X1}{}^{W}$, P_{M1} / P_{D1} , and $Y_1{}^{W}$ gives the following results, which are short-run effects:

$$\delta(G - T) / \delta\left(\frac{P_X}{P_X{}^{W}}\right) = \tau_X \bar{\sigma}_1 \qquad (5.17a)$$

$$\delta(M - X) / \delta\left(\frac{P_X}{P_X{}^{W}}\right) = \bar{\sigma}_1 \qquad (5.17b)$$

$$\delta(G - T) / \delta\left(\frac{P_M{}^{W}}{P_D}\right) = \tau_M \overset{+}{\gamma}_1 \qquad (5.19a)$$

$$\delta(M - X) / \delta\left(\frac{P_M{}^{W}}{P_D}\right) = \overset{+}{\gamma}_1 \qquad (5.19b)$$

$$\delta(G - T) / \delta Y^{W} = \tau_X \overset{+}{\sigma}_2 \qquad (5.20a)$$

$$\delta(M - X) / \delta Y^{W} = \overset{+}{\sigma}_2 \qquad (5.20b)$$

Equations (5.19a) and (5.19b) demonstrate the indirect inter-dependence between the government deficit and external deficit through σ_1 , the price elasticity of export demand. An decrease in the ratio of relative prices causes a $\tau_X \sigma_1$, the revenue elasticity of export tax, decrease in the fiscal deficit due to increased export tax revenue. An increase in the ratio of relative export prices has a negative direct effect on the external deficit through σ_1 .

Equations (5.20a) and (5.20b) demonstrate the indirect inter-dependence between fiscal and external deficits through γ_I , the price elasticity of import demand. An increase in the price elasticity of import demand increase the import tax revenue, hence improving the fiscal deficit while simultaneously worsening the deficit on external account.

Equations (5.20a) and (5.20b) demonstrates the indirect interdependence between the two deficits through σ_2 , the world income elasticity of export demand. An increase in world income increases the export tax revenue and improves the fiscal account while simultaneously worsening the external account.

Differentiating $(G - T)$ *and* $(I - S)$ with respect to r :

$$\delta(G - T)/\delta r = \overset{+}{\mu_1} \tag{5.21a}$$

$$\delta(I - S)/\delta r = (\overset{-}{\beta_4} - \overset{+}{\alpha_2}) \tag{5.21b}$$

Equation (5.21a) and (5.21b) shows the interaction between the fiscal balance and the private sector balance through the interest rate. Assuming functions are taken in log-linear form, μ_1 shows the interest rate elasticity of public domestic debt that affects the fiscal balance. A percentage increase in the interest rate will cause an increase in the fiscal deficit of μ_1 percentage point. $(\beta_4 - \alpha_2)$ is the total interest rate elasticity of the savings-investment gap. The sign of the total interest rate elasticity and the magnitude of the savings-investment gap change depends on the strength of β_4 versus α_2 . If $\beta_4 > \alpha_2$, investment decreases at a faster rate than the change in savings, enlarging the savings-investment gap. If on the other hand $\beta_4 \leq \alpha_2$, savings will rise at a faster rate than the change in investment hence improving the savings-investment gap.

5.5 Comparisons on the External, Private and Government Sectors' Balances: A Simple data Evaluation

5.5.1.a) Measurement

To measure the three sectors' balances, we use the following accounting identity used by Bank Negara Malaysia (Bank Negara Malaysia, Annual Report 1990), also used by Buiter (1988) as a start to analyse the role of fiscal policy in stabilisation and adjustment (Buiter, 1988, pp 4).

$$(S_P - I_P) + (S_G - I_G) = CA \qquad (5.22)$$

Equation (5.22) simply means what is as tabulated below.

(less)	Public Gross domestic capital formation (or development expenditure)
	Public Savings (Balance on government current account)
(a)	Deficit/Surplus (Overall Balance)
(less)	Private Gross domestic capital formation
	Private Savings
(b)	Deficit/Surplus (Private sector balance)
(less)	Gross Domestic Capital Formation
	Gross National Savings
(c)	Balance on Current Account

Row a) measures the savings-investment gap in the public sector and row b) measures the same gap in the private sector. These two gaps equal the external sector gap. By this, we eliminate the problem of having inconsistent data on private savings, by tracing back private savings data with all the others available.

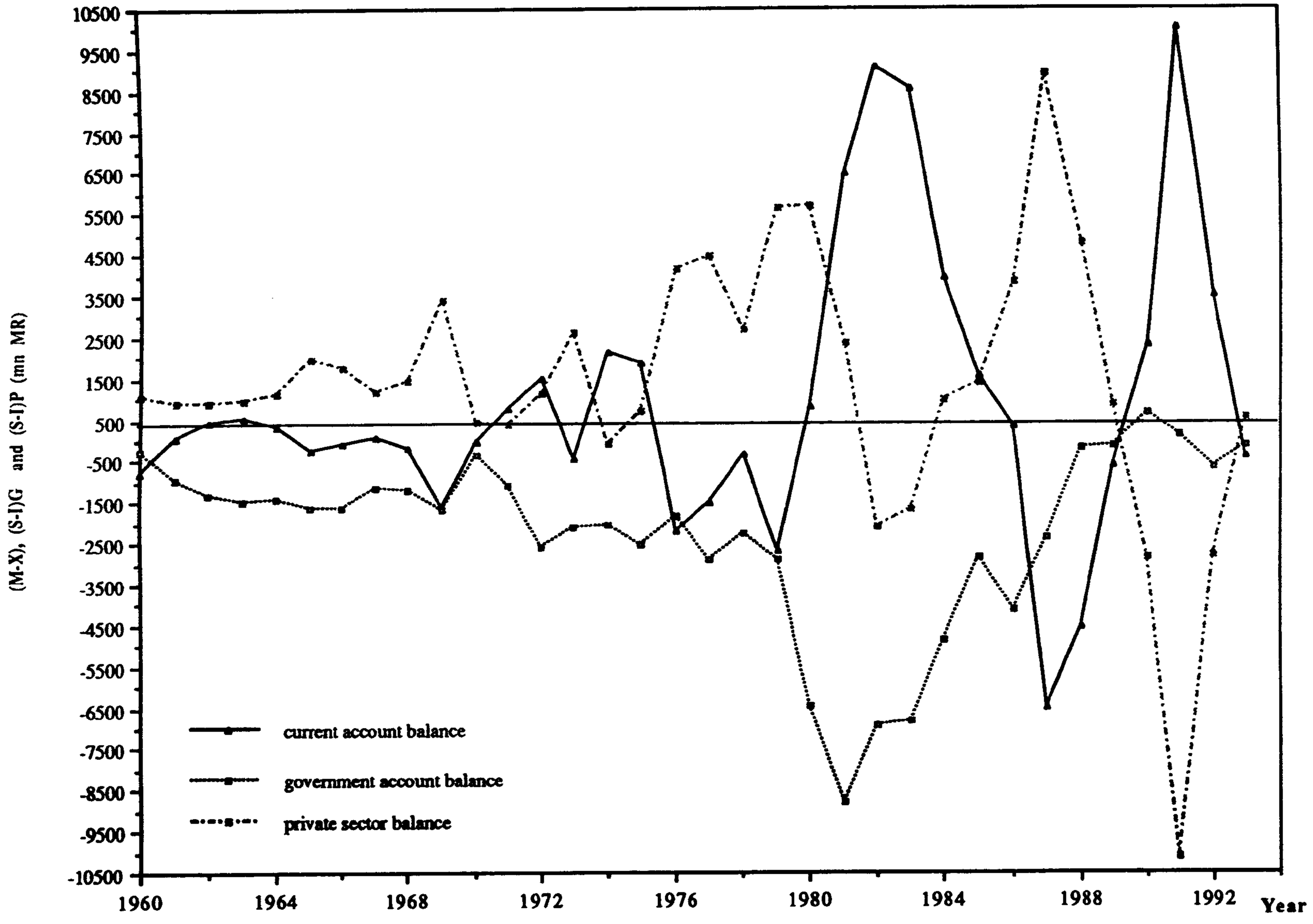
The graph (Graph 1) shows the time path of the three sectors' balances.

5.5.1.b) Description of the Three Balances.

The graph shows fluctuations and movements of the three balances about the x-axis indicating equilibrium is achieved at all points. The external sector shows fluctuations and follow the business cycle. The private sector balance closely mirrors the external sector balance. Ex-ante, when import is greater than export, investment in the private plus the government sector should be greater than savings in both sectors, and vice-versa. The movement of the savings-investment gap and the import-export gap is thus consistent with this, whereas the government sector shows deficit in its savings-investment gap, with the highest level of deficit in 1982, closing-up the gap and by 1988 reaches close to zero and broadly follows a balanced budget policy since then.

The fluctuations in the external and private sector are smaller in the 1960s, become bigger in the 1970s and are further amplified in the 1980s. This pattern reflects the growing activity taking place in the economy over the years under study. As a result of the second oil-shock, the current account balance plunges to its biggest deficit.

External, Private and Government Sectors' Balances.



There are four distinctive exogenous and endogenous shocks that affect the economic system of Malaysia as depicted by the graph. In 1976 and 1977, the external sector is in surplus inducing an increase in private savings following the first oil-shock of 1974-75 and the commodity boom of the early 1976.

In 1979 again the external sectors has increase sharply as a result of the second-oil shock of 1979-80 and savings is greater than investment as depicted. Lagged one year after that the government sector increases its development expenditure tremendously to the highest level of deficits in 1981. Presumably expenditure is made possible due to confidence in increasing petroleum royalties.

In 1982, the Latin American countries experience a debt crisis and the African countries having debt problems at the same time resulting in the world international financial sector becoming unstable due to a draining of credits in most creditor countries. However, Malaysia is not affected at the time in terms of having a debt crisis but affected in terms of enlarging deficits in all the three sectors. The world recession in the early 1980s seems to have some lagged impact on the smaller economies in the east since they experienced recession much later, i.e. in the mid-to-late 1980s. In 1987-88, Malaysia undergoes a recessionary period as a result of poor world economic performance that induces reductions in terms of trade of most commodities exported. Exports is in a big surplus over imports which is reflected in an equal savings surplus over investment.

There is again an oil boom in 1990, but the government was more cautious during this time as evidenced by the balanced-budget policy undertaken. The private sector plunges into its biggest deficits, reflecting the boom in investment especially in the manufacturing sector which is reflected as the biggest excess of import expenditure in 1991 in the external sector. The contribution of the manufacturing sector to total merchandise exports increased to 64.1% in 1991 as compared to 59% in 1990, in nominal terms. Agricultural commodity exports improved and increased by 1.1% in 1991 compared to a decrease of 9.9% in 1990. Oil export earnings decline due to a decline in prices of crude petroleum. Imports expanded rapidly between 1989 and 1991 attributable mostly to investment and intermediate goods imports, which together account for about 83% of the gross imports of goods in 1990 (Malaysian Economic Report, 1992/3).

Government finance in the early 1990s recorded strong growth both in revenue and expenditure. Revenue growth was mainly attributable to petroleum royalties, however,

operating expenditure includes a policy of payment of petroleum subsidies to offset the increase in petroleum prices in 1991 as a result of the Gulf crisis.

5.5.1.c) Correlation among the three balances

To confirm the correlation between the private sector and the external sector balances, we run a correlation matrix and the correlation coefficient of -0.78 confirms that there is a strong negative correlation between them. The correlation coefficient between the government sector and the external sector balances is -0.45 indicating a relatively weaker negative correlation. Finally the correlation between the private sector and the government sector is -0.21 indicating a very weak negative correlation between them.

We further identify factors that are common in contributing towards correlation between the three sectors and we deal with them as follows:

(i) correlation between the external and private sectors:
We say earlier on in the model section that there are no other common variables between the two sectors that can affect their balances simultaneously except for the income/output variable. We propose here that output plays the most important role in affecting their opposite co-movement. We should then treat $\Delta Y = f\,\Delta(K, L)$ where, ΔY is the portion of the deviation in income which is not demand-determined (discussed earlier) and ΔL is change in labour. So we say the changes in capital stock and labour that gives rise to the change in income/output as the main cause of negative correlation. If this holds, the relationship is a long-run dynamic relationship.

(ii) correlation between the external and government sectors:
We found earlier that there are many variables in common to these two balances namely $P_{Xt}/P_X{}^W$, P_{Mt}/P_{Dt}, $Y_t{}^W$, *and* e_t that may result in opposite co-movement between them besides output. We have yet to determine which influence is greatest in a future empirical work. Of all these variables, in the Malaysian case, it may be that the relative prices, since it is assumed that a small economy is a price taker, and the change in income are the most influential variables.

(iii) correlation between the private and government sectors:
The weak correlation between the two sectors is expected as the common variables between them is interest rates r and $I\bar{G}$ as had been said in the model section. We

expect this *a priori* because in the Malaysian case the interest rates have minimal influence on government decisions to invest, and government investment is infrastructural in nature, hence, are less likely to crowd out private sector investment or net exports.

Conclusion

Our long-run equilibrium model of debt and twin deficits addresses the three issues stated in Chapter 4 section 4.1. The model is timely for ASEAN given the continuous accumulation of debt with the inflow of foreign direct investments is uncertain at present. The existing investments have to have their rates of return matched the maturity of debt. The model should be a guide for internal policies to be undertaken.

The role of the private sector is very much reflected in and negatively correlated with the external sector in the case of Malaysia. The government sector has weak correlation with the external sector and does not follow the business cycle but increased spending only after the second oil-boom.

PART III: ASPECTS OF DEBT MANAGEMENT

CHAPTER 6: DEBT SERVICING CAPACITY USING LOGIT ANALYSIS

6.1 Introduction

Debt servicing difficulties became a subject of interest after the first oil shock and since then have become a growing concern especially after the second oil shock in 1979/1980. The magnitude of funds involved and the increasing number of defaults have focused attention on the topic of measuring and forecasting debt servicing capacity. The normal sequence of debt servicing difficulties is when a country runs current account deficits due to internal and external factors, and at the same time is illiquid and unable to borrow enough funds to finance the deficits (Cline, 1984). The problem of liquidity is not just a lack of reserves as mentioned in Cline's analysis (1984) but also a question of the drying up of the use of IMF credits (McKenzie, 1987) and of short term supplier credits (Homi Kharas, 1981).

There are varying degrees of response to debt servicing difficulties that range from temporary moratoriums on principal repayments to outright repudiation (Eaton and Gersovitz (1981), Cline (1984)). For the purpose of this analysis, debt rescheduling is used as representative of debt servicing difficulties.

The term moratoriums on principal repayments means stopping of repayments on principal temporarily or for a fixed period of time as a result of official agreement. Outright repudiation means direct refusal of any form of repayments. Rescheduling means a borrower applies for postponement of repayments of interest and principal and the result is an explicit agreement between lenders and borrowers to modify the schedule of such repayments. A loan is in default when a creditor declares that the borrower has failed to comply with some stipulation of the loan agreement. It may be temporary and consistent with the loan agreement.

The main objective of this chapter is to show that it is the foreign exchange scarcity that leads to the demand for rescheduling by debtors. It also seeks to show the effects of combining both the macroeconomic variables derived from the balance of payments which reflect the availability (scarcity) of foreign exchange, with financial variables derived from the balance sheet which reflect the cash flow position, in determining rescheduling decisions. In this study, it is hoped that the effects of the heterogeneity of regional debt problems be explored by identifying different determinants of debt servicing difficulties being significant in varying degrees in different regions. Logit analysis and significance tests are used to determine the importance of the determinants

of the probability to reschedule debt. To make full use of the logit results, the magnitude of the determinants in terms of their marginal effects and elasticity effects will be calculated. The elasticity effects could provide guidelines as to which variables should be focused upon to deter rescheduling.

The contributions of this chapter (in terms of originality) are in four areas. Firstly, the part of the theoretical framework that identifies debtors' difficulties i.e. the foreign exchange scarcity that leads them to demand for rescheduling. And this leads to the second aspect in which the macroeconomic and the financial variables[1] are country-specific factors which relate to the international financial environment, as opposed to supply factors, as determinants of debt rescheduling. By this, the focus of the research that is, on the foreign exchange scarcity and the demand for rescheduling that arises from the debtors, is reinforced. The debtors macro-economic difficulties are recognised apart from their illiquidity position, as shown by the cash flow items. This study shows the two types of variables are important determinants of the probability of rescheduling. Thirdly, the study takes a lead in capturing the effects of the heterogeneity of regional debt problems that lead to different determinants being significant in different regions. Fourthly, by presenting the magnitudes of the determinants, especially the elasticity effects facilitate policy decisions as to which determinants are to be improved to reduce debt servicing difficulties-cum-debt rescheduling.

The flow of this chapter is as follows. In Section 6.2, a literature review on previous studies will be presented. In Section 6.3, we build our theoretical framework that identifies debtors reactions (ie. demand for rescheduling) towards the scarcity of foreign exchange and it also facilitates creditors in tracking credit-worthiness (ie. for the supply of credits and rescheduling). In Section 6.4, the logit model and the variables hypothesised as the determinants of the probability of rescheduling are presented. Section 6.5 presents the estimated results for the overall sample, the African region, the Latin American region and the Southeast Asian region. In section 6 we present the comparisons of the results among regions and in section 6.7 comparison of the results with previous studies will be presented. Some tentative conclusions are derived in the last section.

6.2 Literature Review

This section is divided into two parts. The summary of the individual studies and comments on them will first be presented. The second part seeks to compare and contrast previous studies.

One of the first studies of the factors affecting a country's balance of payments, and hence its ability to service external debts, was that by et al. (1968). This study undertook a "systematic examination" of both short term and long term factors which determine the ability to service external debts. Their work is qualitative in nature and suggests that short term indicators related to liquidity aspects of a country's ability to service its external debt dealt with general balance of payments vulnerability. The short-term liquidity aspect was separated into three components: fluctuating, offsetting and rigid variables, which consists of the following variables; (1) the growth rate of export volume; (2) the ratio of debt service payments to exports, and (3) the ratio of foreign exchange reserves to imports. The long-term indicators emerged from the analysis that sought to determine the conditions under which economic growth financed in part by foreign capital can succeed and thus provide for continuous servicing of external debt. The variables are; (1) the growth rate of GDP; (2) the ratio of investment to GDP; (3) the ratio of exports to GDP, and (4) the rate of price increases.

The more formal quantitative approach to the study of debt servicing capacity was pioneered by Frank and Cline (1971) using discriminant analysis. Drawing on the work of et al. (1968), Frank and Cline used the following variables:[2]

(1) debt service ratio (+).
This defined as the principal plus interest divided by the export earnings of goods and services. The debt service is a fixed obligation and must be paid in foreign exchange.

(2) export fluctuations (+).
This is measured by taking the deviation from a rising trend, whereby higher index indicates "instability" and thus "higher risks".

(3) compressibility of imports
This is the fixed portion of the total imports of a country, for example expenditures on foodstuffs. There arises a difficulty in measurement in this ratio because a country's compressible imports differ from each other.

(4) imports to GNP ratio (+).

The share of imports in GNP reflects a degree of rigidity since a substantial cut in imports implies a considerable level of unemployment. Even if most non-essential industries are affected, unemployment is still a cost not easily accepted. Therefore, it seems that a higher import to GNP ratio would lead to a higher probability of default in the short run.

(5) imports to reserves ratio (+)

Foreign exchange reserves serve as a buffer against exchange earnings fluctuations. The reserves to imports ratio is taken because it can be controlled internally to some limit, and hence act as a balance against fluctuations which are caused by factors beyond the control of the economy. With a larger ratio of imports to reserves, one expects lower debt servicing capacity.

(6) amortisation to debt ratio (-)

This shows the average maturity of debt. The argument is that a predominantly long-term debt implies that debt service burden cannot be alleviated in the short run by reducing the amount of borrowing. While this is true, we also feel that the longer the maturity, the less is the annual commitment of a country, hence, the less would be the debt problems or rescheduling. .

(7) per capita GNP (-)

(8) growth of exports (-)

In the longer term, the growth of the export sector is considered to be an important element in debt servicing capacity since, if the economy is not stagnating, its import expenditures are bound to increase. A growth of exports is thus necessary for countering these developments. Presumably, a country with a high rate of export growth is less likely to reschedule.

The sample size was 145 observations covering 26 countries (of which 13 were rescheduling cases) for the years 1960 to 1968. The results showed that debt service ratio; debt-amortisation ratio, and ratio of imports to reserves were important determinants of debt servicing capacity:

However, there are shortcomings in the use of discriminant analysis. Due to violation of the normality assumptions, the t-statistic could not be used to test the statistical

significance of the explanatory variables (Maddala, 1986). Maddala also pointed out that when the independent variable is not normally distributed, the discriminant-analysis estimate is not consistent, whereas the logit Maximum Likelihood Estimate is consistent and therefore more robust. Another shortcoming is the discriminant analysis lacks any behavioural underpinnings. Feder and Just (1977) discovered that the problem with discriminant analysis is that it assumes two different groups/components in which a rescheduling country suddenly becomes a member of another specie, i.e. non-rescheduling. To them, it should be a discrete event taking place after the combined effect of certain economic variables reached some threshold level.

Dhonte (1975) uses principal component analysis to examine economic indicators containing debt information that affect debt servicing capacity. However, he provides no rationale for the selection of the variables. This technique, however, is not a quantitative method. It condenses the amount of information contained in a set of variables and forms another new sub-set of variables out of the original set. This means there is no systematic method of eliminating the variables because the significance of the variables are not known. This new sub-set of variables contains a very high percentage of information but with smaller dimensionality (McDonald, 1981).

The use of logit analysis was pioneered by Feder and Just (1977) to determine the importance of determinants of debt servicing capacity. They reexamined the significance of the variables that had been studied by Frank and Cline covering the period from 1965 to 1972. The sample size was 238 observations on 30 countries including 21 rescheduling cases. Two models are used in estimating the logit results. In the first mode, nine variables are included and the rationale for their usage are the same as in Cline's study, namely:-

(1) debt service ratio (+), (2) imports to reserves ratio (+), (3)amortization to debt ratio (-), (4) income per capita (-), (5) capital inflow to debt service ratio (-) - this ratio is not taken from Frank and Cline's study. Capital flows in the form of loans, grants, direct investment and transfer payments- are important source of foreign exchange receipts which can be used for debt service. Higher capital inflows is associated with lower probability to reschedule. The ratio is taken as debt service payments to capital inflows, (6) GDP growth (-) - this is also a variable justified by Feder and Just, (1977), as the most important factor that affect debt servicing capacity in the long run but is not included in the study by Frank and Cline (1971), (7) export growth (-), (8) imports to GNP ratio (+) and, (9) export fluctuations (+).

In the second model, amortization to debt ratio was excluded owing to doubts about the causal relationship between average debt maturity and the probability of default. However, both the models were mis-specified when export fluctuations and imports to GNP ratio were included. Thus, the final form of equations in the first model excluded these two ratios and in the second model, the amortization to debt ratio was excluded. In the first model, six variables are significant at the 5% level whilst GDP growth is insignificant. The likelihood ratio index is 92%. The error rate is lowest at a cut-off probability of 0.4 with one type I error and 5 type II errors. In the second model, all the six variables are significant at the 7.5% level, with a likelihood ratio index of 90%. The cut-off probability chosen from the best model is 0.4 which has the lowest total errors with 3 type I errors and 6 type II errors.

The main contribution of the study by Feder and Just (1977) is the use of logit analysis which enables the systematic elimination of insignificant variables according to the t-statistics. To gain further insight one should consider the following hypothetical situation: for each of the observations in the study above, the predicted probability of rescheduling is known 'a priori' while it is not known whether a rescheduling will indeed happen. Suppose further that the following rule of thumb is adopted: given a critical probability value P*, all countries with probability greater than P* are denied credits while all others are granted loans. Then for any given P*, there are two possible types of errors:

Type 1 error refers to the case where a country has a predicted probability lower than P* but actually defaults/reschedules.
Type II error refers to the case where a country has a predicted probability higher than P* but does not default/reschedule.

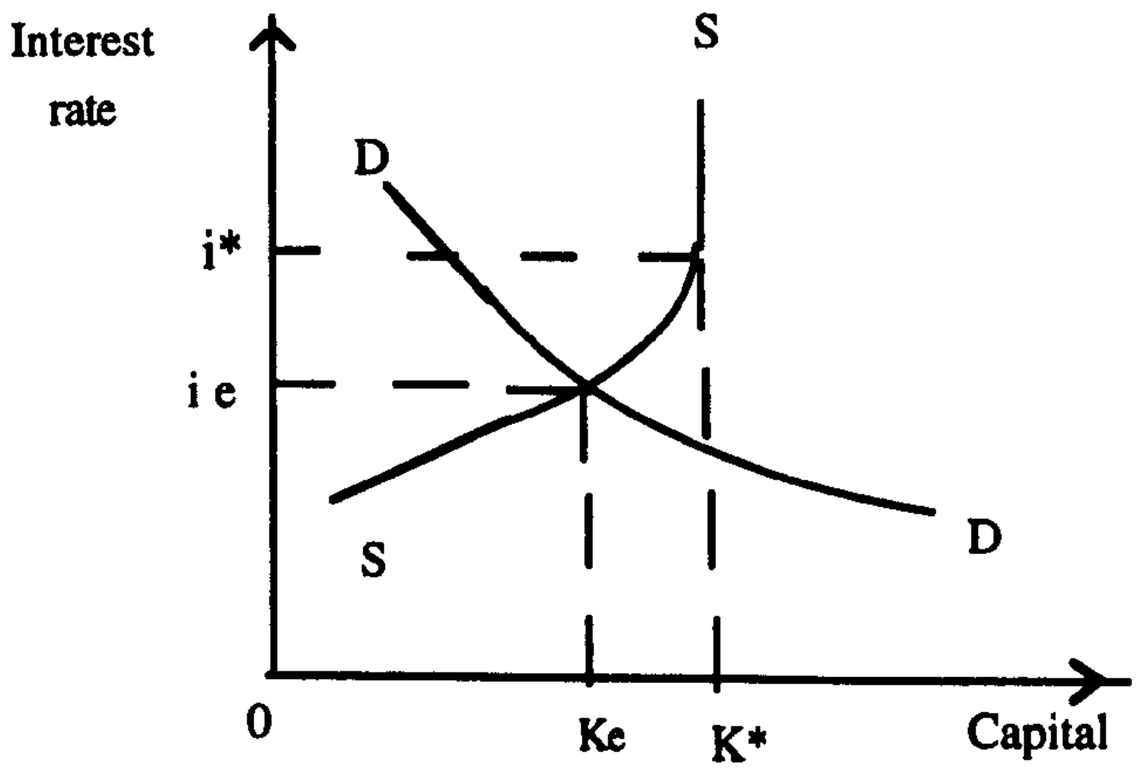
By estimating its type 1 and type 2 error, the predictive capability of the model could be determined and this proves to be useful as guidelines to determine whether credits are obtainable by debtors or can be given by creditors at a certain critical probability threshold.

Although all the studies mentioned above rationalized their choices of variables they lack formal theoretical underpinnings. Feder and Just (1977) and Frank and Cline (1971) for example, reject variables on 'a priori grounds' when the variables sometimes have relevance in causing the probability of default. For example, both studies reject

their statistical finding that the variability of exports lowers the probability of default based on 'a priori' grounds, apparently confusing high variability of exports with a low value of exports. Due to the absence of rigorous theoretical discussions of the previous studies, Cline (1984) and Lloyd- Ellis, McKenzie and Thomas (1987), improve on them by outlining a structured explanation of rescheduling decisions.

Cline (1984) assumes that borrowing more funds is the alternative to rescheduling. He conceptualizes rescheduling as a breakdown in the foreign capital market equilibrium because of credit rationing. He uses the theory of credit rationing (Stiglitz and Weiss (1981)) to explain why lenders are unwilling to lend at a certain level of the rate of interest. The level of interest rate that a borrower is willing to pay is perceived as an informational proxy for the severity of the borrowers' position. The process of credit market breakdown is illustrated below:-

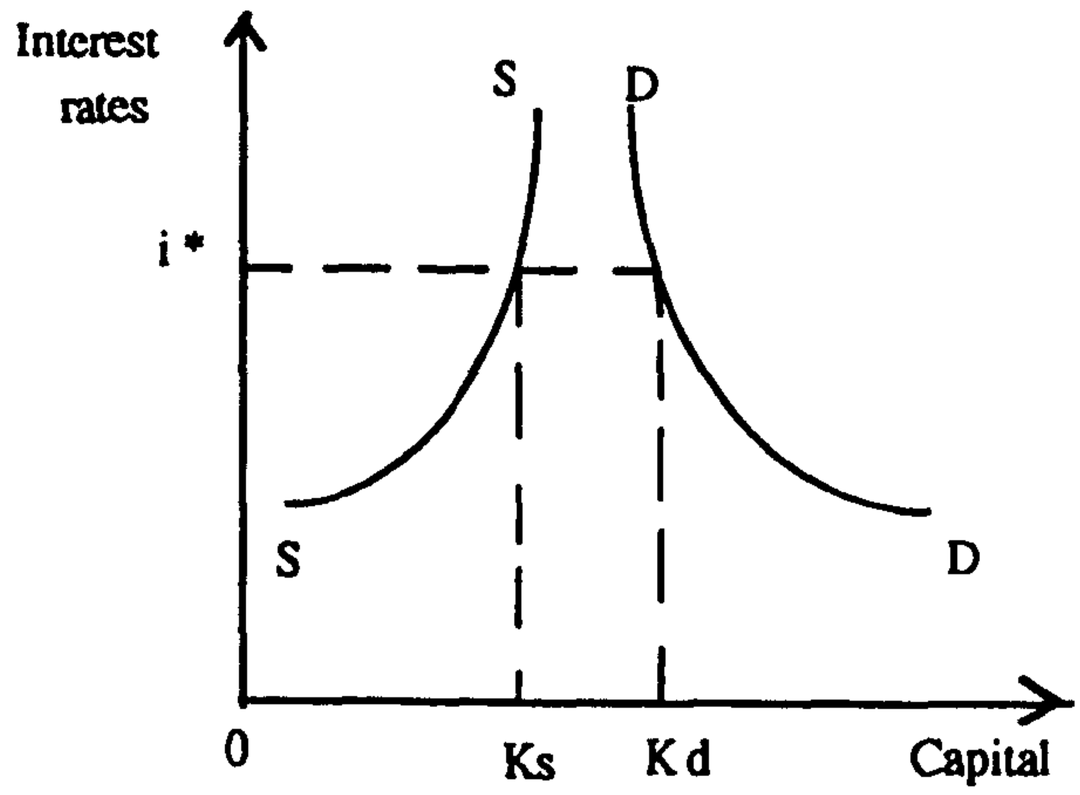
Fig 6.1a. Equilibrium Position



Source: Cline, 1986

In the figure above, the credit market is in equilibrium at the amount K_e and interest rate, i^e since supply of capital is equal to the quantity of capital demanded at below the ceiling interest rate, i^* . At interest rate i^*, supply of capital becomes totally inelastic i.e. no more than the amount of K^* will be supplied regardless of how high an interest rate a country offers. The demand curve shifts outwards when countries demand more foreign borrowings due to scarcity of foreign exchange. The supply curve may also move leftwards due to credit rationing. Thus, the credit market is now in disequilibrium as shown below:

Fig. 1b: Disequilibrium



Source: Cline, 1986

The gap *(G)* between the quantity supplied K_s and K_d and quantity demanded K_s and K_d must be dealt with in a non-market solution, eg. rescheduling. Cline notes that the demand for rescheduling is an induced demand that exists when a country is in disequilibrium. He then uses the logit model to analyse the probability of rescheduling as an outcome of demand and supply side explanatory variables.

Implicitly, we can categorise the macro-economic variables used by Cline (1984) as derived from national income accounting and from the international transactions of a country. The variables used are of two types; one that affects the demand for rescheduling and secondly, variables that affect the supply of rescheduling. The variables that influence the demand for rescheduling cause a shift in the demand curve in fig.1 outwards to the right and influence the supply of rescheduling by causing a shift in the supply curve leftwards. Either way, the probability of rescheduling is raised. The reduced form equation incorporates ratios that are common to both the supply of and demand for rescheduling. The following are explanation of the variables in the reduced form equation:

(a) the debt service ratio (dsr) affects both the demand and the supply side of rescheduling. The debt service ratio affects the demand for rescheduling by raising the probability of rescheduling when the ratio increases. Whilst the maximum probability of rescheduling is one, according to Cline (1984), the debt service ratio can exceed 100% if the interest and principal repayments on short-term debt are also included.

We found that the poorer countries of Africa rescheduled their debt even when the debt service ratio was very low. For most countries in that region the debt service ratio hardly reached 40 %. The graph above shows the probability of rescheduling is greater when the debt service ratio increases but in reality the debt service ratio can be very low, yet the country reschedules. This is true with most low income African countries. On the supply side, creditors tend to see the debt service ratio as a form of claim on the debtor's earnings. The higher the claim, the less credit-worthy is the debtor, hence the greater the likelihood of rescheduling.

(b) the reserves to imports (rsm) ratio reflects the liquidity position of a country. The higher the reserves the less the likelihood of a country to demand rescheduling because export shortfalls can be financed by reserves.

(c) Using the the absorption approach, Cline argues that the greater the growth of output (gr), the greater is the export surplus because the trade balance equals to output less absorption.

(d) the level of per capita income (Y) determines whether a country can sustain a cut in the level of consumption in times of foreign exchange scarcity. Austerity programs that cut consumption, according to Cline, will have less effect on poorer countries.

(e) the greater the ratios of the current account deficits to exports , the greater is the likelihood for the demand curve to shift further to the right, causing a disequilibrium in the credit market, hence the greater the likelihood of rescheduling.

All of the above ratios affect the demand side (except the debt service which affects both the demand and the supply side), and the ratios that follow affect the supply side.

(f) the net debt (gross debt minus reserves) to export ratio measures the debt burden of a country. The higher the ratio the greater is the likelihood of rescheduling.

(g) Higher inflation has two effects on debt; first is that the real value of debt is eroded, and second nominal interest rates will be higher. The net effect in the short run is a cash flow squeeze because of the higher interest payments. However, in the longer run period, the real long term burden of debt will be overstated because of a high nominal interest rate and rising debt service ratio (Cline, (1984)). Cline believes that bankers

view inflation as a factor improving the balance sheet because the debt burden is very much lower than what is stated.

(h) Given a certain debt service ratio, a higher amortization to debt ratio reflects two situations ; either the reduction of a country's liability will be faster relative to others or the total debt is lower relatively or both situations apply. Higher debt to amortization ratio thus means that the debtors are able to repay their debts.

The arguments above are perfectly plausible and show the need for a regional analysis to be conducted because of the wide variation in amortization rates among countries in one region and the countries of another region, for example, the higher income countries of Latin America and the lower-income countries of Africa.

(i) A country with a lower per capita income is perceived by bankers as having a greater likelihood to be in the foreign credit disequilibrium and debt rescheduling.

(j) The higher the savings to GNP ratio the more likely that a country will have a sound financial position and be less likely to reschedule However, we found that in the 1980s, savings are negligible in most of the countries under study.

(k) Higher growth rate of exports naturally reflects the ability of a country to earn foreign exchange, hence the ability to service debt.

(l) According to Cline, the abundant supply of credit in the mid 1970s helped countries in sustaining their debt servicing levels in the late 1970s. The shrinkage in the global credit supply in the early 1980s precipitated debt problems in the developing countries.

We feel there is a problem of measurement for this ratio. What Cline has taken as total net debt could be overstated because of the stock concept of total net debt. Hence, the amount will show the accumulated amount for every year and not the availability of credit supply for each year.

The variables found to be significant and of the expected signs are the debt service ratio, the reserves to imports, the amortization rate, the current account to exports, the growth rate of per capita GDP and global credit abundance. In the second model, the net debt to exports ratio is also significant. Insignificant variables are inflationary erosion of debt, savings rate and per capita income. The choice of a threshold

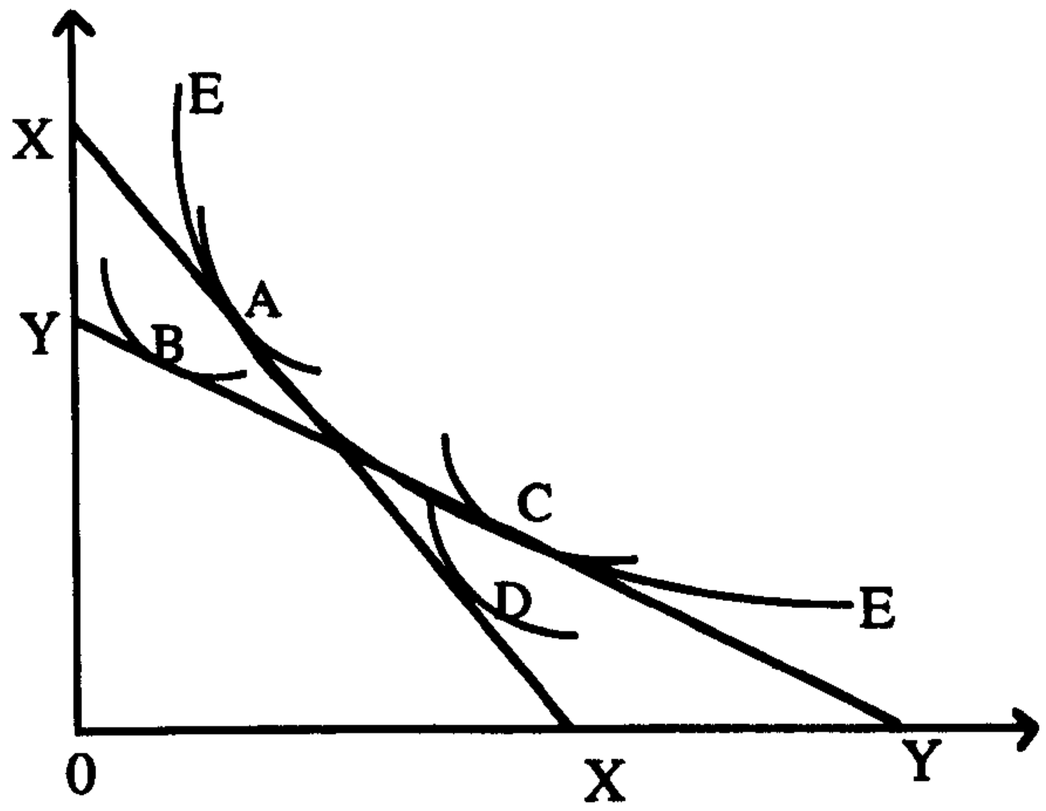
probability is P=0.14 with 12% type I error and 14% type II error. The method used is minimising the total number of errors subject to a balanced distribution of each type of error.

Cline's main contribution in the study of the probability of rescheduling is by having a theoretical framework that recognizes the behaviour of both debtors and creditors in rescheduling decisions. This is a major departure from previous studies although his theoretical framework implies only countries with excess demand for credits will demand rescheduling. However, most of the arguments for the use of the variables above justify the need to conduct a regional analysis since countries in one region seem to have somewhat similar characteristics but they differ between regions. The variables used incorporate both the demand and the supply of rescheduling. Also, a low cut-off probability threshold will favour the creditors. Countries with a predicted probability of 0.14 or less only will be given credits (refer to general comments on section 6.2.1).

A more recent study by Lloyd-Ellis, McKenzie and Thomas (1987) attempts the use of consumer theory in analysing rescheduling decisions. Debtor countries are seen as attempting to maximise their utility by obtaining a particular distribution of net cash flows through time. Utility, which is a function of cash flow in a shorter term future and a longer term future, is maximised subject to two cash flow constraints. These cash flow constraints are basically new credits minus debt service for existing debts (which are debts in period 0 and period I (or short term future)). The first cash flow constraint is a constraint for the utility function under what is termed "normal debt servicing arrangements (DSA)". Lloyd-Ellis, McKenzie and Thomas argue, that "a new possibility may have been brought to the surface because the debtor sees other countries using this method (rescheduling) of raising their short term cash flows", and thus introduces a second constraint under the rescheduling agreement. The second constraint is new loans minus existing debt service, in which the new loans are lower than in the first constraint of lower credit rating of debtors after rescheduling - as seen by bankers. The debt service in the rescheduling period (Period 1) is higher than the debt service in Period 0, i.e. the period when the demand for rescheduling started but pending negotiations.

The indifference map takes the shape as below:-

Fig.6. 2: The Indifference Map



Source: Lloyd-Ellis et.al, 1987

XX refers to the constraint under normal debt servicing arrangements (or DSA). The debtor will maximise utility at point A under normal debt servicing arrangements. YY is the constraint under the rescheduling agreement. The cash flow F_2 in period 2 here is lower than F_2 under DSA because new debts will be lower and debt service for period 1 will be higher due to perceived risks.

Since the debtor will derive greater satisfaction at point *A* than point *B*, it will choose not to reschedule and continue with normal debt servicing arrangements. Alternatively, if the indifference curves are the solid lines in the graph above, point *C* gives greater satisfaction than point *D*. The debtor will then choose to "break-off" from normal debt rescheduling agreements and reschedule its outstanding debt in period I instead. The indifference curve EE is considered to be the "critical state" whereby the debtor is indifferent between normal debt servicing arrangements and rescheduling.

The explanatory variables that explain the probability of rescheduling are chosen from a country's balance sheet because they are capable of characterizing any evolving crisis. They believe that using macro-economic variables only does not provide a comprehensive picture of a borrower country's balance sheet position. They also believe that the variables chosen from the balance sheet provide a better picture of a country's potential cash flow position than the conventional macro-economic indicators. They gave an example of having a high ratio of debt service to exports may

be perfectly acceptable if there exist current account surpluses which enable the debt service to be met. The five financial variables are:

(1) reserves to IMF quota ratio (RESQUOT (+)). The higher the ratio, the greater is the country's liquidity andhence the lower the probability of any debt restructuring.

(2) use of IMF fund credits (UFC (+)). The greater the IMF credits being utilised the greater is the cash flow difficulties because this form of credit is normally a last resort due to the conditions attached. The greater the cash flow difficulties, the greater is the probability of restructuring.

(3) undisbursed credit commitments to a country divided by total bank lending to that country. (UT (-)). A decline in this ratio would be associated with a deterioration in a country's liquidity and hence a higher probability of restructuring.

(4) short term debt to total debt ratio. This ratio signals the willingness of banks to make medium to long term commitments to a borrower country. The higher the ratio, the higher the perceived risk and hence the higher the probability that restructuring will occur.

(5) the proportion of each country's debt relative to total bank lending for the sample. (-). This variable should reflect variations in the country specific component of lending risk. The greater the share of total bank lending to a particular country, the lower the probability of restructuring. If this variable does not play any role, the situation is seen as one where variations in the systematic risk affecting all countries are dominant. That is, variations in TTT will not have a significant impact on restructuring.

In addition, Lloyd-Ellis, McKenzie and Thomas argue that, "if the number and value of reschedulings should be relatively large and/or the terms involved should be improving, countries may perceive that they need to join the band wagon". The following variables which are called the `herd variables' are used to proxy these effects: (1) the number of reschedulings (2) value of reschedulings (3) weighted average of the maturities of reschedulings (4) weighted average of the interest rates on the rescheduled debts (5) LDC debt as a proportion of Bank for International Settlement (BIS) Reporting Area assets.

Logit analysis and Type 2 Tobit involving Heckman's method and Full Information Maximum Likelihood techniques are used. Initially, a logit model which contains the set of financial variables along with four macro-economic variables which are the debt service ratio, GDP growth, export growth and the import to reserves ratio is estimated for twenty-seven largest debtor countries only. The period of estimation is 1977-1981, annually. Only four variables are significant and have the anticipated signs, of which three are the financial variables. Only short term debt is significant in explaining the quantity of rescheduling. By using the Type 2 Tobit enable them to use the probit method to determine the determinants of rescheduling along with a regression equation to determine the determinants of the quantity of rescheduling. By this result, Lloyd-Ellis, McKenzie and Thomas (1987) argue that financial variables as opposed to the macro-economic variables is proven. They then conduct a logit analysis on 59 countries covering the period from 1977 to 1985 - for semi-annual data only. The results show the significant variables which are : (1) undisbursed credit commitments divided by total bank lending (2) reserves to quota - both (1) and (2) are from the set of financial variables defined earlier. All the "herd" variables, except the weighted average of interest rate spread over LIBOR, are significant. Two variables which are not mentioned in the "a priori" expectations are also shown and are significant, one of which presumably refers to total bank borrowing relative to bank deposits. As for the results of the regression equation, the ratios of short term debt to total debt, reserves to quota and weighted average of maturity period are significant in explaining the quantity of rescheduling. With regards to the error rates, no cut-off probability is chosen on the grounds that there are "costs" attached to each type of error.

The main contributions of this study are the use of financial variables and the use of semi-annual data. The financial variables reflect the liquidity position of a country and is capable of signaling any evolving crisis. The use of semi-annual data provides robust results because of more number of observations could be included. These aspects are a major departure from previous studies. With regard to the quantity of rescheduling, this study also shows some financial variables are useful in determining the quantity of rescheduling. Another most important aspect of the study is the recognition of the cost attached to each type of error. Previous studies chose the critical threshold probability that minimizes the total error rate subject to a balanced distribution of the two types of error. By this, the cost of making type I error will be greater than the cost of making type II error. With regard to the underlying theory, it implies that debtors have free choices to rescheduling decisions , hence enabling them to reschedule whenever they feel that they could maximise their utility by having a greater cash flow. In practice

however debtors have to demand rescheduling and the final decision as to whether to reschedule or otherwise lies in the hands of the creditors through the process of negotiation (see also Cline, 1984).

6.2.1 Concluding Comments on Previous Studies

On the use of statistical techniques, the logit analysis proves to be a better tool in explaining a binary-valued dependent variable equation rather than discriminant analysis, component analysis or the probit method. The logistic distribution of the error term is very close to the cumulative normal distribution, except at the tails. The t-statistics can thus be used to determine the importance of individual explanatory variables, unlike discriminant analysis.

The results of the previous studies assume common determinants of rescheduling across countries. This is a strong assumption given the heterogeneous nature of the sample countries. As had been found out in chapter one the characteristics of debt and debt problems differ among regions. In Latin America, debt problems reached their limit and they arose because of excessive borrowings after the second oil shock. Debt contracted is mainly of floating-interest debt and obtained from the private international capital market, which are more costly than official loans. The low-income countries of Africa have debt problems because of very low export earnings although the bulk of the debt contracted is official and concessional in nature. The inability to earn foreign exchange caused these countries be unable to service their debts. Debt in the Southeast Asian region have high yen components as of mid 1980s. At least different behavioural patterns among different regions should be detected, hence some different factors are expected to affect the debt servicing capacity of different regions. Based on the differences in experience between regions, our study will go beyond the overall logit analysis by having regional logit analysis.

The periods of study by Feder and Just (1977) and Cline (1984) include lesser number of reschedulings as compared to the semi-annual data analysed by Lloyd-Ellis, McKenzie and Thomas (1987). This is especially true because the number of reschedulings are more in the 1980s decade. The semi-annual data used by the latter study is a major departure from previous studies and hence will have a greater number of observations in the sample. Their use of Tobit type 2 enabled them to determine the determinants for the quantity of rescheduling.

Whilst the three studies above rationalize their choices of variables, only Cline (1984) and Lloyd-Ellis, McKenzie and Thomas (1987) provide extensive theoretical framework as a basis for the logit analysis. On the variables used, there had been a major deviation in the studies by Lloyd-Ellis, McKenzie and Thomas (1987) from the other previous studies. The financial variables reflect the cash flow position of debtors.

With regard to the error rates, the choice of a critical probability threshold that minimizes the total error are of limited use in forecasting. One reason as had been pointed out by Lloyd-Ellis, McKenzie and Thomas (1987) is that there are costs attached to each type of error, with greater cost attached to type 1 error. Considering that type 1 error is when a country has a predicted probability lower than P* but actually defaults/reschedules, the cost associated with type 1 error should be the cost of making a bad loan. And type 2 error is where a country has a predicted probability higher than P* but does not default/reschedule, the cost associated with a type 2 error will then be the cost of not making a loan to a credit-worthy borrower. Another reason is that the threshold probability is very low, eg.Clines' has $P^*=0.14$ and this tends to favour the creditors. This means that only countries with $P^*=0.14$ or less will be granted loans and the rest will be denied of credits.

6.3 Foreign Exchange Scarcity and Rescheduling: a Theoretical Framework

The framework for analysis is based on the following sequence of prior to rescheduling (i.e. similar to Cline (1984)) : debtors normally continue to incur current account deficits, draw down reserves for the repayment of principal and interest due and run arrears when reserves are lacking and are unable to borrow enough funds to finance the deficits. This was the sequence of events in Mexico in August 1982 when it ran out of foreign exchange , announced a ninety day moratorium on repayments of principal due on its external debt, and soon the moratorium was extended into 1983. Mexico was then forced into a series of drastic remedial measure: severe devaluation, unprecedented exchange controls, nationalisation of private banks and an emergency agreement with IMF (Thorp and Whitehead,1987). The financial crisis of that year extended to the whole of the Latin American region because of the interconnection of the international banking system. Though of smaller scale, a similar sequence of events is observed in the Philippines in 1983. Against this sequence of events, the underlying theory that follows will reflect the debtors reaction to the scarcity of foreign exchange

and the creditors decision about the supply of loans and rescheduling - over time and across countries.

The ability to pay principal is a central issue in identifying the determinants of the demand for rescheduling as well as the supply of rescheduling. What determines the ability (inability) to repay debts is the availability (or scarcity) of foreign exchange. We conceptualize that the debtors demand rescheduling to overcome the scarcity of foreign exchange and to halt its outflow in order to finance its debt repayments and hence its deficit on current account which is caused by variability in external earnings. When foreign exchange shortage is acute and deficits prolonged, the debtors will declare inability to pay and apply for rescheduling which may or may not be supplied by creditors.

Against the background of foreign exchange scarcity, rational debtors upon their demand for new loans, would expect that the present value of expected future net cash inflows must be greater than or equal to zero. This means that the present value of future net cash inflows depends on the difference between the present value of disbursement (or new loans) and the borrowing requirements. We conceptualize that the Net borrowing requirements are equal to the resource gap which comprises of a) the current account deficit (which includes the interest payments), and b) the principal due on existing loans.

Niehans[3], as discussed by Lloyd-Ellis, McKenzie and Thomas (1987), hyphothesises that it is the prospect of negative transfer that triggered off the debt crisis. (Net transfer refers to new loans minus principal and interest). "If and when negative transfer appears on the horizon, the debtor will threaten to default unless some restructuring agreement is offered (Lloyd-Ellis, McKenzie and Thomas, 1987, p20). However in our analysis we argue that the debtors problems are deeper than mere anticipation of negative net transfer that leads to the threat of default. We stress the scarcity of foreign exchange a reflection of the resource gap mentioned above (i.e. the current account deficits including interest payments, the principal due, all at time t), which has to be financed by new loans - if this new loans could not finance the entire resource gap will lead to the demand for rescheduling by debtors. We attempt to formulate our view as below:

$$NPV(I) = NPV(D - B) \geq 0 \qquad (6.1)$$

This means the net present value of cash inflow *(I)* at time t must be equal to the Net present value *(NPV)* of disbursements *(D)* minus the borrowing requirements *(B)*, both at time t, which must be greater than or equal to zero . And ,

$$B = CA(-) + P \geq 0 \tag{6.2}$$

Which means the Borrowing Requirements *(B)* is equal to the Current Account Deficit *CA(-)* plus Principal due *(P)* , all at time *t* . Substituting (6.2) into (6.1) we get;

$$NPV(I) = NPV(D - CA(-) - P \geq 0 \tag{6.3}$$

If the net present value of future cash inflow is less than zero, the resource gap will not be covered and the debtors will run arrears on its debt repayments. Once debtors declare inability to pay and demand debt rescheduling, creditors will allow some form of debt relief , eg. moratoriums on principal repayments as an initial measure. However depending on the severity of the case, rescheduling is normally granted especially to avoid moratoriums on interest repayments which are more severe.

Eaton and Gersovitz (1981) argue that "if all components of the net benefit could be calculated precisely the probability of default then would be one if the net benefit was positive and zero otherwise. As one cannot hope to measure the net benefit perfectly, there is merely a positive relationship between the probability of default and the net benefit of default as actually measured." This is true, however, the cost of default is severe to debtors since they could be excluded from future borrowings. The exclusion from future borrowings is a severe form of punishment to the debtors and the cost will be inability to enter the credit market forever, confiscation of overseas assets and sanctions on international trade. On the question of the net benefit of rescheduling to the debtors, Eaton and Gersovitz (1981) argued that the net benefit is the difference between the gross benefit of rescheduling and the cost of rescheduling; each of which has an immediate or long run component. For instance export performance unexpectedly below trend in a particular year may be viewed as an immediate cause of default. But if such a performance goes on for several years, it can be viewed as a long run cause of rescheduling. Similarly, if interest payments are tied to the London Interbank Offer Rate (LIBOR) and this rate changes unexpectedly, debt service may be higher than anticipated . Thus, the debt service ratio serves as one index of the short-run benefit of rescheduling. The ratio of total debt to exports may be viewed as a

long run benefit because rescheduling merely postpones repayment without increasing the total debts (the interest cost will increase but not the principal).

Our theoretical framework thus identifies the debtor's behaviour in their demands for rescheduling to reduce foreign exchange scarcity and to overcome debt problems. It also serves to enable creditors to predetermine debtors' behaviour by examining their foreign exchange position and equating the disbursements with the amount of foreign exchange scarcity.

Previous studies that have relevance to our theoretical framework are the studies by Cline (1984) and Lloyd-Ellis, McKenzie and Thomas (1987). As had been mentioned earlier, Cline (1984) conceptualizes that there is a credit market disequilibrium whereby there exists a gap between the supply and demand of capital because lenders are unwilling to supply credits at a certain level of interest rates. In other words, credit is rationed and interest rates are used as an informational proxy for the severity of the borrowers financial position. The gap between the supply and demand of capital must be dealt with via a non-market solution such as rescheduling.

We disagree with the basic point that the interest rate is useful as an informational proxy about a debtor's financial position or more specific, their debt problems. Because markets are characterised by credit rationing, interest rates do not fully reflect all the information which is important to lenders. In particular the individual lender will have to know the total debt of the potential borrower, regardless of the interest rate offered on a loan. Otherwise the lender could not ascertain the strength of the borrowers' incentive to violate loan commitments.

Also Cline's model implies that it is the excess demand for credits that leads to the probability of rescheduling. As such, only countries with excess demand will be considered for rescheduling purposes. We argue that it is the new loans that do not match debtors foreign exchange scarcity that leads to the demand for rescheduling.

Lloyd-Ellis, McKenzie and Thomas (1987) conceptualizes that debtors have two choices - reschedule or continue to service debt under the normal debt service agreement.

Firstly, we argue that the debtors do not have a free choice but their demands for rescheduling will be considered by creditors through the process of negotiation, often

the Paris Club for public and publicly guaranteed debt. The expected utility approach above implies the debtor countries will want to reschedule in the immediate future only

Table 6.1: Rescheduling Cases

Countries	Years of Reschedulings
1. Philippines	1983,1985
2. Argentina	1982,1985
3. Bolivia	1981, 1983, 1986
4. Brazil	1983,1984,1985,1986
5. Chile	1983, 1985
6. Costa Rica	1983, 1985
7. Ecuador	1982,1983,1985
8. Mexico	1982,1983,1985,1986
9. Panama	1985
10. Peru	1980,1983, 1984
11. Uruguay	1983, 1986
12. Venezuela	1986
13. Central African Republic	1981,1983,1985
14. Cote d' Ivoire	1983,1985,1986
15. Gabon	1986
16. Liberia	1980,1981,1982,1983,1984
17. Mauritania	1985,1986
18. Morocco	1983,1985,1986
19. Niger	1983,1984,1985,1986
20. Nigeria	1983, 1986
21. Sierra Leone	1984, 1986
22. Somalia	1985, 1986
23. Sudan	1981,1983,1984,1985
24. Togo	1981,1983,1984,1985
25. Zambia	1983,1984,1985,1986

Source: Word Bank, World Debt Tables, various issues

if it increases its expected utility. We feel the unsustainable debt problems of Latin America and Africa in the 1980s forced them to demand for rescheduling; and in many cases rescheduling occurs a few times repeatedly for a few consecutive years. Finally, we felt the two cash flow constraints mentioned above equals the net transfer i.e. new loans minus debt service for existing debts. We take a slightly different approach whereby we stress the foreign exchange scarcity which is equal to new loans minus current account deficits and principal due.

Our sample size consists of 301 country-year observations covering 43 countries for the years 1980 to 1986. Out of the 301 country-year observations , 69 are rescheduling cases (22.92%). The regions covered are Africa, Latin America and Southeast Asia . Logit analysis and significance tests are used to determine the importance of the

determinants of the probability to reschedule debt in the overall 301 sample and the regional samples. Data are obtained from the World Bank-World Debt Tables 1988/89, the International Financial Statistics 1988/89 and the Balance of Payments Yearbook 1988/89. Rescheduling cases are presented in Table 6.1.

6.4 The Logit Model and the Variables Used

6.4.1. The Logit Model

Due to the shortcomings of the discriminant analysis such as violation of normality assumptions, lack of behavioural underpinnings, etc; as well as the component analysis as described earlier, logit analysis is used in this study. It overcomes the disadvantages of the other approaches, especially when the logistic distribution is almost similar to the normal distribution except at the tails, t-statistics are applicable in determining the importance of the explanatory variables. The logit model proves a better quantitative behavioural model that affords a summary measure to the examination of creditworthiness over time and across countries. The model takes the form:-

$$y^* = \beta x_i + \mu \qquad (6.1)$$

y^* is the latent variable representing the probability of default and is hypothesised to depend on particular observable characteristics of the country in question. What is observed is a dummy variable y, where,

$y = 1$ if $y^* > 0$ (i.e. reschedule)
$y = 0$ if otherwise (i.e. not reschedule)

The probability of rescheduling is therefore:

$$\Pr ob\ (y_i = 1) = \Pr ob(\mu_i > -\beta x_i)$$
$$\Pr ob\ (y_i = 1) = 1 - F(-\beta x_i) \qquad (6.2)$$

Where F is the cumulative distribution for μ_i. If the cumulative distribution is logistic, the functional form F is:-

$$F(-\beta x_i) = \frac{\exp(-\beta x_i)}{1-\exp(\beta x_i)}$$

$$F(-\beta x_i) = \frac{1}{1-\exp(\beta x_i)}$$

$$1 - F(-\beta x_i) = \frac{\exp(\beta x_i)}{1+\exp(\beta x_i)}$$

The likelihood function can be written as:-

$$L = \prod_{i=1}^{n} (\frac{1}{1+\exp(\beta x_i)})^{1-y_i} (\frac{\exp(\beta x_i)}{1+\exp(\beta x_i)})^{y_i}$$

or in logarithms;

$$L = \sum (1-y_i) \log(\frac{1}{1+\exp(\beta x_i)}) + y_i \log(\frac{\exp(\beta x_i)}{1+\exp(\beta x_i)}) \qquad (6.3)$$

The parameters β are non linear in terms of the x_i and therefore an iterative method such as that of Newton-Raphson is used to maximise L with respect to β. The standard errors are obtained from the variance-covariance matrix of β which is the inverse of Fishers information matrix:-

$$I(\beta)^{-1} = E(\frac{\partial^2 \log L}{\partial \beta \partial \beta'})^{-1}$$

As the log likelihood function for the logit model is concave, convergence is assured from any starting values to the maximum.

The estimated parameters are not straightforward to interpret. We thus calculate the effect of a change in any of the explanatory variables on the probability of rescheduling, ceteris paribus, by:-

$$\frac{\partial P_i}{\partial x_i} = \beta_i P(1-P) \qquad (6.4)$$

i.e. the marginal effects.

Thus, the effect of a percentage change in x on the percentage change in P, ceteris paribus, is given by:-

6.23

$$\frac{\frac{\partial P_i}{P_i}}{\frac{\partial x_i}{x}} = \frac{\partial P_i}{\partial x_i} * \frac{x_i}{P_I} \qquad (6.5)$$

i.e. the elasticity.

In order to obtain a parsimonious model representation of the determinants of the probability of rescheduling, insignificant variables will be dropped. Any zero restriction imposed will be tested aagainst the original model using the likelihood ratio test:

$$-2\{(\log L \text{ (no restrictions)}) - (\log L \text{ (with restrictions)})\} - x_k^2$$

where k is the number of restrictions.

6.4.2 The Variables[4]

Implicitly, we can categorise the macroeconomic variables used by Cline (1984) as derived from the national income accounting identity and from the international transactions of a country. The variables used in the reduced form equation that affects both the supply and demand for credits are: the debt service ratio *(dsr)*, reserves to import *(rsm)*, growth per capita *(g)*, per capita income *(Y)*, current account deficits to export *(cax)*, net debt to export *(dx)*, inflationary erosion of debt to export *(pD)*, amortization rate *(A)*, savings rate *(S)*, exports growth *(xg)*, and global credit abundance *(L)*.

We focus on the significant macroeconomic variables that are derived from the balance of payments and therefore reject the insignificant variables and the variables that come from the national income accounting identity (ex. savings rate). As for the amortization rate we felt that it has been captured in the debt service ratio. We will not include the global supply of lending variable because we concentrate only on country specific factors rather than on supply side factors. Also, the regression equation describes rescheduling according to the underlying theory in section 6.3 and no direction of causation has been tested.

Of these, Cline found the following variables to be significant: total debt to exports, debt service ratio, the reserves to import ratio, the current account deficit to export ratio, amortization to debt ratio and global borrowings..

Based on Lloyd-Ellis, McKenzie and Thomas (1987), we will use three of the 'herd' variables. This is because we focus only on country-specific conditions as mentioned earlier rather than the supply-side condition.

The variables hypothesised to affect the probability of rescheduling are derived from the current account, the capital account and the balance sheet . The variables derived from the current and capital accounts reflect the longer term macroeconomic problems of debtors. The financial ratios are taken from the balance sheet and reflect the shorter-term liquidity problems. By taking the following variables, debtor-country specific conditions are taken into consideration in determining their demand for rescheduling.

(a) Debt service ratio (dsr (+)). The debt service ratio is the amount of interest plus principal due divided by the export earnings of goods and services. It is expected that an increase in the debt service ratio leads to an increase in the probability of rescheduling. This ratio is included because it had been proven to be an important determinant for the probability of rescheduling by previous studies - among them are Feder and Just (1977), Frank and Cline (1971), and Cline (1984).

(b) Current account deficits divided by exports of goods and services (CAX(+)). Current account deficits are a major part of the resource gap mentioned earlier. They reflect foreign exchange scarcity. This ratio is included because of the massive current account deficits accumulated in the 1980s by the developing countries as had been discussed in chapter one. They are divided by exports because only exports can bring in foreign exchange to finance imports, interest and other services. The greater the current account deficits, the greater is the probability of rescheduling.

(c) Growth rate of export earnings (xgro(-)). An increase in export earnings raises the availability of foreign exchange to finance the resource gap. We argue along Cline's (1971) justification that this variable is important in the longer term horizon because it is necessary to counter the developments in import expenditure if imports are not stagnating. The faster the growth rate the lower is the probability of rescheduling. Feder and Just (1977) found this variable to be significant. In the 1980s, export

growth was found to be negative and if the aggregate figure is large enough, it should be significant but will have a negative sign.

(d) Total debt to export (TDX(+)). Exports are the only source of foreign exchange earnings to service debts or to finance the non-interest current account balance. If total debt takes up a substantial proportion of export earnings, the likelihood of rescheduling will be greater. Unlike Cline's study which takes net debt rather than total debt , we believe total debt is more appropriate because the total debt will proxy information about to the strength of the borrower's incentive to service debt.

(e) Reserves to IMF quota (resquot) (-). Reserves are the most liquid form of a country's asset. The higher the ratio the lower is the probability of rescheduling because a country will still be perceived as liquid. By including this ratio, we will be able to know the role of IMF quota on reserves in ensuring liquidity and deterring rescheduling.

(f) Reserves to imports (RESM) (-). This ratio reflects import cover whereby the tradition is to use reserves to finance imports when foreign exchange is scarce. Although the critical ratio varies, banks have perceived three months import cover as indicative of a country being fairly liquid. The greater the ratio in this case, the more sizable is international liquidity and hence the lesser the likelihood of rescheduling. However, the accumulation of reserves may also be a result of the availability of external borrowings. This was especially true before 1981. If this is the case, it can also raise the probability of rescheduling because of greater debt accumulation.

(g) Use of IMF credits divided by IMF quota (UFC) (+). The use of IMF credits is normally a last resort form of financing deficits due to the conditionality attached. Borrowing larger sums relative to quota means submitting to higher conditionality, which requires the country to design a specific programme to reduce the deficits as agreed by the IMF. Such usage signals greater debt servicing difficulties, hence the greater the likelihood of rescheduling. In the 1980s, the use of IMF credits soared in all regions. However, Lloyd-Ellis, McKenzie and Thomas(1987) do not find it significant presumably because of the period of study that included the period between 1977-1981 when the usage was very low might have cancelled the effect for the period from mid-1981 to 1987.

(h) Short-term debt divided by total debt (ST) ($\pm$). Short term debt is defined as debt that has an original maturity of one year or less. When a country faces the resource gap problem, short term debts become highly demanded. The growth of short term lending was rapid in the late 1970s and this helps precipitate rescheduling (Dale and Mattione, 1983). Short-term debt can cause debt servicing problems because of bunching of maturities when countries borrow more short-term debt to repay interest and principal due. After 1982, short-term debts were not being rolled over in many countries and this lead to an increase in the probability of rescheduling. The sign can either be positive or negative.

6.5 The Results

In what follows are presented various results estimated for the overall sample, the African region, the Latin American region and the Southeast Asian region. Then a comparison among the regional results will be presented followed by a discussion on the comparison with the results of the previous studies. The tables for each of the results show the significance level of the variables, the marginal effects (i.e. the effect of increasing variable x by one unit on the average probability of rescheduling, ceteris paribus), the elasticity (i.e. the effect of a percentage point increase of variable x on the average probability of rescheduling), the overall significance test and the critical probability threshold which by the conventional method is $P^*=0.5$. It implies if the predicted probability is greater than or equal to 0.5 , rescheduling should be predicted. Since this conventional approach results in an extremely unbalanced distribution of errors because of the small percentage of occurrences of rescheduling relative to total sample size, the critical probability threshold that minimizes the error is preferred and discussed.

6.5.1 Results For The Overall Sample

The estimated results broadly confirm the *a 'priori'* expectations set in sub-section 6.3. Table 6.2 presents the results for both the unrestricted and restricted models. Unrestricted means all the variables hypothesised to affect the probability of rescheduling are included in the logit equation. Restricted means all significant variables from the unrestricted results will be included in the final logit equation.

Table 6.2: Logit Estimation on the Probability of Rescheduling for the Overall Sample, for the years 1980 to 1986.

	Unrestricted Model			Resrticted Model		
Variables	β estimates	Marginal effects	Elasticity effects	β estimates	Marginal effects	Elasticity effects
Constant	-2.7892			2.7579		
resquot	-0.1936**	-0.0342	-0.7760	-0.1835**	-0.0324	-0.7348
	(0.1302)			(0.1224)		
CAX	2.2689***	0.4008	0.5365	2.2311***	0.3942	0.5276
	(0.5722)			(0.5674)		
ufc	0.0070***	0.0012	0.6225	0.0075***	0.0013	0.6744
	(0.017)			(0.0017)		
dsr	0.0163	0.0029	0.2079	-	-	-
	(0.0180)					
TDX	0.0040***	0.0007	0.8069	0.0043***	0.0008	0.9223
	(0.0013)			(0.0012)		
ST	-3.2634*	-0.5765	-0.3662	-2.9430*	-0.5199	-0.3303
	(2.3443)			(2.2617)		
RESM	0.0420**	0.0073	0.4602	0.0447**	0.0079	0.4981
	(0.0213)			(2.1561)		
xgro	-0.4541	-0.0802	-0.0148	-	-	-
	(-0.7278)					

Number of observations = 301 Rescheduling cases = 69

Log of likelihood function	-114.173	-114.909
Log of likelihood function (β =0)	-162.044	-162.044
Likelihood ratio test	95.742	94.27
% correct predictions	81.73	81.40
Pseudo- R^2	0.3066	0.3029
$\bar{P}$	0.2292	0.2292

Type 1 and Type 2 errors

		p<0.5	p≥0.5
y	0	214/232	18/232
		= 92.24	= 7.76
	1	33/69	36/69
		= 47.82	= 52.17

		p<0.5	p≥0.5
y	0	212/232	20/232
		= 91.38	= 8.62
	1	34/69	35/69
		= 49.28	= 50.72

The reserves to quota ratio has the correct sign and is significant at the 97.5% level of confidence. The elasticity value is relatively high and ranked second highest among other variables, in which a percentage increase in it will lead to a 0.7% decrease in the average probability of rescheduling (see table 6.3).

Table 6.3: Ranking of the Elasticity *(E)* of Significant Variables According to Samples

Overall sample		Africa		Latin America		Latin America		ASEAN	
Var.	*E*	Var	*E*	Var	*E*	Var	*E*	Var	*E*
TDX***	0.92	*TDX****	0.67	*Dsr****	1.17	*TDX****	1.88	*Dsr***	0.08
resquot**	-0.73	*ufc****	0.56	*ST**	-0.92	*ST***	-1.16	ufc*	0.02
ufc***	0.67	*resquot***	-0.54	*ufc****	0.79	*CAX****	-0.82		
CAX***	0.53	*CAX****	-0.49	*RESM**	0.56	*ufc***	0.66		
RESM**	0.49	*RESM***	0.47	*CAX***	-0.52				
ST*	-0.33								

Note:
*** Significant at the 99 % level of confidence
** Significant at the 97.5 % level of confidence
* Significant at the 90 % level of confidence

The current account deficits to exports ratio has the correct sign and is highly significant at the 99% level in both the restricted and unrestricted model. An increase in this ratio will increase the probability of rescheduling. The elasticity value ranked fourth amongst other variables. The use of fund credits over IMF quota also has the correct sign and is significant at the 99% level of confidence in both models. The use of IMF credits was highly resorted to by Latin America after 1981 when private credits were rationed, and by Africa since 1980. Table 6.4 shows the use of IMF credits by continent.

Table 6.4: Use of the IMF Credits by Continents (US$ mns)

Continents	1980	1981	1982	1983	1984	1985	1986
Latin America	1.31	1.55	2.94	8.80	11.51	14.5	16.3
Africa	1.97	3.42	3.99	5.09	5.26	6.01	6.35
East Asia	1.73	3.71	3.63	4.04	3.82	3.78	4.51
Europe	2.60	3.36	4.36	5.53	5.83	5.59	4.47
TOTAL	7.611	2.04	14.92	23.46	26.42	29.88	31.63

Source: World Debt Tables 1988/89.

The elasticity value ranked third, i.e. a percentage increase in the variable will lead to a 0.67% increase in the average probability of rescheduling.

The debt service ratio is not significant. As had been pointed by Gibson and Thirlwall (1989), the reasons for this are: a) the vast bulk of the African countries' borrowings are official on concessional terms, hence the interest rates are subsidised and the maturity is longer and, b) the debt service ratio is calculated based on interest and amortization payments actually paid out in a particular year as opposed to debt service payments falling due in that year, which causes the ratio to be understated especially in the case when a country is having debt servicing problems. However, the second case applies to all countries and therefore it should not affect the direction of our analysis.

The total debt to exports ratio has the correct sign and is significant at the 99% level of confidence in both models. It has the highest elasticity value (E =0.92%). As had been mentioned elsewhere earlier, the total debt is important to ascertain the borrowers' incentive to repay. The short term debt to total debt ratio is significant at the 90% level and has a negative sign. There are reasons for this. Dale and Mattione (1983) point out that the rapid growth in the volume of short-term lending since the mid 1970s until the first half of 1982 helped precipitate rescheduling in many countries. For example, short term loans to Mexico increased sharply from US$ 8.3 bn in 1977 to some US$ 32 bn in mid 1982. This exacerbated Mexico's funding problems and helped in causing default. Mexico's default led to doubts about the ability of the Latin American borrowers to meet their obligations. Bankers' behaviour in the second half of 1982 was not to roll-over short-term loans. In other words, short-term loans were being rationed. The World Bank estimates shows the decreasing trend in short term loans to developing countries plus a rescheduling of an amount of US$ 45 bn short term to long term debt between 1983 to 1986 (World Bank, World Debt Tables 1987/88). It may then be argued tentatively that the estimated result picks up the trend from 1982 onwards. The consequence of short-term debt not being rolled-over in many countries after the second half of 1982 leads to a decrease in their volume which will then cause an increase in the probability to reschedule, hence the negative sign.

The reserves to import ratio is significant at the 97.5% level of confidence and has a positive sign. It can be conjectured that; 1) some countries raise their reserves through external borrowings (BIS Report,1988 and Eaton and Gersovitz (1981)), hence increasing their credit-worthiness to obtain more loans and, 2) the import component of the ratio had decreased sharply due to some countries undergoing adjustments on

imports (BIS Report,1988) thus causing the reserves to import ratio to be larger. The BIS report also state that the size of debt at the end of late 1970s, although it does not measure the extent to which increases in countries' foreign exchange reserves during the preceding years had resulted from external borrowing. Both debt and the holding of international reserves represent part of a country's overall portfolio allocation decision. Eaton and Gersovitz (1981) state that an increase in debt is initially reflected in an increase in reserves which are drawn-down later. Therefore, reserves and debt decisions will be related to the same group of country characteristics. The export growth variable has the correct sign but is not significant.

To measure the overall statistical performance of the model, concentration will be on the likelihood ratio test and the percentage correct predictions. With regards to the overall statistical performance of the model for the overall sample, it shows a very good performance indeed as indicated by the high percentage of correct predictions which is 81%. The likelihood ratio test is another indicator for the overall significance , which is above 94 in this model and is well above the value required to indicate overall significance at the 1% level which approximates 17.

Using the conventional approach to indicate the performance of the model in predicting the occurrence and absence of rescheduling, at a critical probability threshold (P*) = 0.5, the model correctly explains about 92% non-rescheduling cases and above 47% rescheduling cases. Using the alternative approach of minimising the error subject to a relatively balanced distribution of errors and focusing on minimum possible type 1 error , the choice of P* is at 0.3 . At P* = 0.3 , the model correctly explains about 85% of non-rescheduling cases and above 81% of rescheduling cases. This means that only countries with P* < 0.3 will be granted loans and the rest will be denied credits.

6.5.1.1 Conclusions on The Overall Result.

The overall results show a combination of the macroeconomic variables and the financial variables are important in determining the determinants of the probability of rescheduling . We have seen that three of the macroeconomic variables which are; the total debt to export ratio , the reserves to import ratio and the current account deficits to exports ratio, (which is in line with Cline's (1984) study); and three of the financial variables which are; the reserves to quota ratio, the short-term debt to total debt ratio (which are in line with Lloyd-Ellis, McKenzie and Thomas's study), and the use of IMF credits over its quota as significant determinants of the probability of rescheduling.

Our result thus shows the importance of the scarcity of foreign exchange as shown by the macroeconomic variables and the cash flow position shown by the financial variables are important in rescheduling decisions.

6.5.2 Results For The African Region

Broadly speaking, the results for the African region (refer to table 6.5) reflect the overall results in terms of the variables that are significant .The reserves to quota ratio has the correct sign and is significant at the 97.5% level of confidence. The current account deficits to exports ratio is highly significant at the 99% level.

The use of IMF credit to quota is significant at the 99% level of confidence. Because the African countries can qualify for only a very limited amount of finance from commercial banks based on perceived credit ratings, they are led to seek credit from the IMF at an earlier stage, that is since 1979/1980. Latin American countries sought this type of credit after 1981. Similar to the overall result , the elasticity ranked second.

The debt service ratio has the opposite sign and is not significant, the insignificance is presumably due to the concessional nature of the vast bulk of loans contracted and simultaneous financing by official creditors taking place.

The total debt to exports ratio is significant at the 99% level of confidence. This variable has the highest elasticity amongst other variables in the region, hence indicating its importance in affecting rescheduling decisions. Short term debt to total debt is not significant which indicates the non-access of the region to short term debt in the private capital market. Where countries have access to short term debt in the private market such as Gambia, Nigeria and Somalia , the short term debts had been restructered to a longer term debt with concessional terms in 1986 for the first two countries and in 1985 for the third country (see World Debt Tables, 1988/89).

The reserves to import ratio has a positive sign and is significant at the 97.5% level of confidence. The curtailing of imports which has taken effect since 1980 caused the increase in the ratio.

The results show a good overall statistical significance with a percentage correct prediction of about 79% and a likelihood ratio test of 39 which is significant at the 1%

Table 6.5: Logit Estimation for the Probability of Rescheduling for the African Region, from 1980 to 1986.

Unrestricted Model				Restricted Model		
Variables	β estimates	Marginal effects	Elasticity effects	β estimates	Marginal effects	Elasticity effects
Constant	-2.2187			2.2876--		
resquot	-0.4027**	-0.0785	-0.5500	-0.3953**	-0.0771	-0.5402
	(0.2351)			(0.2144)		
CAX	1.8892***	0.3682	-0.4896	1.8819***	0.3668	-0.4877
	(0.7211)			(0.7247)		
ufc	0.0054***	0.001 1	0.5601	0.0055'***	0.001 1	0.5601
	(0.0021)			(0.0019)		
dsr	-0.0007	-0.0001	-0.0052	-	-	-
	(0.0286)					
TDX	0.0031***	0.0006	0.6724	0.0031***	0.0006	0.6724
	(0.0014)			(0.0013)		
ST	-0.3212	-0.0626	-0.0252	-	-	-
	(4.8784)					
RESM	0.0680**	0.0133	0.4871	0.0664**	0.0129	0.4725
	(0.0338)			(0.0324)		
xgro	-0.7069	-0.1378	-0.0162	-	-	-
	(0.8786)					

Number of observations = 147 Rescheduling cases = 39

Log of likelihood function	-65.270	-65.625
Log of likelihood function (β=0)	-85.044	-85.044
Likelihood ratio test	39.548	38.838
% correct predictions	78.91	79.59
Pseudo-R^2	0.2438	0.2452
$\bar{P}$	0.2653	0.2653

Type 1 and Type 2 errors

		p<0.5	p≥0.5			p<0.5	p≥0.5
y	0	96/108	12/108	y	0	100/108	8/108
		= 88.89	= 11.11			= 92.59	= 7.41
	1	20/39	19/39		1	22/39	17/39
		= 51.28	= 48.72			= 56.41	= 43.59

level . As to the predictive capability of the model, using the conventional approach at P* = 0.5, the model correctly explains above 89% of non-rescheduling cases and above 49% of rescheduling cases. By the alternative approach of error minimization, P* is at 0.3 which results in the model correctly explaining 79% of non-rescheduling cases and 82% of rescheduling cases.

In conclusion, the ratios of current account deficits to exports, total debt to exports and the use of fund credits play important roles in determining the probability of rescheduling in this region. The effect of falling export earnings raised the first two ratios just mentioned. This is suggestive of a need for reappraisal of export policies in this region, especially a call for stabilisation of export prices of primary commodities by importing industrial countries is needed urgently. Although debt is mostly official and on concessional terms for this region, the significance and elasticity value for total debt to exports indicates that it contributed the most to the probability of rescheduling. This means bilateral and multilateral debts from official creditors do not ease debt problems in this region at all. Unless part of the total debt and IMF credits are written-off - the debt problems, smoothing of consumption and export earnings could hardly have improved.

6.5.3 Results For The Latin American Region

In the case of the Latin American region we present two models: one includes the total debt to exports ratio (model 1) the other the debt service ratio (model 2). The reason for this is the high correlation between these two variables (the correlation coefficient is 0.628). Tables 6.6a and 6.6b show the results for the Latin American region. Taking the variables one at a time indicates that both are important determinants of the probability of rescheduling. Based on theory, the debt service ratio increases rapidly with the amount of increase in total debts. This is empirically proven for this region before 1982 (Lever and Huhne,1985) but part of the increase in the debt service ratio was also due to the increase in interest rates in 1978 to 1982. Although the increase was slower after 1982, the region had reached the limit of its debt servicing capacity in the early 1980s as shwon in the tables in chapter 2.

Table 6.6b: Results of the Restricted Model; With and Without Debt Service Ratio; for the Latin American Region

	Unrestricted Model			Restricted Model		
Variables	β estimates	Marginal effects	Elasticity effects	β estimates	Marginal effects	Elasticity effects
Constant	3.4644	-	-	3.2139	-	-
resquot	-	-	-	-	-	-
CAX	2.3257***	0.4079	-0.5209	3.6276***	0.6363	-0.8126
	(0.8585)			(1.1353)		
ufc	0.0096***	0.0017	0.7984	0.0078**	0.0014	0.6586
	(0.0037)			(0.0040)		
dsr	0.0706***	0.0124	1.1739	-	-	-
	(0.0305)					
TDX	-	-	-	0.0093***	0.0016	1.88
	-			(0.0027)		
ST	-6.7303*	-1.1806	-0.9209	-8.4861**	-1.4886	-
	(4.4296)			(4.8540)		
RESM	0.0359*	0.0063	0.5609	-	-	-1.16
	(0.0208)					
xgro	-	-	-	-	-	-

Number of observations = 119 Rescheduling cases = 27

Log of likelihood function	-40.58	-38.84
Log of likelihood function (β=0)	-63.723	-63.723
Likelihood ratio test	46.286	49.766
% correct predictions	85.71	84.03
Pseudo R^2	0.3730	0.3906
$\bar{P}$	0.2269	0.2269

Type 1 and Type 2 errors

		p<0.5	p≥0.5
y	0	85/92	7/92
		= 92.4	= 7.6
	1	10/27	17/27
		= 37.03	= 62.96

		p<0.5	p≥0.5
y	0	85/92	7/92
		= 92.39	= 7.76
	1	10/27	17/27
		= 37.04	= 62.96

The results of the two models are presented in tables 6.6a and 6.6b. We discuss first the model which includes the debt service ratio followed by the model including the total debt to exports ratio.

6.5.3.1 Results For Model 1

The results show the reserve to quota ratio is not a significant determinant. The fact is that reserves had been drained in the period under study to compensate the financing of the debt problems in the region. The current account deficits to exports ratio and the use of IMF credit over it's quota are significant at the 99% level of confidence. Before 1980 the use of IMF credits was negligible but increased sharply after 1980. Table 6.7 below illustrates three countries in the region that had exceeded their quota from 1983 onwards. The elasticity value is higher than the overall sample or the African region and ranked third.

Table 6.7: Use of IMF credits over IMF quota (mns of SDR's)

Countries	1980-1981	1982	1983	1984	1985	1986
Argentina	0/803	0/803	1121/1113	1121/1113	2105/1113	2241/1113
Brazil	0/998	499/998	2526/1461	4270/1461	4205/1461	3680/1461
Mexico	0/803	201/803	1204/1166	2408/1166	2703/1166	3319/1166

Source: International Financial Statistics, 1988/89

The debt service ratio is highly significant at the 99% level of confidence and has the correct sign. The elasticity value is highest among all other variables. This implies any policy decision to reduce the probability to reschedule should have a main focus on this variable. Also the individual components (see for example Gibbon and Thirwall, (1989)) of this ratio should be carefully examined in order to bring effective changes in the probability of rescheduling. In their study, the debt service ratio is disaggregated into five components namely the effects of: (i) a change in the volume of debt, (ii) a change in the rate of interest, (iii) a change in the rate of amortization, (iv) a change in the volume of exports and, (v) a change in the price of exports. Their findings show that there is an increase in the debt service ratio by 7.6 percentage points in the developing countries taken as a group in the period 1980 to 1985. This increase had been contributed by the increase in the debt volume itself and the falling export

earnings. Interest and amortisation rates had decreased and without their decrease would have increased the debt service ratio by 8.7 percentage points. In the Latin American region, the growth of debt increased the debt service ratio by 15.9 percentage points, however the joint effect of falling interest rates (by 2.4 percentage points), amortisation rates (by 9.5 percentage points), and increasing export earnings (by 2.0 percentage points) caused the debt service ratio to increase by 4.7 percentage points altogether. As such a measure to decrease the debt service ratio so as to deter rescheduling should focus on the growth of debt itself in the period under study. As a comparison, the debt service ratio in Africa increased by 8 percentage points . This is due to the contribution of 5.8 percentage points from the debt volume, 1 percentage point from the increasing amortization rate, 3.1 percentage points from falling export earnings and a reduction by 0.7 percentage points from falling interest rates. They, too deduced that the increase in the debt service ratio in the Southeast Asian region (the most among other regions) is largely due to the growth of the debt volume itself. The World Debt Tables 1987/88 indicate that the growth in the debt volume is partly contributed by exchange rate factors because of an increasing amount of yen credit contracted as of 1985 onwards, hence raising the dollar value of the reported total debt.

The short- term debt to total debt has a negative sign and is significant at the 90% level of confidence. The explanation of the negative sign in the overall region exactly applies here, that is, as of 1982 onwards, short-term debts were rationed and whilst at the same time there was a restructuring of short-term debt to longer-term debts thus short-term debt to total debt was falling as a result of the rescheduling process.

The reserve to import ratio has a positive sign and is significant at the 90% level of confidence. The explanation in the overall sample also applies here; i.e. an increase in reserves financed by external borrowing when external borrowing was still available and a simultaneous decrease in imports; gave a higher reserve to import ratio. The export growth variable is not significant.

The model has high overall statistical significance with a percentage correct prediction of about 87% and the likelihood ratio test shows significance at the 1 % level. As to the predictive power of the model, at a threshold probability $P^* = 0.5$, the model correctly explain 96% of non-rescheduling cases and 67% of rescheduling cases. By the alternative method of error minimization subject to a balanced distribution of errors, $P^* = 0.3$ explains 87% of non-rescheduling cases and 85% of rescheduling cases correctly.

6.5.3.2 The Results For Model 2

With the inclusion of the total debt to exports ratio and excluding the debt service ratio, the following differences are noted:-

1) the reserves to quota ratio is not significant

2) the current account deficits to exports remain significant at the 99% level of confidence. The elasticity value increases from -0.52 to -0.81 and is now ranked third.

3) the use of IMF credits over its quota decreases in significance from the 99% level to the 97.5% level.

4) the total debt to exports ratio is highly significant at the 99% level of confidence. The elasticity ranks first.

5)the short term debt improves in significance from 90% to 97.5 % level of confidence and its elasticity ranks second.

6) the reserve to import and exports growth variables are not significant.

The overall statistical significance is also very high with a percentage correct predictions of 84% and the likelihood ratio test shows significance at the 1% level. At P* = 0.5, the model correctly explains 89% of non-rescheduling cases and 59% of rescheduling cases. By the alternative approach of error minimization, P* = 0.3 where the model explains 90% of non-rescheduling cases and 78% rescheduling cases.

Having presented both the models for this region, the higher percentage correct predictions and the lesser amount of type 1 error in model 1 led us to choose model 1 as a better model. It is also theory consistent in which the debt service ratio is more important in this region in determining the probability of rescheduling. This is because (as mentioned earlier) the debt service payments rise not only together with the amount of debt but also with the rate of interest.

In conclusion, there is a crucial need for this region to reduce current account deficits and total debts by curtailing imports by debtors, reducing interest rates by creditors and export price stabilization by the industrialised countries, especially on commodities to reduce the probability of rescheduling. Common to both the African and the Latin American regions is the use of IMF credits which increased sharply in the 1980 decade signalling debt problems. The greater use of IMF credits by both regions also implies that all other sources of financing foreign exchange scarcity vis-a-vis debt problems had been depleted and private financial capitals had been rationed

Short-term debt played an important role in affecting the probability of rescheduling in the Latin American region. The danger with this form of financing is there is a tendency for bunching of maturities when repayment falling due coincide with repayment for the longer term debts, and earnings could not be generated fast enough to repay.

An examination of the ratios that are significant in this region suggest that all forms of financing either by export earnings or by capital inflows had been exhausted.

6.5.4 Results for the ASEAN Region

The sample size of this region is smaller (i.e. 35 country-year observations), hence most of the variables are insignificant. Therefore, the unrestricted model consists of the debt service ratio, current account deficits to exports and use of IMF credits over its quota as explanatory variables. Table 6.8 shows the results for the Southeast Asian region.

Out of the three variables above, the debt service ratio is a significant determinant of the probability of rescheduling. It is significant at 97.5% level of confidence. The highest debt service ratios are from the Philippines, Malaysia and Indonesia (World Debt Tables 1988/89). The use of IMF credit is also a significant determinant (at the 90% level).

Unlike the Latin American and the African regions whose debt has very high dollar components, the debt contracted by the Southeast Asian region has a very high yen component. Whilst the Latin American countries experience relatively little from exchange factors as compared to interest rate factors, the Southeast Asian countries experienced increases of 8% to 10% in the dollar value of their debt because of appreciation of the yen and other major currencies. One can deduce that the increase in the debt service ratio in the Latin American region is partly due to the increase in interest rates that are tied to LIBOR, but the increase in the Southeast Asian region is the effect of exchange factor because the interest component of the ratio does not move with the movements of LIBOR.

Table 6.8: Results of the Unrestricted and Restricted Model for the ASEAN Region

Unrestricted Model				Restricted Model		
Variables	β estimates	Marginal effects	Elasticity effects	β estimates	Marginal effects	Elasticity effects
Constant	-10.1348	-	-	-7.4440	-	-
dsr	0.2536**	0.0136	0.0834	0.2506**	0.0135	0.0832
	(0.2483)			(0.1638)		
CAX	0.2824	0.1521	0.0045	-	-	-
	(3.7273)					
ufc	0.0189***	0.0010	0.0163	0.0205**	0.0011	0.0179
	(0.0169)			(0.0142)		

Number of observations = 35 Rescheduling cases = 2

Log of likelihood function	-5.44	-5.73
Log of likelihood function (β=O)	-8.66	-8.66
Likelihood ratio test		
% correct predictions	94.27	94.28
Pseudo R^2	0.1181	0.1819
$\bar{P}$	0.057	0.0571

Type 1 and Type 2 errors

		p<0.5	p≥0.5
y	0	33/33	0/33
		= 100%	= 0%
	1	1/2	1/2
		= 50%	= 50%

		p<0.5	p≥0.5
y	0	31/33	2/33
		= 93.9	= 6.1
	1	1/2	1/2
		= 50%	= 50%

6.6 Comparisons Among the Regional Results

The debt service ratio is most important in the Latin American region and the elasticity value is highest among all regions indicating debts contracted are from international private markets and the vast bulk have floating interest rates. This naturally calls for a reduction in the debt service ratio. Rescheduling, while it does reduce the immediate debt burden as measured by the debt service ratio, will only postpone the debt problems or debt repayments to the future generation. It will also cause a reduction in a debtor's credit rating and affects their future participation in the credit market, especially when the perceived risks increase due to past rescheduling causes the spreads over LIBOR of future borrowings to increase. Therefore, the individual components of the ratio as mentioned elsewhere earlier should be dealt with. The ratio is significant in the ASEAN region because debts are also contracted from the international private markets, and an increasing amount has been from the yen credit market especially as of 1985 onwards (World Bank, World Debt Tables, 1987/88). However, the elasticity value is not that significant. This reflects the effects of higher export earnings. The debt service ratio is not significant in the African region because debts contracted are mostly from official sources and are concessional in nature. It is the total debt to exports ratio that is most significant in this region whereby exports earnings are too low to sustain the amount of debt obtained.

Short term debt to total debt is significant and has a relatively very high elasticity value in the Latin American region but not significant in the other regions. Bankers rolled-over short term debt prior to 1982 to the Latin American region and this is mostly used to service existing debt. The African region is simply not eligible to borrow short term debt from private sources.

The ratio of reserves to quota is significant in the African region because quotas are very low for this region , hence raising the ratio itself. It is not significant in the Latin American region because the quota for that region is very high and reserves had been drained out in the period under-study.

6.7 Comparison With Previous Studies

Table 6.9 in Appendix 2 shows the summary of all the previous studies of debt rescheduling using logit analysis, including our studies for the basis of comparison. On our overall results, the macro-economic variables that are significant are in line with

Cline's study. The three ratios that are highly significant are also highly significant in Cline's study. They are the current account deficit to exports ratio, the reserves to import ratio and the total debt to exports ratio. In another model of Cline's study it is the debt service ratio instead of the net debt to exports ratio that is highly significant, in which we found this as highly significant in the Latin American and the ASEAN region but not in the overall region. The fact that it is significant in Cline's overall result could be due to differences in the period under-study, especially in the late 1970s and the early 1980s when debt service ratios mounted in every region. Also, it is not significant in our overall result because of a trade-off effect from the African region whose debt service ratio does not play a part in determining the probability of rescheduling. Pertaining to the reserves to import ratio, similar to our study, Feder and Just (1977) also found it to be highly significant. This shows that increases in reserves are important to increase a country's liquidity regardless of whether the increase is due to external borrowings. If reserves are increased by borrowing this will lead to increased indebtedness, although it will allow a country to use up the reserves in times of financial deterioration. The other macroeconomic variable used in this study which is not significant is the growth of export earnings. Feder and Just found this variable to be significant during his period of study. It is not significant here presumably because export growth is negligible in the 1980s but there had been a great increase in export growth in the 1960s and the period before the second oil shock.

On the financial variables, all three that are included are significant. Reserves to quota and short-term debt are significant determinants which is in line with Lloyd-Ellis, McKenzie and Thomas's study. In addition, the use of IMF credits over its quota is also significant. Although there could be an endogeneity problem here in the sense that the use of IMF credits may be an effect of rescheduling rather than a cause of rescheduling. However, the use of IMF credits over its quota still shows the liquidity position of a country and if a country exceeds it's quota, even if the quota is small, it is still an indicator of its liquidity position.

6.8 Conclusions and Policy Implications

Table 6.10 below summarizes the significance level of the determinants of the probability of rescheduling according to different samples. The table also shows the common ratios that are significant in all samples or in most of the samples.

We can conclude that the most common determinants are the current account deficit to export and the use of fund credits to its quota, next comes total debt to exports. The rest of the variables vary in importance according to regions. This finding confirms the hypotheses that the heterogeneity of experiences and debt problems among regions will result in different determinants being significant in different regions. From the table, we can also see that some common ratios which are significant in the overall sample are not significant in the African region (eg. short-term to total debt ratio) or the Latin American region (eg. reserves to quota). By taking one overall sample size only, previous studies (Cline (1984), Feder and Just (1977), and Lloyd-Ellis, McKenzie and Thomas (1987)) had assumed common determinants of rescheduling across countries. This is a strong assumption given the heterogeneous nature of the sample countries.

Table 6.10: Summary of Significant Variables by Samples

Significant	Overall	Africa	Latin Amer.(1)	Latin Amer.(2)	SEAsia
At 99% level	+CAX	+CAX	+CAX	+CAX	.
	+UFC	+UFC	+UFC	+TDX	.
"	+TDX	+TDX	+DSr	.	.
At 97.5% level	-resquot	-resquot	.	+UFC	+DSr
"	+RESM	+RESM	.	-st	.
At *90%* level	-st	.	-st	.	+I~FC
"	.	.	+RESM	.	.

The elasticity analysis could at least signal which variables have the highest influence on the probability of rescheduling, and by how much they should be increased or decreased to lower the probability.

By going through rescheduling, a case by case approach is ensured for countries experiencing debt problems. The Latin American countries will benefit most from rescheduling at the times when they were experiencing debt crisis. The average change in the debt service ratio for rescheduling countries of Latin America over the period 1982-85 was -7.5 percentage points (Gibson and Thirlwall,1989, page 19). The fall was attributed to reductions in interest and amortization rates as well as improvements in export earnings. However, rescheduling will jeopardize their future applications for borrowings in the private capital market because of a lower perceived credit rating. As for the African countries, rescheduling does not ease their debt problems or their

overall financial problems because continuous flow of funds are needed for the economic growth and only write-offs of existing debt will ease the debt problems. The debt service ratio for example, had an average change of only -0.4 percentage points mainly because the African countries gain less from the fall in interest rate. The nature of debt contracted in the region is official on concessional terms. Continuous official funding from bilateral and multilateral sources are needed for development in general. As for the ASEAN region, funding for development are largely from the yen capital market in the 1980s, hence, countries should seek to borrow optimally by following closely the Japanese prime movements rather than LIBOR.

The nature of the debt problems in the 1980s had been captured by the inclusion of both variables from the balance of payments and the financial variables which had been affected by internal and external shocks during that period. One therefore, could not conclude which of the two types of variables are more relevant because both are as important depending on individual cases. This reflects its liquidity position before or after rescheduling.

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1 Lloyd-Ellis, McKenzie and Thomas (1987) did conduct a study including the two types of variables in an annual sample for twenty-seven largest debtors only from 1977 to 1981. The purpose is to prove their hypothesis that the financial variables are more important determinants of the probability to reschedule. They found only one out of four of the macroeconomic variables as significant but had an opposite sign, and three out of the five financial variables as significant (refer also to Literature Review Section). Taking still other previous studies by Cline (1984) and Feder and Just (1977) who showed that macroeconomic variables are important determinants, we believe there is some significance in the macro-economic variables in the wake of the 1980s debt problems.

2 On all ratios mentioned from now onwards, the expected signs will be shown at the side of the variables

3 Niehans,J, "International Debt With Unenforceable Claims", 1985

4 There is no collinearity between variables and choice of variables are according to correlation coefficient, where variables correlate, a systematic elimination of insignificant variables at the 10% level of confidence in the regression equation are dropped. All variables tested are all the variables used by all previous studies discussed.

CHAPTER 7: THE LINKAGE BETWEEN EXCHANGE RATE AND DEBT SERVICE

7.1. Introduction[1]

During the deepening of the financial crisis in the international environment in the 1980s, an important concern of the ASEAN countries, was what policy variable to target in the attempt to avoid falling into financial strains. The choice of target in the ASEAN countries was often the current account balance. However, the ASEAN countries did not adopt the monetarist policy of a gradual expansion of money supply at a preannounced rate, seeking a balanced budget and letting the exchange rate float freely, thus relying on the market to determine whether and how much the balance of payments should go into surplus or deficit (Bank Negara Malaysia, Annual Report, 1988). The current account balance measures the degree to which a country borrows from or lends to the rest of the world. It also measures the extent to which savings exceed domestic investment. It becomes necessary to judge the sustainable and optimal capital flows to which the current account should be adjusted.

However, the theory of optimal level of foreign borrowing or lending is not well developed. Eichengreen and Portes (1986) argue that there is no .."accepted body of economic doctrine that can bring together in a comprehensive and systematic way the numerous forces - including actual and expected foreign exchange rate and interest rate differentials - that can serve as a response to overcoming financial strains". In the absence of the 'so-called' integrated body of guiding doctrine, Eichengreen and Portes establish three distinguishing features (shown in Figure 1) which interact with each other, which they believe are capable of causing a generalised financial crisis. Of these three features, the role of the exchange rate in causing the disturbances proves to be significant.

According to Fig. 7.1, the linkages between debt default and bank failures, between exchange market disturbances and debt defaults, and between exchange market disturbances and bank failures give rise to a generalised financial crisis. Eichengreen and Portes suggest that there are two sets of factors involved in the propagation of a crisis: asset-market linkages, running from debt defaults and exchange market disturbances to the stability of the banking system; and the role of economic policy in blocking these linkages and thereby insulating the banking system and the macro-economy from threats to their stability. It is largely towards this issue - the linkages

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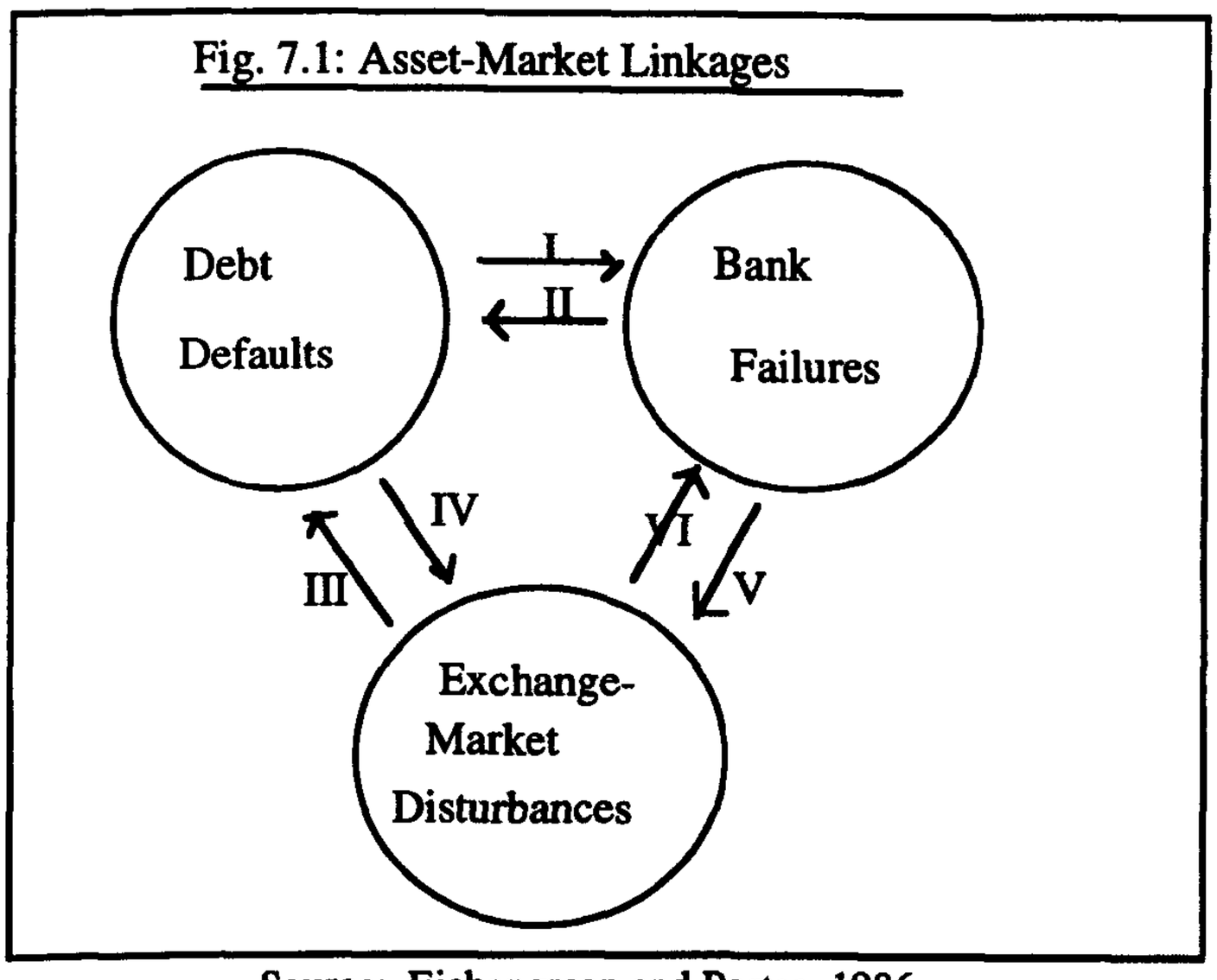
1 Parts of this chapter has been published in Latifah and Ariff, (1992).

which run from debt service or debt default to exchange market disturbances which can cause instability in the financial system - that this chapter is directed.

Fig. 7.1: Asset-Market Linkages



Source: Eichengreen and Portes, 1986.

Most available studies of the developing countries deal with the issue of what exchange rate regimes to adopt (eg. Black (1976)). One study on the ASEAN exchange rates focuses on trade issues (P.Rana (1981)). None, however, link the issue of exchange rate to debt service.

This chapter analyses the movements of effective (import-weighted) exchange rates in each of the ASEAN countries and the linkages of such movements with the countries' debt service. We concern ourselves with the issue of whether exchange rates can be used as a response to overcome debt servicing difficulties. Section 2 outlines some approaches to exchange rates. Section 3 outlines the exchange rate regimes and responses of the ASEAN countries to the evolution of the international monetary system. A distinction is made between the officially announced and the actual exchange rate regimes. In section 4, the trend and short-term variability of effective (import-weighted) exchange rates of the five ASEAN countries are presented. Section 5 estimates the import demand as well as the export demand and supply functions for ASEAN countries. Finally, the effects of exchange rate changes on the value of exports are determined as a principle of balance of payments adjustment.

7.2. Conceptual Issues on Exchange Rates

The main concern in this section is trying to find out the association between exchange rate and debt or debt service. We briefly examine the different exchange rate regimes and identify its connection with exchange market disturbances. With regards to the linkage between the exchange market and debt, we review the only study that shows such linkage which has relevance to our study - the study by Eichengreen and Portes, (1986).

The breakdown of the par value system of exchange rates under the Bretton Woods system in 1971 brought hope that order could be restored by allowing all exchange rates to float freely (Black 1973). The prices of the goods which are traded among countries are supposed to coalesce into a form of purchasing power parity, resulting in reasonably stable exchange rates. Purchasing power parity is the earliest view on the determination of exchange rate, it stresses that exchange rate is equals to some domestic (P) price level to a comparable foreign price (P^*) level, given by:

$$S = \frac{P}{P^*} \tag{7.1}$$

where, S is the spot price of a unit of foreign exchange (MacDonald, 1990). PPP only considered traded goods. However, enormous financial flows among currencies may respond to causes other than the trade balances that are primarily responsive to the price comparisons embodied in purchasing power parities.

Currencies were free to shift, and the free movement of exchange rates inhibits a source of instability in the foreign exchange markets due to speculative activities. This leads to the pure theory of floating as unacceptable. Yet the par value system did not work - not only because purchasing power parities had diverged as economic performance and inflation rates varied widely among countries, but also because the overlay of capital flows created new uncertainties. As a consequence, limited floating or managed floating has constantly been under experimentation. Meanwhile, attention has also been revived to the earlier "free floating" school - the doctrine of monetarism.

The monetarist approach argues that domestic monetary expansion aligned with the expected growth rate over a period of years ensures comparative stability in average domestic prices. Stable prices provide a basis for developing stability in the exchange rates amongst currencies of similarly "monetarised" countries. That is, with money supply growth closely related to average growth in productivity, individual prices

changes will only fluctuate around a steady norm, and purchasing power parities among monetarised countries will support a relatively stable condition among their exchange rates.

A steady, gradual increase in money supply, the objective of monetarism, will result in the monetary authorities being indifferent to any fluctuations in interest rates. Yet such rates may swing over a wide range due to the rise in the money supply. The consequences are flowing of funds into high-rate currency and out of others, thereby creating further conditions of instability in the foreign exchange markets. The currency attracting funds will tend to become overvalued in relation to its purchasing power parity with other currencies. The currencies whose interest rates are relatively unattractive will be sold, and then will become undervalued. As a result, a distortion will be introduced into the domestic economies of each as imports are stimulated by the overvalued currency, and exports, by the undervalued currency.

7.2.1. Exchange Rate as a Policy Variable

The adjustment of balance of payments can be achieved by combining two types of measures. Firstly, there is the expenditure-switching policy which includes adjustments in import protection, export subsidies and the valuation of the currency. This is designed to switch demand from domestic to foreign sources of supply. Secondly, there is the expenditure-increasing/decreasing policy which includes monetary and fiscal policies, as well as policies that directly target savings and investment. Another policy variable used to adjust the current account balance is exchange rate protection. Holding down the exchange rate favours the production of traded goods at the expense of non-traded goods, which involves restraining domestic expenditure (consumption or investment) from a given national income.

If an exchange rate is to play a role the desired band of currency appreciation or depreciation should be defined. There are two approaches to determine the desired amount of appreciation or depreciation. One is to depreciate (appreciate) the real effective exchange rate over a preceding period, then determine how much to appreciate (depreciate). The base period at the time the exchange rate appears to be in equilibrium should be chosen. The alternative approach requires the comparison of the desired and the actual current account balance. The degree of appreciation (depreciation) needed depends on the amount that brings about the desired changes in the expected current account balance. This requires information on the current account surplus (deficit),

export elasticities and import elasticities with respect to the change in the exchange rate. We use the second approach later in this study.

Fluctuating exchange rates introduce exchange rate risks in investing and trading transactions and have an adverse effect on trade and capital flows. Exchange rate risks can be avoided in several different ways (such as forward markets and other hedging opportunities), but such facilities are not generally, though increasingly, available in developing countries. Currency blocs formation in response to generalized floating causes trade diverting bias. Floating exchange rates among developed countries induce increases in the cost of capital to developing countries because lenders will demand higher risk premiums to lend abroad to cover the greater exchange rate risk. Flexible exchange rates permit developed countries to pursue more independent interest rate policies, this might mean greater uncertainty for developing country's borrowing in international markets. With regard to reserves, fluctuations in the exchange rates can cause fluctuations in the value of reserves. There is a need to diversify the reserve portfolio to minimize losses.

The link between exchange rate and debt is implied in the study by Eichengreen and Portes (1986) in that the linkages between the three distinguishing factors mentioned earlier results in the international financial crisis of the 1930s which has similarities with the situation in the 1980s. In his review of the international financial crisis of the 1930s, he identifies three factors which increased the international financial system's susceptibility to destabilizing shocks: flux in the foreign exchange market; rapid institutional change in the banking system; and dramatic shifts in the volume and direction of international lending. These have relevance to the recent developments.

In principle, borrowing countries could have chosen to default on their external debts while defending the gold standard in the 1930s, to let their exchange rate go while maintaining debt service or to default and depreciate simultaneously. Sacrificing exchange rate and honouring debt was seen as a pragmatic approach because default automatically precluded additional foreign borrowing, while depreciation has less impact on credit-worthiness. It was even suggested that in so far as depreciation stimulated exports, it might facilitate foreign bond flotations. Nevertheless, policy makers themselves saw depreciation as a threat to national credit. The situation in the 1980s are of similar context in terms of rescheduling although international reserves could not be defended. Ariff (1991) argues that apart from stimulating exports, depreciation could also increase debt burden in domestic currency terms.

In Eichengreen's et.al review of the international financial environment in the 1980s, he points out that the environment begins with the breakdown of the Bretton Woods payments settlement and exchange rate systems in the 1970s. The major events in this period brought deep structural change closely analogous to that of the 1920s, in the exchange rate system, in international lending and in financial institutions.

Eichengreen et.al argue that the currency convertibility and the international institutions established at Bretton Woods seem to have survived in the guise, and gave the example of the European Monetary System (EMS) with its exchange rate mechanism which provides for a 'zone of (relative) monetary stability' among most of the EC currencies. Even outside the exchange market intervention in the EMS, the major currencies have not floated freely since 1973. Exchange rates have been regarded as important indicators or even targets for monetary policy, leading to intervention, whether sterilized or unsterilized. With regard to this Eichengreen et.al pose the question as to whether, by the end of the 1970s, the resulting exchange rate system was well suited to absorb major macro-economic and financial shocks, or whether the system propagated or even magnified such disorders, which might then be transmitted to the capital markets and the financial system (linkages 3 and 5).

Since debt servicing capacity depends on trade flows, there is an indirect link from the exchange-market disturbances of the past decade to debt defaults (linkage III). Yet this differs from the link Eichengreen et.al identified in the earlier period, in which convertibility crises and the threat of exchange control induce withdrawals of short-term funds, which in turn can lead to default. In his view, exchange rate misalignments do not appear to have threatened the banking systems in either creditor or debtor countries (linkage V). But exchange rate uncertainty and volatility may have increased the importance of this link by offering banks new opportunities for speculation. Some have participated aggressively in these markets (often seeking to build up earnings depleted by bad loans). Some have not been successful.

A more important example of linkage III can be found in the developing debtor countries themselves. In several cases, exchange rate over-valuation has led to massive capital flights by domestic residents, seriously exacerbating debt servicing difficulties. Insofar as over-valuation is a direct result of government policy, exchange market intervention rather than post 1973 exchange rate flexibility is the cause of the problem.

On balance, Eichengreen et.al tend to agree with the view that flexible exchange rates have serve more as a shock absorber than as a source of destabilizing influences in the financial system or as a link in their transmission. The misalignments which this

flexibility has permitted, by removing a constraint on monetary and fiscal policies, have not themselves provoked financial crises or exacerbated financial instability, whatever their negative effects on trade and investment. It is in fact the process of correcting the misalignments without the appropriate coordination of macro policy mixes which may be highly destabilizing. There is a further indirect linkage from exchange market disturbances to debt servicing difficulties which was a major threat in the 1980s: exchange rate misalignments have resulted in pressure for protectionist trade policies, which impede the ability of debtor countries to earn the export surpluses they require.

In the 1930s, debt default did not generally force down a debtor's exchange rate. On the contrary, debt service burden had that effect even to non-defaulting countries in the 1980s. Pressures from the government budget and the need to run current account surpluses both work in this direction insofar as depreciation relieves the financial burden of supporting an overvalued exchange rate while raising net exports.

7.3. Exchange Rate Regimes of ASEAN Countries

March 1973 marked the adoption of floating exchange rates by major countries. The official and actual exchange rate regime of ASEAN countries seems to differ. The International Monetary Fund classification of exchange rate regimes is based on the reported policy of individual countries, but the actual regime being followed is often different. This is because some currencies that are officially floating are often managed in order to stabilize the rate, and conversely, some currencies that are officially pegged are frequently adjusted. Hence, in evaluating exchange rate policies, inconsistencies in official and actual regimes need be taken into account.

The official exchange rate regimes of four of the five ASEAN countries, with the exception of the Philippines, pegged their currencies to a major currency within the prescribed margin of 1% during the Bretton Woods period of fixed but adjustable exchange rates. Indonesia and Thailand pegged their currencies to the U.S. dollar, while Malaysia and Singapore pegged theirs to the pound sterling. Only the Philippines allowed its currency to float during the era of the par value system. The Philippines peso was first floated in November 1965, but was pegged to the U.S. dollar in 1967. Because of severe balance of payments problems, however, the peso has been allowed to float again since February 1970.

By August 1971, the par value system showed signs of breaking down when some major currencies were allowed to float. The system was reinstated, however, after the Smithsonian Agreement in December 1971, only to collapse shortly thereafter. During this unsettled period in the international monetary system, the only countries in ASEAN which changed their exchange regimes were Malaysia and Singapore. Both decided not to follow the floating of the pound sterling in June 1972, and instead adopted gold pegging, with the U.S. dollar as the intervention currency (Rana, 1981).

Attempts to revive the par value system failed, and finally in March 1973 major currencies started to float again. This time the floating system seemed likely to be permanent. In response to this, other countries began to seek suitable exchange rate policies. Of the five ASEAN countries, four (excluding the Philippines) have changed their regimes during the present system of generalized floating. Malaysia and Singapore floated their currencies from June 1973, and in September 1975 pegged them to an unclassified undisclosed basket of currencies within certain margins. Indonesia and Thailand followed the same course in November 1978. The Philippines has expressed its desire to peg the peso to a basket, but this proposal has not been pursued in the 1980s.

To determine the actual exchange rate regimes adopted by the ASEAN countries, Rana (1981) uses the following rule; the regime is classified as managed floating if fluctuations of greater than a margin of 2.25% in the monthly dollar rates are observed with some frequency. Otherwise, the regime is classified as US dollar pegging. Pegging to a basket presents a problem of classification due to difficulties in detecting whether exchange rate fluctuations are due to weight adjustments or to changes in the values of currencies composing the basket. Therefore, the rule above is also used to determine the actual exchange regimes of basket peggers.

Rana's result of this exercise noted several differences between official and actual regimes can be noted: a) Indonesia and Thailand have continued to peg their currencies to the US dollar even after the declared change of policy in November 1978; b) The Philippines has discontinued floating and has again pegged its currency to the US dollar since July 1975; and c) Malaysia and Singapore have continued their policy of managed floating which was adopted in June 1973 in spite of their official change in policy.

Indonesia adopted a managed-float exchange rate regime since 1978. Its exchange rate index is trade-weighted average exchange rate for a basket of currencies from Indonesia's major trading partners (including Japanese yen and US dollar).

Singapore, since 1980s, chose to target the nominal exchange rates rather than the interest rates or the growth of money supply. This is due to the objective of ensuring price stability and exchange rate is seen as an important anti-inflationary instrument. Though managed float, the currency seems to follow the movements of the U.S. dollar very closely (GATT Trade Policy Review, 1991: Singapore).

There are no exchange controls in ASEAN but the Central Banks retain responsibility for exchange control matters (Bank Negara Malaysia, Annual Report, 1991). The ASEAN countries have a more integrated market than the pegger. However, the market for Malaysia and Thailand is not as integrated as the average floater. The implications on exchange rate regimes are that Singapore can expect a floating rate to be stable, at least in the short run, while other ASEAN countries may be able to tolerate relatively more flexible exchange rates than the average pegger. However, independent floating may still not be feasible for them.

7.4. Exchange Rate Variability and the Movements of Debt Service Ratio

The ASEAN countries have experienced increased variability in their effective exchange rates, both nominal and real, since the advent of generalized floating. The variability has had some adverse effects on the trade flows of the ASEAN countries (Rana, 1981). This suggests that an exchange rate regime which would minimize the effects of third-country exchange rate fluctuations and other random external disturbances on the domestic market should be adopted. The increase in variability could heighten the region's susceptibility to debt servicing difficulties, especially if it impedes the flow of trade since debt is serviced mainly from trade earnings.

In our analysis of the variability of the effective exchange rate, we focus on the effective (trade weighted) exchange rates. To account for the offsetting relationship between prices and exchange rates, a distinction is made between nominal and real effective exchange rates.

The multilateral measures of exchange rate changes give an average change of a country's exchange rate against all countries. They are calculated by weighing changes in the exchange rate of a foreign country and the home country (relative to a base period) by weights that reflect the importance of the foreign country to the home country. Since the import-weighted exchange rates provide the closest approximation to effective exchange rates in the developing countries (P.Rana (1981)), an import

weighted exchange rate is used in this study. Also, Black (1976) has shown that the import-weighted exchange rate in small open economies approximates to the multilateral exchange rate model (MERM - developed by IMF) and suggests effects on trade balance.

We use the equation below to calculate the nominal effective (import-weighted) exchange rate (NER) of country i :

$$NER_i = \frac{\sum (m_{ij} / m_i) * r_j}{r_i} \qquad (7.2)$$

where,

r_{ij} = the price of the US dollar in terms of country i's or j's currency relative to 1980 (base year).

$\frac{m_{ij}}{m_i}$ =value of country i's imports from country j as a proportion of country i's total imports.

We calculate the index of real effective exchange rate (RER) using:

$$RER_i = \sum \frac{(m_{ij} / m_i) * (r_j / P_j)}{(r_i / P_i)} \qquad (7.3)$$

where,

P_{ij} =is the wholesale price index (WPI) in local currency for country i or j relative to base year 1980.

An analysis of the movements of the effective exchange rate in the 1970s by Rana (1981) shows instability in the nominal effective exchange rate in Indonesia and the Philippines, mainly due to devaluations undertaken. Comparing April 1973 and October 1979 shows that the Indonesian rupiah, the Philippine peso, and the Thai baht had effectively depreciated by 38.5%, 13.5% and 3.7% respectively, while the Malaysian ringgit and the Singapore dollar had effectively appreciated by 10% and 8.1% (Rana, 1981). The loss of competitiveness due to the appreciating currencies of Malaysia and Singapore was, however, offset by low domestic rates of inflation. The

Indonesian rupiah and the Philippine peso are the most unstable currencies in the ASEAN. They have effectively depreciated substantially in the 1970s. Gains in competitiveness brought about by the depreciations have been more than offset by the rapid domestic inflation rates in these countries, hence causing balance of payments problems. For example, although the peso depreciated by 35% in the 1970s it had effectively appreciated by 42%.

Table 7.1: Nominal and Effective Exchange Rates of ASEAN

Year	Malaysia		S.Korea		Singapore		Thailand	
	N	R	N	R	N	R	N	R
1974	119.6	163.1	165.8	97.1	108.4	121.8	113.5	112.2
1975	108.3	135.8	138.8	92.3	108.3	106.4	111.2	103.2
1976	86 7	99	126.7	89.3	94.6	89.9	103.9	91.3
1977	89 7	97.5	133.6	95.7	98.9	90	104.7	90.9
1978	108.1	115.9	160.4	122.8	109.9	94.8	124	109.8
1979	87.8	90	153.3	131.1	101.7	93.9	109.3	100
1980	100	100	100	100	100	100	100	100
1981	121.6	124 .1	92.3	103.9	93.2	90.2	93.4	98.3
1982	123.5	126.9	76.7	87.8	87.5	77.2	88.1	92.9
1983	111.9	116.3	75.3	86.9	90.1	74.7	87.7	94.3
1984	99.5	104.4	76.1	87.8	90.4	72 1	85.5	89.9
1985	90.9	92.9	70.6	80.9	91.9	69.2	68.9	72.7
1986	114.3	116.2	93.9	112	120.5	77.7	95.9	102.3
1987	113.9	116.3	111	135.5	131.3	90.4	148.6	162
1988	115.0				84.8			
1989	115.4				90			
1990					96.5			

Year	Philippines		Indonesia	
	N	R	N	R
1974	100.8	88.6	124.9	82.1
1975	99.3	82.0	122.9	87.2
1976	99.4	83.1	115.4	90.7
1977	99.3	84.4	110.5	88.4
1978	113.2	96.5	123.6	100.4
1979	106.9	99.9	82.2	76.0
1980	100	100	100	100
1981	100.3	105.1	82.9	86.9
1982	100.7	110.6	77.4	84.9
1983	118.8	139.2	52.1	62.0
1984	179.5	302.7	42.1	64.0
1985	96.5	396.2	51.3	54.6
1986	240.7	531.5	49.5	71.1
1987	268.9	563.5		74.8
1988	237.5			
1989	237.6			
1990				

Source: Calculated Using equations 7.2 and 7.3

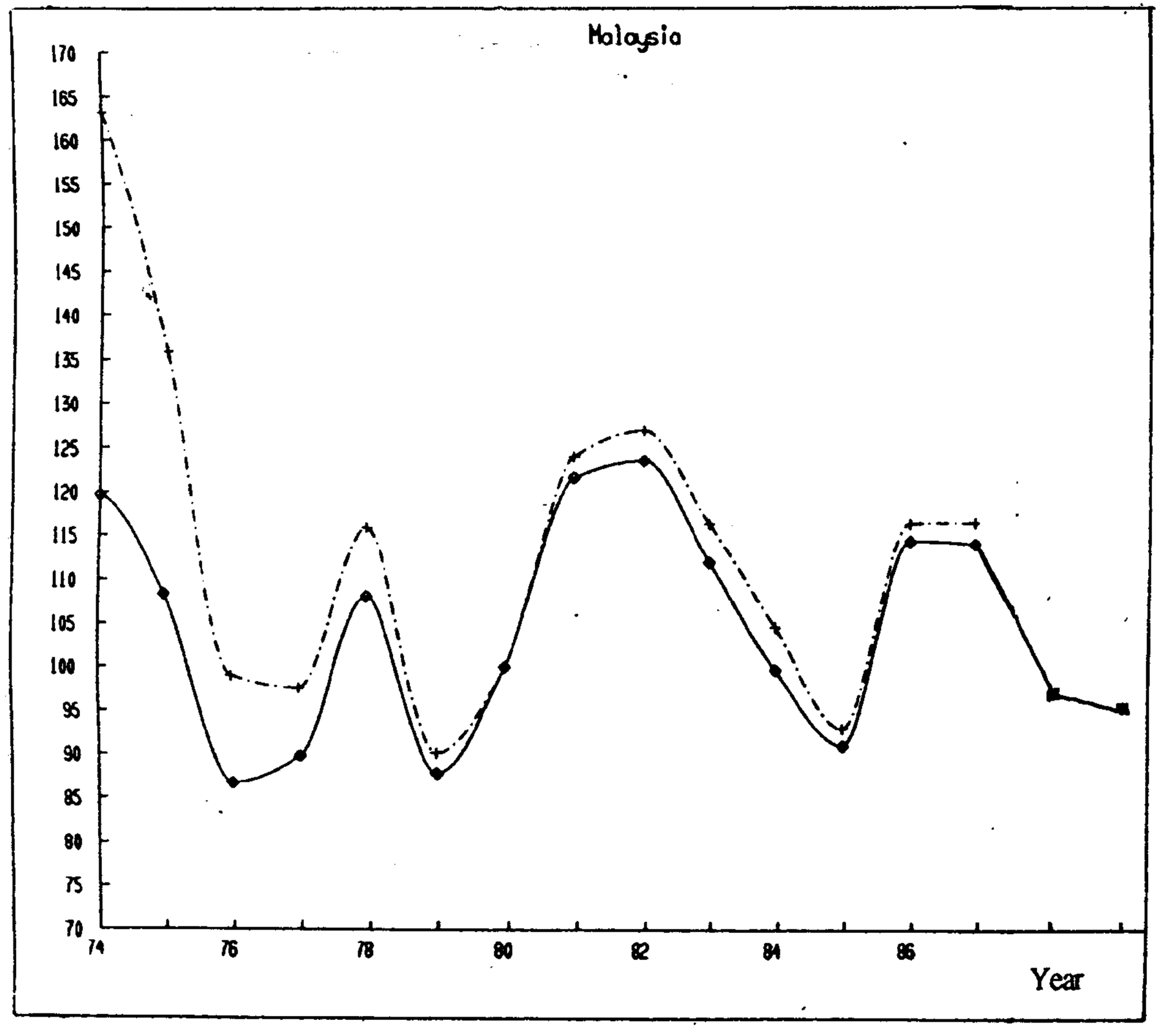
Rana (1981) measures the quarterly changes of the exchange rate by using the scale measures for Paretian distribution and the Gini's mean difference. The findings indicate exchange rate variability increased substantially during the generalized floating period (1973 to the present) in all ASEAN countries, as compared to the pegged period (1967-71).

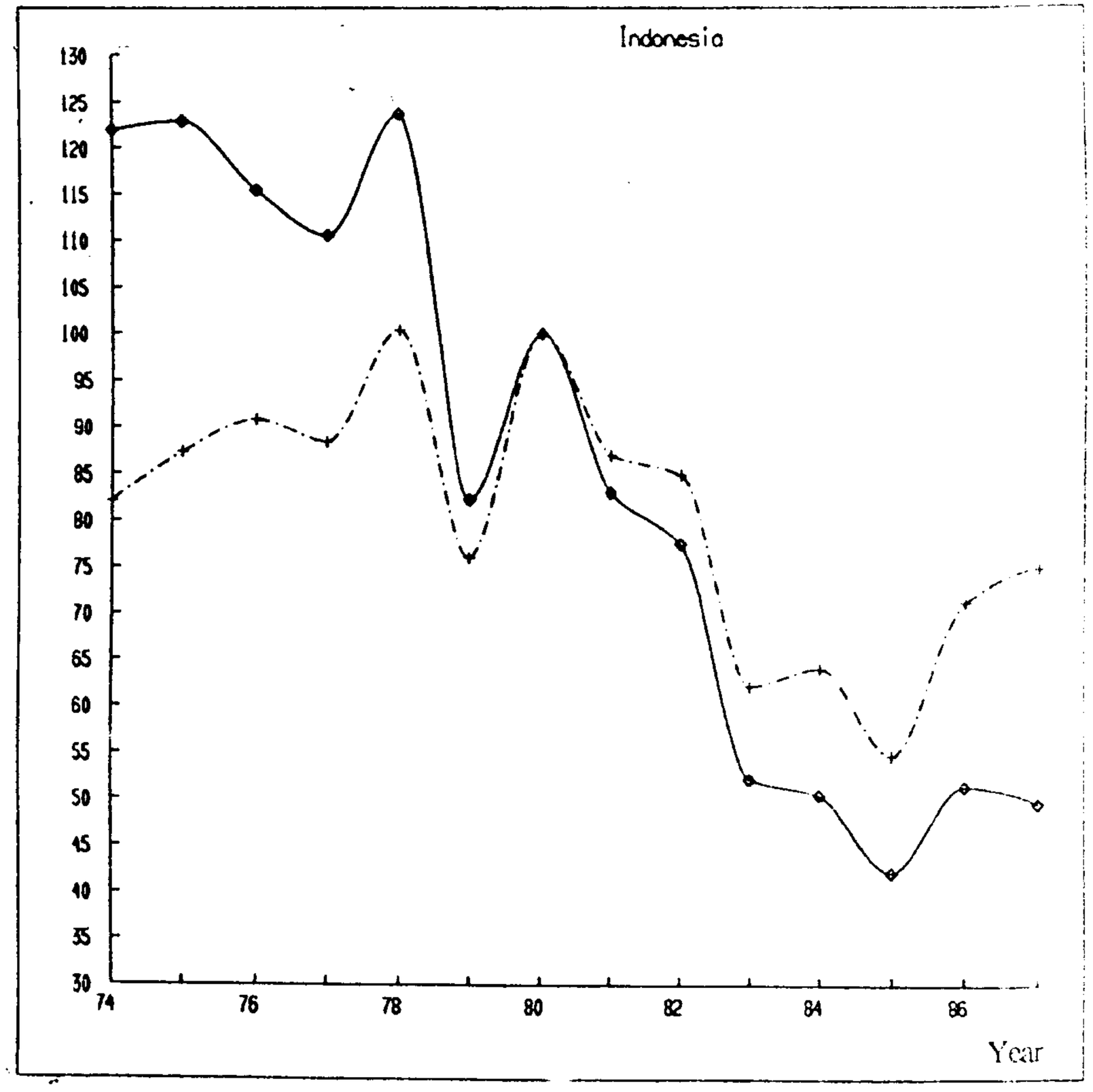
Our analysis of the movements of the effective exchange rate of the ASEAN countries in the 1980s is shown in Table 7.1, and on graphs in Figs 7.2. We also present the plots of debt service ratio (Figs. 7.3) for the purpose of detecting any linkages between the movements of exchange rates and the movements of debt service ratio. We establish a hypothetical situation whereby the effect of appreciating exchange rates, ceteris paribus, causes the debt service ratio to rise, while the rise in the debt service ratio in turn forces down the effective exchange rate, i.e. a vicious circle develop between the movements of the effective exchange rate and the debt service ratio.

The graphs in Figures 7.2 show a distinctive trend in the effective exchange rates in the 1980s in all of the ASEAN countries - their currencies appreciated in 1985 and depreciated to the lowest point in 1986-87 (except for Malaysia and Indonesia). The debt service ratio started to rise in 1984 reaching its peak in 1985 and remaining high from then on. The simultaneous movement of the debt service ratio and the exchange rate in 1985 was possibly due to the effect of the appreciating exchange rate in 1985 itself which affected trade earnings hence reducing the ability to service debt and thus leading to an accumulation of debt service in the subsequent years. This is especially true in the case of the Philippines. Another reason may have been the particularly strong dollar currency in 1985 may have raised the debt service of all debtors. The effect of the deteriorating bilateral exchange rate with the U.S. dollar forced the debt service ratio to rise and the vicious circle we had hypothesised developed as rising debt service ratio forced down the effective exchange rates of the ASEAN countries in the following years (1986-87).

From the graphs, the details of the movements of the effective exchange rates for each individual countries can be seen. Wide variations in the effective exchange rate of the Philippines and that of Thailand is observed. Comparing the figures between 1982 and 1987 the currencies for the Philippines and Thailand depreciated effectively by about 170% and 70% respectively. The debt service ratio of both countries during the period between 1982 and 1987 also show drastic increases. Between that period the debt service ratio increased by 9% in the Philippines and 10% in Thailand. Although the increase did not cause a problem to Thailand it did to the Philippines because it had already been trapped in debt problems in the early 1980s and had experienced financial

Fiq.7.2: Nominal and Real Effective Exchange Rates





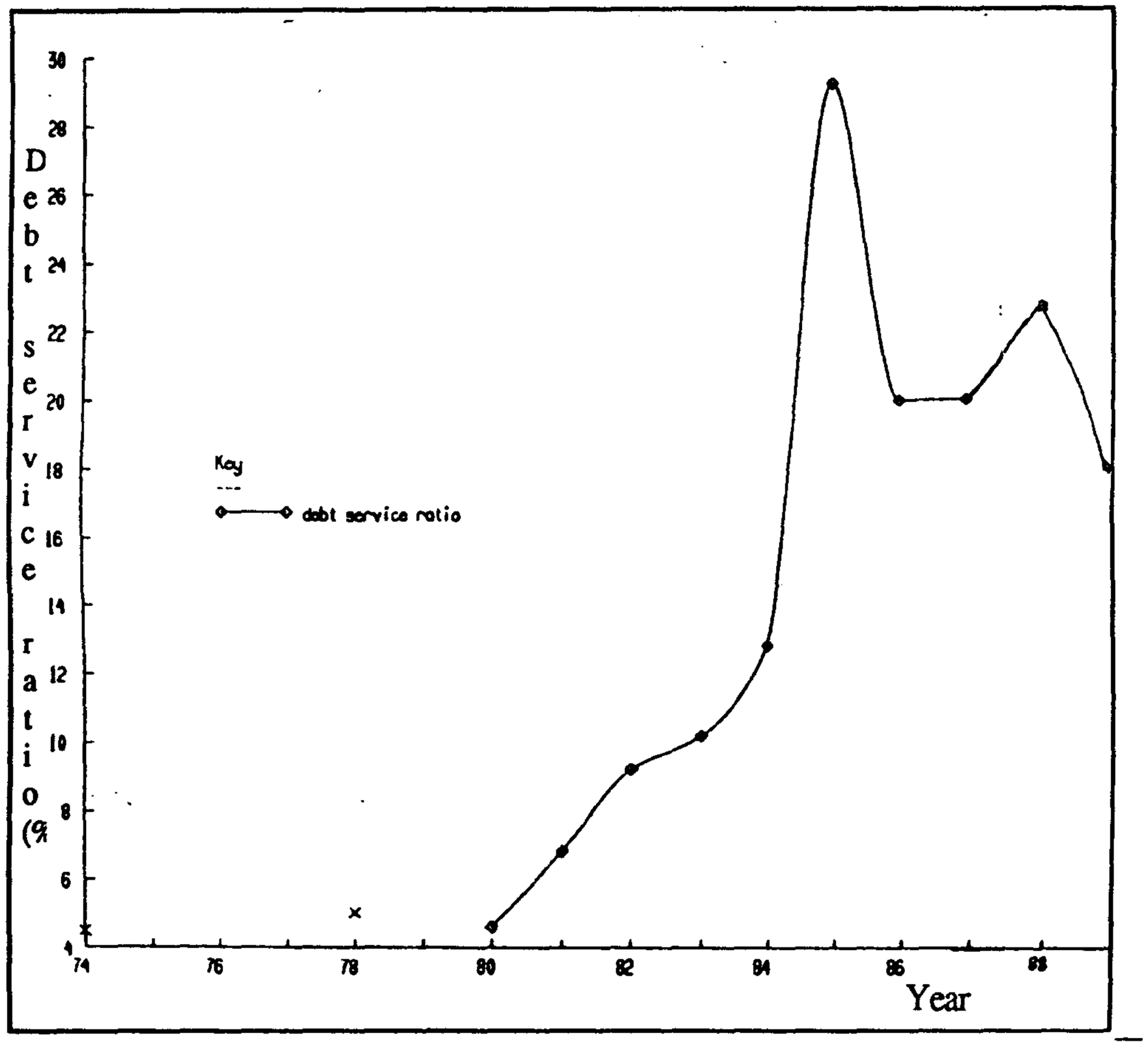
Note:

------- real effective exchange rate

_____ nominal effective exchange rate

Fig. 7.3: Debt Service Ratio

Malaysia



Indonesia

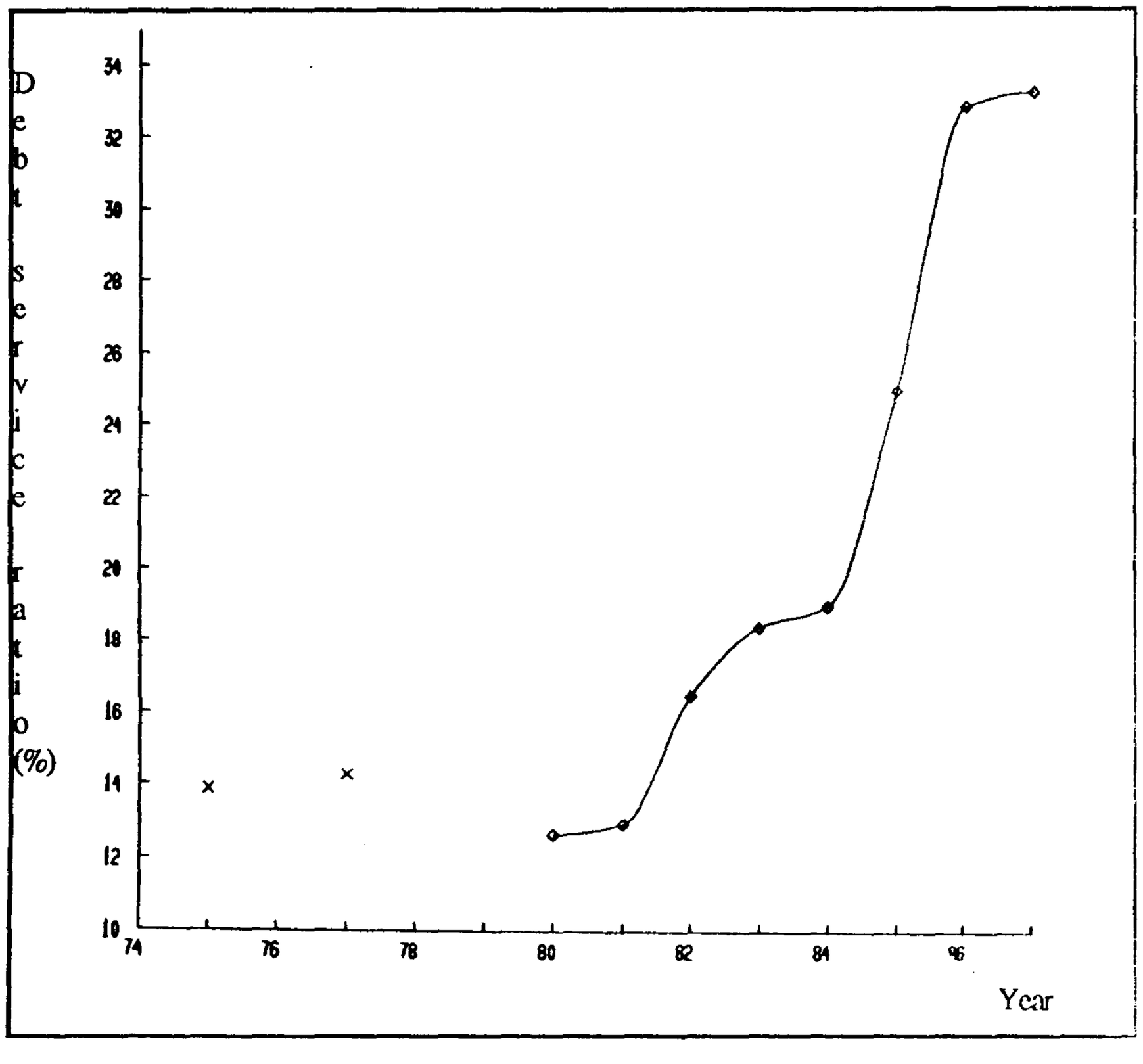
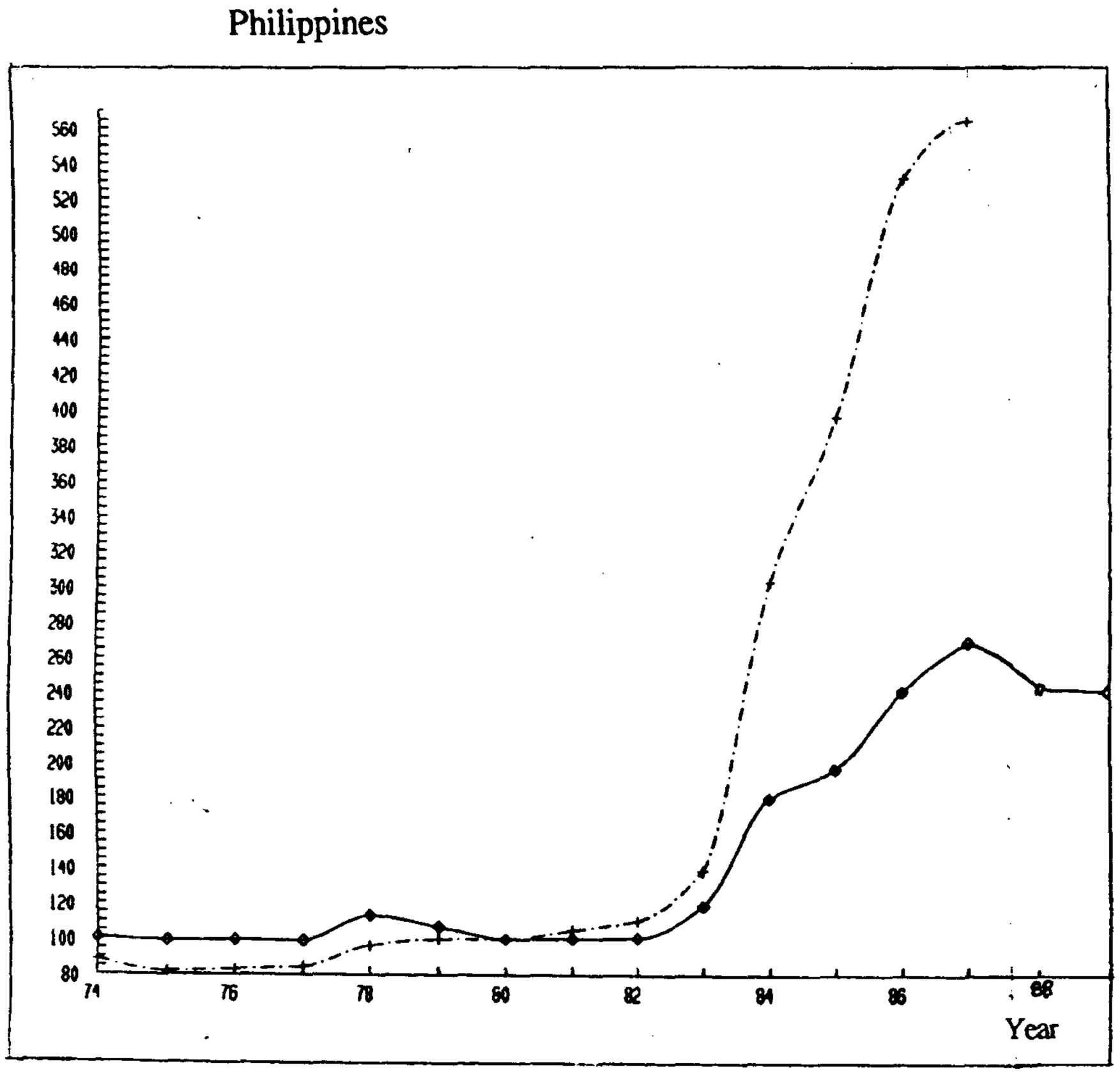
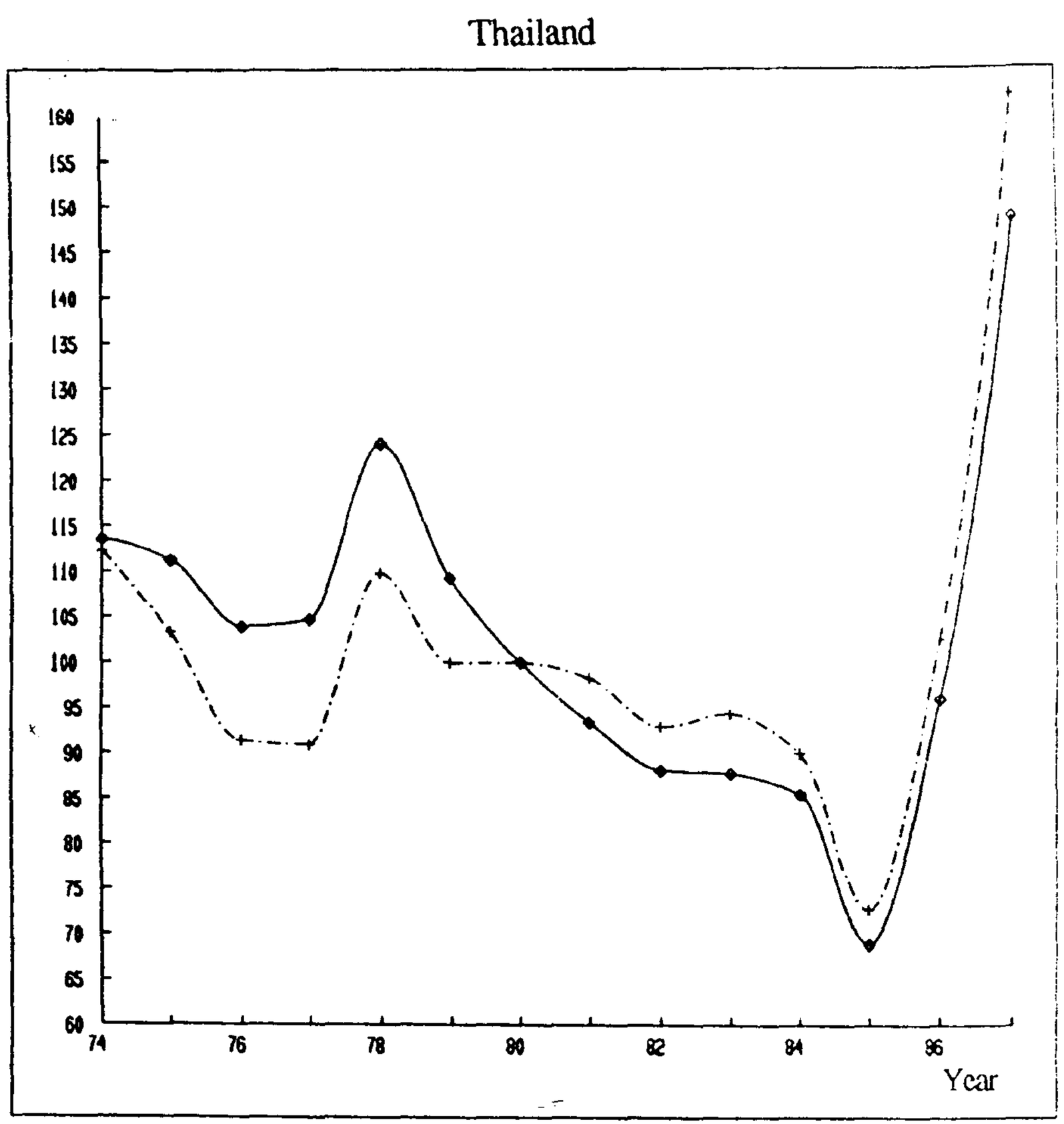


Fig. 7.2: Nominal and Real Effective Exchange Rates.



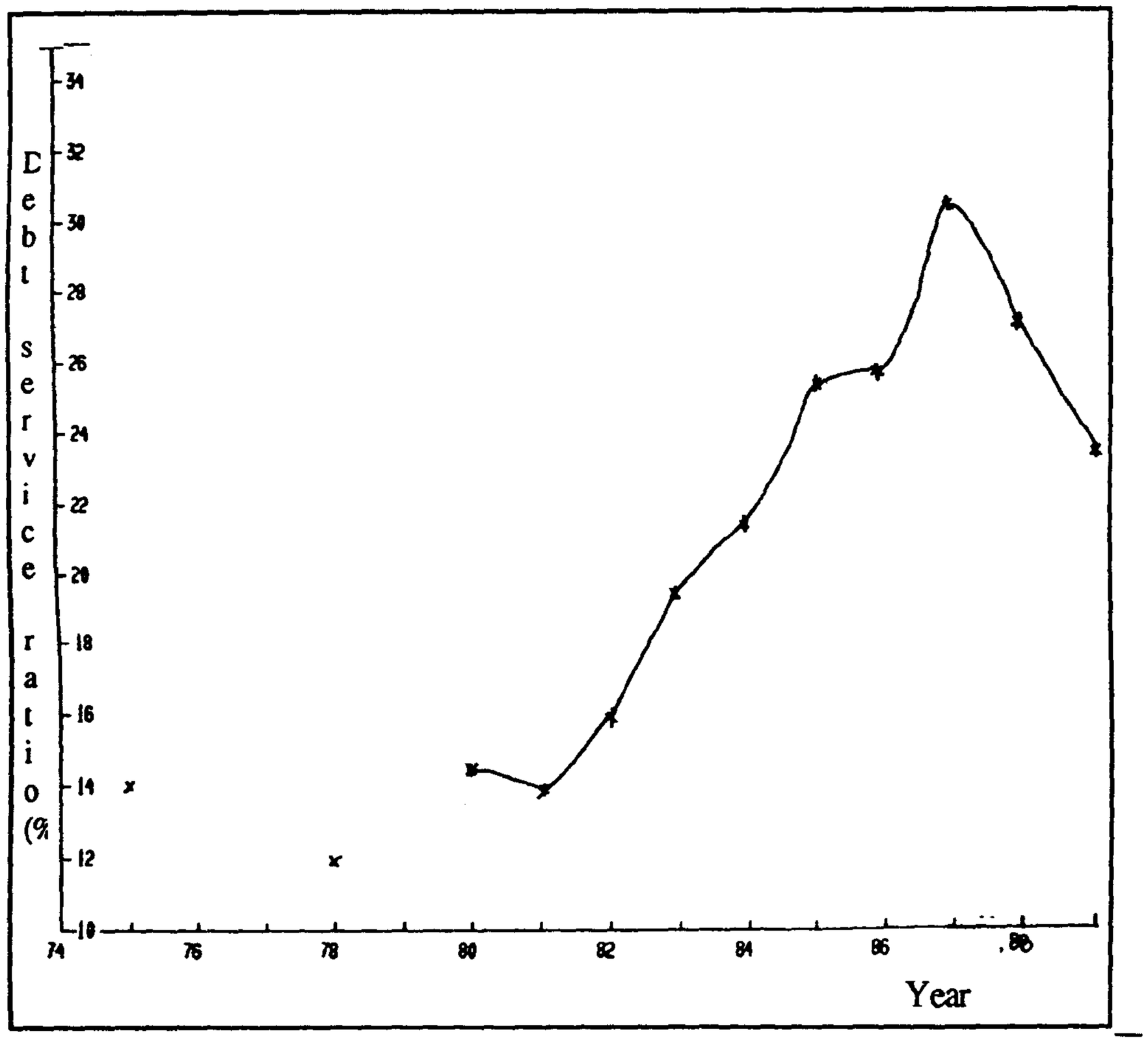


Note:

----- real effective exchange rate
_____ nominal effective exchange rate

Fig. 7.3: Debt Service Ratio

Philippines



Thailand

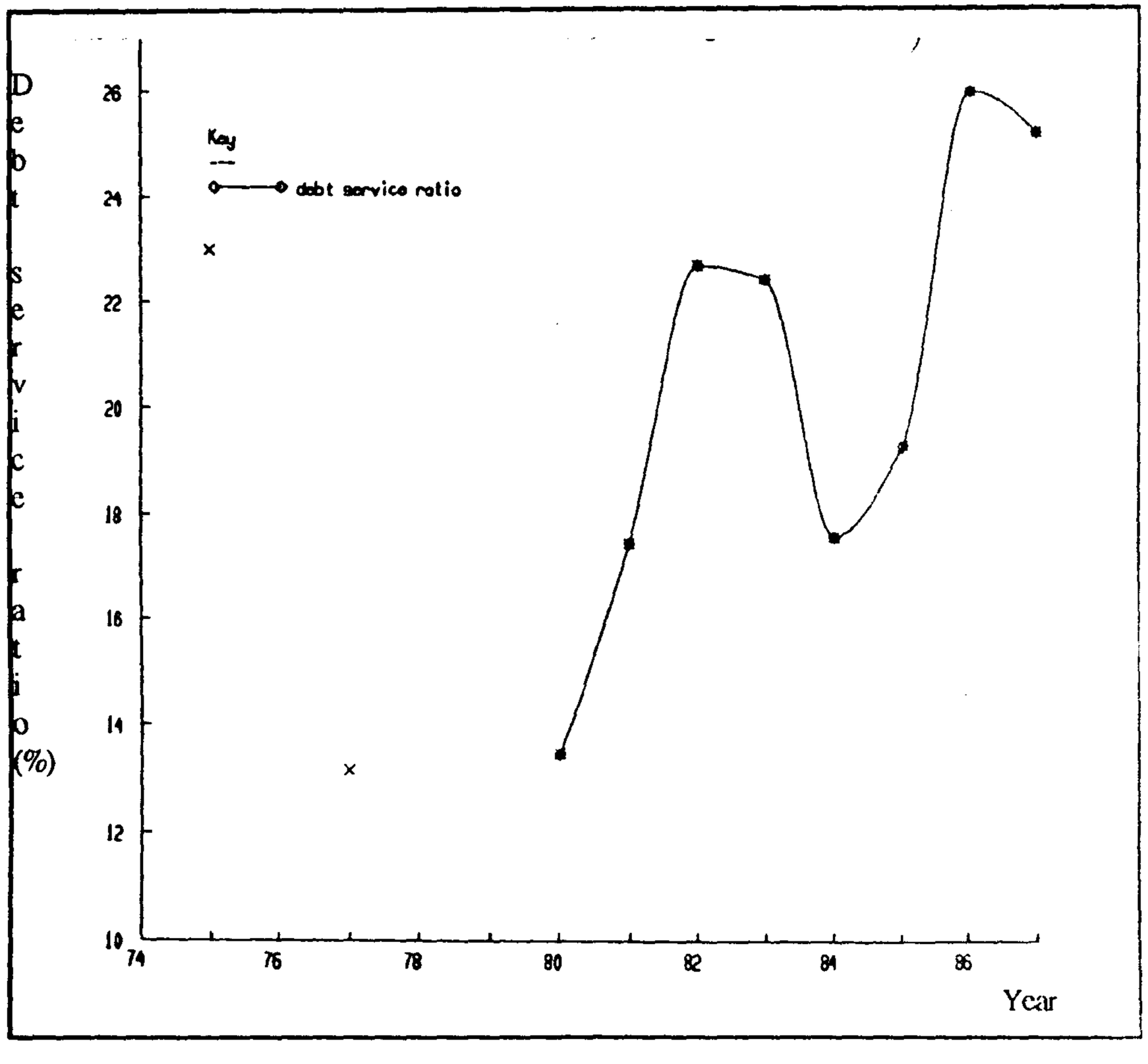
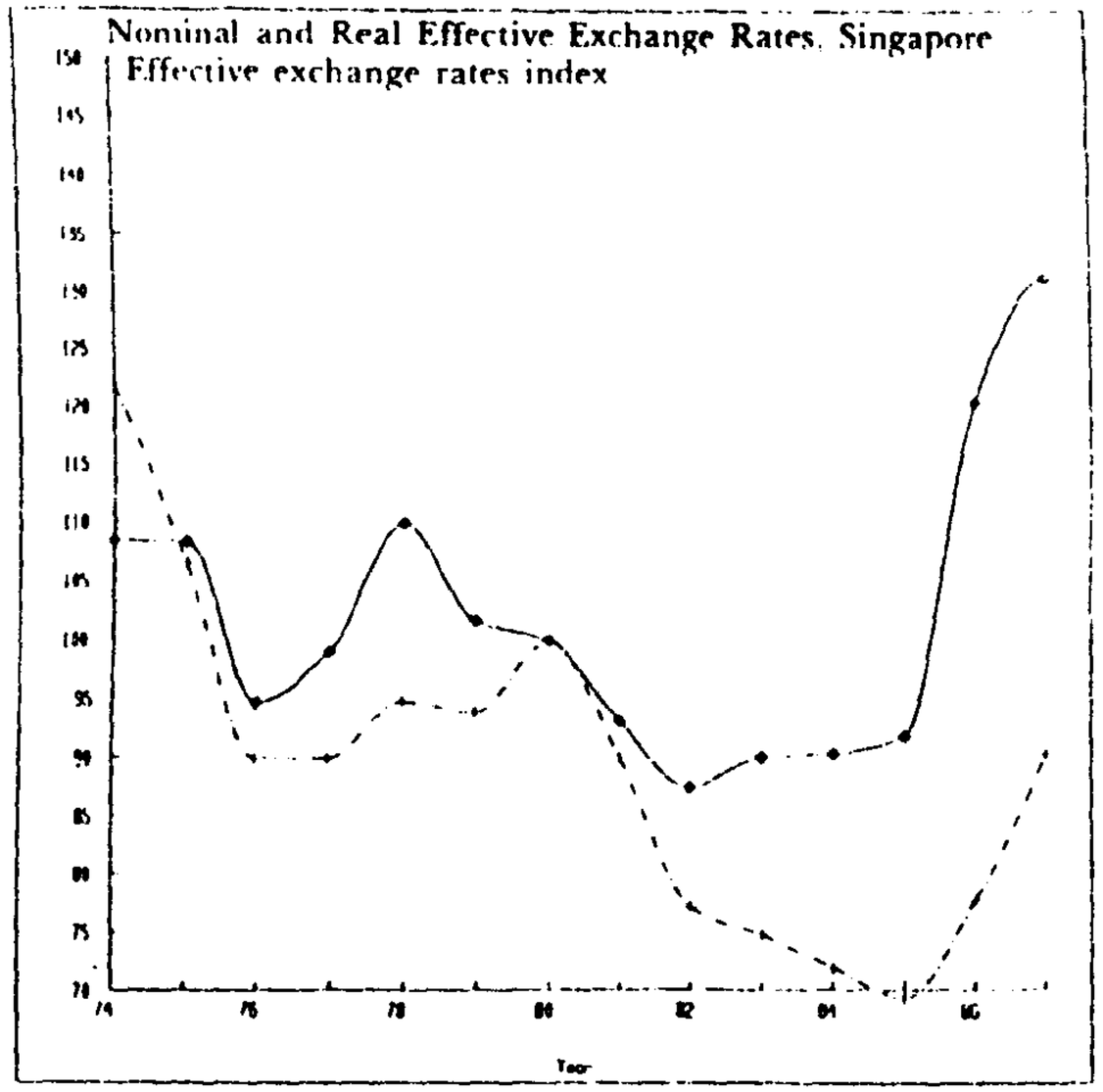


Figure 7.2

Nominal and Real Effective Exchange Rates



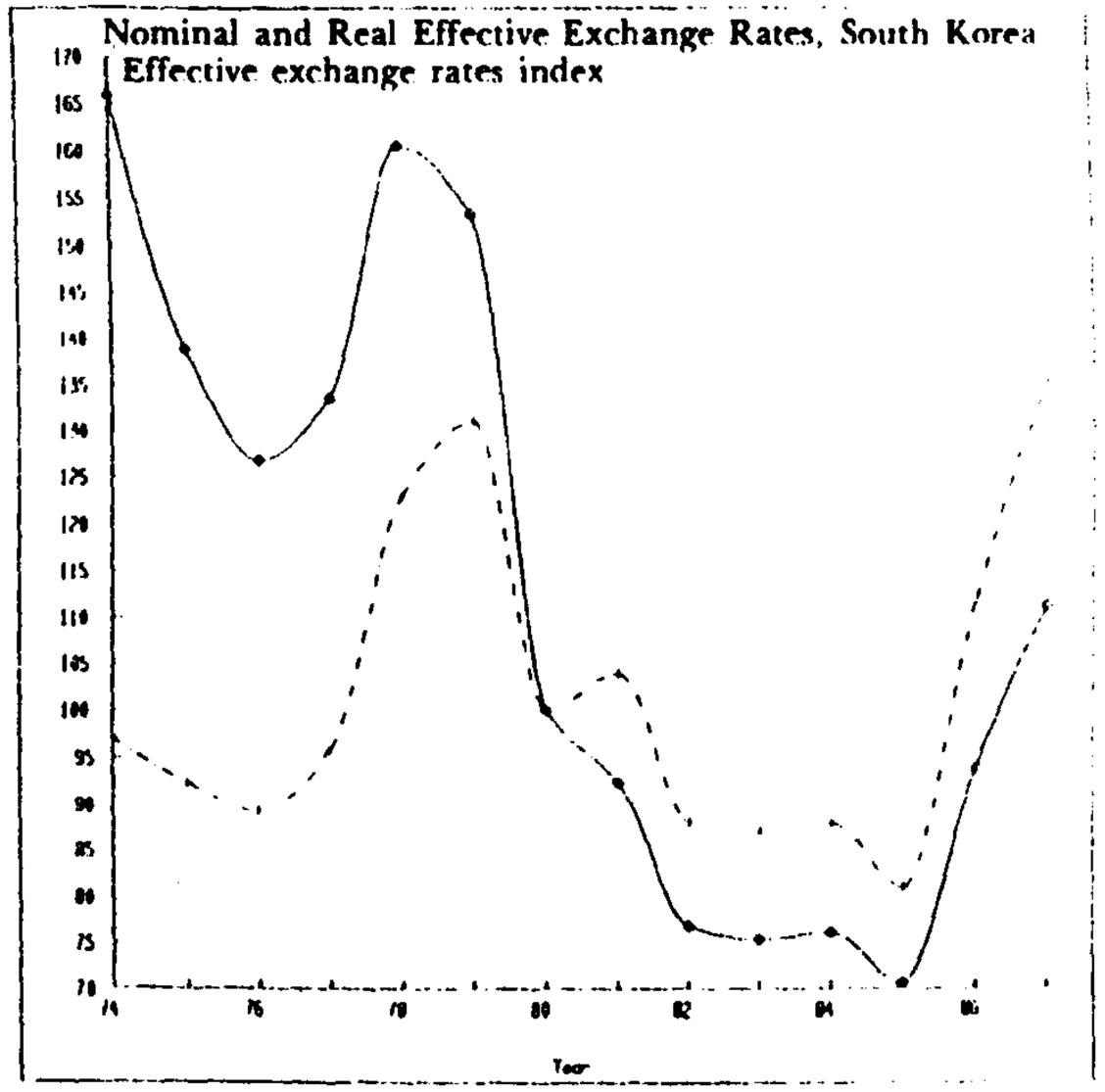
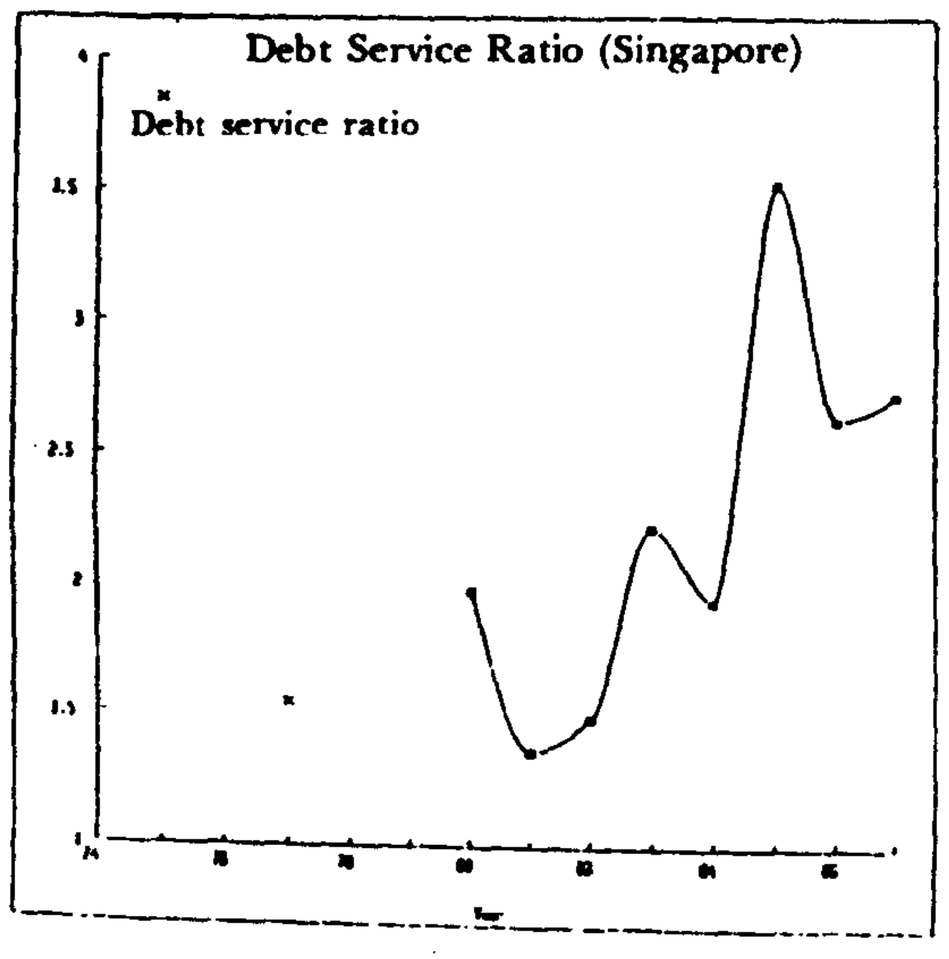
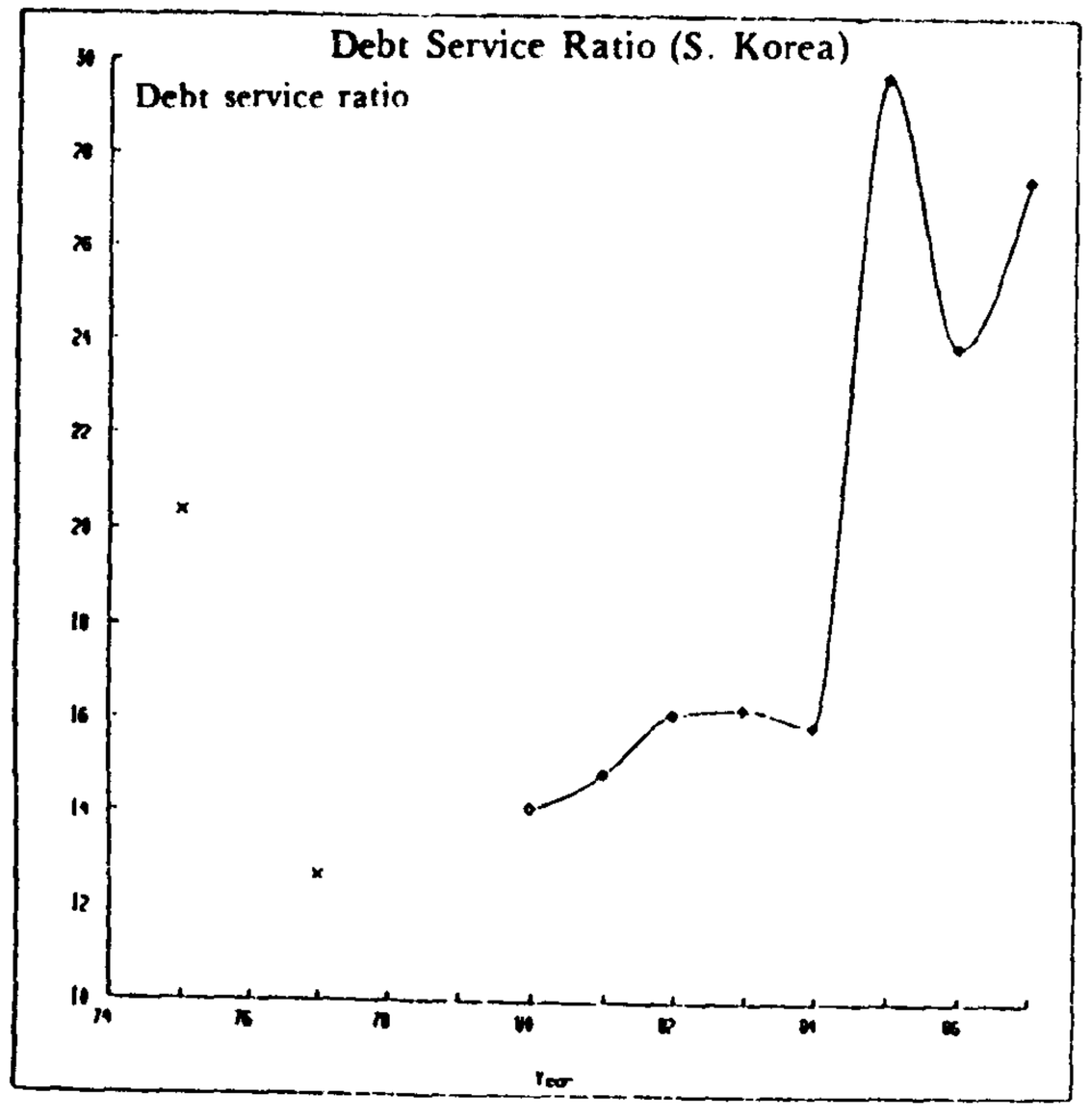


Figure 7.3
Debt-Service Ratio





difficulties since then. The inverse relationship between depreciation and the debt service ratio in the Philippines is due to the fact that the prevailing liquidity squeeze deteriorated the financial situation yet earnings could not be generated via the depreciation that supposedly stimulated exports mainly due to the price inelasticity of export demand for its primary products. This forced the Philippines to devalue substantially in order to increase export earnings while at the same time additional debt inflow was resorted to as the only means of financing to ease liquidity.

There is a one year lapse between the peak of the debt service ratio (1986) and the peak of the depreciation of the effective exchange rates (1987) in both countries. This means that there may be lagged response to the exchange rate being forced down by the debt service ratio. The year 1985 was a year in which the U.S. dollar was particularly strong in terms of other major currencies (Mathieson et.al, 1987). Having the denomination of their debts in U.S. dollar caused the debt service ratio to rise to its peak in 1986.

As for the Malaysian currency, although the exchange rate fluctuates in the 1980s the variations are to a lesser degree than those of the two countries mentioned above. The Malaysian currency depreciated by about 25% between 1981 and 1983. The debt service ratio remained low in the early 1980s but shows an increasing trend since 1984. Currency fluctuations did not seem to have much impact on the debt service ratio which remained low between 1978 and 1984. In 1985 the currency recorded its sharpest appreciation since the last major appreciation in 1979. At the same time the debt service ratio reached its peak at 29%. A plausible explanation could be either a sharp appreciation in the exchange rate may be associated with a sharp reduction in the trade earnings that hampers the servicing of debt; or the debt service is raised due to exchange rate valuation changes. The current account balance does show a sharp drop of US$ 613 mn in that year. As opposed to most ASEAN countries where the debt service ratios remained at their peak after 1985 the debt service ratio of Malaysia fell by about 9% in 1986 as compared to 1985. This is due to the fact that the denomination of debt in yen currency began to rise in that period as compared to the dollar component when the dollar was strongest (Bank Negara Malaysia Report, 1987).

The Indonesian currency followed a different pattern altogether from the movement of the currencies of the other ASEAN countries. The appreciating trend after 1980 indirectly caused the debt service ratio to increase gradually until 1984 but sharply in 1985 - at the time when appreciation was at its highest level. The repayment of interest on debt had traditionally used up the trade surpluses leaving the current account balances to be negative since 1985. This forced the Indonesian government to devalue its currency in 1986-87. However, current account balances remained negative due to

interest payments on the existing large amount of debt accumulated. The debt service ratio rose to its peak in 1986 and 1987 the rise being 20% in excess of the 1980s figure.

As mentioned earlier the exchange rate policy in Singapore and South Korea is considered as an important stable policy that contributed to the expansion of exports. The graphs in Figure 7.3 show distinctive trends in the effective exchange rate of the two NICs - an appreciation from 1980 to 1985 (with highest appreciation in 1985) and a depreciation in 1986-87 (highest depreciation in 1987). After September 1985 the currencies of these economies followed the depreciating U.S. dollar. Between 1985 and the first quarter of 1987 the Singapore dollar appreciated on average by 3%. In the same period the real effective exchange rate depreciated by 29% in Singapore and 21% in S.Korea. The debt service ratio in South Korea was stable in the period 1980-84 averaging 15%. In 1985 it rose to 30% which was the cause of concern for over-borrowing at that time. However, South Korea managed to reduce the debt service ratio to 24% in 1986 the reduction to a large part being a response to the effective depreciation of the currency. In particular the 59% depreciation of the S.Korean won against the Japanese yen between 1985 and April 1987 improved S.Korea's competitive position vis-a-vis Japan. In 1986 for the first time since 1977 South Korea's current account showed a surplus amounting to US $ 5 bn. Though the fall in oil prices and the decline in world market interest rates had contributed to the surplus, the major contribution to more than US $ 5 bn rise comes from exports as a result of the effective depreciation (Bank Negara Malaysia Report, 1988). In 1987, the debt service ratio remained high at almost 28%.

The Singapore dollar had largely followed the rise in the value of U.S. dollar in 1980-84 and its fall in 1985-86. As in the early 1980s the basic balance and the inflationary pressures were both strong so that real appreciation was necessary. By 1985 the economy had gone into deep recession and inflation had been brought under control so that depreciation was sought vis-a-vis the basket. The near constancy of the exchange rate vis-a-vis of the U.S. dollar since 1985 led to a substantial depreciation of the Singapore dollar in relation to the currencies of its trading partners and competitors. The extent of depreciation in real terms (Balassa et. al (1987) calculated this by taking the average of the results obtained by using trading-partner and competitor weights and deflating by the wholesale and the consumer price index) was 34% between 1984 and the first quarter of 1987. Depreciation was 31% in real terms compared with 1981 when the appreciation of the dollar had began. Considering that the Singapore dollar depreciated by 5% in terms of nominal effective exchange rates in the first half of 1987 it would appear that the policy of following the U.S. dollar down resulted in an

undervalued currency for Singapore. Consequently the deficit in the balance of merchandise trade has declined and a surplus on the current account may remain in view of the reductions in the cost of labour even after the temporary favourable oil price factors of 1986 disappear. As for the debt service ratio, as always, remains very low with the highest ratio of 3.5% in 1985. In short for the two NICs the extent of the depreciation in real terms between 1981 and the first quarter of 1987 was largest for S.Korea (36%) followed by Singapore (31%).

While more recent price data are not available calculations of nominal effective rates provide an indication of changes in real effective rates since price differentials amount to little in a short period of time. Between the first quarter of 1987 and the end of April 1987, the extent of depreciation was 3% in S.Korea and 5% in Singapore. These depreciations have contributed to the development of major current account surpluses in S.Korea and Singapore. Real effective exchange rates fluctuated much more drastically in many other developing countries including Latin America. This meant periodic overvaluation in the exchange rate and uncertainty in economic decision making discouraged exports.

Capital markets were freer in the ASEAN region than in Latin America. Interest rates remained positive in real terms though not prohibitively high generally avoiding low-return investments. Incentives provided for domestic savings also discouraged capital outflows which were further limited by some exchange controls. In contrast apart from their effects on domestic savings and investments artificially low interest rates reinforced the effect of overvalued exchange rates in contributing to the outflow of capital from several Latin American countries.

In conclusion, consistent with the study by Eichengreen et.al, some linkage between debt service and effective exchange rate ratios do exist in the analysis for the ASEAN countries. Two major effects as hypothesised are: (1) the appreciation of exchange rates has an indirect effect in causing the debt service to rise, i.e. the appreciation causes loss of competitiveness in exports hence reducing exports earnings which further reduces ability to service debt. Devaluation on the other hand raises the export earnings and lowers the debt service ratio. However, the case of the Philippines is an exception - since debt had already become unmanageable in the early 1980s it had resorted to default and depreciate simultaneously; and (2) high debt service ratios force down effective exchange rates. The next section provides empirical evidence to support point (1) in the ASEAN region.

7.5. Estimating the Effects of Exchange Rate Changes

It is important to estimate the effect of the exchange rate on the trade balances of the ASEAN countries because the exchange rate policy may be one of the policies (besides the balance of payments policy) responsible for the ASEAN countries to service their debts. The substantial depreciation of the exchange rates of Singapore and S.Korea for example led to surpluses in their current account. Since debt has to be repaid out of the current/trade account surpluses and the exchange rate does play a role in the development of the surpluses, an analysis of the effects of the exchange rate is important.

Estimating the effects of changes in an exchange rate on the trade balance requires information on the response of imports and exports to these changes. For the ASEAN countries it can be assumed that the prices of their imports are set on the world market. However, many of these countries may influence the prices of their exports. Since the ASEAN countries are not able to influence the prices of the goods they import the responsiveness of these imports to changes in the exchange rate will be determined by the domestic price elasticity of import demand. Whereas in the case of exports both the domestic price elasticity of export supply and the foreign price elasticity of export demand will be relevant.

Among the countries concerned estimates of the price elasticity of import demand are available for S.Korea. The elasticity was estimated by Yoo (1984) as noted in Balassa et.al (1987) to be 0.50 for 1966-80 while an alternative estimate for 1966-84 is 0.67 by Corbo and Nam (1987), also as noted in Balassa et.al.

We use a single equation in the import demand function because it gives satisfactory estimates according to Goldstein and Khan (1987), incorporating the variables representing foreign demand (the real GDP of the industrialized countries) and the competitive position of a country's exports (the ratio of unit labour costs in Korea, for example, to that in the other ASEAN countries) is used. But the single equation estimation is not appropriate in the present case since the results are affected not only by changes in foreign demand but also by domestic supply. Rather, simultaneous equation estimation is necessary for indicating changes in the prices and the volume of exports in response to changes in the exchange rate.

7.5.1 Estimating the Import Demand Function

The income elasticity of demand for imports, estimated out of an import demand function will enable us to obtain the elasticity value for the purpose of determining the elasticity of foreign exchange supply. The income elasticity of demand for import measures the proportional change in demand for imports with respect to a proportional change in the country's income. The income elasticity of demand for export measures the proportional change in the demand for a country's exports with respect to a proportional change in other countries' income. It is also important to state here that if a country's income elasticity of demand for imports is less than the income elasticity of demand for its exports, it is possible, other things remained the same, for a country to grow at a faster rate without imports growing faster than exports, and the balance of payments deteriorating. If however, a country's import elasticity is higher than its exports elasticity, it cannot grow at a faster rate without the balance of payments deteriorating unless relative price effects are favourable.

This section attempts to estimate the import demand function for the ASEAN countries under the framework of imperfect substitutes suggested by Goldstein and Khan (1987). The key underlying assumptions for the imperfect substitutes model is; neither imports nor exports are perfect substitutes for domestic goods. If foreign and domestic goods are perfect substitutes, the followings are observed: a) production will be at constant or decreasing cost, hence, either the domestic or the foreign goods occupy the whole market; or b) each country will either be an importer or exporter of traded goods but not both. The co-existence of imports and domestic output and the existence of two-way trade causes the perfect substitutes framework to be rejected. Furthermore, there are price differences for the same product in different countries, as well as price differences between domestic and export prices of a given product in the same country. The 'law of one price' does not hold either across or within countries. According to the conventional demand theory, a consumer will maximize his utility subject to a budget constraint. The resulting demand function for imports thus represents the quantity demanded as a function of the level of income in the importing region, the imported good's own price and the price of domestic substitutes. In the simple model, only current income matters for import demand, and no distinction is made between secular or cyclical income movements. Assuming that the supply price elasticities for imports are infinite permits satisfactory estimation of the import demand equation by the single equation method, since the prices of imports can then be viewed as exogenous (Goldstein and Khan (1987)). The multiplicative import and export demand function, transformed to its logarithmic form are shown below :

7.18

$$LogM = \eta + \eta_1 LogP + \eta_2 \log Y \qquad (7.4)$$

where,

M = the quantity of imports

P = the price of imports relative to the price of domestic goods measured in common currency

Y = real income

Therefore, η_1 and η_2 in equation (7.4) measures the price and income elasticities of demand for imports respectively. Domestic prices will be measured by the wholesale price indices and consumer price indices.

The estimated results for the import demand function are shown in Table 7.2. The table presents the period covered, the two types of domestic prices - wholesale and consumer prices, the income and price elasticities and the test results. The estimated income elasticity is significant at the 1 % level of confidence for all countries and in all cases, have positive signs which is consistent with theory. The estimated income elasticities fall in the range of 1.07 to 1.35 in Singapore, Malaysia and South Korea. In the absence of secular increase in the relative prices of imports, this implies the share of imports to GNP is expected to rise over time. An income elasticity of demand for imports in excess of unity implies an increasing penetration of imports into the domestic market. This is a typical situation in the three countries just mentioned. As a comparison, the income elasticities of demand for a representative industrial country fall in the range of 1 to 2 on both import and export sides (Goldstein and Khan, 1987). The income elasticity of demand for the Philippines and Thailand are relatively low (approximately 0.15 and 0.90 respectively).

The estimated relative price elasticity η_1 is significant at the 1 % level of confidence for the Philippines and Thailand, and significant at the 10 % level of confidence in South Korea. As for the results for Malaysia and Singapore, the relative price elasticities have perverse signs (and is not significant at the 10 % level of confidence for Singapore). The relatively low but significant price elasticities ranging from -0.03 to -0.48 in the Philippines and Thailand show relative prices do play a role in the demand for total imports. The relative price elasticities for industrial countries lie in the range of -0.5 to -1.0 (Goldstein and Khan, (1987)).

Table 7.2: Estimates for Import Demand Equations

Countries	Price Type	Constant	Elasticity		Test Results			
			Income	Price	R^2	Adj R^2	DW	F-stat
Malaysia (1970-1987)	WP	-10.11	1.35*** (0.06)	0.26* (0.13)	0.98	0.98	1.64	173.8
	CP	-8.71	1.22*** (0.07)	0.44* (0.18)	0.98	0.97	1.75	195.9
Philippines (1968-87)	WP	0.39	0.74*** (0.07)	-0.35*** (0.17)	0.93	0.91	1.84	60.3
	CP	-0.18	0.85*** (0.09)	-0.33*** (0.11)	0.94	0.93	1.86	74.1
(1970-87)	WP	0.34	0.76*** (0.07)	-0.19*** (0.246)	0.93	0.91	1.91	50.8
	CP	-0.15	0.84*** (0.08)	-0.27** (0.15)	0.93	0.92	1.93	62.1
Singapore (1971-87)	WP	-6.30	1.07*** (0.058)	0.06 (0.12)	0.98	0.98	1.21	226.5
	CP	-6.40	1.08*** (0.11)	0.50 (0.10)	0.98	0.98	1.49	242.0
Thailand (1965-87)	WP	-2.01	0.98*** (0.06)	-0.49*** (0.19)	0.96	0.95	1.28	198.2
	CP	-1.66	0.94*** (0.06)	-0.23* (0.16)	0.95	0.94	1.28	156.9
(1970-87)	WP	-1.415	0.89*** (0.09)	-0.21 (0.25)	0.92	0.90	1.77	70.3
	CP	-1.08	0.86*** (0.08)	-0.04 (0.17)	0.91	0.89	1.92	66.8
S.Korea (1968-87)	WP	-8.99	1.28*** (0.09)	-0.15* (0.13)	0.99	0.99	1.19	426.1
	CP	-9.29	1.31 (0.08)	-0.11 (0.12)	0.99	0.99	1.08	414.8
(1970-87)	WP	-8.85	1.18*** (0.27)	-0.06 (0.16)	0.99	0.98	1.40	212.0

Note:

*** significant at the 1% level of confidence

** significant at the 5% level of confidence

* significant at the 10% level of confidence

CP & WP are consumer and wholesale prices indeces

7.5.2 Estimating the Export Demand and Supply Functions

In our estimates of the export supply and export demand function we use the simultaneous equation developed by Goldstein and Khan (1987) for industrialized countries. Two models of export demand and supply as in equation (7.5) and (7.6) below are estimated simultaneously so as to eliminate any bias arising from a two-way relationship between export quantities and export prices. In an equilibrium condition the world demand for an individual country's exports is specified in log-linear form:

$$LogX = \alpha_1 + \alpha_2 Log(\frac{P_X}{P_X^W}) + \alpha_3 LogY^W \qquad (7.5)$$

where,

X = quantity of exports demanded

P_X = price of exports

P_X^W = weighted average of the export prices of the country's trading partners

Y^W = weighted average of the real incomes of the country's trading partners.

Since equation (7.5) is specified in logarithms α_1 and α_2 are the (relative) price and real income elasticities of export demand respectively. It is expected that α_2 will be negative and α_3 positive.

The supply of exports is specified as a log-linear function of the relative price of exports (i.e. the ratio of export prices to domestic prices) and of an index of the productive capacity of the country:

$$LogX = \beta_1 + \beta_2 Log(\frac{P_X}{P}) + \beta_3 Y \qquad (7.6)$$

where,

X = quantity of exports supplied

P_X = price of exports

P = domestic price index

Y = logarithm of an index of domestic capacity

Equation (7.6) embodies the hypothesis that as the price of exports rises relative to domestic prices, production for export becomes more profitable and, hence, exporters will supply more. In addition, exports are posited to rise, *ceteris paribus,* when there is an increase in the country's capacity to produce. We therefore expect the results to show both β_1 and β_2 to be positive. The equation can be normalized for the price of exports P_X to yield:

$$LogP_X = \beta_4 + \beta_5 LogX + \beta_6 Y + \beta_7 LogP \qquad (7.6a)$$

where,

$$\beta_4 = \frac{\beta_1}{\beta_2}; \beta_5 = \frac{1}{\beta_2}; \beta_6 = -\frac{\beta_3}{\beta_2}; \beta_7 = \frac{\beta_2}{\beta_2}.$$

Since $\beta_2, \beta_3 \geq 0$, we expect that $\beta_5 \geq 0; \beta_6 \leq 0; \beta_7 \geq 0$..

The parameter (β_5) which is the price elasticity of the supply of exports can be obtained from (7.6a) by calculating $(\beta_2)^{-1}$.

As β_2 tends to zero β_5 will tend to infinity. The estimated results by Goldstein and Khan (1987) for the industrialized countries, Greece and Korea by Balassa et.al (1986), and for Hong Kong by Reidel (1986) as noted in Balassa, are shown in Table 7.3. Our estimates of the domestic price elasticity of export supply, foreign price elasticity of export demand, as well as the elasticity of supply of foreign exchange for the ASEAN countries are shown in Table 7.4.

The estimated parameters of the domestic price elasticity of export supply and the foreign price elasticity of export demand are then combined to derive the elasticity of supply of foreign exchange. The elasticity of supply of foreign exchange (E) representing the percentage change in export value associated with a 1% change in the exchange rate depends on the domestic elasticity of export supply (β_5) and the foreign elasticity of export demand (α_2) according to the formula (Balassa and Williamson, 1987):

$$E = \frac{\beta_5(\alpha_2 - 1)}{(\beta_5 + \alpha_2)} \qquad (7.7)$$

Domestic export supply elasticities in the industrialized countries range from 1.1 to 6.6. The estimates by Balassa et.al (1987} are between 1.8 and 2.3 for Greece and Korea

and 5 for Hong Kong. The Korean estimates show changes in export supply in response to changes in the exchange rate which is the concern of the present study. All other estimates concern the effects of changes in domestic export prices relative to the prices of non-export goods reflecting changes in the dollar prices of exports in the domestic prices of non-export goods as well as in exchange rates the effects of which are far from uniform. Foreign price elasticities of export demand (α_2) range from -0.8 to -3.3 for the industrialized countries except for a perverse estimate of +2.5 for Japan. The corresponding estimates are -1.0 to -1.1 for Greece and Korea.

Table 7.3: Elasticity Estimates for Total exports

Industrial Countries	Period of study	β_5	α_2
Belgium	1955-70	+1.2	-1.6
France	1955-70	+1.9 ~	-1.3
Germany	1955-70	+4.6	-0.8
Italy	1955-70	+1.1	-3.3
Japan	1955-70	+2.9	+2.5
Netherlands	1955-70	+2.5	-2.7
United Kingdom	1955-70	+1.5	-1.3
United States	1955-70	+6.6	-2.3
Developing Countries			
Greece	1960-78	+2.1	-1.0
Greece	1960-78	+1.8	-3.4
Hong Kong	1972-84	+5.0	infinite
Korea	1965-78	+1.9 to +2.5	-1.0 to -1.1

Source: Balassa and Williamson (1987). Industrial Countries estimated by Goldstein and Khan (1987), Greece and Korea by Balassa et.al (1986a), Hong Kong by Reidel (1986). The estimated coefficients are statistically significant at the 1 % level except those for Japan which are significant at 10 % level. a.manufactured exports.

From Table 7.4, the domestic price elasticity of export supply (β_5) ranges from +1.27 to +3.98. The estimated coefficient of (α_2) in the export demand function is positive and significantly different from zero in all countries implying a positively sloped supply function for exports.

Table 7.4: Elasticity Estimates for Total Exports for the ASEAN Countries

Countries (1)	Sample years (2)	Elasticities for Total Export Demand (3) (α_2)	(4) R^2	(5) DW
Singapore	1970-88	-1.44	0.99	2.47
Malaysia	1968-87	-0.753	0.93	2.01
South Korea	1968-87	-2.862	0.95	1.08
Thailand	1968-87	-0.636	0.99	1.75
Indonesia	1970-87	-8.03	0.99	2.39

Countries	Elasticities for export supply (6) (β_2)	(7) R^2	(8) DW	(β_5) (9)	(E) (10)	(η_1) (11)
Singapore	0.37	0.99	2.24	2.70	-3.717	1.07
Malaysia	0.33	0.99	1.74	3.06	-2.325	1.34
S.Korea	0.25	0.98	1.00	3.98	-13.740	1.18
Thailand	0.79	0.99	2.15	1.27	-3.269	0.89
Indonesia	0.31	0.99	2.77	3.24	+6.09	-

Note: α_2 = price elasticity for export demand

β_5 = price elasticity for export supply

E = elasticity of foreign exchange

η_1 = price elasticity of import demand

R^2 and DW are the tests for the regression equations.

Note: The results are significant at the 10% level of confidence.

As expected our estimated price elasticities of export demand for the ASEAN countries have negative signs and are significantly different from zero at the 5% level of confidence in most countries in the sample. Singapore and South Korea have estimated price elasticities greater than unity which implies a fairly large response of exports to changes in relative prices. This points to the important role of relative prices in determining the world demand for these countries exports. Strangely the price elasticity for export demand for Indonesia is -8 which is even higher than in the industrialized countries. This may be driven by the responsiveness of oil prices to world demand because oil is the major export. As for Malaysia and Thailand relative prices do not play much role due to the larger proportion of primary exports in the years understudy.

Column (10) in Table 7.4 shows the elasticity of supply of foreign exchange which ranges from -2.3 to -13.7 except for a perverse estimate for Indonesia (+6) (similar to the case of Japan in the study by Balassa). It can be deduced that the effect of a 1 % change in the exchange rate has the greatest impact on the export value of S.Korea. A 1 % appreciation will reduce the export value by 13.74 %. This is consistent with Dornbusch's (1987) argument that the effectiveness of devaluation depends on the size of a country's exports of manufactures. The larger the size the more effective is devaluation in developing countries.

Between 1984 and April 1987 the won depreciated by 5% against the dollar, by 79% against the yen, by 64% against the Deutschmark, by 51% against the French franc, and by 25% against the pound sterling. As mentioned earlier the depreciation contributed to the surplus in 1987 of US$ 5 bn. To effect a shift from US$ 5 bn to 6 bn of the current account in 1987 Balassa et.al (1987) estimated the magnitude of change of the exchange rate should be a 10% to 15% appreciation in real effective terms (Balassa and Williamson, 1987). The resulting change is said to undo less than one half of the 36% depreciation in real effective terms which occurred between 1981 and 1987. Our study shows a more optimistic figure for South Korea for the 1990s. If a 1% change in the exchange rate can bring about a change of 13.7% in the value of exports the won then needs to appreciate by only 1 % in the first quarter of the 1990s to maintain the current account surplus at US$ 5 bn. The more optimistic figure obtained is due to the more recent sample taken when S.Korea had already become an NIC (sample years from 1970 to 1986 - whereas the study by Balassa et. al uses the sample years 1965 to 1978. It is also expected that the equilibrium exchange rate may have appreciated over time. The appreciation however has to be accompanied by reductions in import protection and export incentives.

In 1986 Balassa et.al suggested that an appropriate objective for Singapore might be a zero basic balance which corresponds to a current account deficit of perhaps 1 billion dollars or at most a balanced current account. To attain this target the appreciation of the Singapore dollar should be in the order of 10% to 15% in real effective terms (Balassa and Williamson, 1987). Such an appreciation would undo nearly one-half the depreciation of the Singapore currency in real terms calculated by deflating price indices since 1981. In 1989, for example, Singapore had a current account surplus of 2.3 billion, still our study confirms that the amount of appreciation suggested is what is required. A 10% to 12% appreciation will result in a reduction of US$ 0.8 bn in its 1989 current account and an increase of US$ 0.5 bn in its imports since the price elasticity of import demand obtained is 1.07. A larger appreciation is not recommended because the rise in labour costs relative to prices has only been partially undone through

the recent cuts in labour charges. Table 7.5 in the Appendix shows an excerpt of the current account and trade position of the ASEAN countries. Singapore's flexible exchange rate arrangements made it feasible to adjust the exchange rate gradually. Forward premium in the exchange rate persist as evidenced by its low interest rate which is below foreign interest rates.

A devaluation of the Thai currency might be an appropriate objective in the early 1990s considering that it has a current account deficit of about US$ 2.5 bn in 1989. Our estimate shows a devaluation of 1% of exchange rate could increase the export value by 3.27 %. This means that a 10 % to 12 % devaluation of the exchange rate could raise about 1 bn of the current account balance or eliminating the current account deficit by 1 bn in 1989.

As for Malaysia having experienced a current account deficit of US$ 0.18 bn in 1989 it should also adopt the policy of depreciating its currency. Since 1987 there has large net outflows as both public and private sectors made substantial repayments and prepayments of their foreign debts. New foreign borrowing has however declined. The governments policy since 1988 has been to continue reducing the external debts in favour of inflows of equity capital through direct foreign investment. Malaysia's debt is particularly expensive since it is denominated in currencies which have appreciated relative to the ringgit. Between 1986-89 the ringgit depreciated by 10% against the U.S. dollar, 55% against the yen, 50% against the Deutschmark, and 20% against the Singapore dollar. Low domestic interest rates are also encouraging the ringgit to slide and helping the ringgit to raise export earnings. Our analysis shows a positive 1% change in the exchange rate will cause a negative 2.33 % change in the exports value. This means a 10 % depreciation of the currency could at least increase the current account balance by US$ 0.04 bn or reduces the deficit by this amount. Since Malaysia has a substantial amount of debt to be repaid it should at least aim at zero current account balance in the 1990s. This requires a gradual devaluation of her currency by about 25% in the earlier part of the decade.

In Indonesia the sale of fuel oils is almost offset by subsidies of fuel oil sales in the domestic market. It has nevertheless used less foreign aid than had been budgeted. The increased availability of domestically mobilised funds limits the growth of external indebtedness and helps to control inflationary pressures by restricting liquidity at a time of rapidly rising demand. More recent nominal depreciations offsets the high domestic inflation rates relative to its trading partners (GATT Policy Review, 1991: Indonesia). The real effective exchange rate has remain stable since early 1987. The government aims at decreasing the overall volume of foreign borrowings which implies a sharper

decline in terms of foreign exchange owing to the on-going steady depreciation of the rupiah. Real depreciation has a greater impact on Indonesia's non-fuel merchandise trade balance. Indonesia's ability to avoid the debt crisis is due to a large degree on its effective management of exchange rate policy (GATT Policy Review, 1991: Indonesia).

7.6. Conclusion

The imbalance in financial performance among the ASEAN countries will not benefit the region as a whole in the future. Some of the countries focus their exchange rate too much on the U.S. dollar. Pegging it to a basket of currencies consisting of their most important trading partners would be more beneficial. Apart from appreciating their currencies to eliminate part of their surpluses, South Korea and Singapore should also liberalize imports especially imports of primary goods from the other ASEAN countries. Through this they could at least help encourage exports especially from the Philippines since depreciation of the pesos appears to have no effect on increasing exports earnings. For the NICs to maximize the chance of being able to accompany the appreciation with stimulative fiscal and monetary policies that might limit a recession, appreciation should be effected gradually. This will require the maintenance of inward capital controls in the form of debt for sometimes, but outward controls should be relaxed and directed to the other ASEAN countries. As for Malaysia and Thailand who are moving towards the export of more manufactures, it is appropriate for them to devalue gradually when the need arise to encourage exports. At the same time they should also limit inward capital inflows in the form of debt creating flows as well as limit the outward capital flows. The Philippines and Indonesia should enforce an outward capital control at once, reduce imports and attract more non-debt creating flows. With the above suggestions, the developing ASEAN countries may be able to have a timely and sustainable debt service.

The study shows that changes in exchange rates do have an impact on ASEAN export earnings and debt service. Pertaining to relative price movements, a depreciation is expected to lead to a less-than-proportionate rise in export prices measured in the home currency, which means a fall in the foreign currency price but a rise in the volume of exports. The price of imports in domestic currency terms will rise leading to a lower import volumes, consequently leading to an increase in real net exports. The volume responses should be large enough to outweigh the negative terms of trade shift that arises due to export price rising less than import prices, hence, the trade balance improves. In general, this will happen in ASEAN since, Table 7.4 shows the sum of

the price elasticities, $(\alpha_2 + \beta_2)$, is greater than one, hence, the so-called simple Marshall Lerner condition which is infinity is not fulfilled. This is possibly due to the powerfull role of domestic price of exports relative to world price of exports in determining the quantity of exports demanded by the rest of the world. The terms of trade shifts more rapidly than the volume adjustment, the trade balance tend to deteriorate in the short-run before improving - the so-called J-curve. Where a country has little influence over it terms of trade the main channel through which exchange rates affect the economy is the ratio of traded goods prices to non-traded goods.

Another issue of concern is that the currency denomination of debt has to be a function of the market in which borrowing is done. Thus, diversification among sources of borrowing would be a prudent policy. The share to be borrowed in each market should be roughly the same as the share of the specific foreign currency in the merchandise trade balance of the country. As a result fluctuations in debt service costs would be approximately offset by fluctuations in net earnings from foreign trade in goods. The same policy can be followed with respect to reserve holdings which should be co-ordinated with debt service and merchandise trade to hedge against the impacts of shifts in exchange rates. Implicitly the diversification rule is "borrow from countries to which you export and lend to countries from which you import". This reverses the typical practice of trade finance but then much of the ASEAN trade is financed in foreign centres.

Unlike the Latin American countries, heavily indebted South Korea and the not-so-heavily indebted countries of Indonesia and Malaysia choose to sacrifice exchange rates to honour their debt. This practice is pragmatic since default leads to future exclusion from the credit market. Nevertheless, it is only possible to depreciate since in general depreciation does stimulate exports in the ASEAN region. In summary, in general, the management of exchange rate seems to have remove one uncertainty in resource allocation while allowing gradual liberalising of trade in ASEAN.

CHAPTER 8: CONCLUSIONS AND POLICY IMPLICATIONS

8 Conclusions and Policy Implications

On the broader perspective, three most important debt aspects can be drawn from the thesis. Most importantly, the thesis shows that debt is an increasingly important means of financing economic development in the developing countries, at least up to a certain stage. In the course of financing economic development, debt can contribute towards the growth of output or debt can cause serious problems. The degree of debt problems varies from short-run illiquidity to long-run solvency. It calls for policy makers to identify systematically the sources (cost) and usage (rates of return) of debt since the fundamental condition for debt to bring in benefits is for the rates of return to be at least equal the costs, if not greater. In our macromodel, the cost of debt is shown by the coefficients on the interest rates factors while the benefits of debt is shown by coefficients on the growth of output. By rule of thumb, if the coefficient of growth of output is significantly different from zero and larger than the coefficient for interest rates, debt should bring in benefits. In the microeconomics perspective, the cost of debt (according to sources) is matched with the discounted net present value of future streams of rates of return on its usage on different types of debt-financed projects.

In the ASEAN region, development was rapid in the 1980s and in association with development, debt mounted, especially when foreign direct investment was at a lower level relative to the amount needed for rigorous economic development. In the late 1980s, both debt and foreign direct investment increased - financing the even rapid growth of income (GNP) and deficits enlarged further. When a develoing country reaches a higher stage of development or when the growth of income is relatively high, there is a tendency for deficits to fall and the usage of debt decreases or a country can even become a net capital exporter (as in the case of South Korea). All qualitative evidences including the micro/real side factors as well as macro-policy issues, show that the ASEAN region's debt problem in the 1980s was that of a short-run illiquidity. The micro or real side factors include a wider export-base in tradables undertaken by the active role of private sector in the region, lower debt burden as evidenced by indicators of debt burden as shown in chapter 2, etc., hence, implying that rates of return on debt-financed projects is at least equals its cost, if not greater, or simply debt usage is profitable. Assessment of debt-financed investment projects constitute a thesis in itself, and further research in this micro-economics aspect of debt should be undertaken by researches to further investigate profitability issues. The macreconomic policy issues has been

dealt with in this thesis by the macro-model in chapter 5. Due to the nature of debt problem in the ASEAN is that of short-term illiquidity, observers view ASEAN as a profitable region for investment, possibly explaining why when debt mounted, foreign direct investment also increased.

In the Malaysian data (representative of ASEAN countries), it is found that the private sector correlates strongly and positively with the external sector, whereas, the government sector has a weaker negative correlation with the external sector. This findings draws three fundamental points. Privatisation is an important form of structural adjustment in the region with the private sector's role becoming increasingly important in economic development in the ASEAN countries. Thus, project financing enables the cost of debt and the rate of return to be quantified. Secondly, by following a broadly balanced budget policy in recent years, the government releases domestic resources for use by the private sector. In many cases, privatisation of government projects seem more efficient and cost-effective, as in the case of privatisation in Malaysia. However, the release of resources are not enough to meet the demand by the private sector, thus the gap between private investment and savings need be filled with debt inflows. This shows that foreign exchange in the economy is inadequate, tax income are in domestic currency and frequently, may not matched the value of debt repayments. Hence, the importance of foreign exchange earnings. Thirdly, the existence of the strong correlation between the private and the external sector serves to show that the twin deficits need not necessarily be between the government and the external sector as claimed by the traditional twin deficits theory and empirical studies in the case with the U.S.

While the ASEAN case shows that there have not been serious debt problems, the Latin American countries have experienced debt crisis in that massive reschedulings have occurred. This demonstrates the 'ill' aspect of debt, possibly 'wrongly' used and sourced. On the usage side, it is well demonstrated that debt mounted, deficits enlarged and growth of output have been negative. The consequence is rescheduling. On the source aspect, it is also well demonstrated that debt has been of floating interest rates and banks have been lending aggressively, with concentration on a few selected countries.

On the specific perspective of the thesis, our model of debt and twin deficits addresses the three macro-issues stated in Chapter 4 section 4.1. The model is

timely for ASEAN given the continuous accumulation of debt and the inflow of foreign direct investments becoming uncertain at present (i.e. increasing at a lesser rate or in some cases stagnating), indicating that foreign direct investment tends to flow towards areas where the cost of labour are relatively cheaper such as in China and Vietnam. A more rigorous intra-ASEAN trade may enable ASEAN to reap the benefits of having different comparative advantage in each country, for example, the abundant labour and the raw materials that they provide. Surpluses ASEAN countries may also invest in the lower income countries such as the Philippines, to facilitate Philippine's recovery at the same time benefitting from its abundant labour. In the light of the above discussions, the contributions of the model are thus in line with the three areas mentioned. Firstly, the model contributes towards linking indebtedness and the twin deficits. Increased deficits is associated with increased indebtedness. Secondly, it contributes towards identifying the details of the internal policy variables that have effects on the twin deficits and increased indebtedness. The policy variables are numerous and it calls for policy makers to focus on these variables to identify exactly which variable contributes the most towards debt and deficits so that any policy action taken is most effective and efficient, and targeted towards solving the problem. Major policy areas identified involve tax policies (rates, revenues, elasticities, etc), financial policies (interest rates, investments, savings, debt, etc.) and trade policies (import and export policies, exchange rates, etc.). While the two aspects above constitute demand-side management, the final contribution deals with the supply-side management. The final contribution involves identifying the link between debt, twin deficits and the growth of output. A distributed lag of past outputs adjusts to last period investment (together with an initial endowment) gives output this period, which is also a determinant of deficits. In the new twin deficits model which also constitutes an aggregate demand and supply management, prices (domestic prices, relative export price to world export price, relative world import price to domestic price, exchange rate and interest rate) and output adjust to restore equilibrium in both the internal sector *(AS=AD)* and between the internal and the external sectors *({M-X)=(G-T)+(I-S)}*. With these adjustments, they serve to show that exchange rates and interest rates alone do not fully adjust to equilibrate the external and the internal sectors as implied by the conventional twin deficits notion. Our model thus makes a contribution in this respect. Referring to equations (5.2') to (5.7'), exchange rates adjust only partially in the tax, export and import equations; it does not play a role in the other equations. Even in the import and export

equations, it only adjust partially and not fully because of the presence of subsidies and taxes in both the prices of imports and prices of exports. Thus, the conventional twin deficits outlined by Gordon or as in the Mundell-Fleming framework is rather oversimplistic and ad hoc. Further, output adjustments as denoted in equation (5.11) ensures a long-run equilibrium. However, to ensure a long-run dynamic model, the change in output resulting from a change in capital and a change in labour was further considered in section 5.5.1.c).

While we are concerned with internal policy issues our model also has in-built transmission mechanisms for external shocks via exchange rates, the prices of exports and imports, and interest rates. External shocks that give rise to debt accumulation and debt problems like oil-price shocks, interest rate or exchange rate shocks, and terms of trade movements (as had been discussed in Chapter 1) can be accounted for in the model. By focussing on adjustments of these variables, policy-makers can insulate the economy against external shocks.

The significance of the common variables appearing together in the three systems of equations (as in Table 5.2 chapter 5) is that they cause co-movements among the sectors, hence are targets for necessary adjustments as discussed above. The behavioural interdependence among sectors, as demonstrated by equation 5.16 on page 5.35, makes it possible for policy targets be aimed at either one of the parameters stated to be increased or reduced to generate the desired balance on any of the sectors.

As had been noted, the stage of development that a country is in seems to have connection with the type of financing that a country is engaged in. The case of South Korea demonstrates the higher the stage of development the lower is the usage of debt creating flows at the same time deficits eased. Further, when the external balance turns into a surplus, it permits a country to become a capital exporter rather than a capital importer. When a country becomes a capital exporter, earnings from profits repartriation (from investment) constitute an important source of foreign exchange. Also, the higher is the stage of development, the more a country contracts debt from the international financial markets rather than from official sources due to perceived creditworthiness by creditors and perceived efficiency and competitiveness of loans by debtors. High growth of output (income) generates higher tax revenues and taxes as a form of financing naturally become important contribution. When a country has

a high growth of income, it is automatically categorise as a creditworthy customer, debt creating inflows may be more competitive in terms of cost for lenders compete to invest. Investment inflows will also increased as had been the case in ASEAN. The effects of debt versus foreign direct investments versus tax can be detected according to our new twin deficits model by looking at their specific coefficients. The effects of permanent income and cyclical income on the importance of tax versus debt versus foreign direct investment can also be detected by the model. The effects of debt for tax substitution or the Ricardian Equivalence effects is applicable in the government equation on government debt and taxes.

Other specific areas of contribution of the thesis are such as the logit study in Chapter 6 and the foreign exchange elasticity in chapter 7. The logit framework identifies debtors' difficulties in servicing debt, i.e. debtors' foreign exchange scarcity lead to demand for rescheduling. Secondly, macroeconomic variables together with financial variables (as opposed to taking either one of them) are important determinants of debt rescheduling signifying the importance of macro and micro policy areas in debt management. Thirdly, the study contributes towards capturing the effects of the heterogeneity of regional debt experiences that are shown by different determinants being significant in different regions. Fourthly, the elasticity effects facilitate policy decisions as to identify which determinants contribute the most in determining debt servicing difficulties thus, providing guidelines as to which variables should be focussed upon to deter rescheduling. The error management, i.e., by estimating the Type I and Type II errors, enables debtors and creditors to predictive crditworthiness, hence, enabling them to detemine whether credits are obtainable by debtors or can be given by creditors at a certain critical probability threshold.

Further, some other characteristics of debt and debt problems are shown to differ among regions. In Latin America, debt problems reached their limit and they arose because of excessive borrowings after the second oil shock. The low-income countries of Africa have debt problems because of very low export earnings although the bulk of the debt contracted is official and concessional in nature. Debt in the ASEAN region has high yen components as of mid 1980s. At least different behavioural patterns among different regions are detected.

The final specific conclusion that can be drawn from the thesis is the elasticity of foreign exchange discussed in Chapter 7 which shows the percentage change in export earnings associated with a percentage change in the exchange rate, thus demonstrating the role of the exchange rate in influencing earnings. It is found that devaluation/appreciation of the currency does have quite significant effects on foreign exchange earnings. Exchange rate management is shown to be important in controlling the debt service ratio - that is, an appreciating exchange rate, ceteris paribus, is associated with a rising debt service ratio which in turn may force down the effective exchange rate. Income proves to play a more significant role in determining the volumes of exports and imports than prices in the ASEAN countries.

To conclude, the thesis contributes to both the area of international finance and of development economics. Broadly, an improvement in the external account balance requires improvements in both the public and private sectors' financial position. Budget deficits do not necessarily cause external deficits in the sense budget deficits can be financed by seigniorage and domestic borrowings. However, when domestic capital markets are thin limiting domestic borrowing, there is more likely to be a close link. Both government and private sectors will borrow externally. A large proportion of external debts are sovereign debts possibly due to non-solvency condition of a country as opposed to a firm. `

APPENDICES AND REFERENCES

APPENDIX I

Chart 1: Nominal and Real Interest Rates, 1965-88 (% per year)

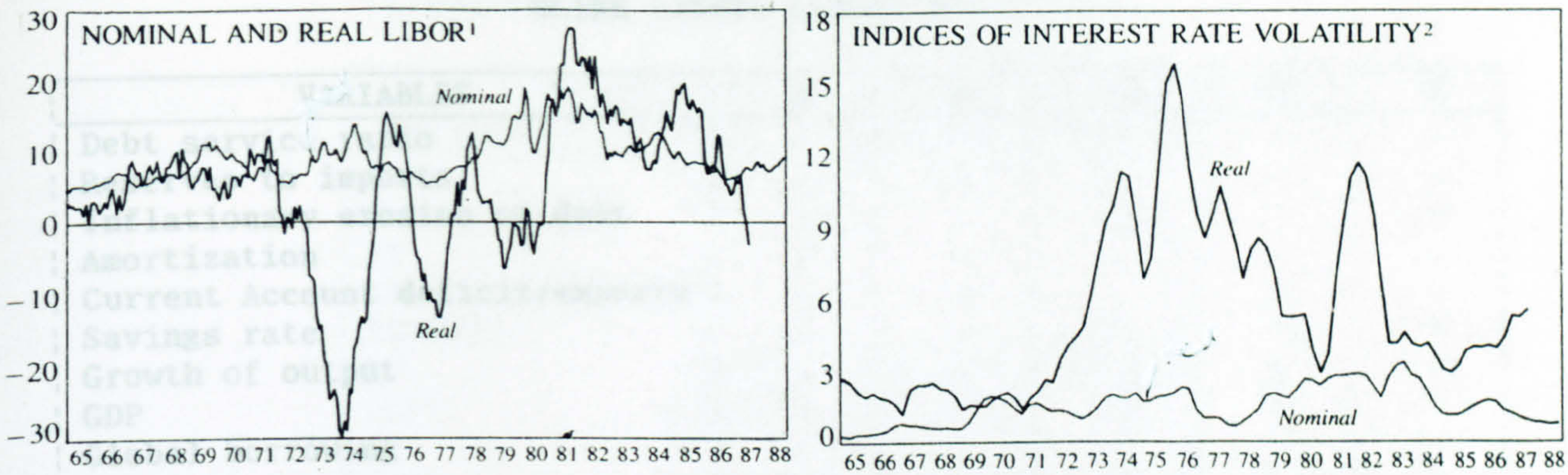


Chart 2: Indices of Exchange Rate Volatility, 1960-88 (% per year)

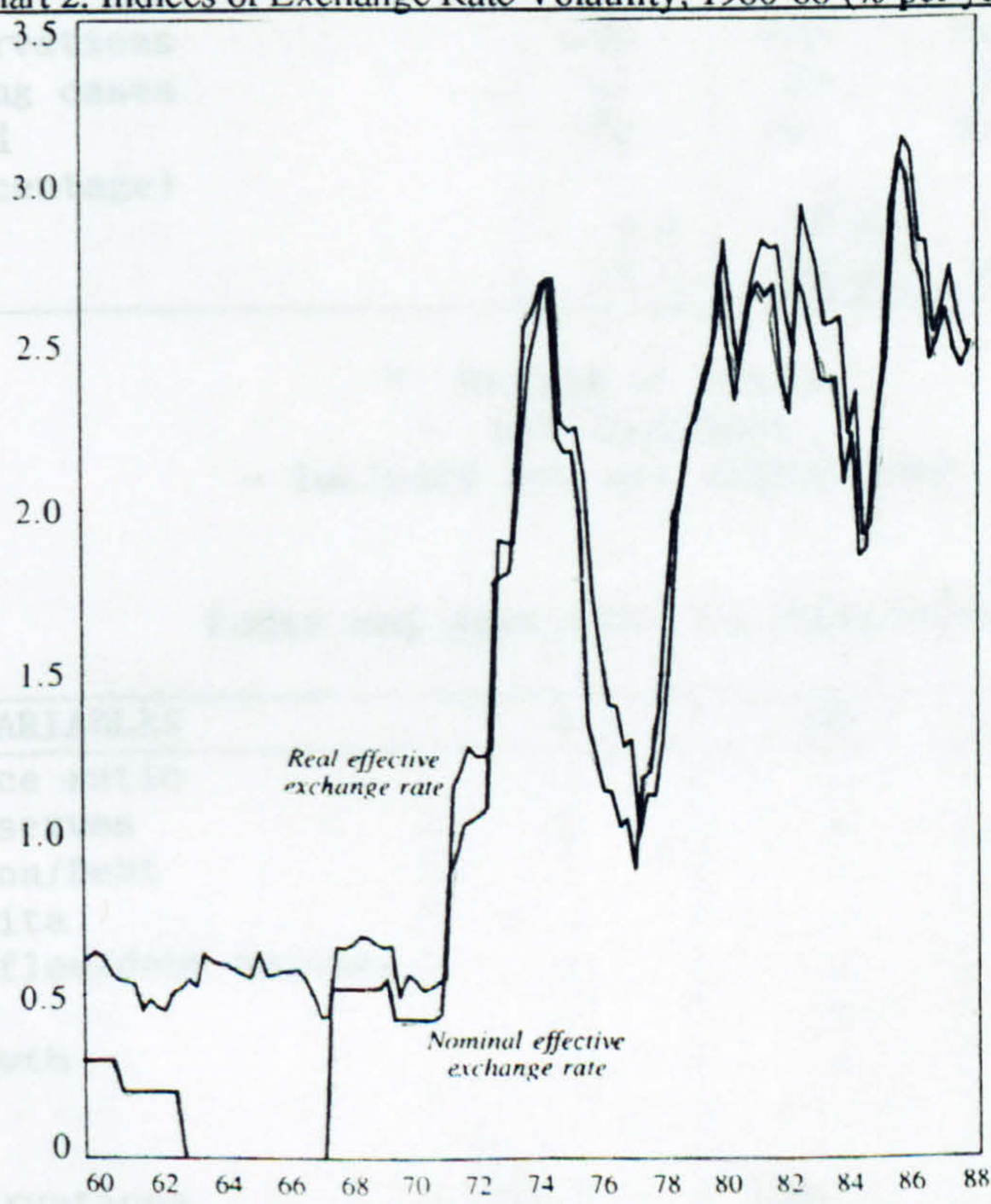
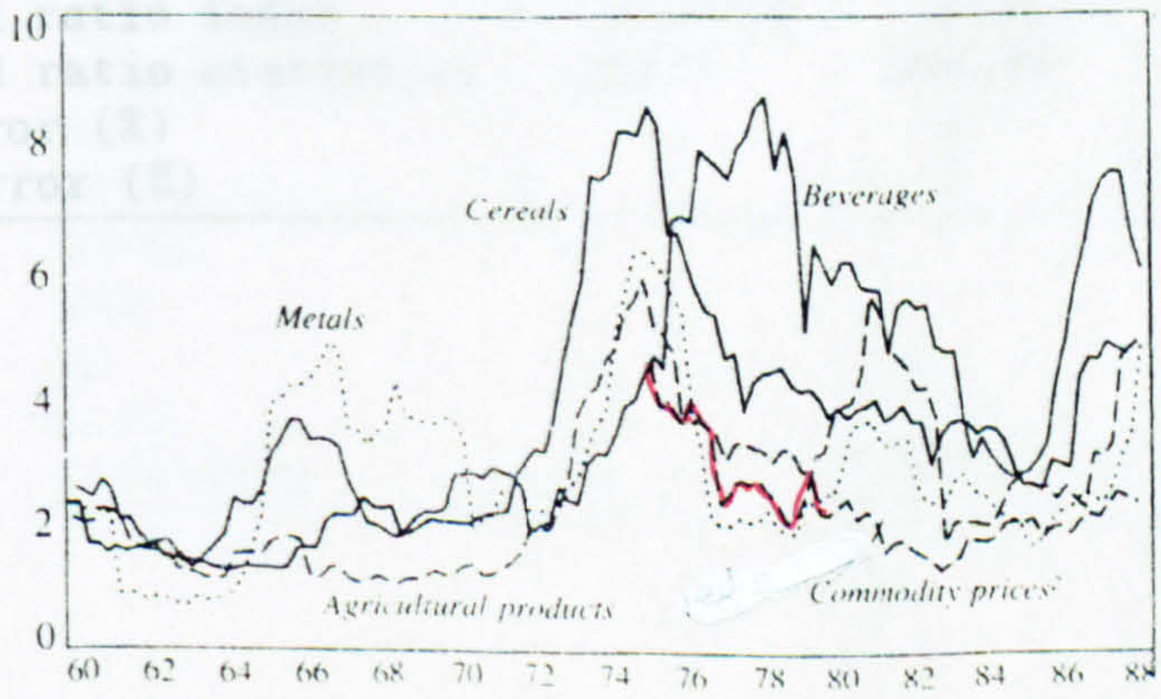


Chart 3: Indices of Commodity price Volatility, 1960-88 (% per year)



Source: Mathieson et.al, 1989.

CLINE (1984) [1968-1982]*

VARIABLES	A	B	(C)	(D)	E
Debt service ratio	.	-	.	-	.
Reserves to imports	.	.	.	.	.
Inflationary erosion of debt	.	.	-	-	-
Amortization	.	.	.	.	.
Current Account deficit/exports	.	.	.	.	.
Savings rate	.	.	-	-	-
Growth of output	.	.	.	.	.
GDP	.	.	-	-	-
Global borrowing	.	.	.	.	.
Net debt to export	-	.	-	.	-
Export growth	-	-	-	-	.
No of observations	640	640	670	670	574
Rescheduling cases	22	22	22	22	20
Chi-squared	772	762	812	795	700
Error (percentage)	.	.	.	.	.
Type I	9.1	18.6	9.1	13.6	10.0
Type II	13.6	14.6	13.0	16.1	12.5

* Period of Study
\- not included
\- included but not significant

Feder and Just (1977) [1965-1972]

VARIABLES	A	(B)	(C)	D
Debt service ratio	.	.	.	.
Imports/reserves	.	.	.	.
Amortization/Debt	.	.	-	-
Income/capita	.	.	.	.
Capital inflow/debt service	.	.	.	.
GDP growth	.	-	.	-
Export growth	.	.	.	.
No of observations	238	238	238	238
Rescheduling cases	21	21	21	21
Likelihood ratio index	0.9222	0.9217	0.9086	0.9019
Likelihood ratio statistics	304.26	304.09	299.79	279.56
Type I error (%)	.	1	3	.
Type II error (%)	.	5	6	.

Lloyd-Ellis, Mckenzie and Thomas (1987)

ANNUAL DATA [1977-1981]			
Variables	LOGIT	Heckman	FIML
EXP	.	.	.
TLA	.	.	.
ST	.	.	.
AT	.	.	.
RESQUOT	.	.	.
$\underline{R}^2$	0.426	0.426	0.426
LLF1	-19.82	-19.50	-
ST	-	.	.
MILLS RATIO	-	.	-
SIGMA	-	-	.
RHO	-	-	.
$\underline{R}^2$	-	0.507	0.670
LLF2	-	3.495	-
LLF1+LLF2	-	-16.013	-15.861

SEMI-ANNUAL DATA [1977-1985]			
Variables	LOGIT	Heckman	FIML
TLA	.	.	.
MT	.	.	.
UT	.	.	.
UA	.	.	.
RESQUOT	.	.	.
NOR	.	.	.
VOR	.	.	.
WAGP	.	.	.
WAM	.	.	.
DUM	.	.	.
$\underline{R}2$	0.198	0.197	0.199
LLF1	-170.28	-169.40	
ST	-	.	.
RESQUOT	-	.	.
WAM	-	.	.
MILLS RATIO	-	.	.
SIGMA	-	-	.
RHO	-	-	.
$\underline{R}2$	-	0.752	0.721
LLF2	-	0.981	-
LLF1+LLF2	-170.28	-168.42	-168.42

OUR STUDY [1980-1986]

Variables	Overall Results	Regional Samples			
-		Africa	L. Amer. (1)	L. Amer. (2)	SEA
Resquot	.	.	.	.	.
CAX	.	.	.	.	.
UFC	.	.	.	.	.
Dsr	.	.	.	.	.
TDX	.	.	.	.	-
ST	.	.	.	.	-
RESM	.	.	.	.	-
Xgro	.	.	.	.	-
Likelihood Ratio Test	94.27	38.39	46.28	49.76	6.86
Pr. correct predictions	81.40	79.59	85.71	84.03	94.28
Pseudo-$\underline{R}^2$	0.303	0.245	0.373	0.390	0.182
$\underline{P}$	0.2292	0.2653	0.2269	0.2269	0.057
Sample size	301	147	119	119	35
Rscheduling cases	69	39	27	27	2
Error rates *	.	.	.	.	.
Type I	19%	18%	15%	22%	10%
Type II	15%	21%	13%	10%	8%

* Using the method of minimizing the total error subject to a relatively balanced distribution of errors, and focussing on minimum possible type I error.

APPENDIX III

Table 7.5: Current Account Balance and Trade Position for ASEAN (mn US dollars)

Country	Item	1985	1986	1987	1988	1989	1990
S.Korea	CA bal	-887	4617	9854	14161	5056	-2172
	Export	26442	33913	46244	59648	61408	63123
	Import	26461	29707	38585	48203	56811	-65127
Singapore	CA bal	-4	319	224	1306	2338	2170
	Export	21533	21336	27464	37993	43239	50684
	Import	24362	23402	29910	40338	45713	55803
Malaysia	CA bal	-613	-123	2636	1817	-175	-1672
	Export	15133	13547	17754	20852	24825	28956
	Import	11556	10302	11918	15306	20926	-27032
Thailand	j CA bal	-1537	247	-365	-1655	-2455	-7282
	Export	7059	8803	11595	15781	19824	22811
	Import	8391	8415	12019	17856	22772	-29561
Indonesia	CA bal	-1923	-3911	-2098	-1397	-1108	-2369
	Export	18527	14396	17206	19509	22974	26832
	Import	12705	11938	12532	13831	16310	20734
Philippines	CA bal	-35	954	-444	-390	-1465	-2695
	Export	4629	4842	5720	7074	7821	8186
	Import	5111	5044	6737	8159	10419	12206

Source: IMF, International Financial Statistics, various issues.

Table 6.6a: Results of the Unrestricted Model: With and Without Debt Service Ratio; for the Latin American Region

Unrestricted Model				Restricted Model		
Variables	β estimates	Marginal effects	Elasticity effects	β estimates	Marginal effects	Elasticity effects
Constant	-3.4469	-	-	-4.0382		
resquot	-0.1024**	-0.0179	-0.3199	-0.1991	0.0349	0.6238
	(0.1962)			(0.2137)		
CAX	2.2612***	0.3966	-0.5065	3.7337***	0.6549	-0.8364
	(0.8673)			(1.1508)		
ufc	0.0099***	0.0017	0.7984	0.0078**	0.0014	0.6575
	(0.0038)			(0.0041)		
dsr	0.0708***	0.0124	1.1739	-	-	-
	(0.0311)					
TDX	-	-	-	0.0097***	0.0017	1.9995
	-			(0.0031)		
ST	-6.4655*	-1.1342	-0.8847	-8.1331**	-1.4267	
	(4.5158)			(4.8582)		
RESM	0.0482	0.0084	0.7478	0.0023	0.0004	-1.1129
	(0.0311)			(0.0353)		
xgro	-0.0364	-0.0064	-0.0016	0.9292	0.1629	0.0359
	(1.4141)			(1.6913)		0.0419

Number of observations = 119 Rescheduling cases = 27

Log of likelihood function	-40.03	-37.73
Log of likelihood function (β=0)	-63.723	-63.723
Likelihood ratio test	47.386	51.986
% correct predictions	86.55	84.03
Pseudo R^2	0.4181	0.4071
$\bar{P}$	0.2269	0.2269

Type 1 and Type 2 Errors

		p<0.5	p≥0.5
y	0	88/92	4/92
		=96.65	=4.35
	1	9/27	18/27
		=33.33	=66.67

		p<0.5	p≥0.5
y	0	82/92	10/92
		=89.13	=10.87
	1	11/27	16/27
		=40.74	=59.26

REFERENCES

1. Abell J.D. (1990), "Twin deficits During the 1980s: An Empirical Investigation," Journal of Macoreconomics, Winter, vol. 12, no. 1.

2. Ahmad E. and Stern N., 1989, "Taxation for Developing Countries", in Handbook of Development Economics, Volume 11, edited by H.Chenery and T.N. Srinivasan.

3. Alejandro, C.D., "Some Aspects of the Development Crisis in Latin America", in Thorp and Whitehead, Latin American Debt and the Adjustment Crisis, 1987.

4. Areskoug K., 1969, "External Public Borrowing: Its Role in Economic Development", New York, Praeger.

5. Arize A. (1987), "The Supply and Demand for Imports and Exports in a Simultaneous Model," Applied Economics 19, pgs 1233-1247.

6. Arize A. (1991), "Specification Test of the Aggregate Import Demand Model in Developing Countries," International Economic Journal 5, pgs 79-89.

7. Arize A. and Afifi (1987), "An Econometric Examination of Import Demand Function in Thirty Developing Countries," Journal of Post Keynesian Economics 9, pgs 604-616.

8. Aschauer D.A. (1985), " Fiscal Policy and Aggregate Demand", The American Economic Review 75.

9. Asian Development Bank, (1986), "Key Indicators of Developing Member Countries", vaious issues.

10. Asian Development Bank, Annual Reports, various issues.

11. Atkinson A.B. and Stiglitz J.E, (1980), "Lectures on Public Economics", New York: McGraw-Hill.

12. Bahmani-Oskoee (1984), "On the effect of efective exchange rate on trade flows, Indian Journal of Economics, LXV, 56-67.

13. Balassa B and Williamson J, (1987), "Adiusting to Success: Balance of Payments Policy in the East Asian NIC's", Institute of International Economics, Washington D.C.

14. Bank For International Settlement Economic Papers, "Reserves and International Liquidity", No. 22, June 1988, Basle.

15. Bank Negara Malaysia Annual Reports, various issues.

16. Bank Negara Malaysia Quarterly Bulletin, 1990.

17. Bank of England, Quarterly Buletin, June 1981.

18. Bank of Japan (1980), "Development of International Financial Market in Hong Kong ans Singapore", Economic Research Department, Tokyo, Discussion Paper No. 88.

19. Bank of Japan (1986), External Financing by Developing Asian Countries: Present Situation and Future Outlook," research and Statistics Department, Special Paper No. 138, Tokyo.

20. Bank of Japan (1988), "Greater Role of the Asian Economies in the World and Growing Interdependence among Asia, the United States and Japan," Special Paper No. 166, Tokyo.

21. Barro R.J. (1974), "Are Government Bonds Net Wealth?" Journal of Political Economy, 1974, vol 82, no. 6., The University of Chicago.

22. Bernheim B.D. (1987), "Ricardian equivalence: An Evaluation of Theory and Evidence", National Bureau of Economic Research Macroeconomic Annuals, vol. 2.

23. Bird R.M. and Oldman O., (eds) (1990), "Taxation in Developing Countries," Baltimore: John Hopkins University Press.

24. Black SW, (1973), "International Money Markets and Flexible Exchange Rates", Princeton University.

25. Black SW, (1976) "Exchange Policies for Less Developed Countries in a World of Floating Rates,"

26. Blejer MI. and Khan MS., "Government Policy and Private Investment in Developing Countries," IMF Staff Papers, Vol. 31, No. 2, June 1984.

27. Blejer, M.I. and Isabell Geurrero, 1988, "Stabilization Policies and Income Distribution in the Philippines", in Finance and Development, Dec. 1988.

28. Brown and Jackson, (1990), "Public Sector Economics", 4th edition, Blackwell, Oxford.

29. Bryant. R (1985), Financial Structure and International Banking in Singapore," Brookings Discussion Paper in Economics, Washington.

30. Buiter W.H. (1985), "A Guide to Public Sector Debt and Deficits", Economc Policy 1, A European Forum.

31. Buiter W.H. (1988), "Some Thoughts on the Role Of Fiscal Policy in Stabilisation and Structural Adjustment in Developing Countries", National Bureau of Economic Research, Working Paper no. 2603.

32. Burgess R. and Stern N. (1992), "Taxation and Development," The Development of Economic Research Programme, London School of Economics.

33. Cameiro, 1987, "Long-run Adjustment, the Debt Crisis and the Changing Role of Stabilisation Policies in the Recent Brazilian Experience", in Thorp and Whitehead, Latin American Debt and the Adjustment Crisis, Macmillan, 1987.

34. Chelliah R.J., (1971), "Trends in Taxation in Developing Countries," IMF Staff Papers 18, pp 254-331.

35. Chelliah R.J., Baas H.J. and Kelly M., (1975), "Tax Ratios and Tax Effort in Developing Countries, 1969-71," IMF Staff Papers 22, pp187-205.

36. Chenery H.B. and Eckstein P., 1970, "Development Alternatives for Latin America," Journal of Political Economy, 78, Supplement.

37. Cooper RN, (1971), "Currency Devaluation in Developing Countries", Princeton University.

38. Cox D. R. "The Analysis of Binary Data", 1970, Reprinted 1977, Chapman and Hall Limited.

39. Creedy J. and Gemmell N. (1982), "The Built-in Flexibility of Progressive Income Taxes: A Simple Model," in Public Finance 37, No. 3. pp 361-71.

40. Dale R. S. and Mattione R.P, 1983, "Managing Global Debt", A Staff Paper, Brookings Institution.

41. Deaton A., (1987), "Econometric Issues for Tax Design in Developing Countries," in Newberry D. and Stern N., eds., The Theory of Taxation for Developing Countries, A World Bank Research Publication.

42. Deaton A., 1989, "Saving in Developing Countries: Theory and Review," in Annual Conference on Development Economics - Proceedings of the World Bank.

43. Dhonte P., 1975, "Describing External Debt Situation: A Roll-over Approach", IMF Staff Papers. Vol. 22 pp. 159 -186.

44. Direction of Trade Statistics, various issues.

45. Dittus P., O'Brien P.S. and Blommestein H.J., (1991), "International Economic Linkages and the International Debt Situation", OECD Economic Studies, No. 16 (Spring), pp 133-168.

46. Dornbusch R. (1986), Inflation, Exchange Rate and Stabilisation, Essays in the International Finance, No. 65, Princeton University, New Jersey.

47. Dornbusch, R., 1987, "Dollars, Debts and Deficits," MIT Press.

48. Drazen A and Elhanan Helpman, (1986), "Inflationary Consequences of Anticipated Macroeconomic Policies", National Bureaue of Economic Research, Working Paper no. 2006.

49. Easterly W. and Fischer S., (1990), "The Economics of the Government Budget Constraint," in The World Bank, Research Observer, July 1990, Vol. 5, No. 2, pp127-142.

50. Eaton and Gersorvitz, 1981, "Poor Country Borrowing in Private Financial Markets and the Repudiation Issue", No. 47, Princeton Studies in International Finance.

51. Economics Department, Monetary Authority of Singapore (1986), "The Financial Structure of Singapore," Singapore.

52. Eichengreen B and Portes, (1986), "The Anatomy of Financial Crises", Discussion Paper Series No 130, Centre for Economic Policy Research, London.

53. Enders, W and Lee B.S, (1990) "Current Account and Budget Deficits: Twins or Distant Cousins?", Review of Ecvonomic and Statistics, LXXII (3), August, pp 373-381.

54. Eshag E. (1983), "Fiscal and Monetary Policies and Problems in Developing Countries", Cambridge University Press.

55. Feder G. and Just R., 1977, "A Study of Debt Servicing Capacity Applying Logit Analysis", Journal of Development Economics, pp. 25 - 39.

56. Feldstein M.S. (1986), "The Budget Deficit and the Dollar", Macroeconomics Annual, ed. Stanley Fischer, National Bureau of Economic Research,.

57. Fifth Malaysia Plan, 1986-90.

58. Finance and Development, March 1987, "Debt Problem of sub-Saharan Africa", A Staff Report.

59. Fleming J.M. (1971), "Essays in International Economics", George Allen and Unwin, London.

60. Frank C. R. and Cline W. R., 1971, "Measurement of Debt Servicing Capacity: An approach of Discriminant Analysis", Journal of International Economics, p. 327 -344.

61. Frenkel J., and Razin A., (1987), " Fiscal Policies and the World Economy," Massachusettes Institute of Technology.

62. GATT: "Trade Policy Review 1993", Indonesia.

63. GATT: "Trade Policy Review 1993", Malaysia.

64. GATT: "Trade Policy Review 1993", S.Korea.

65. GATT: "Trade Policy Review 1993", Thailand.

66. GATT: "Trade Policy Review 1993", The Philippines.

67. Gawronski, P.G., 1990, "Optimal Currency Composition of Foreign Debt: The Case of Five Developing Countries", OECD.

68. Gemmell N. (1987), "Taxation and Development" in The Public Sector and Development, in N. Gemmell (ed), Surveys in Development Economics, Basil Blackwell.

69. Gemmell N. (1990), "Fiscal Dependence on Trade Taxes and Development: Some New Evidence," CREDIT Research Paper, Nottingham University, December.

70. Gemmell N. (1993), (edited), "Wagner's Law and Musgrave's Hypotheses," The Growth of the Public Sector, Theories and International Evidence.

71. Gersovitz M., 1988, "Saving an Development," in Chenery and T.N Srinivasan, (eds.), Handbook of Development Economics, vol. 1, Amsterdam:Elsevier.

72. Gibson H. D. and Thirlwall A. P., 1989, "An International Comparison of the Cause and Changes in the Debt Service Ratio 1980 - 1985", Banca Nazionale Del Lavoro - Roma, No. 168.

73. Goldstein M and Khan, M., (1988), "Income and Price Effects in Foreign Trade," in International Monetary Economics and Finance Vol.2, Handbook of International Economics, edited by Jones and Kenen.

74. Goldstein M. and Khan MS. (1987), "The Supply and Demand for Exports: A Simultaneous Approach," The Review of Economic and Statistics, Vol.

75. Goldstein M., Khan M.S. and Officer L.H. (1980), "Prices of Tradable and Nontradable Goods in the Demand for Total Imports," Review of Economics and Statistics 62, pgs 190-199.

76. Gordon RG, (1990), "Macroeconomics," Fifth edition, Harper Collins College Publisher.

77. Grawe P. and Theo Peters, (1983), 'Exchange Rates in Multicountry Econometric Models," The Macmillan Press.

78. Grawe RN, (1985), "Real Exchange Rates Variability from 1920-26 and 1973-82," Princeton University.

79. Greenaway, D. (1980), "Trade Taxes as a Source of Government Revenue: An International Comparison", Scottish Journal of Political Economy, Vol 27, pp 175-82.

80. Greenaway, D. (1984), "A Statistical Analysis of Fiscal Dependence on Trade Taxes and economic development," Public Finance 39, pp 70-89.

81. Greenaway, D. and Sapsford D. (1987), "Further Econometric Analysis of the Relationship Between Fiscal Dependence on Trade Taxes and Economic Development", Public Finance 42, No. 2, pp 309-19.

82. Greene, J. "The Debt Problem of sub-Saharan Africa", in Finance and Development, June 1989.

83. Helleiner, G. K., 1983, "The IMF and Africa in the 1980s", Essays in Internal Finance No. 152, Princeton University.

84. Houthakker H.S. and Magee S.P. (1969), "Income and Price Elasticities in World Trade," The Review of Economics and Statistics 51, pgs 111-125.

85. IMF Annual Report, 1982.

86. International Monetary Fund, "Intemational Financial Statistics Yearbook", various issues.

87. International Monetary Fund, "Balance of Payments Yearbook", Various Issues.

88. Jones R.W. and Kenen P.,eds, (1988), International Monetary Econom- ics and Finance," Vol 2, Handbook of International Economics, North Holland.

89. Jose V. R., 1985, "Mortgaging the Future: The World Bank and IMF in the Phllippines".

90. Judge G.G., et. al, (1988), "Introduction to the Theory and Practice of Econometrics," 2nd Edn. , John Wiley.

91. Khan M.S. (1974), "Imports and export Demand in Developing Countries", IMF Staff Papers, November, pgs 678-693.

92. Khan M.S. (1975), "Cyclical and Secular Income Elasticities of the Demand for Imports," The Review of Economics and Statistics 57, pgs. 357-361.

93. Khan M.S. and Ross K.Z. (1977), "The Functional Form of Aggregate Import Demand," Journal of International Economics 7, pgs. 149-169.

94. Kharas H., 1981b, "On Structural Change and Debt Service Capacity", World Bank Domestic Finance Study No. 74.

95. Kletzer K.M. (1990), Sovereign Debt Renegotiation in a Consumption-Smoothing Model," Economic Growth Centre, Yaale University, Discussion Paper No. 610.

96. Lahiri A., 1989, "Dynamics of Asian Savings, The Role of Growth and Age Structure," in IMF Staff Papers, Vol. 36 (1), March.

97. Lapuran Bank Negara Malaysia, 1988.

98. Latifah and Ariff, 1992, "The Linkage Between Exchange Rate and Debt Service: The ASEAN Experience," Asian Economies, No. 85, Dec., Research Institute of Asian Economies, Seoul, Korea.

99. Lee, J., Rana, P.B., and Iwasaki, Y., (1989), "Effects of Foreign Capital Inflows on Developing Countries"

100. Lever and Huhne, 1985, "Debt and Danger", Penguin Books Ltd.

101. Llewllyn D.T. and Milner C., (1990), eds. "Current Issues in International Monetary Economics," Macmillan.

102. MacDonald R., "Empirical Studies of Exchange Rate Determination," in Llewllyn D.T. and Milner C., (1990), eds. Current Issues in International Monetary Economics, Macmillan.

103. Maddala G. S., 1983, "Limited Dependent and Qualitative Variables in Econometrics", Economic Society Monograph No. 3, Cambridge University Press.

104. Marston R. (1971), "Income Effects and Delivery Lags in British Import Demand: 1955-1967," Journal of International Economics 1, pgs. 375-399.

105. Mathieson, D.J., David Folkerts-Landeu, Timothy Lane and Igbal Zaidi, "Managing Financial Risks m Indebted Developing Countries", IMF, June 1989.

106. McDonald D., 1981, "Debt Capacity and Developing Country Borrowing: A Survey Literature".

107. McFadden D., 1973, "Conditional Logit Analysis and Qualitative Choice Behaviour", in Frontiers in Econometrics, P. Zarembka, ed. 1973, New York: Academic Press.

108. Melo O. and Vogt MG. (1984), "Determinants of the Demand for Imports of Venezuela," Journal of Development Economics 14, pgs 351-358.

109. Mid Term Review of the Fifth Malaysia Plan 1986-1990.

110. Mikesell and Zinser, 1974, "The Nature of the Savings Function in Developing Countries: A Survey of the Theoretical and Empirical Literature," in Journal of Economic Literature.

111. Monetary Authority of Singapore, Annual report, various issues.

112. Mundell, R.A. (1968), "International Economics" Macmillan, New York.

113. Naya, S. "Effects of Extemal Schocks on the Balance of Payments, Policy Responses and Debt Problems of Asian Developing Countries", The Philippine Economic Joumal, No. 1, 1984.

114. Newbury D. and Stern N., eds., (1987), "The Theory of Taxation in Developing Countries", A World Bank Research Publication

115. OECD Survey, 1982, "Extemal Debt of Developing Countries", OECD.

116. OECD Survey, 1983, "Extemal Debt of Developing Countries", OECD.

117. OECD, "Geographical Distribution of Financial Flows to Developing Countries", various issues.

118. Ortiz, Guillermo and Alain Ize, (1987), "Fiscal Rigidities, Public Debt and Capital Flight," IMF Staff Papers, Vol 34 No. 2, June, pp 311-331.

119. Pindyck and Rubenfield, (1991), " Introduction to econometrics".

120. Rama M.,(1990), "Empirical Investment Equations in Developing Countries," Policy Research and External Affairs Working Papers on Macroeconomic Adjustment and Growth, The World Bank.

121. Rana PB, (1981), "ASEAN Exchange Rates- Policies and Trade Effects," ASEAN Economic Research Unit, Institute of Southeast Asian Studies, Singapore.

122. Rana PB, and Alboro F, (1987), "Economic Stabilization Policies in ASEAN Countries," Institute of Southeast Asian Studies, Singapore.

123. Roosa R.V., (1983), "Economic Instability and Flexible Exchange Rates," Lectures, Workshops and Proceedings of International Conferences, Institute of Southeast Asian Studies, (ISEAS), Singapore.

124. Rosensweig J.A. and Tallman E.W. (1993), "Fiscal Policy and Trade Adjustment: Are the Deficits Really Twins?", Economic Inquiry, Vol. XXXI, October.

125. Runkle D.E., (1987), "Vector Autoregressions and Reality," Journal of Business and Economic Statistics, Oct. Vol.5, No. 4.

126. Solomon R. (1992), "The Status of LDC Debt Problem", International Economic Letters, Vol. XII, No.4, R.S. Associates, Washington.

127. Spaventa L., (1987), "The Growth of Public Debt: Sustainability, Fiscal Rules and Monetary Rules", IMF Staff Papers, Vol. 34 No. 2, June, pp 374-399.

128. Stern N., (1987), "The Theory of Optimal Commodity and Income Taxation: An Introduction," in Newberry D. and Stern N., eds., The Theory of Taxation for Developing Countries, A World Bank Research Publication.

129. Summers L.H., and Carroll C., 1989, "The Growth-Savings Nexus," Paper presented to National Bureau of Economic Research Conference on Savings, Maui, Hawaii.

130. Sundarajan and Malhos, "Financial Reform in Indonesia", Finance and Development, December, 1988.

131. Sundarajan V. and Thakur S., (1990), "Public Investment, Crowding Out, and Growth: A Dynamic Model Applied to India and Korea," IMF Staff Papers No. 27, pp 814-855.

132. Tait A.A, Wilfrid L.M. Gratz and Eichengreen B., (1979), "International Comparisons of Taxation for Selected Developing Countries, 1972-76," IMF Staff Papers, 26.

133. Tanzi, V. (1991), "Public Finance in Developing Countries" , Edward Elgar.

134. The Philippines Economic Journal, No 55, Vol XXlll, 1984.

135. Thursby J. and Thursby M. (1984), "How Reliable are Simple, Single Equation Specifications of Import Demand," The Review of Economics and Statistics 66, pgs 120-128.

136. Treasury, Annual Economic Reports, Malaysia, various issues.

137. U Tun Wai, (1989), "Role of Capital in Southeast Asian Countries," ASEAN Economic Research Unit, ISEAS, Research Note and Discussion Papers No.68.

138. Warner A.M. (1989), "Did the Debt Crisis Cause the Investment Crisis?", Quarterly Journal of Economics, pp 1160-1186.

139. World Bank, "World debt Tables", various issues

140. World bank, (1993-94), "World debt Tables, External Finance for Developing Countries".