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"The Impacts of Different Exchange Rate Regimes on Inflation and Trade of Some LDC's : A Study of South Korea, the Philippines, Malaysia, Indonesia, Singapore and Thailand"

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"The Impacts of Different Exchange Rate Regimes on Inflation and Trade of Some LDC's : A Study of South Korea, the Philippines, Malaysia, Indonesia, Singapore and Thailand"

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and

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This research report is a first part the project to be further undertaken by the authors with special reference to the trade and balance of payments impacts of these countries.

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Abstract

The study is primarily concerned with exchange rate policies with a view to assessing the impacts of exchange rate changes on domestic price levels and the balance of payments developments of a selected group of countries of ASEAN and the Republic of Korea. The methodological viewpoint adopted for the present investigation is the monetary approach to exchange rate determination.

In an attempt to contribute to an analysis of the issues being considered, the following findings of substantive importance should be spelled out.

First, since and after the generalized floating of major currencies, the sample countries' currencies were shifted from pegging to the U.S.dollar with prescribed margins to adoption of the rate regimes based on managed floating for the Philippines, during 1971-1974, for Malaysia and Singapore during 1973-1979, and in case of the Republic of Korea during 1971-1973. The notable feature of the exchange rate regimes of Indonesia and Thailand is that their currencies were pegged to the U.S.dollar throughout the period, except for Thailand whose currency was pegged to a basket of major currencies in November 1978. It is interesting to note that countries with high and medium inflation rates, Indonesia and Korea, pegged

their currencies to the U.S.dollar, whereas those with lower inflation rates allowed their currencies to float, or rather adopted a managed float. Secondly, the sample countries being considered experienced relatively small movements in their effective exchange rates (defined as the weighted average of the bilateral exchange rates); and the effective exchange rates of the various countries depreciated substantially (except for Singapore whose exchange rate appreciated slightly). For these countries, prices of import and export goods are determined on world markets, and not influenced by the exchange rate. The domestic price of traded goods is thus determined by the price on world markets converted into home currency by the given exchange rate. In the whole, it may be said that exchange rate movements in the sample countries had only marginal effects on the respective inflation rates of these countries. The main findings bear out the assertion that the intensity of inflation rates in the countries under study could be attributed to changes in the prices of commodities imported from foreign countries. Thus, the prices of internationally traded goods, especially the import price was the key factor contributing to domestic inflationary pressures in the sample countries being reviewed during 1973-1979. Thirdly, if the fact is that the sample countries experienced a similar degree of foreign or imported inflation, and as indicated in the preceding paragraphs,

encountered relatively small changes in their effective exchange rates over the sample period, what accounts for the diversity of inflation rates in these countries over the period from 1973 to 1979? The present study argues that differences in the domestic inflation situation could not be explained by these countries' respective exchange rate policies nor by repercussions associated with their exchange rate changes, since it has shown that these countries experienced relatively small movements in their effective exchange rates. The present study takes the view that the diversity of the inflation developments resulting in differential rates in the sample countries was ascribed mainly to differences in the conduct of their respective monetary and especially credit policies. Given the similar changes in the foreign prices facing these countries, the countries that increased their money supply relatively faster than the growth rate of real output experienced higher inflation rates, and vice versa. In fact, a ranking of the sample countries according to their money supply growth rates matches correspondingly that according to their inflation rates. Taking into account the role of imported prices, domestic inflation developments in the various countries being studied can be said to depend on the rate of change of traded goods prices (and these changes in the prices of traded goods indirectly affect the prices of non-traded goods, because as traded goods prices increase,

supply adjust from non-traded to traded goods, which causes prices to be pushed upward), and the growth rate of money supply in the countries being reviewed.

Fourthly, the increasing demand for traded goods along with the excess supply of money exerts inflationary pressures to a significant extent. Moreover, the excess supply of money increases the demand for traded goods and led to the deterioration in the balance of payments developments.

Chapter I

Introduction

1.1 The Setting of the Problem : Exchange Rate Arrangements Since the 1970's

The Bretton woods international system of fixed exchange rates in the name of the renown gold exchange standard, which served as a fountainhead of the world's trade and payments since 1944, came to a fatal collapse in August 1971; and a short-lived Smithsonian Agreement which followed eventually broke down in 1973. During the years of the fixed rate system, the majority of countries of the world, including developing countries (LDCs) pegged the values of their currencies to the United States dollar because the dollar predominated as a key currency, and convertibility between the dollar and gold was formally assured by the United States government's commitment to maintain fixed price of gold. However, the suspension of the U.S. dollar and gold convertibility in August 1971, and the subsequent developments of two formal and unsuccessful devaluations of the dollar in an attempt to establishing an appropriate par value,were abandoned in March 1973, after which the U.S. dollar became a floating currency. As a consequence of such unprecedented events, currency realignments among major industrial as well as some developing countries took on a running course. The 1971 currency realignment, accompainied by exchange rate instability and the severe

disequilibrium in the international monetary system on a scale not seen since the Great Depression, has provoked a profoundly detrimental effect on trade and development, especially of developing countries, and certainly endangers basic goals of the International Monetary Fund and the world Bank for maintaining internal stability with external payments equilibrium, and for improving living conditions in developing countries during the United Nations Third Development Decade.

A notable feature of the international trade and payments since the 1970's has been a widespread shift among the major industrial and developing countries from a system of fixed parities to flexible exchange rates, although it has fallen far short of a complete move to a freely floating exchange rate regime. "Floating exchange rates have existed by default rather than by design. Monetary authorities have generally agreed that recent disturbances caused by the oil price rise, rampant inflation, and volatile flows of short term capital ruled out the fixing of exchange rates"[1]

The currency realignments have correspondingly witnessed shifts of unprecedented magnitude in the current account balances of major groups of countries, expecially LDCs. During 1970 - 73, industrial countries as a group recorded annual current account surpluses by an order of magnitude of between $ 14 billion and $ 19 billion, whereas over the same

period non-oil exporting LDCs ran annual current account deficits of between $ 9 billion and $ 12 billion and oil-exporting countries' current account surpluses rose from $ 6.5 billion in 1973, to $ 68 billion in 1974, as shown in Table 1.1. The counterpart of the shift in 1974 was apparently the emergence of deficits for industrial countries and non-oil exporting LDCs. Since 1975 the current account surplus of industrial countries declined rather sharply; but for non-oil LDCs the current account deficits varied from $ 38 billion in 1975 to $ 25 billion in 1976 and settled at about $ 22 billion in 1977. This suggests that LDCs as a group bore nearly the full burden of account deficits.

The currency realignment aftermath has produced a dilemma for LDCs which have been faced with a range of options for exchange rate policies. A remarkable feature of LDCs in this connection has been a conspicuons fact that, although some LDCs made recourse to the flexible or quasi - flexible rates, the majority of them has opted for pegging their currencies to a single currency or a composite of foreign currencies. The study by the International Monetary Fund suggests that the current international monetary system is the defacto one in which fixed exchange rates predominate but the floating rate regime coexists.[2] According to the IMF tabulation, the present exchange rate regimes may be classified into five main categories : (i) currencies pegged to a single currency; (ii) currencies pegged

to a basket of currencies; (iii) countries that float independently; (iv) currencies that float jointly; and (v) countries that are pegged to others but change the peg frequently. Firstly, it should be noted that of the total of 122 currencies of the Fund member countries in 1975, only 11 members were operated under the independent floating exchange rates (the United States, Britain, France, Italy, Canada, Japan, Switzerland), and developing countries included Malaysia, the Philippines, Singapore, Morrocco, Nigeria, Saudi Arabia, etc. This group of independent floaters accounted for about 46.4 percent of world trade as of June 1975. Secondly another exchange regime is joined by those Western European countries which maintain common currency margins with each other and were classified as joint floaters. They included Belgium, Denmark, Germany, the Netherlands, Norway and Sweden. This group accounted for about 23 percent of international trade in 1977. Finally, the remaining 104 member countries which included industrial and developing countries of the world, all pegged their currencies to a single convertible currency, such as, the US dollar, the French franc, or to a composite of foreign currencies weighted by their trade proportion with their trading partners of this group 77.88 percent of 104 countries were pegged to a single foreign currency and 18.27 percent to a basket of currencies or other indicators such as the SDR, as can be seen in Table 1.2.

Table 1.1

Current Account Balances of IMF Member Countries, 1970-1977

(In billions of US dollars)

	1970	1971	1972	1973	1974	1975	1976	1977
1. Industrial Countries	13.6	17.1	14.4	18.8	-3.9	26.0	6.8	0.8
2. Oil exporting countries	0.2	2.0	3.0	6.5	67.8	34.7	40.9	35.4
3. Major Developed Areas	-3.2	-2.4	1.7	1.1	-14.5	-14.8	-13.7	-13.3
4. Less developed countries(LDCs)	-9.4	-12.2	-9.7	-11.3	-29.9	-37.7	-25.2	-22.0
5. Other agricultural countries	-12.6	-14.6	-8.0	-10.2	-44.4	-52.4	-38.9	-35.2

Source : Sydney Dell and Roger Lawrence, The Balance of Payments Adjustment Process in Developing Countries, New York : Pergamon Press, 1980, p. 2.

Table 1.2

Exchange Rate Regimes of International Monetary Fund Members:

Types of Exchange rate regimes	Number of currencies	Percentage Share of trade
1. Currencies that float independently	11	46.4
2. Currencies that float jointly	7	23.2
3. Currencies pegged to a single currency	81	14.4
3.1 Pegged to U.S. dollar	54	12.4
3.2 Pegged to French Franc	13	0.4
3.3 Pegged to pound sterling	10	1.6
3.4 Pegged to South African rand	3	-
3.5 Pegged to Spanish peseta	1	-
4. Currencies pegged to a composite of currencies	19	12.4
5. Currencies pegged to others but change the peg frequently	4	2.0
	122	99.4

Source : International Monetary Fund, Annual Report, 1977.

The point of crucial importance is that a variety of exchange rate regimes impinge on developments in the balance of payments adjustment process of the countries concerned. In fact, there is widespread agreement that improvement requires more flexible exchange rates than under the Bretten woods system, and the Jamaica Agreement of January 1976 legitimized flexible rates. However, as indicated in the Table 1.2, the majority of LDCs chose a system of fixed parities because they feared that greater exchange rate flexibility would be detrimental to LDCs and some claimed that LDCs have already been injured by the smithsonian realignment of exchange rates in 1971, the dollar devaluations in 1973, and the flexible exchange rates that thereafter permeated major group of industrial countries thereafter.[3] In view of this, for a group of LDCs that strictly held on to fixities, flexible exchange rates would be anathema. The government authorities of these countries insisted on supporting unchanged parities in relation to their respective industrial country trading partners on the grounds that flexible exchange rates would worsen the terms of trade and induce general price increases which may "rapidly undercut the improved competitiveness that devaluation is designed to achieve".[4] Thus, Common Wealth countries anticipated that flexibility of their exchange rates in terms of the pound would reduce the real value of their export

earnings for those commodities whose prices were quoted in sterling. Even at the international forums, including the meetings of the United Nations Conference on Trade and Development (UNCTAD III), representatives of LDCs defended their position by arguing that LDCs had lost real value of dollar and sterling reserves due to shifts in major currency parities among industrial countries.[5]

In addition, theoretical arguments put forward by economists and policy makers opposed to greater exchange rate flexibility have been pervasive and varied. Briefly, the arguments include the following points : (1) flexible rates for LDCs would increase uncertainty about import prices and foreign exchange reserves; (2) it would exacerbate commodity price fluctuations; (3) Trade elasticities of LDCs would not facilitate exchange flexibility to provide for increased exports; (4) exchange rate flexibility would trigger vicious cycle of inflation in LDCs; (5) it would raise problems of external debt and reserve management.[6] In sum, free floating is not likely to be a viable policy option under the present regime of generalized floating among major currencies. On the other hand, fixing the exchange to one or more currencies under the present regime implies floating against all other currencies.[7]

A problem of crucial importance confronting LDCs under generalized flexible exchange rates among the major world currencies, is how to respond to this situation in the setting of LDCs' own exchange rates. A pertinent issue in this connection relates to whether the differential exchange rates regimes adopted by LDCs have contributed to the level of domestic inflation in these countries, and through what channel an impulse of inflationary upward pressure is transmitted into domestic prices as a result of exchange rate changes.

At the onset of the generalized - floating period, during the 1970's economists appeared to believe that exchange rate flexibility among the industrial and developing countries had surely solved the external - adjustment problem once and for all. However, the short interval of floating rate experience has witnessed adverse shifts in the current accounts of industrial and non-oil exporting developing countries of an unprecedented scale as a result of exchange rate fluctuations. These fluctuations not only have failed to restore balance of payments equilibrium as anticipated but also have led to high cost of resource utilization through restrictions. As Marina V.N.Whitman enunciated at the annual meeting of the American Economic Association in 1975 :

> "The fundamental question to which we seek an answer from recent experience is, of course, whether greater flexibility of exchange rates is indeed an effective means of reducing or eliminating payments disequilibrium, thus alleviating the burden of adjustment which must be otherwise be borne either by internal measures or by direct restrictions on international transactions".[8]

Undoutedly, this is the question of fundamental importance during the generalized floating and it is the issue of crucial importance in the world today. The adjustment cost in terms of "internal measures" spelled out by Professor Whitman in the foregoing quotation implies the possible domestic inflation costs associated with the use of monetary and fiscal policies for stabilization purposes, if exchange rate adjustment is ruled out. Some economists believe that exchange rate depreciations lead simply to higher inflation rates without any significant benefit for the current account. In particular, the evidence pertaining to the sample countries shown in Figure 1.1 indicates that during 1973 - 1979 countries with depreciating currencies have had relatively high inflation rates and weak current - balance achievement, while countries with appreciating currencies experienced relatively low inflation rates and rather strong current account

performances. However, it is not possible to conclude on the basis of this evidence whether the domestic sources of inflation have been the causal factor for the exchange rate depreciation, or vice versa. It does suggest, nonetheless, that the whole period of floating rates since 1973 has been characterized by a certain shift and divergence between countries with current - account surpluses and countries with current - account deficits. On the whole, the transmission of inflation under the recent exchange rate adjustment has important implications that may impair the effectiveness of monetary - fiscal measures as instruments of demand management for stabilization purposes.

1.2 The Significance of the Problem

The Variety of exchange rate regimes and the attendant exchange rate policies adopted by different groups of countries in response to the advent of generalized floating since March 1973 have intensified interest in identifying the sources of exchange rate changes and in assessing the comparative performance of the flexible versus the fixed parity regimes. A most notable feature of the current floating rate regimes is that they have been characterized by large fluctuations in exchange rate even for relatively stable economies. Movements in spot rates of some currencies of the order of 20 percent over the span of quarter to quarter, 5 percent week to week, have not been

unusual; and such a magnitude certainly is rather large by historical standards. In response to the event, Chancelor Schmidt of West Germany contended that the excessive fluctuations in the dollar rates for European currencies have been disruptive. He may have overstated the exchange rate effect, but his statement merits serious consideration :

> "I believe that volatile floating rates have contributed to the current world recession. The transition to floating exchange rates was, on the other hand, an unavoidable step if international trade and payments were to be kept free of restrictions in the face of balance of payments deficits and sizable differences in the rate of inflation. We should all be trying to ensure that oscillations do not become as large again as they were during the first phase of floating."[9]

The wide fluctuations in the exchange rates since the advent of generalized floating have been duely recognized by economists and government officials, and this fact probably explains why a preponderant majority of countries, especially less - developed ones, preferred the fixed rate system, pegging their currencies to a single convertible currency or a composite

of currencies. As already stated, the major advantage of the fixed rate regime lies definitely in the certainty which renders underlying cost and demand conditions of the trading countries reasonably stable, and there is no reason to expect abrupt shifts in either the supply of or the demand for foreign exchange, and thus no possibility for erratic exchange rate movements to arise.

Moreover, the International Monetary Fund reflects the attitude favorable to the experience with floating, "On the whole, exchange rate flexibility appears to have enabled the world economy to surmount a sucession of disturbing events, and to accommodate divergent trends in costs and prices in national economics with less disruption of trade and payments than a system of par values would have been able to do."[10] Nevertheless, the Fund was concerned about the urgent problem of how to deal with disorderly exchange markets and considerably wide fluctuations in exchange rates. In the outline of reform of the international monetary system, the deputies of the Committee on Reform of the International Monetary System and Related Issues in June 1974 laid down the exchange rate policy that countries with floating rates should follow :

(1) A member with a floating exchange should intervene on the foreign exchange market as necessary to prevent or moderate sharp and disruptive fluctuations from day to day and from week to week in the exchange value of its currency

> (2) a member with a floating rate may act, through intervention or otherwise, to moderate movements in the exchange value of its currency from month to month and quarter to quarter, and is encouraged to do so, if necessary, where factors recognized to be temporary are at work. ___ the member should not normally act aggressively with respect to the exchange value of its currency (i.e., should not so act as to depress that value when it is falling, or to enhance that value when it is rising)."[11]

In the declaration following the Rambouillet (France) conference in November 1975, government officials from the United States, Germany, Japan, France, the United Kingdom, and Italy reaf-firmed the need to cooperate in achieving greater monetary stability and in countering "disorderly market conditions or esratic fluctuations in exchange rates."[12] And, the meetings legitimized the floating system.

Recently the International Monetary Fund has forwarded to its members for approval a comprehensive second amendment to the Fund Agreement," Surveillance Over Exchange Rate Policies", the essential feature of which is its recognition of the international interest in a contry's exchange policy, regardless of the rate system:

> The Fund shall exercise firm surveillance over the exchange rate policies of members, and shall adopt specific principles for the guidance of members with respect to those policies,------- Carrying out these commitments will require a policy and guidelines for a floating rate system and the above document explicitly set out the guidelines in Principles as follows : "A member should intervene in the exchange market if necessary to counter disorderly conditions which may be characterized inter alia by disruptive short-term movements in the exchange value of its currency".[13]

A specific issue on which recent experience of developing countries in our study might throw some light centers on the relationship between the exchange rate regime or the type of exchange rate adjustment adopted by LDC authorities and ability to untertake effective fiscal and monetary policy measures. Large, discrete devaluations invariably involve a difficult political decision - making problem which may force policy makers into taking actions on several fronts simultaneously. Macro - economic policy measures accompanying nominal exchange rate adjustments are of course only one of many possible influences on the behavior of the general price level.

If the exchange rate change is attended by a relaxation of trade restrictions, domestic prices need not rise as inflationary effect will be offset since devaluation simply substituted for import controls. Moreover, exogenous disturbances, such as adverse terms of trade movements and bad weather, could generate domestic inflationary pressures independently of exchange rate changes. Further, producers might take the opportunity to raise prices which they have been for any reason able to do before devaluation; prime examples are public utility enterprises and firms whose products are subject to government control or to wage pushes. Finally, the reactions of consumers and investors to exchange rate changes, such as under inflationary expectation, would also have an impact on aggregate demand and hence on the general level of prices.

A point of critical importance pertaining to the effect of exchange rate changes on the general price level is that for inflationary pressure to sustain, there must be an accommodating expansion of money supply that would validate increases in domestic prices and money wages from any source. The role of government fiscal policy is important also because public expenditure represents a major component of total absorption in developing countries and it is uncommon that budgetary deficits have led to excessive increase in money supply, especially when such deficits were

financed by resort to central bank credit. If the deficit is financed fully by taxes or public bond issues, the same amount of government expenditure would be less inflationary, since money supply is not augmented.

The question concerning the inflationary effect of exchange rate changes have received due attention by economists and a number of empirical studies have been published. Cooper (1971) undertook to examine 24 devaluation episodes involving 19 (mostly developing) countries during the period 1959 - 1966, and he finds that increases in the wholesale and consumer prices have been on average for less than the devaluation, by 32 and 42 percent, respectively, of the devaluation.[14] Connally and Taylor (1976) have likewise, noted that 8 devaluations in 5 LDCs during 1962 - 1970 resulted in faster increases in wholesale and consumer prices in the year following devaluation but at much lower rates than export and import prices, over two years "devaluation would have added 13 and 14 percent to export and import price indices," (p. 857).[15]

On the other hand, the study by Crockett and Goldstein (1976) for a number of industrial countries over the period 1958 - 1970 indicate that the inflationary impact of exchange rate changes had been, if any, negligible to sustain increases in the general price level.[16] Recently, Krueger (1978) examined the inflationary

impact of devaluations in 10 developing countries using data through 1972, and the author concludes that, after taking account of monetary repercussions the net effect of other influences on the rate of price increase in each of the four quarters following devaluation has not been statistically significant.[17]

The empirical studies on the devaluation mentioned above took place under the Bretton Woods system of adjustable par values, involving large, discrete exchange rate changes. However, country studies on LDCs experience with small, gradual exchange rate adjustments under generalized floation, are not available. In view of the nature and empirical significance of the inflationary impacts of exchange rate changes and in view of the fact that the operation of such mechanisms have yielded conflicting evidence in the literature, a study of this mechanism for certain Asian developing countries will be worth-while.

1.3 The Purposes of the Study

In recapitulation, a period after about a decade of floating exchange rates, there remains serious and fundamental disagreement about how floating exchange rates have provided impacts of importance on basic economic adjustment. A relevant issue is whether floating exchange regime, as compared to the fixed exchange system, contributes as an exogenous variable to the level of inflation and the degree of uncertainty in the

system. The present study explores two issues. First the study investigates the question about how the recent exchange rate regimes have worked, using a sample of six East Asian and the Pacific countries as a case of investigation. These countries include Indonesia, Malaysia, the Philippines, Singapore, Thailand and South Korea, over the period between 1970 - 1979. The reason for selecting these countries rests on the similarity of their respective stages of economic development and especially on their economic interdependence in terms of foreign trade, through which the exchange system serves as a channel for linking these economies. The second objective of the present study is to explore the question as to whether the differential exchange rate regimes of the sample countries have contributed to the level of inflation in these countries. A pursuit of this latter issue will help in assessing the transmission channels through which exchange rate changes are imparted into the domestic economies of the sample countries; and particularly in verifying the hypothesis that exchange-rate flexibility insulates a country from external inflationary repercussions. It is not our purpose to inquire into the causes of inflation at its various sources. Before pushing further, it should only be noted at the outset that by "inflation" is meant a rise of prices generally, not an increase in a particular price or group of prices as might result from tastes, in techniques, or shortages of particular

resources. A nominal exchange rate is defined as units of domestic currency in terms of foreign currency. An effective exchange rate whenever it is being referred to, will be difined as exhibited in the immediately following section.

1.4 Review of the Sample Countries' Economic Characteristics

1.4.1 Exchange Rate Policy as An Instrument of Demand Management

As the various economies of the countries under question have characteristics peculiar to themselves, so the role assigned to exchange rate policies varied considerably among these countries over 1971-1979. An outstanding feature of developing countries that can be distinguished from industrial economies may be briefly indicated in the following terms. First, most developing countries, and a majority of them included in the present study, are exporters of primary products, and raw materials to a greater extent, although in some countries studied (Republic of Korea and Singapore) manufacturing and other industrial activities produce a substantial and growing proportion of the country's national product. In Indonesia, Philippines Malaysia, and Thailand, industrialization is still at an early stage, and some common characteristics shared by them being their reliance on primary exports. Now, it is generally agreed in literature that for these countries there tends to be low substitutability between export goods, import goods, and non-traded goods.[18] Domestic demand for export goods is normally small

relative to total output. In the other hand, manufactured imports in these countries do not compete significantly with domestic output, with a result that developing countries can improve their external payments situation by redirecting existing factors of production from the non-traded goods sector and employing them in export and import-substituting activities. The implication of this characteristic is that it may take longer time for developing countries in making adjustment to achieve a durable external payments equilibrium.

A second distinguishing characteristic of developing countries, is that they meet the "Small country" assumption, as far as prices paid for imports and received on their exports are concerned. With export prices determined by the world market, expenditure-switching policies by means of exchange rate changes to increase export earnings can be effective only through expansion in supply of output. However, empirical studies suggest that supply elasticities are relatively low for primary agricultural exports, and for the development of new export goods (e.g. mineral resource) lags may be rather long and it means long lags in the adjustment process.[19] This situation becomes a factor constraining developing countries to find it more difficult to bring about a balance of payments improvement.

Thirdly, the sample developing countries studied (with an exception of Singapore and Korea) is characterized by the rudimentary nature of the financial system. The only major source of financial intermediation is the banking system which often operates under severe financial repression, such as lending ceilings and interest rate limitations. It has been recognized that in a regulated financial system and subject to controls on interest rates in developing countries, interest rates are not the main mechanism by which credit is rationed.[20] Therefore, under LDCs circumstances, higher interest rates world not necessarily reduce aggregate demand. Higher rates should rather foster financial deepening which enables LDCs to maintain over-all investment levels while improving financial intermediation and maintaining external equilibrium.

This suggests that the effect of the underlying characteristics of developing countries studied, to the extent they apply, is to accentuate attempt of these countries to achieve a balance of payments equilibrium by relying on measures that focus solely on restraining domestic demand, especially the instruments of demand management in the form of exchange rate devaluation. Finally, in the environment of developing economies, the instrument of exchange rate policies has been during the past decades subject to considerable debate. As emphasized in the preceding section, frequent autonomous or

Figure 1.1

Nominal Exchange Rate Changes and Changes in Consummer Price Indices of the Sample Countries 1971-79

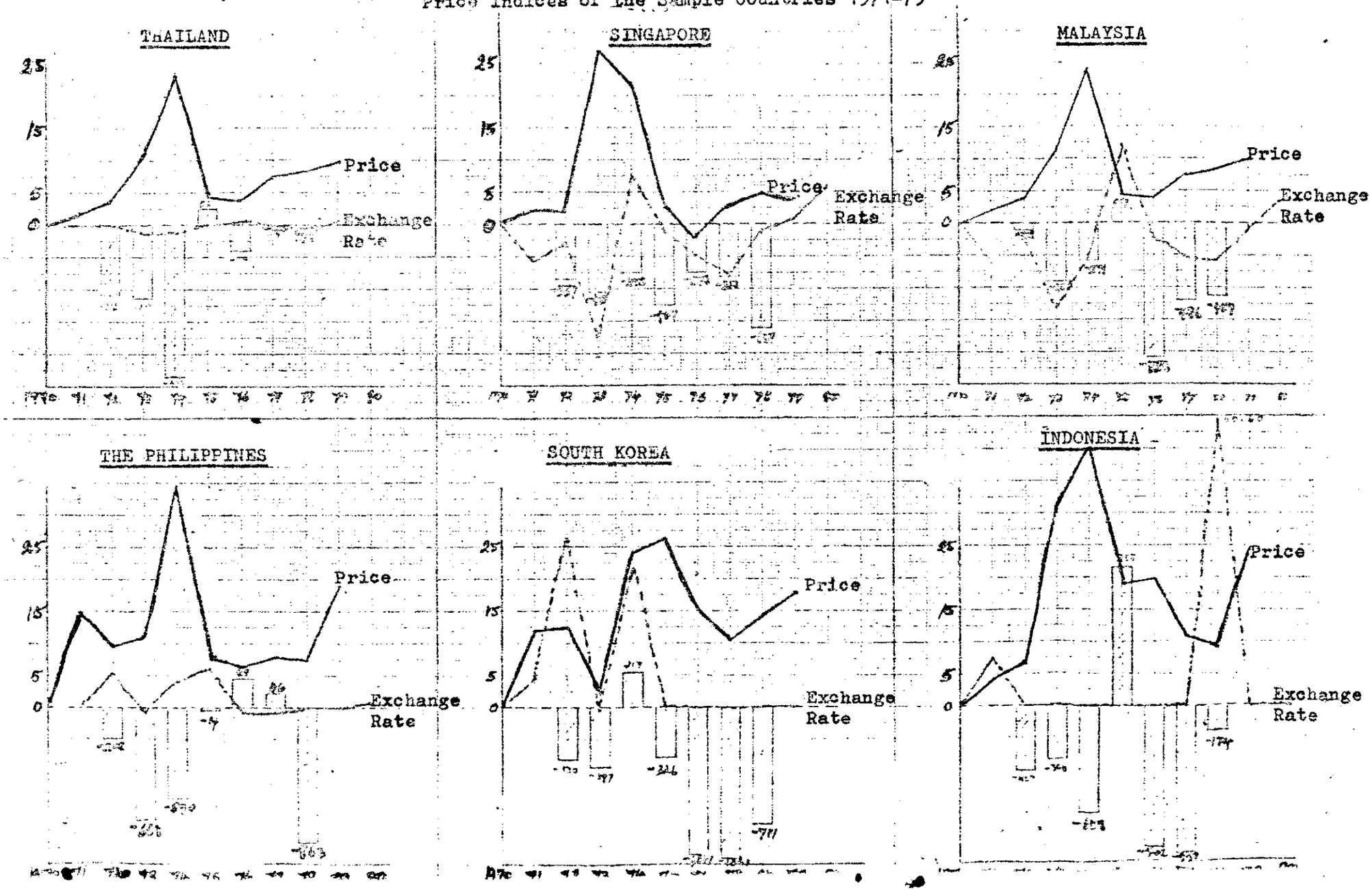
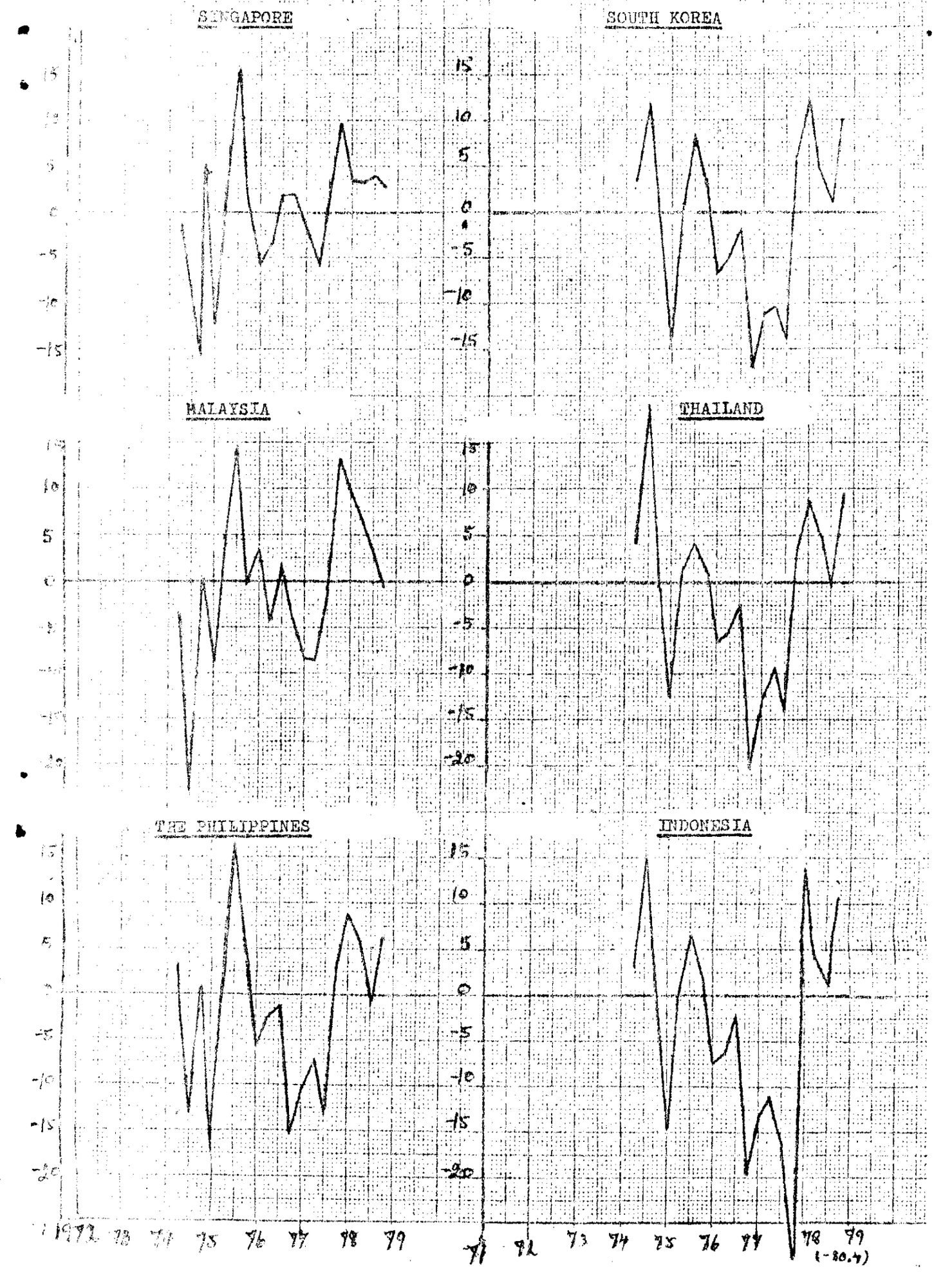


Figure 1.2

Effective Exchange Rate of the Sample Countries 1971-79



induced changes in exchange rates in several developing countries have been to a great extent in excess of inflation rate differentials. Although the magnitudes of these exchange rate changes have been considerably large, trade balances have tended to respond sluggishly and frequently have exhibited a perverse movement. This implies that for small open economies, the length of time over which such responses have been observed makes it difficult to dismiss them as short-term J-curve phenomenon. Thus, one recent empirical study concludes that although devaluation usually improves the over-all balance of payments, in almost all cases, it does not improve the trade balance.[21]

Against these terms of reference, it is evident that the countries under investigation varied considerably in so far as the role assigned to the instruments of demand management, especially exchange rate policies, are concerned. While in some countries, namely, Philippines, Singapore, Thailand and Republic of Korea, economic policies are generally basically market-oriented, the role assigned to exchange rate instruments differed markedly. The peso had been allowed to float quite independently since 1970, the Singapore dollar was floated beginning in March 1973, and similarly for the Malaysian ringgit. The Korean won went through relatively large devaluations several times before and after the generalized floating during the 1970's. Thailand's baht and Indonesian currency had been pegged to the U.S. dollar or a

basket of foreign currencies. Furthermore, it should be noted that some countries studied (Singapore and Republic of Korea) made rather successful efforts at financial reforms, and the instrument of exchange rate policie and exchange rate devaluations played a crucial and for-reaching impact not only in stimulating these countries manufactured exports, but also in gradually eliminating financial repression. The financial structure of one of these latter countries (Singapore) serves as an efficient network for mobilizing surplus funds from countries in Asia, the Middle East and Europe and at the some time, their financial system functions as a fulcrum for channeling funds into development projects in a number of Asian countries including Thailand. The relative growth achievement and the current account developments are shown in Tables 1.3, and 1.4, and their monetary expansion in relation to the consumer price index changes is given in Table 1.5. Furthermore, a chart exhibiting the nominal exchange rate changes and changes in consumer price indices of the sample countries over 1971-1979 are shown in Figure 1.1. The relative money supply and price changes are shown in Table 1.5.

The over-all performance of the various economies during the period under study also differed rather substantially. During the period from 1970 to 1973, some countries, notably Korea and Singapore, grew at average annual rates that exceeded

10 percent, while Philippines and Thailand's national product grew at relatively low rates with an average annual rates of 6 percent and 6.6 percent, respectively. During the 1974-75, the 400 percent increase in oil prices to fuel world wide inflation and triggered deep recession in 1975, the economies of these countries and Republic of Korea fell off rather markedly. Thus, after 1973, certain growth patterns emerged in the performance of the sample countries. The commodities boom of the 1970's turned to gloom as these sample countries struggled to cope with burgeoning deficits, rising inflation and deepening recession of unprecedented magnitude. A notable feature of these economies after 1970's is that sharply higher current account deficits characterized the entire period. During the 1974-1979 period, overall economic performance deteriorated in almost all seven countries, experiencing rates of growth of national product over the period and especially in 1979 that were lower than those achieved in the 1970-1973 period. At the same time, rates of price inflation during 1974-75 accelerated rather sharply in all countries, and throughout the years that followed, which had not been brought under control to a comparable level in the 1970's, see Table 1.3 and Table 1.5.

Table 1.3 : Growth of Real GDP of Sample Countries

(Annual Percentage Change; 1975 price)

	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Indonesia	2.30	2.28	11.11	7.07	7.54	5.95	9.43	11.31	7.63	4.98	6.88	7 42	7.21	4.89
Korea	12.18	5.90	11.34	13.85	8.76	10.07	6.14	15.28	8.26	8.09	13.88	10.05	11.33	7.40
Malaysia	-	-	-	-	-	7.08	9.39	11.70	8.32	0.80	11.07	7.60	7.58	8.47
Philippines	4.36	4.81	5.36	5.33	4.30	5.78	4.92	9.55	6.33	5.86	6.11	5.71	6.27	5.82
Singapore	28.17	-3.04	13.88	13.69	13.72	12.51	13.42	11.53	6.35	4.09	7.48	7.90	8.64	9.25
Thailand	12.21	7.78	8.48	7.93	6.48	1.08	4.28	10.29	5.44	7.14	9.34	7.34	10.72	6.71

Source : IMF, International Financial Statistics, 1980

Table 1.4 : External Current Accounts and Reserve Changes Sample Countries

(in millions of U.S. dollars)

Country	Current account balances				Changes in international reserves			
	1970-73	1974-75	1976-78	1979	1970-73	1974-75	1976-78	1979
Korea	-3106	-3609	-2852	-4565	-417	-202	-3380	-895
Indonesia	1037	4050	7732	5871	-777	-913	-117	-1439
Malasia	1355	581	4729	3419	-579	176	-1790	-2881
Philippines	-75	-1646	-3285	-1539	-1136	-565	-731	-440
Singapore	-4283	-4651	-6771	-3022	-1459	-721	-2296	-515
Thailand	-1410	-1047	-1849	-1594	-436	-452	-392	+228

Sources : IMF, International Financial Statistics, various issues, for country reports.

Table 1.5 : Changes in Consumer Prices and Money Supply of Sample Countries 1966-1979

(Annual Percentage Change)

	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Indonesia														
1. CPI	-	-	-	15.87	12.33	4.39	6.54	30.92	40.70	19.05	19.8	11.10	8.57	24.43
2. Money Supply	-	-	-	57.83	36.42	27.58	48.50	41.56	40.45	35.22	25.63	25.33	24.02	33.27
Republic of Korea														
1. CPI	11.76	11.14	10.85	12.53	16.03	13.49	11.67	3.22	24.30	25.31	15.30	10.15	14.41	18.31
2. Money Supply	29.72	44.54	44.47	41.81	22.06	16.39	45.08	40.60	29.50	24.96	30.67	40.70	24.92	20.66
Malaysia														
1. CPI	0.91	4.52	-0.14	-0.43	1.88	1.71	3.22	10.43	17.42	4.49	2.60	4.78	4.93	3.64
2. Money Supply	10.81	-9.04	12.23	11.42	8.37	5.07	24.71	37.61	8.54	7.25	20.88	16.55	18.20	17.18
Philippines														
1. CPI	5.57	6.33	2.48	1.94	14.01	15.00	9.96	14.00	33.53	8.23	6.10	7.92	7.60	18.83
2. Money Supply	5.66	16.19	2.86	22.54	7.29	16.27	29.12	12.32	23.95	14.51	17.06	23.72	13.44	11.20
Singapore														
1. CPI	1.93	3.27	0.67	-0.17	0.33	1.62	2.11	26.35	22.36	2.67	-0.02	3.27	4.74	4.06
2. Money Supply	14.06	-2.09	18.68	18.48	15.10	7.91	35.51	10.36	8.59	21.48	15.21	10.30	11.65	15.83
Thailand														
1. CPI	3.96	4.33	1.83	2.45	.02	0.48	4.91	15.41	24.35	5.26	4.20	7.58	7.85	9.93
2. Money Supply	12.67	3.77	9.47	4.56	7.94	10.20	16.35	21.00	9.31	6.05	16.84	9.24	19.40	14.81

Source : Estimation from IMF International Financial Statistics, 1980.

Notes : 1. CPI = Consumer price indices

2. Money Supply refers to narrowly defined money which equals currency plus demand deposits at commercial banks.

1.4.2 Some Measures of Exchange Rate Changes

In essence, therefore, exchange rate policy in the current regime of generalized floating can be analyzed in terms of two policy options : (i) what currency or basket of foreign currencies to peg to; and (ii) how to adjust the peg when the underlying circumstances are called for. The discussions the first section suggest that there have been divers exchange rate arrangements adopted by developing countries, from independent floats, joint-currency floats, and pegging to a basket of currencies or a single currency with frequent or discrete, infrequent peg adjustments. In principle, pegging to a chosen standard (be it a single currency or basket of currencies) and adjusting the peg appropriately should enable a country to attain a target effective exchange rate even under the circumstances of major currency realignments. This can simply illustrated. A developing country trades with two foreign countries, assuming to be Japan (j) the United States (s). If the base year trade shares are used as weights in determining the effective exchange rate (e), then the oppropriate adjusting of e is provided by the following formula :

$$\dot{e} = (i-w_s)\dot{e}_j + w_s\dot{e}_s \qquad (1.1)$$

where dots (.) denote proportionate changes of the effective exchange rate, and w_s denotes U.S. trade share of this LDC, and

e_j and e_s are the bilateral exchange rates in units of domestic currency per yen and per U.S. dollar, respectively; the ratio of e_s and e_j represents the yen-dollar exchange rate, e*; thus,

$$\dot{e}_j = \dot{e}_s - \dot{e}^* \qquad (1.2)$$

By substituting (1.2) into (1.1), the following is obtained :

$$\dot{e} = (1 - w_s)(\dot{e}_s - \dot{e}^*) + w_s \dot{e}_s \qquad (1.3)$$

$$= \dot{e}_s - (1 - w_s)\dot{e}^* \qquad (1.4)$$

This final equation demonstrates that for a given e*, it is possible to achieve a target effective exchange rate, e, by adjusting this LDC, country's peg in a way that the nominal exchange rate in terms of the U.S. dollar becomes :

$$\dot{e}_s = \dot{e} + (1 - w_s)\dot{e}^* \qquad (1.5)$$

It is apparent that major currency realignments are exogenous to this LDC and changes in exchange rates among partner countries, due to generalized floating will unavoidably affect the country's exchange rates, the extent of which depends on the degree of openness of the economy measured by the U.S. trade share. Fortunately, the effective exchange rates measured in terms of trade-weighted indices have been regulary published for most

of the Asian and Pacific countries, the Pacific Basin Economic Indicators, and the present study will make use of such effective exchange rates for the sample countries. For purposes of the present analysis, it will be relevant to note the wide variation in the patterns of effective exchange rates movements among the sample countries which may be divided into two main groups : Korea and Indonesia went through large, discrete devaluation, shown in Table 1.5a and the rest of the sample countries with small changes in

Table 1.5a

Percentage Changes in Effective Exchange Rates After Devaluations in October 1978

	1 quarter	2 quarter	4 quarter
Republic of Korea	15.3	6.3	0.7
Indonesia	25.0	13.4	2.0

Sources : Estimated from Pacific Basin Economic Indicators, 1980.

effective exchange rates. It is clear that the initial increases in the effective exchange rates after devaluations in these two countries are rather large on a first quarter timespan but reverted virtually to the pre-devaluations after about one year. The patterns of the effective rates were also different from those of the nominal exchange rate movements. In terms of mean, standard deviation, and coefficient of variation, no marked differences showed up for the period under fixed as compared with the period of flexible rates for the countries involved; Table 1.6, Table 1.7, and Table 1.8.

The remaining of this study will be organised as follows. Chapter 2 reviews the controvial issues over the transmission of inflation under fixed versus flexible exchange rate regimes intended to provide a background for theoretical discussion of the exchange rate determination. The diverse exchange rate determination models were examined in somewhat detail in chapter 3, for the purpose of giving theoretical perspectives on the role of exchange rates and the potential impact effects of exchange rate adjustment. Then, chapter 4 took up a theoretical synthesis upon which the empirical framework was explicitly laid out. Finally, the empirical findings were presented in chapter 5.

Table 1.6

Change in Nominal Exchange Rates:

Mean, Standard deviation and Coefficient of variation

	Malaysian Ringgits (Per U.S. dollar)	Peso (Per U.S. dollar)	Singapore dollar (Per U.S. dollar)
1. For period 1965-1972			
Mean	2.984	5.503	2.974
Standard deviation	0.108	1.298	0.114
Coefficient of Variation	0.036	0.235	0.038
2. For the period 1973-1979			
Mean	2.378	7.271	2.374
Standard deviation	0.138	0.251	0.114
Coefficient of Variation	0.058	0.034	0.048

Source: International Monetary Fund, International Financial Statistics, various issues andPacific Basin Economic Indicators.

Table 1.7

Exchange Rate Changes of Certain Industrial Countries

For Floating and Fixed Periods

	Germany Deutsch Marks (Per U.S. dollar)	Japanese Yen (Per U.S. dollar)	British Pound (Per U.S. dollar)	French France (Per U.S. dollar)
1. Over the Fixed period 1959-1972				
Mean	3.870	353.38	2.654	5.019
Standard deviation	0.305	19.94	0.188	0.235
Coefficient of variation	0.078	0.056	0.070	0.046
2. Over the Floating period 1973-1976				
Mean	2.497	282.15	2.401	4.500
Standard deviation	0.130	12.47	0.077	0.275
Coefficient of Variation	0.051	0.044	0.032	0.061

Source: William R. Cline, International Monetary Reform and Developing Countries, Washington, the Brookings Institution, 1976. p. 11.

Table 1.3

Changes in Effective Exchange Rates of the Sample Countries, 1975-1979

(percentage changes in terms of U.S. dollars)

	1975				1976				1977	
	Q1-Q2	Q2-Q3	Q3-Q4	Q4-Q1	Q1-Q2	Q2-Q3	Q2-Q4	Q4-Q1 (1976)	Q1-Q2	Q2-Q3
Thailand	4.1	19.0	-0.8	-12.7	1.3	4.2	0.9	-6.5	-5.7	-2.4
Singapore	-1.4	-15.9	5.1	-14.6	4.2	16.0	2.6	-5.5	-3.1	1.8
Malaysia	-23.0	0.4	-8.9	4.6	14.7	-0.1	3.5	-4.1	1.7	
Philippines	3.5	-12.9	1.0	-17.2	3.2	6.2	1.7	-5.9	-2.5	-1.4
Korea	3.3	11.7	0.3	-14.8	0.9	8.3	2.7	-6.6	-5.3	-1.7
Indonesia	3.0	15.4	0.1	-14.9	0.5	6.6	2.3	-7.4	-6.1	-2.2

To be continued

Table 1.8 (Cont.)

	1977		1978				1979		
	Q3-Q4	Q4-Q1	Q1-Q2	Q2-Q3	Q3-Q4	Q4-Q1	Q1-Q2	Q2-Q3	Q3-Q4
Thailand	-20.4	-13.3	-9.1	-14.0	3.6	8.5	5	-0.5	10.6
Singapore	2.0	-2.0	-6.1	3.2	9.6	3.5	3.4	4.0	2.6
Malaysia	-4.4	-8.1	-8.3	-1.1	13.1	9.9	6.9	3.6	-0.6
Philippines	-15.5	-10.6	-7.4	-13.2	3.5	8.8	5.8	-1.2	6.3
Korea	-17.0	-11.1	-10.4	-13.9	5.1	12.1	4.8	1.1	10.0
Indonesia	-19.8	-13.3	-11.0	-16.5	-48.4	14.8	7.7	1.2	10.6

Source: Pacific Basin Economic Indicators, Various issues.

Note : Malaysia, and Singapore began float in March 1973 and turned to basket pegging in late 1978.

The Philippines floated the peso in 1970 and adopted the pegging to basket of currencies in 1978.

Footnotes

1. William Cline, International Monetary Reform and Developing Countries, The Brookings Institution, 1976, p.8.
2. International Monetary Fund, Annual Report, June 1975, and 1978 Supplement.
3. William Cline, op.cit. p. 8-47.
4. R.N. Cooper, "An Assessment of Currency Devaluation in Developing Countries," in G. Ranis, (ed.) Government and Economic Development (New Haven : Yale University Press, 1971), p. 21.
5. A.D. Crockett and S.M. Nsouli, "Exchange Rate Policies for Developing Countries," Journal of Development Studies, March 1977; William Cline, op.cit. p. 12.
6. William S. Black, "Exchange Policies for Less-Developed Countries, in a world of Floating Rates," in the International Monetary System and Developing Nations, ed. by Danny M. Leipziger (Bureau for Program and Policy Coordination, Washington, D.C. 1976), p..20-24.
7. W.H. Branson and L.T. Katseli-Popaefstration, "Income Stability, the terms of Trade and Choice of Exchange Rate Regime," Journal of Development Economics III (1980), p. 49-69.
8. Marina V.N. Whitman, "The Payments Adjustment Process and the Exchange Rate Regime : What Have We Learned?" American Economic Review Vol. 65 (May 1975), p. 31-52.

9. Chancelor Schmidt's statement was expressed in Financial Times, London, October 25, 1975.
10. International Monetary Fund, Annual Report 1975, p. 33.
11. Outline of the Reform, Annex 4, International Monetary Reform : Document of the Committee of Twenty (Washington 1974), p. 33-37.
12. Rambouillet Declaration in Pledges Recovery Without Renewed Inflation, IMF Survey Vol. 4 (November 24, 1975), p. 350.
13. International Monetary Fund, Annual Report of the Executive Directors for the Fiscal Year Ended April 30, 1977 (Washington, D.C., 1979), p. 109.
14. R. Cooper, op.cit.
15. M. Connolly and D. Taylor, "Testing the Monetary Approach to Devaluation in Developing Countries," Journal of Political Economy Vol. 84 (August 1976), p. 849-859.
16. Andrew Crockett and M. Goldslein, "Inflation under Fixed and Flexible Exchange Rates," IMF Staff Paper Vol. 23 (November 1976), p. 524-25.
17. Anne O. Krueger, Foreign Trade Regimes and Economic Development : Liberation Attempts and Consequences (New York : Columbia University Press, 1978); see also Miles in the following footnotes for a contrary view of devaluations.
18. Andrew D. Crockett and Saleh M. Nsouli, "Exchange Rate Policies for Developing Countries," Journal of Development Studies, Vol. 3, 1977, p. 125 - 142.

19. Ibid.,

20. Ronald I. McKinnon Money and Capital in Economic Development, the Brookings Institution, (Washington, D.C., 1973); Sawong Swetwatna, Financial International and Economic Development, Thai Watna Panich, 1979.

21. Marc A. Miles, "The Effects of Devaluation on the Trade Balance and the Balance of Payments : Some New Results," Journal of Political Economy, Vol. 87 (June 1979), p. 600-20.

22. R. Cooper, op.cit. p..510-12.

*"Financial repression", originally used by R. McKinnon, refers to a situation in which a regulated financial system is subject to direct controls on interest rates, exchange rates and trade activities through tariffs, ect. These control measures are responsible for hindering financial growth and development that should have proceeded in absence of such restrictions. Thus, McKinnon, among others, advocates that if financial expansion compatible with the level of investment, income and other economic activities is to be sustained, they must be gradually be eliminated. To be specific, higher interest rates in developed countries are viewed as a means of restraining aggregate demand, and thus are contractionary in their impact. However, in a regulated financial market

of less-developed countries, higher interest rates do not necessarily reduce aggregate demand; to the extent that they direct financial resources from consumption to saving, they enable financial intermediaries to finance a higher volume of investment. Similarily, exchange rates should be allowed to adjust so that over-valued rates should be minimized.

[R.I. McKinnon, Money and Capital in Economic Development, 1973, chs. 3, 6, 8.]

Chapter II

Some Controversial Issues Over Channels of Transmission of Inflation under Fixed and Flexible-Exchange Rates : A First Approximation.

2.1 The Effects of Exchange Rates on Inflation under Fixed Rates

Prior to proceeding to some rather detailed analysis of the impacts of differential exchange rate regimes on domestic inflation in the countries studied, the present chapter provides for a review of the controversy over the long-standing arguments made in favor of or in opposition to the transmission of inflation under fixed versus flexible exchange rates. First, consider a fixed exchange rate system. The current account operates as a major channel for the transmission of fluctuation in real output and money supply among countries that is, the trade flows effects are imparted into domestic prices through shifts in demand for tradable goods.[1] It may be helpful to distinguish between a number of variants of this argument.

One variant argues that variation in bilateral exchange rates is due to randomly distributed shocks and to divergencies between home country and foreign country's monetary policies impinging on aggregate demand. Since the exchange rate is defined as the units of domestic currency in terms of foreign currency, an increase in the domestic money supply to accommodate domestic

demand would generate an ultimate increase in domestic prices relative to the rest of the world. The domestic price rise will eventually be in proportion to changes in the money supply which is required to maintain money market equilibrium. In the process, residents in the first country will direct their spending toward cheaper goods, namely, imports from abroad, which residents in the rest of the world will divert their spending away from the expensive goods exported by the inflating country. Therefore there will be greater spending in goods imported from foreign countries with the result that domestic prices of imported goods and domestic prices in general will rise even further and deterioration in current accounts im-balances will ultimately result in a depreciation of an exchange of the first country. The argument, naive as it seems, has been accepted widely to explain the persistently erratic and disproportionate exchange rate variations and the inflationary transmission after the generalized currency realignment.

A second variant of the current account transmission mechanism focuses on an inflationary bias of foreign price changes countries. Under a regime of fixed-exchange rates, if prices in one country (including the imported goods) show a tendency to increase more rapidly than in foreign countries, residents in the first country will direct spending toward cheaper goods from abroad, while purchasers in the rest of the

world will divert their spending away from the goods exported by the inflationing country, with the result that there will be greater spending on the goods produced in the rest of the world and a rise in the prices of those goods. Meanwhile, the rest of the world will encounter a balance of payments surplus and the increased foreign exchanges would impart an inflationary bias to the effect that the rise in prices will be taking place.[2]

A more sophiticated version of this transmission channel revolves around a notion of demand shift inflation in an international setting. According to the International Monetary Fund director, the exchange rate regime can affect the rate of inflation by changing shifts in the sectoral composition of demand, even if the level of aggregate demand remains unchanged, as prices will rise in those sectors of the economy where demand is increasing by more than they will fall in those sectors where demand is declining :

> Exchange rates influence the distribution of demand between domestic and foreign products, and rate fluctuations will involve demand shifts which will later in some measure be reversed. These demand shifts may well exert a ratchet effect inflation.... shifts in purchase patterns brought about by the exchange rate changes, or even the expectation of such shifts, may tend to raise prices in the countries

> of depreciation currency without affecting a corresponding price reduction in the countries of appreciating currency.[3]

This statements apparently views an impact of an exchange rate change to alter the relative price of tradable and non-tradable goods. The more pronounced and frequent are exchange rate changes, under a regime of fixed exchange rates, the more important will be those intersectoral demand shifts and the more serious will the inflationary presure be fed into the domestic economy.

The third variant of the transmission of inflation concentrates on the government's demand management policy strategy. It is argued that the government's policy targets are influenced by the exchange rate system in two important ways. The first arises from the fact that any upward price bias fed in by the exchange rate regime will alter the nature of the policy trade-off, between inflation-and unemployment objectives of the policy-making authorities, and hence will prompt revision of policy targets. The second results from the fact that the balance of payment equilibrium objective requires more active use of domestic policy instruments under a system of fixed exchange rates than it does under a floating rate regime. These effects will be taken up in turn.

The first effect may be described in this way. The policy strategy involves a process of assigning a number of policy instruments so as to achieve a set of predetermined targets. The central of theory of economic policy, developed by Tinbergen[4] (1956), among others, recognized that there are trade-offs between high employment, price stability, rapid growth and balance of payments equilibrium, and it suggests that these objectives can be reconciled. An important principle of this assignment problem is that there must, as a general rule, be as many policy instruments as there are targets, if all the specified targets are to be attained. As indicated in the preceding paragraph, under the regime of fixed exchange rates inflationary pressure tend to be introduced through foreign price bias or international demand shifts. When a country experiences higher prices at a given level of demand, it will result in lower real income and will tend to generate an increase in unemployment.[5] The fact is that the policy-making authorities attach high priority to maintaining a given rate of unemployment, the authorities may respond to this situation by an increase in aggregate demand, with an objective of preventing an increase in unemployment. The result of this type of expansionary policy will be an exacerbation of inflationary pressures. In this policy scenario, it is not structural factors but rather the government's attachment to high employment target that triggers inflationary acceleration.

The second, and more important, channel through which the fixed exchange rate regime may affect inflation involves the constraints that bear on governments' freedom of policy implementation. This argument, referred to us the "discipline argument" and has long been prominent in the contreversy over fixed versus flexible exchange rates. Even supporters of flexible exchange rates, Yeager,[6] among there, regards the discipline principles as a most potent merit of the fixed exchange rate system. The argument runs as follows : Under a system of fixed exchange rates, a country that experiences a higher rate of inflation than its partners will, other things being equal, suffer a deterioration in its balance of payments and an incipient loss of foreign exchange reserves. Since under a system of fixed rates, the use of exchange rates to restore equilibrium is only marginal and is almost completely closed, the high inflation country will enventually discipline itself by restraining aggregate demand so us to bring its inflation under control and to be in line with its trading partners; otherwise the country will have to run down its reserves which has a limit. For this reason, the fixed exchange rate and running down reserves provide a wedge necessarily constraining the high-inflation country to willingly impose a policy of domestic restraint which over time will help relieve the payments deficits. With this discussion about the transmission process under the regime of fixed rates, we turn to the mechanism under the flexible rates.

2.2 Inflation Transmission Under Flexible Rates

Now we turn to examine the major tenet of flexible exchange rates. One argument on behalf of freely flexible rates is that they put an end to this inflationary-bias transmission mechanism. The arguments may be reviewed as follows.

A first variant of arguments supporting this regime is that under flexible exchange rates, the central bank does not buy or sell foreign currency in order to maintain exchange rates; therefore, if residents of a country receives more foreign currency from sales of goods or securities, they would be unable to sell foreign currency to the central bank in exchange for domestic currency balances, and this would prevent domestic prices from rising. The adjustment is achieved through rises in the price of foreign exchange. On the contrary, in circumstances with the demand for foreign currency in excess of the supply, the depreciation of the exchange rate would bring about an equilibrium between the supply and demand in the foreign exchange market. To make this same point in a different way, if the first country is experiencing inflation and the foreign country is not, the increasing demand for goods by residents of then high-inflation country from the stable country will operate to bid up the foreign exchange price of the stable country's currency rather than the domestic prices of the stable country's goods (i.e. imports of the first country). In this way, it is asserted, a country, under

flexible exchange rates, should be able to independently select its own rate of inflation, whereas this would not hold true under a fixed exchange rate regime.[7]

Thus, it has traditionally been argued that a more to flexible exchange rates will insulate countries from external disturbances. Futhermore, the elimination of the balance of payments constraint enables authorities to assign monetary and fiscal instruments to the achievement of demand management targets, and control over the nominal money is considerably enhanced by the move to greater exchange rate flexibility.[8]

A second variant of argument on behalf of flexible exchange rates concerns their effect on the demand for liquidity (both official and private). It is argued that since the demand for goods and service, in a general equilibrium framework, is the opposite side of the coin to the demand for money and financial assets, the exchange rate system affect the former if it affects the latter. Specifically, it is assumed that national monetary authorities many find a reduced need for currency reserves in a system of flexible exchange rates, because adjustment to balance of payments imbalances takes place to a greater extent through changes in the exchange rate. Likewise, the private sector many decide to hold smaller money balances in the flexible rate system because of the lower degree of certainly with foreign exchanges can be converted into another currency.[9]

The argument that the demand for international liquidity by monetary authorities will be reduced by a move to flexible exchange rates lies in that the supply and demand for foreign currencies will be equilibrated through movements in exchange rate in the foreign exchange market. Consequently, governments that hold large amount of reserves will encounter costs (Unproductive use) and will seek to run down reserves. However, the available empirical evidence on reserve use under fixed versus flexible rates is still limited and ambiguous. A recent study by Suss (1976), for instance, provide results which lend support to the prior expectation that reserve demand by authorities fall under flexible rate regimes.[10] There have been counter arguments, of course, and it is beyong the scope of the present study to pursue the question any further. What is relevant to our review in this connection is that".....in interpreting evidence, one should note that none of the studies is able to develop a fully satisfactory method for estimating the independent effect of either increased exchange rate flexibility or generalized floating on reserve use?"[11]

However, there have been counter arguments against flexible exchange rates. First, the flexible rates are conductive to inflationary bias. The argument that flexible rates provide a leverage for authorities to insulate countries from external repercussions, means that the achievement to this effect operates through and depends on the relative strength of price and real

balance effects. If domestic expenditure falls and there is an incipient move of the current account towards surplus, the exchange rate will appreciate; the resulting increase in real balances in the appreciating country will in turn help to sustain domestic demand while dampening demand abroad. Price effects of an appreciation at least in the short-run will contribute to balance of payments equilibrium by redirecting domestic and foreign demand from domestically produced goods to goods produced abroad. Some economists challenge that this argument is not realistic in that it ignores the effect of exchange rate movements on the price of domestically produced goods which may partially offset the relative price effects of exchange rate changes; and it virtually excludes the role of the capital account in the exchange rate determination.[12]

The foregoing counter-arguments are central to the stabilizing versus destabilizing speculation and uncertainly issues which have implication for the controversy about the efficiency of monetary and fiscal policies under the fixed vis-a-vis the flexible exchange rates. Friedman who has been a prominent proponent of flexible rates for a long time, argues thus : "On bance, it seems to me undesirable for a country to engage in transactions on the exchange market for the purpose of affecting the rate of exchange. I see no reason to expect that government officials will be better judges than private speculation of the likely movements in underlying conditions of trade and hence no reason to expect that

government speculation will be more successful than private speculation in promoting a desirable pace and timing of adjustment".[13] Friedman contended that the freedom of exchange rates to move under flexible rates does not imply that they will in fact be unstable, and if underlying cost and demand conditions at home and abroad are reasonably stable, there is no reason to expect that private capital movements associated with speculation will cause shifts in either the supply of or the demand for foreign exchange and therefore, no need for erratic fluctuations in exchange rates. Friedman admitted that private capital flows that are not based on judgements about the long-run equilibrium level of exchange rate, could surely generate temporary rate fluctuations but that it could not be profitable to investors for a sustained period and the market as a whole. Moreover, Friedman asserted, destabilizing speculation would suggest that investors in the market buy when the price of foreign exchange is high and sell when the price is low which means speculators run into capital losses and these "amateur" speculators which may be only a small proportion will be ultimately driven out of the market. Therefore, the conclusion emerged from the Friedman thesis is that private capital flows may exert temporary fluctuations in exchange rates but over the long-run it will be of a stabilizing variety in that speculation in terms of capital movements will push exchange rates toward their equilibrium position and oscilatory "overshooting" rates will be ruled out.[14]

In challenge to the foregoing proposition, Nurkse (1944) long ago argued that a compressed expenditure level that contributes to a current account surplus noted in the preceding section may be viewed as temporary by market participants and to the extent that there is a high degree of substitutability between domestic and foreign assests, offsetting capital outflows may respond to exchange-rate or/and interest-rate movements with the result that these movements especially of exchange rates could become self-perpetuating even in a short period. The Nurksian argument explicitly points out that the magnitude of exchange rate changes depends on the market participants' expectations about the future rate. If they expect the future rate would be revised in the same direction as the actual change in the rate, the extent of self-perpetuating rate movement would be rather large. In the other hand, if the speculators have realized that the rate had moved too far in that direction, they would revise expectations which could push the rate too far in the opposite direction, the case in which speculation being viewed to be destabilizing. In sum, the Nurksian thesis concludes that destabilizing speculation via private capital movements was responsible for volatile and self-perpectuating movements in exchange rates during the 1920's and it was this factor which tend to prevent the spot exchange rate from stabilizing at a particular level and causing it to deviate from the purchasing

power parity. Nurkse proposed that the only way to offset speculative capital flows is for the monetary authorities to recourse to direct exchange stabilization measures. Thus, the argument against flexible exchange rates centers on the reason that the exchange-rate movements may have to be very large in case of appreciation to induce equilibrating capital outflows; and the rate variation may have to be excessive in case of depreciation to induce stabilizing capital inflows required for achieving the balance of payments equilibrium.

From the foregoing consideration, there have emerged counter arguments, firstly, that flexible exchange rate will generate greater exchange uncertainly and will be more variable and unpredictable than the fixed system of exchange rate; and secondly, flexible rates by way of exchange rate uncertainties faced by international traders so that the costs of uncertainty are higher and thereby exert inflationary bias into the domestic economy. The essence of these arguments are as follows. When exchange changes in an unpredictable way, importers and exporters face uncertainty they are not sure about the price they will have to pay or receive for foreign exchange. To the extent that these traders are able to buy insurance against this uncertainty (i.e. where forward exchange markets are developed) such insurance or "hedging" costs can be added to the costs of production and marketing to the effect that flexible rates may generate an

increase in the price of traded goods and the domestic price level.[16]

Actual experience with flexible exchange rates since March 1973 provides evidence that the advent of generalized floating has been associated with substantial oscillation in bilateral exchange rates, as indicated in the first chapter. However, in interpreting these rather wide fluctuation in exchange rates, one needs to bear in mind the following facts.[17] First, the underlying conditions, especially the 400 percent increase in oil price over 1973-1974, the worldwide recession in 1975, and so on, had been severely disturbed; and most observers would concede that had the fixed rate system been existed, substantial changes in parity would probably have been occurred any-way. Secondly, exchange rate volatility during the period might be put in a process of adjustment toward the new equilibrium pattern of exchange rates, since the "parities" under the Bretton Woods system were not realistically credible. Finally, Friedman suggests that the system of flexible rates enables a country to use the exchange rate as the equilibrating instrument in balance of payments adjustment which otherwise some other adjustment i.e., aggregate demand management, incomes policy, exchange and trade controls, will have to bear more of the adjustment burden. In a similar vein, Whitman[19] put forward a defense of flexible rates, arguing

that the exchange rate uncertainty will in fact be less under flexible rates because the private traders can predict the timing and size of exchange rate changes better with the information comes from market forces rather guesses about political judgements.

Finally, Mc-Kinnon[20] has provided evidence to show that there has been no substantial expansion in the facilities for forward trading during the floating period, and to the extent traders have access to insurance facilities against exchange risk, these costs of protection have been indeed negligible so that should have no impact on the continuing rate of inflation.

Considering the impacts of flexible rates on trade-flows, one is confronted with shortages of empirical studies. A general observation has been that over the period of generalized floating, there seems to be no evidence that the volume of international trade has been adversely affected by exchange rate variability. Thus, one author can state : "Despite substantial fluctuations in exchange rates, the widely feared decline in international trade and investment has failed to materialize."[21] It should be noted, however, that before-and-after comparisons of trade flows are not really reliable for testing the independ effect of exchange rate uncertainty on the volume of trade. What is really more relevant is whether flexible rates affected trade flows relative to what it would have been under a system of fixed rates. At present, there are no empirical studies on this issue to make any definite

conclusion, and the controversy over the inflation transmission under fixed versus flexible exchange rates cannot be simply resolved.

2.3 Some Summary Statements

In appraising the controversy about transmission of inflation under fixed versus flexible exchange rates, it may be pertinent to clarify the issue in terms of a simple analytical apparatus of an equation form.

Assume a "small developing country" faced by the generalized floating like that of 1973, so that some other price in this economy is fixed with a result that the economy cannot return to the pre-currency realignment equilibrium set of relative prices. Over the period of disequilibrium, changes in the exchange rate are faster or slower than relative price changes between home country and the rest of the world, and the real effects will be transmitted to domestic economy. In fact, from the review of controversies in the preceding sections concerning the inflation transmission and experience since generalize floating a useful generalization that can be made is that the magnitude of exchange rate fluctuations has been considerably larger than that of corresponding relative price changes between countries. In some cases, exchange rate "overshoot" as and when they change by more than that is warranted by relative price changes and then reverse to restore relative price equilibrium. This phenomenon has led to

frequent and sometimes prolonged deviations from purchasing power parity, the problem which will preoccupy our discussion in the following chapter.[10] Another consequence of the disequilibrium which characterize exchange rate fluctuations over the period have been adverse effects in terms of trade of LDCs, thus, indicating a link between exchange rate changes and the country's terms of trade. Let us take up the second issue first.

Assume that this small developing country exports to the United States and imports from Japan with prices set in the respective trading partner countries. An appreciation of the Japanese Yen vis-a-vis the U.S. dollar that is not offset by price changes will imply an improvement in the Japanese terms of trade and a resultant worsening of the terms of trade of the developing country in question. This adverse terms of trade means this developing country will suffer a rise in import prices relative to export prices, and this holds true independently of whether its currency is pegged to the U.S. dollar or the yen, or some combination of the two.[22] If the country in question is pegged to the U.S. dollar, import prices will rise in domestic currency, thereby worsening its terms of trade. If it is on the yen standard, its export prices via the appreciation of the yen will fall with the same effect. If it's currency is pegged to a basket in which the export-weighted and the import-weighted indices are used, domestic currency prices of imports will increase,

though to a lesser extent than in case of a U.S. dollar peg, and prices of exports will fall, to a lesser extent than in case of a yen peg, the final outcome will be adverse terms of trade effects for the country in question. The terms of trade (T) in domestic currency may be written as follows :

$$T = \frac{p_x^{us} e_{us}}{p_m^j e_{us}/e^*} \qquad (1)$$

where the notations are : T = terms of trade in domestic currency; p_x^{us} = price of exports in US dollar; p_m^j = prices of imports in yen; e_{us} = domestic price of U.S. dollar; and e* Yen price of U.S. dollars

It can be seen that equation (1) is reduced to (2)

$$T = \frac{p_x^{us} e^*}{p_m^j} \qquad (2)$$

which implies that if relative prices are fixed in the country's trading partners, namely Japan and the United States, and if purchasing power parity is maintained, the choice of an exchange rate regime or changes in exchange rates cannot exert influence on the country's external terms of trade, in which the terms of trade equation becomes

$$\dot{T} = \dot{p}^{us} - \dot{p}^{j} + \dot{e}^{*} \qquad (3)$$

$$\dot{e}^{*} = \dot{p}^{j} - \dot{p}^{us} \qquad (4)$$

Note that a dot over a symbol denotes a proportionate change, and in case of fixed relative prices in trading partners, x and m can be dropped. Thus, when purchasing power parity holds, the proportionate change in terms of trade is zero (equation (4)), because movements in relative prices offset exchange rate changes.

However, under circumstances when purchasing power parity does not hold, such as, a depreciation of the U.S. dollar vis-a-vis the yen, there will be an impetus to reallocate of resources from the export sector to the import substituting sector, and the exchange rate arrangements exert an important impact on terms of trade as well as on domestic price levels. Thus, if the country concerned pegs its currency to an export weighted basket, i.e., U.S. dollar, so that P_x is fixed, the import and the over-all traded goods price indices will increase :

$$P_x = e_{us} P_x^{us} \qquad (5)$$

$$P_m = \dot{e}_j = -\dot{e}^{*}$$

And, consider this country pegging to an import-weighted basket, i.e., the yen, so that $e_j = P_m = 0$. In this case the export price as well as the index of the traded goods price will fall :

$$\dot{P}_x = \dot{e}_{us} = \dot{e}^*$$

$$P_m = \dot{e}_j P_m^j \qquad (6)$$

The domestic price index can be written as

$$P^d = (e_j P_m^j)^a (e_{us} P_x^{us})^b \qquad (7)$$

where $a + b = 1$

It is evident that under the circumstances of disequilibrium where PPP does not hold, the price equation when pegging to the U.S. dollar can be simplified to

$$P = aP^j + bP^{us} - ae^* \qquad (8)$$

when e^* denotes a cross-rate ej/e_{us}. Likewise, if the country concerned pegging to a yen-dollar basket, a yen having a weight α and the dollar having a weight β then

$$e\ us = \alpha e^* \qquad (9)$$

$$e\ j = -\beta e^* \qquad (10)$$

The domestic inflation rate will become

$$P = \alpha P^j + \beta P^{us} \qquad (11)$$

which implies that the domestic inflation rate equals a weighted sum of the U.S. and Japanese inflation rates. It is abundantly clear, that under fixed exchange rates, whether the country's

currency is pegged to single foreign currency or on the basis of trading partners' trade weighted basket, that country is not capable to select its own rate of domestic inflation.

As regards the impacts on inflation of exchange rates under a flexible rate regime, the foregoing reviews reveals ambiguous and conflicting substantive arguments. One line of thinking seems to be that the transmission under flexible rates resembles closely that operating under fixed rates. The controversy over the transmission chennels through which exchange change effects, under the alternative exchange rate regimes, are imported into domestic inflationary bias cannot be resolved without theoretical framework in which an appropriate assessment can be facilitated. In the Chapter 3, a survey is expedited about theories of exchange rate determination.

It is hoped the survey of theoretical perspective about exchange rate determination will help in building up an empirical frame in chapter 4. The main theme of the survey focuses specifically on two main strands of thinking : the manner in which exchange rates are determined, and the possibility and the extent to which exchange rate change effects are transmitted to trigger domestic inflation.

Footnotes : chapter 2

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Chapter III

Survey of Literature on Exchange Rate Theories

The controversy over the transmission channels by which exchange rate changes, under the fixed versus the flexible rate system are imparted into domestic price costs which provoke an inflationary pressure, has preocoupied economists for more than a decade, and there seem to be no possible concensus among economists on the issue. One way to resolve the controversy has to do with providing empirical evidence to verify the stated hypotheses. The present chapter attempt to survey the ensuing literature, focussing on the main strands of thinking which underline different exchange rate theories. For the purpose of the present study, and in consideration of the questions under investigation, it may be of more relevance to examine five major theories of exchange rate determination, recently appeared in the literature : Purchasing Power Parity theory, balance of payments theory of exchange rate, the Mundell-Flemming approach, the Portfolio Balance theory of exchange rates, and the exchange rate dynamics theory. Each of this theory will be breifly reviewed with a view to assessing in what manner can these theories be incorporated into an analytical frame which should help analyzing the transmission of exchange effects one domestic prices.

3.1 The Purchasing Power Parity (PPP)

A long-standing building block of the theory of exchange rate determination is the purchasing power parity which in simple terms states that the equilibrium exchange rate equals the rates of domestic to foreign prices, or alternatively, that changes in exchange rates are related to changes in price ratios. The purchasing power parity doctrine...simply states that prices in terms of any given currency, of same commodity must be the same every-where...The equilibrium to which the foreign exchange market tends is an equilibrium of the price level...of the currency units of two countries be concidered in terms of foreign trade product only, then the rate of exchange between the two currency units will approximately closely to the rates of their purchasing power so calculated.."[1] The problem of purchasing power parity principle is that it holds over long period of times but in the short-run horizon, deviations from it in the present regime of generalized floating among major currencies have been quite persistent, and have revived an interest among economists in PPP.

The extent to which deviations from the trend of exchange rates of developing countries in the short period has been an issue of relevance in trade theory. For in this connection, PPP leaves open two questions of operational importance. First, the question relates to the channels by which inflation differentials and exchange rate depreciation would come about. There has been considerable

controversy and confusion on this issue. The second question centers around the extent to which purchasing power parity is complete, i.e. does it hold only in the short-run and is there no possibility of trend deviations in the long-run?

Some economists, Dornbusch in particular, argued that there is the possibility that systematic deviation from PPP may arise in connection with non-traded goods.[2] The reason is that non-traded goods in the form of services tend to be labour-intensive and indicate low technical progress compared to manufactured, one would expect that rapidly growing and innovating countries to experience increases in real price levels over time. With traded goods prices tend to be equalized, the productivity growth and innovation in the traded sector would raise costs and the relative price of non-traded goods and hence the price levels in the rapidly growing economies. Therefore, a country with rising price levels will encounter a corresponding depreciation of its currency at least in the short-run.

A second source of deviation from PPP, as pointed out by a number of authors which can be traced far back to Viner (referred to by Dornbusch), may be attributed to the effect of capital flows or current account imbalances. The argument is that a country experiencing current account deficits is compelled to recourse to external borrowing which will result in a rise in the relative price of non-traded goods and accordingly the price

level in general.[3] Finally, a number of authors provided evidence to suggest that a link of importance through which spot exchange rates can be pushed away from their purchasing power parity centers on monetary changes by authorities which produce adverse responses in exchange markets and in turn induce inflationary bias and at the same time a higher spot exchange rate (i.e. a depreciation of domestic currency). Following a simple but instructive presentation of Dornbusch, purchasing power parity operating through goods "arbitrage" to equate the prices of internationaly traded goods, may be written as :[4]

$$P_t = EP_f^* \qquad (1)$$

when P_t and P_f^* denote the domestic and currency prices, of traded goods, and E represents the domestic currency price of foreign exchange. In equilibrium relationship, the relative price of traded goods in terms of the price levels for a first country (θ) and the rest of the world ($\overset{*}{\theta}$) will be

$$P_t = \theta P; \text{ and } P_f^* = \theta^* P^* \qquad (2)$$

where P and P^* stand for the price levels in the country in question and the rest of the world, respectively; and where θ and θ^* denote the equilibrium relative prices.

By substituting (2) into (1), the exchange rate is expressed in terms of price levels and relative prices.

$$E = (P/P^*)\ (\theta/_{\theta}{}^*) \qquad (3)$$

Next, Dornbusch introduced the monetary sector into the preceding analysis. Define the domestic and foreign nominal money supply as M and M*, and by invoking a condition of monetary equilibrium in which demand for real money balances equals the supply of money in both countries, one obtains:

$$\frac{M}{P} = L(\quad),\ \frac{M^*}{P^*} = L^*(\quad) \qquad (4)$$

And thus,

$$E = \left(\frac{M}{M^*}\right)\left(\frac{L^*}{L}\right)\left(\theta/_{\theta}{}^*\right) \qquad (5)$$

Thus, the determinants of an equilibrium exchange rate are decomposed into three major factors, namely, the relative nominal quantities of money supply, the real demand for money, and the relative prices in domestic country relative to the rest of the world.

Equation (5) may be rewritten to have a meaningful interpretation by using a differential as a percentage change of each vairable, as follows :

$$E = (M-M^*)+(L^*-L)+(\theta-\ {}_{\theta}{}^*) \qquad (6)$$

It is evident that according to Dornbusch's analysis when money and prices are linked with purchasing power parity, changes in the spot exchange rate are made a function of :[5]

(1) Relative monetary changes, meaning a country with higher growth rate of money supply will experience a depreciating exchange rate; thus, differences in inflation rates associated with the authorities' stabilization policies will be reflected in deviations the spot rates from purchasing power parity.

(2) Relative changes in real money demand, implying that, in equation (6), the country whose real demand for money increases relative to abroad will have an appreciation in the rate of exchange (a lower spot exchange rate).

(3) The last term in equation (6) captures the effect of changes in the relative prices on exchange rate, and those factors affecting relative price changes include changes in absorption, shifts in demand, and technological change, etc., This represents a channel through which PPP holds, and the extent to which the spot rate deviates from its long-run equilibrium value.

This analysis suggests that a country with higher expected inflation through relatively higher money supply growth will inavoidably experience a higher spot exchange rate, i.e., as depreciation in the exchange rate, whereas in the country with real demand for money balance increases relative to abroad will run into a balance of payments surplus due to a rise in the nominal

interest rates which induces a surplus in the capital account by attracting foreign capital, and this country therefor will have an appreciation of domestic currency.

To sum up, Dornbusch has resolved the question concerning through what channels purchasing power parity comes to hold and to what extent the spot rate deviates from its equilibrium value using PPP as a benchmark. This resolution has important implications for our subsequent synthesis. Before providing for a synthesis it will be in order to turn to the monetary approach of exchange rate theory.

3.2 The "Monetary Approach" of Exchange Rate Theory

The recent system of generalized floating exchange rates differs significantly from the exchange rate regime based on the Bretton Woods principles which had operated prior to 1971. In many circumstances, the monetary authorities no longer seek to maintain fixed parities, nor do they forego direct intervention in the foreign exchange markets, as briefly indicated in the first chapter of the present study. Paradoxically, economists contend that the basic theoretical framework of the monetary approach to the balance of payments, developed for a fixed rate system, remains relevantly applicable to the current regimes of exchange rates that have prevailed since the generalized floating of major currencies. As a matter of fact, the monetary approach of exchange rate theory can

be viewed as a combination of purchasing power parity doctrine with the quantity theory of money, briefly noted in the proceeding section.[6]

It is pertinent in this connection to derive the final form of equation which simply summarizes the monetary approach of exchange-rate determination. Suppose M,P,Y, and V denote, respectively, nominal quantity of money, the price level, real income and velocity of money. The well-known text book version of the quantity theory of money may be written as[7]

$$MV = PY \qquad (7)$$

Or alternatively,

$$P = \frac{MV}{Y} \qquad (8)$$

Which implies that for a given velocity and real income an increase in money leads to an proportionate increase in the price level. An Increase in the velocity also raises the price level, whereas an increase in real income, ceteris paribus, will raise real money demand, and thereby would lower the level of prices.

As stated in the preceding section, purchasing power parity theory holds that the equilibrium exchange rate equals the rates of domestic to foreign prices, since commodity arbitrage equalized prices of internationally traded goods. That is,

$$P = EP^* \qquad (9)$$

When P and P* are domestic and foreign prices, respectively, and E is defined as the domestic currency price of foreign exchange. substituting (9) into equation (8) yields the equation of equilibrium exchange rate :

$$E = \frac{MV}{Y} \cdot \frac{1}{P^*} \qquad (10)$$

Equation (10) suggests that the equilibrium exchange rate depends on nominal money, real output and velocity of money (measured by the income-money rates). An increase in nominal money supply and for velocity would induce the exchange rate to depreciate in the proportional manner, while a rise in real output results in an appreciation of exchange rate.

However, when an economy is open to foreign trade, foreign prices are linked with the country's domestic prices through the exchange rate. The foreign price level is determined by demand and supply conditions in the foreign country, so that equation (10) becomes

$$E = \frac{(M)}{M^*} \frac{(V)}{V^*} \frac{(Y^*)}{Y} \qquad (11)$$

In this perspective, the arguments that determine the equilibrium exchange rate are relative supplies of money, velocities of monies and real income in the two countries. If the money supply in the first country increases relative to the second (foreign) country,

it implies that, other things being equal, the first country's exchange rate will depreciate. Real income expansion in the first country will, by contrast, lead to the exchange rate appreciation.

If the velocity of money is assumed to depend on real income and the cost of holding money, equation (11) may be rewritten in logarithmic form as :

$$\ln E = a_1 \ln M - a_2 \ln M^* + a_3 \ln Y^* - a_4 Y + a_5 \ln(r^* - r) \qquad (12)$$

The final equation suggests that the equilibrium exchange rate is nothing but a relative price of two currencies, and it is determined by the relative supply and demand for the two currencies.

A formal derivation the equilibrium exchange rate equation (12) can alternatively be facilitated as follows.[8]

The real money demand of residents in a country is assumed to be a stable function of the level of real income and the nominal rate of interest :

$$M = PF(Y,r) \qquad (13)$$

Similarly, in the foreign country, the real money demand function will take the form

$$M^* = P^* f(Y^*, r^*) \qquad (14)$$

Where M,Y,r and P denote respectively the money supply, level of real income, the nominal interest rate, and the price levels for

the first country, and an asterish refers to the foreign country. It is clear from the preceding discussion that the real money demand, F(Y,r) is negatively related to the nominal interest rate and positively related to the real income level. Next, the purchasing power principle links the exchange rate to the ratio of the price levels, as specificed in equation (9)

$$P = EP^* \qquad (9)$$

By substituting (9) into equation (13) and taking into account equation (14), one obtains the reduced form equation for the equilibrium exchange rate as :

$$E = \frac{MF(Y^*, r^*)}{M^* f(Y, r)} \qquad (15)$$

Writing this equation in logarithmic form yields the solution expressed in equation (12). To repeat,

$$\ln E = b_1 \ln M - b_2 \ln M^* + b_3 \ln Y^* - b_4 \ln Y + b_5 \ln(r^* - r) \qquad (12)$$

The meaning of this equation has already been noted.

It is clear that the monetary approach of an exchange rate determination is built on the monetary approach to balance of payments analysis. This monetary approach of exchange rates is predicated on the assumption that the demand for real money balances is a stable function of a limited number of arguments and this money

demand function constrains the equilibrium size of the money supply. Under the fixed exchange rate system, the foreign component of the money supply is endogenous because the monetary authorities are committed to buying and selling foreign exchange to maintain the par values of their national money. If demand for real money increases due to a change in one of the arguments of the money demand, and if the domestic component of the money supply remains unchanged, the monetary approach predicts that the country in question will experience a payments surplus, and thereby an appreciation of the exchange rate. Under such circumstances the authorities will buy foreign exchange and thus increase the foreign source component of the money supply. On the other hand, under a system of fixed exchange rate if the authorities are compelled to increase the domestic credit component of the money supply, while there is no change in any of the arguments governing the money demand, the result will be an excess of money supply which would exert downward pressure on the exchange rate. To avoid the exchange rate depreciation, the authorities would compress the foreign source component of the money supply. Thus, the adjustment toward balance of payments improvement lies in the equilibrium condition between money supply and real money demand.

In their contributions to the monetary approach to the balance of payments, Mundell (1968) and Johnson (1976)[10] advocated that the approach, which had been applied to the countries under

fixed exchange rates, was equally applicable to the flexible exchange rate system. In the words of Frenkel and Johnson the view is explicitly expressed.

> In a floating rate world, the theory commonly misapplied to a fixed rate world-that the monetary authority controls the money supply and the price level-again becomes valid; but for the monetary approach this merely shifts the focus of analysis from the determination of the balance of payments to the determination of the exchange rate. (The theory views) purchasing power parity as determining either a nation's price level via its exchange rate under a fixed rate system, or its exchange rate via its domestic money supply under a floating rate system.[11]

What these authors emphasize in this context is that the monetary approach to the balance of payments views international adjustment not as an automatic process but rather as an instrument of demand management policies designed to maintain payments equilibrium and internal stability; and under the flexible exchange rate regimes, it is the exchange rate that must adjust to achieve the result.

What is of crucial importance is that the balance of payments theory that applies directly under a system of fixed exchange rates is equally applicable under the recently emerged system of generalized flexible rates. What distinguishes the application of the monetary approach of exchange rate theory from the monetary approach to balance of payments theory lies in the

adjustment of exchange rate. Under a regime of flexible rates the foreign source component of the money supply is fixed. Thus, if any of the arguments of the money demand function or in the domestic credit component of the money supply shifts, equilibrium in the money market cannot be accomplished by changes in the foreign source component of the money supply. Since under the flexible rate system, the monetary authorities do not buy or sell foreign exchange to maintain parities of their currencies, equilibrium can come about through the adjustment of exchange rates. These rate adjustments induce effects on the variables which govern the money demand function, namely, incomes, interest rates, prices and so on, with the result that the exchange rate under the flexible rate regime must change sufficiently to achieve equilibrium between money supply and real money demand.

As for the controlled exchange rate regimes, the countries that made recourse to flexible rates do not allow freely flexible rates to operate. The monetary authorities under this managed floating regime intervene frequentcy as they see fit in the foreign exchange market to monitor fluctuations in exchange rates to a managable extent but they do not maintain fixed rates by engaging in the foreign exchange buying and selling operations. The monitoring of exchange rates affects the variables of the money demand relative to the domestic source component of the money supply, and thereby putting pressure on the exchange rate.

The policy strategy of the authorities under the managed rate situation centers on deciding the extent to which this pressure will be relieved by allowing the rate to change and the extent to which it will be absorbed through changes in foreign exchange reserves. That is, the policy decision involves a "trade-off" between costs due to permitting variations in the exchange rates and foreign exchange reserve changes.

To recapitulate, the monetary approach of exchange rate determination demonstrates that real money demand and money supply constitute the approximate determinants of exchange rates. However, it needs be pointed out that "real" variables are also important in determination of exchange rates, notably, the level of real income.

"We give emphasis to the role of monetary considerations in the context of exchange rate determinations,....the exchange rate is approximately determined by the balance between money supply and real money demand. The fact that the approach here is "monetary" in no manner precludes the role of "real" factors since these must be expected to enter as determinants of the demand for real balances and thus exert an effect on the exchange rate,...there is no relevant sense in which one would want to assert that exchange rate is an exclusively monetary phenomenon."[12]

That is, a country that experiences rapid growth in real income will also experience rapid growth in the real demand for money. Unless the monetary authorities allow the domestic source component of the money supply to expand more rapidly than the real money

demand, the monetary approach of exchange rate theory predicts that this country should run balance of payments surplus and/or appreciating exchange rates. On the other hand, in a country where real output and employment fall, the governments are likely to resort to expansionary monetary and fiscal policies with the result that the domestic credit component of the money supply increases more rapidly than the real money demand. Thus, the country should be confronted with the balance of payments deficits and/or depreciating exchange rates.

3.3 Balance - of - Payments Theory of Exchange Rate Determination

For purpose of our review of literature that is relevant to our pursuit, it may be worth while to briefly examine the text-book balance-of-payments approach to exchange rate determination. In essence, this traditional theory views exchange rates as a mechanism which adjust balance receipts and payments arising from international trade in goods, services and assets. The current account consisting of exports, imports and invisible items is affected by the exchange rate because it alters the relative prices and hence competitiveness, the capital account is affected to the extent that interest differentials and expectations about changes in the rates are important. The theory may be couched in the functional form as follows.[13]

$$BOP = 0 = C(EP^*/P, Y, Y^*) + F(r, r^*, U) \qquad (16)$$

Where BOP denotes the balance of payments measured by changes in foreign exchange reserves which becomes zero in equilibrium; E is the domestic price of foreign exchange; P* and P stand for foreign and domestic price levels, respectively, and thus EP*/P captures the relative price of foreign goods and service as a measure of competitiveness; C represents the current account, and F the rate of capital inflow which depends on the relative differential between domestic interest rate (r) and foreign interest rate (r*). U is inserted to serve as a speculative variable which will be ignored for our purpose.

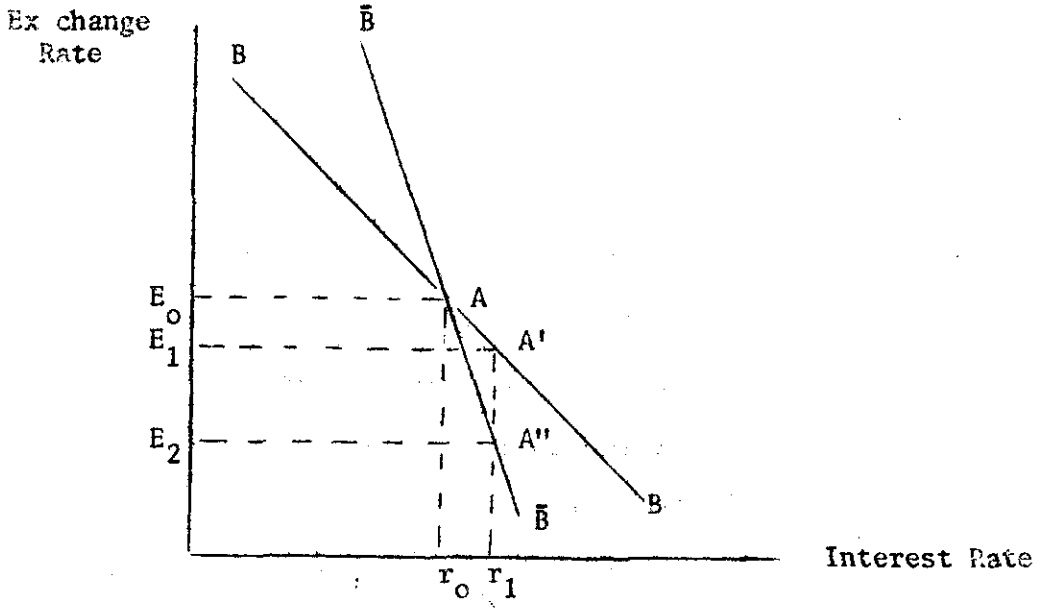
The point of importance for this theory lies in the inverse relationship between exchange rates and domestic interest rates. This has an intuitive appeal because for a country's external payments of imports of goods and services including assets to be in equilibrium; a rise in E,i.e.,a depreciating exchange rate, would render this country more competitive and thus improves the current account, given prices, foreign income and interest rates. This means the current account would tend, due to favorable competitiveness, to surpluses. To restore an over-all balance-of-payments equilibrium, dower interest rates are required to provoke an offsetting capital outflow. In this conceptual framework, the exchange rates can be shown to depend on interest rates, real incomes, relative price levels and the exogenous variables surrounding the composition of world demand.[14]

$$E = f(Y, Y^*, r, r^*, P^*/P) \qquad (17)$$

This suggests that exchange rate changes have significant direct effects on relative commodity prices which in turn affect the current account balances. Essentially, the exchange rate is viewed as the relative price of national relative to foreign output which contradicts the monetary model of exchange rate determination. Moreover, the balance-of-payments theory assumes that the exchange rate is determined by the conditions for equilibrium in the markets for flows of funds, including the rate of capital movements over a period of time. On these grounds, a devaluation would reduce relative prices of domestic output (the country's exports) relative to foreign output (the country's imports), and the effectiveness of currency devaluation depends critically on the relevant trade elasticities.[15] Thus, an increase in the country's income, due probably to an autonomous spending increase, would worsen the current account and therefore requires an offsetting exchange rate depreciation. An increase in foreign prices or an increase in the domestic interest rates relative to foreign countries will lead to an offsetting appreciation. The channel by which higher domestic interest rates result in an exchange rate appreciation is illustrated in Figures 3.1.

Figure 3.1

The channel by which Higher Domestic Interest Rate Result in an Exchange Rate Appreciation



In this illustration, BB is the balance-of-payments schedule. Exchange rate is measured on the vertical axis and interest rates on the horizontal axis. An increase in interest rates leads to a net capital inflow or a reduced capital outflow and therefore causes the over-all balance of payments to move into surplus. The exchange rate will appreciate, and the rate appreciation will be sufficient to offset a worsening of the current account; where the economy moves from A to A' on the BB schedule, given prices, foreign incomes and interest rates. However, if the domestic country's real output declines due to higher domestic interest rates and aggregate demand falls, the BB schedule shifts inward overtime. The long-run payments schedule that incorporates the

equilibrium of income implied by the real exchange rate and interest rate will be the steeper schedule such as $\bar{B}\bar{B}$. And, the long-run exchange rate will be further appreciated to the position such as point A".

In comparison with the previous theory, it is evident that this traditional approach relies on two major assumptions. Firstly, an exchange rate is viewed as the relative price of national outputs rather than the relative price of national currencies. Second, it is assumed that the exchange rate is determined by the condition for equilibrium in the markets for flows of funds rather than by the condition for equilibrium in the markets for stocks of assets. Thus, capital-flow constitutes, in this theory of exchange rate, an important mechanism by which exchange rate changes affect capital flows, the extent of which depends on the interest rate. This balance of payments theory predicts that an increase in domestic interest rates create an incipient capital inflow with the result that the exchange rate appreciates. This conclusion is in sharp contrast with the monetary model of exchange rate determination which predicts that an increase in domestic interest rates will produce a depreciating exchange rate, since the increased interest rates compress the real money demand.

Another apparent conflict with the monetary model of exchange rates arises in the exchange rate and income relationship. This traditional theory predicts that higher levels of real income

would lead to increasing demand for imported goods, thereby the current accounts deficit and a depreciating exchange rate. On the contrary, the monetary approach to exchange rate determination, reviewed in the preceding section, predicts that higher levels of real income result in an increase in the real money demand and create an incipient balance of payments surplus and hence an appreciation of exchange rate. With this summary statement, we turn now to another model of exchange rate determination, the Mundell-Flimming approach.

3.4 The Mundell-Flemming Model

The balance of payments theory, indicated in the preceding section, has drawn attention to the role of capital flows in the determination of exchange rates. This is also the perspective accepted in the modern macro-economic approach to exchange rate determination originated with the pioneering work of Mundell (1963) and Flemming (1962).[17]

The Mundell-Flemming thesis revolves about the macro-economic framework of interest and output determination which links goods market and money market equilibrium with the balance-of-payments nexus because exchange rate changes influence competitiveness and capital movements, with domestic price level fixed. Changes in the exchange rates, particularly devaluation, constitutes an important instrument of demand management, since it tends to increase the demand for domestic output so that its role in a stabilization

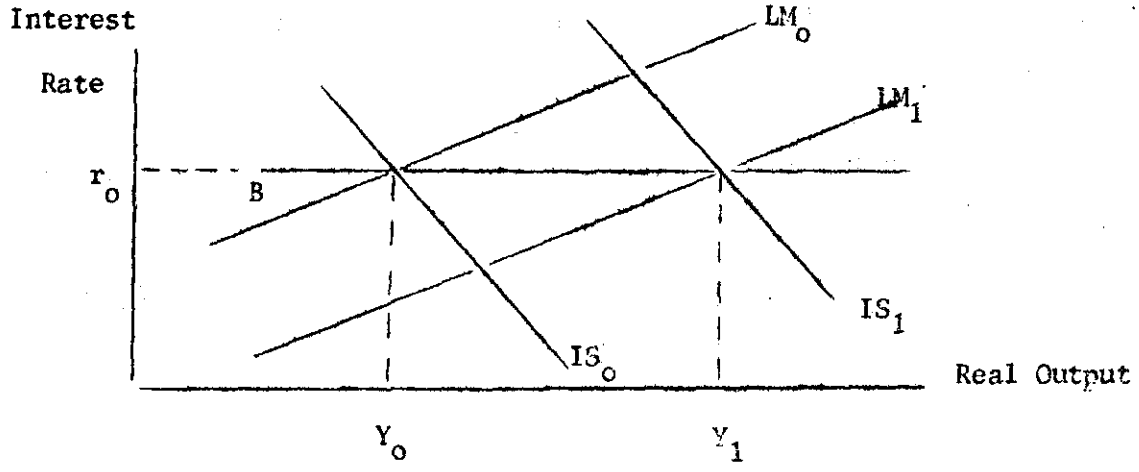
program is both to switch demand to the foreign sector which should improve the balance of payments and to offset in part the deflationary impacts of a restrictive demand management policy. On the whole, devaluation shifts foreign demand towards the goods exported by the country in question and acts as an expansionary stimulus.[18] Thus, with prices and foreign real income fixed, net exports are a decreasing function of domestic real income and the exchange rate. On capital account, with foreign interest rate exogenous, net inflow is an increasing of the domestic interest rate and the expected rate of appreciation of the domestic currency.

The Mundell-Flemming theory may be summarized by referring to a conventional IS-LM diagram, with the assumption of perfect capital mobility, imposed by the positively sloped balance of payments schedule. Note that perfect capital mobility implies that there is on only one rate of interest at which the balance of payments can be in equilibrium. If the interest rate were higher, there would be capital inflows which lead to a current account surplus and conversely if it were lower. The money market equilibrium is represented by the conventional LM, and the goods market equilibrium by the IS schedule except that it incorporates not export as a component of demand determined by income and competitiveness. Thus, exchange rate depreciation should shift the IS schedule to the right. This is shown in Figure 3.2.

With perfect capital mobility and of the "small-country" assumptions, the analysis the Flemming-Mundell analysis may be easil explored. Let the country in question floats rather freely. Next, assume an expansion of the money supply indicated by the rightward shift of the LM schedule. The impact effect is to lower interest rates and to exert an expansionary effect on domestic expenditure. The fall in interest rates, however, leads to exchange rate depreciation due to incipient capital outflows. The depreciation in turn enhances the country's competitiveness, thereby, stimulating net exports and/or import-substituting activities. Thus, the IS schedule shifts to the eight to a new equilibrium point at A'. The outcome of the monetary expansion, then, is that, output and income have increased sufficiently for the increased money balances to be absorbed at the original rate of interest, and therefore leading to the depreciation of exchange rates. The extent of depreciation is greater, the less the interest and income elasticities are in the demand for money, the larger propensity to import, the smaller are price elasticities in trade, and the more interest-responsive is domestic expenditure.

Figure 3.2

The Mundell - Flemming Theory : IS - LM Diagram.



This Mundell-Flemming analysis has some important implications for exchange rate theory and monetary policy. First, under perfect capital mobility condition, with given the world rate of interest, monetary policy operates not by raising interest-sensitive components of spinding, but rather by provoking a depreciation and a current account surplus. It is through net export component that monetary policy works and doing so quite effectively. Secondly, the analysis brings into the forefront the link between interest rates and exchange rates, and this has become central to recent exchange-rate models.

Let the condition of goods market equilibrium[19] be represented by

$$Y = A(Y, r) + C(EP^*/P, Y, Y^*) \qquad (15)$$

where A( ) denotes aggregate domestic spending, C the trade balance, and other notation being as previously defined, then it can be shown that an equilibrium exchange rate is determined by the following arguments.[20]

$$E = E(r, Y, Y^*, P^*/P, O) \qquad (16)$$

Where O captures fiscal policy variables and other exogenous determinants.

In a reduced form equation, an equilibrium exchange rate in this model becomes;

$$E = E(M, Y^*, O) \qquad (17)$$

That is, an exchange rate in equilibrium of all markets would be a function of the stock of money and foreign demand for the country's goods and services, as well as other fiscal policy variables.

Note that the Flemming-Mundell model has a number of short-comings. First, the theory implies that strict interest rate equality must obtain internationally, and it exclusively leaves out the role of exchange rate exprectations. Second, the analysis takes no account of the effect of exchange rate depreciation on domestic price levels. The model virtually neglects the depreciation either to affect the price level, and thereby the real value of money balance, or the price of the country's output and hence the country's competitiveness. That is why monetary increase leads to expansion in output and income and depreciation the currency, to maintain, through the current account, external balance with whatever mix of output (higher) and interest rates (lower) required to restore equilibrium in the goods and money markets .

Moreover, the Mundell-Flemming approach seems questionable, expecially in the light of recent experience and throritical developments. This involves the absence of dynamics, i.e. lags in response of output and trade, and lack of the role of expertations. If these lags operate and are taken into account, it would imply that monetary policy in the short run may not be expansionary as the theory predicts. Likewise, if an interest rate effect on capital

flows operate with long lags, such effects will cease as flows occur. In view of these remarks, we turn to a more elaborate analysis which incorporate asset preferences and the requirement for portfolio balance on current account.

3.5 The Asset Market Approach to Exchange Rate Determination :

The Mundell-Flemming theory assumes perfect substitutability between domestic and foreign assets with the implication that there would be only one rate of interest at which the balance-of-payments equilibrium can be maintained. The asset market approach of exchange rates, relaxing the stringent "perfect capital mobility" assumption, emphasizes a more limited substitutability between domestic and foreign assets and argues that the exchange rate along with asset yields determine balance between asset demand and asset supplies. A vast literature on the asset market theory or the portfolio balance approach, as sometimes referred to, has appeared over the past decade. The review in the present section focuses only on the main strand of thinking on this approach of exchange rates insofar as it is relevant to our mainstream of our investigation.

The main theme of the asset market or the portfolio balance approach of exchange rate discussed in the present section follows models that have been developed by Dornbusch (1975), Dornbusch (1976)[21] Schadler (1976)[22], Kouri[23] (1976), and Branson[24] (1979)

Before taking up a critical review of this approach, it may be helpful to breifly pinpoint the basic assumptions of the asset market equilibrium model.* The first assumption of the asset market equilibrium model is that it views a multiplicity of factors as determining an equilibrium exchange rate, including money, bonds and other financial assets, domestically supplied and those in existence abroad. Secondly, the asset market equilibrium assumes that stock equilibrium, rather than flows equilibrium in the goods market and balance of payments, play a prominent role in the markets for money, securities, and foreign assets. According to the asset market theory, asset holders continuously adjust the composition of their portfolios on the basis of which to reflect relative expected rates of return on various domestic and foreign assets, and it is changes in interest differentials which induce capital flows. It therefore implies that changes in current-account positions play a rather subdued role in the short-run, not only because commodity markets are assumed to adjust only gradually but also because longer lags come to play in the adjustment of current accounts to price changes. Finally, the portfolio balance model assumes that expectations are regressive playing a limited part in affecting trade flows.

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*The terms "asset market equilibrium" model is used here synnonymously with the "portfolio balance" approach of exchange rate.

Following Dornbusch (1976) and Branson (1979) we assume the situation in a typical country as follows : Domestic residents hold domestic money and bonds, which form the tradable asset; those domestic money and bonds are not held by foreigners, and any increase in liabilities to foreigners indicates a fall in domestic holdings of foreign bonds, which represents net foreign assets assumed to be positive. The proportion of any form of wealth which domestic residents desire to hold, as already stated, depends on relative expected yields of assets.

Under these circumstances, the exchange rate performs three functions. First, since it is assumed the domestic residents are in net credit position, an appreciation will cause wealth to rise. Second, exchange rate expectations are linked with changes in interest differentials which form a component of relative expected yields of domestic and foreign assets. Thirdly, the asset-market model incorporates the Mundell-Flemming analysis of the exchange rate effect on the current account, by arguing that this effect determines the net acquisition of foreign assets.

Thus, the exchange rate is viewed as a relative price being determined by equilibrium in the asset markets, i.e. where the existing stock of a vast variety of assets are willingly held, or the maintenance of portfolio balance is achieved in the short-run, with lagged feedbacks affecting the current account and the accumulation of foreign assets. In the long-run the current

balance will be unchanged and the accumulation of foreign assets will cease. Thus, in the short-run, the exchange rate in portfolio balance models plays the role of equating asset markets, providing a corrective mechanism for foreign exchange markets, working through the capital account; in the long - run, trade and other real variables are allowed to adjust partially. This analysis draws sharp distinction between the short-run and long - run responses of exchange rates to monetary changes which may produce different results. It implies that the factors that establish a stock equilibrium in asset markets may not necessarily be consistent with those that would produce continuing flow equilibrium in commodity markets because variability in the factors that impinge on expected rates of return or risk will tend to cause wide variation in exchange rates. Since changes in commodity prices and trade flows respond only gradually toward their equilibrium position, the equilibrium exchange rate in the short-run is achieved when existing stocks of financial assets are fully absorbed in the wealth-holders' portfolios. The implication of this assertion is that the focus of the analysis of the asset market equilibrium theory is on the short-run, considering relative prices of goods and production factors to influence exchange rates in the long - run. In effect, this theory maintains that the factors that establish a stock equilibrium in asset markets may not necessarily be compatible with those that would produce continuing flow equilibrium in commodity markets; and

since this theory assumes that expectations play a limited role in current accounts and that the response of current - account flows to their underlying determinants operates with lags of longer duration, the exchange rate in this model may move to a level which, while clearing the foreign exchange market in the short-run, is not necessarily consistent with continuing equilibrium in the long-run. In other words, the short-run stock equilibrium exchange rate that is obtained in the asset market may considerably deviate from the flow equilibrium rate that would achieve external payments balances over a long - run period.

To appreciate the model described above, it may be useful to clarify the asset market approach in terms of equational forms. Specifications of the asset market model have been made at various levels of generality and theoretical rigor. This review is intended to spell out only the basic elements of the asset market model, following a comprehensive study undertaken by Kouri.[25] According to Kouri's interpretation, the focus is on the relation between the domestic absorption and trade balance. The private sector is assumed to hold a stock of assets, the demand for which being a function of expected rates of return on such assets and an activity and wealth variables. Rates of return on foreign assets are made a function of expected exchange rate changes. The trade balance is residually defined which corresponds to income less total domestic absorption (private and government). A full model is as follows.[26]

$$W = \left[M + A/r + A^*E/r^* \right] P \quad (1)$$

$$A^i/P = A^i(Y,W,r,r^*) \quad (2)$$

$$M/P = M(Y,W,r,r^*) \quad (3)$$

$$BOT = Y - C(Y, W) - G \quad (4)$$

$$E = E(r^*,M,A,A^*) \quad (5)$$

Where W denotes total wealth, M,A,A* are respectively, money stock, stock of domestic asset and stock of foreign asset; Y stands for real income, and P the price level; C and G represent private consumption and government expenditure; r and r* are domestic and foreign rates of return on assets, and E is the exchange rate. Wealth equals money supply foreign assets times exchange rates and domestic asset.

This simple framework should enable to analyze the two basic questions connected with the asset market theory : firstly, the extent to which the short-run exchange changes lead to a disproportionately large change in the long - run equilibrium rate, following financial sector shocks; and secondly, whether the short-run exchange rate adjusts gradually to its long -run equilibrium.

Note that the reduced form equation of this model, in which an equilibrium exchange rate is determined by relative asset supplies; and in particular, an increase in domestic nominal assets,

money or securities, relative to external assets, will lead to an exchange rate depreciation. The asset market model draws attention to the possibility of substitution between domestic and foreign assets but they are imperfect substitutes and therefore, their relative supplies determine, along with the money stock, equilibrium interest rates and the exchange rate. The link with the current account is achieved by the fact that foreign assets are acquired over time through the current account surplus. Next, consider the implications in this framework of an increase in the money supply brought about by the authorities. An expansionary domestic rates of interest to fall relative to those in foreign countries, and the decline in the interest rates will be sufficient until domestic bonds, money and real assets are willingly held in the desired portfolio balance. However, the lower domestic interest rate induces an increase in the demand to hold foreign assets but since foreign assets are imperfect substitutes with domestic residents are limited, the exchange rate bears the burden of adjustment; the exchange rate depreciation will arise and the extent of depreciation will be sufficiently large so that the excess demand for foreign assets is completely eliminated.

The analysis also suggests that the short-run exchange rate adjusts gradually to its long-run equilibrium. In the process, deviations between the two will equal the initial proportional change of the money supply.

And, as domestic sesidents continue to acquire foreign assets with the result that the exchange rate depreciates the current account should move into a surplus. However, this will not occur since the theory assigns lags of long duration to the response of trade account, and expecially under conditions that the domestic interest elasticity of money demand is less than the elasticity of demand for foreign assets (will respect to domestic interest rate), trade account must, therefore, settle at deficits for a long period of time. And, so long as the trade account deficits continues, the short-run exchange rate will depreciate even further.

The similar conclusion that the exchange rate depreciation will result can also be arrived at, in case where the foreign rate of interest rises relative to domestic rate.

On the contrary, a case where the domestic economy acquires net holdings of foreign assets. The foreign source component of money supply increases, and to maintain external payments target, the domestic credit source component will be reduced, so that the equilibrium exchange rate appreciates to the extent equal to the increase in foreign assets.

Finally, note that the asset market model has also certain drawbocks. First, it leaves out the role of expectations effect. Second, this model has merit in the analysis of exchange rate without relying on shifts in money demand or supply as sole determinants of exchange rate changes. However, it is still a

partical equilibrium analysis in that dynamic adjustment which is considered is still attenuated.

3.6 The Dornbusch Exchange Rate Dynamics Model

The most recent development is Dornbusch's model of exchange rate dynamics which has in common with the basic monetary model the demand for money and the assumption of interest parity; and the theory assumes competition in trade is imperfect so that PPP does not necessarily hold. In addition, there are differences in speeds of adjustment between assets and goods markets, with interest and exchange ratio responding faster to shocks than goods prices and output; the expected exchange rate and interest rate become endogenous, and free to equilibrate the money markets. In essence, the Dornbusch dynamics model incorporates the monetary approach into the asset market equilibrium models of exchange rate determination. The model reduces to two major relationships between the price level and exchange rates, one explaining the condition for market equilibrium in financial markets, the other the condition for equilibrium in domestic goods markets and money markets. They may be summarized as follows.

3.6.1 Interest Rate Parity

The distinguishing feature of the exchange rate dynamics model is an assumption of imperfect competition in trade, and hence the model lends support to the possibility for deviations from PPP;

and the interest rate parity condition constitutes the primary link between international financial markets. The interest rate parity condition may be expressed as

$$r - r^* = \log (F/E) \qquad (1)$$

where log F/E denotes the forward premium, F being the forward exchange rate, E is the spot rate, and r and r^* are domestic and foreign interest rates, and $(r - r^*)$ represents the interest rate differential. For simplicity, equation (1) may be rewritten as

$$r - r^* = \hat{E}; \text{ or } r = r^* + \hat{E} \qquad (2)$$

where $\hat{E}$ is the expected value of the spot rate in the period t+1, conditional upon the information available in period t.

3.6.2 Regressive expectations

Exchange rate expections in (2) are assumed to be regressive, that is, the expected rate of appreciation depends on the discrepancy between the expected long-run exchange rate $\bar{E}$ and the actual current rate :

$$\hat{E} = (\ln\bar{E} - \ln E) \qquad (3)$$

This suggests the hypothesis of rational expections, meaning that traders form expectations by projecting that future exchange rate movements would be in the same direction as the actual change in the rate. This does not suggest that investors always project the

future rate perfectly accurately but only "rationally" in terms of the information available; this hypothesis (3) is consistent with rationality and perfect foresight.

3.6.3 Money market

The Dornbusch dynamics of exchange rate follows the monetary model of exchange rates in specifying the real money demand to be stable function of certain limited arguments, i.e. real income and nominal interest rates. The demand for money may be written in logarithm :

$$\ln M^d = k\ln Y - \ln r \qquad (4)$$

The nominal money supply is regulated by anthoritus; in logarithmic form

$$\ln M^s = a\ln P - (1-a)\ln P^* - (1-a)\ln E \qquad (5)$$

In specifying these money functions the problem arises as to what relevant price indices should be used for deflating the nominal money balances and other financial assets, so as to reflect portfolio balancing for both domestic and foreign assets. The present study interprets that the relevant price index for Dornbusch dynamics analysis of exchange rates should be the "general price level", weighted by domestic prices and foreign prices (i.e. prices of imported goods); that is the general price but ($\bar{P}$) is represented by a fixed weight index that depends on

the price of domestic goods and the domestic equivalent of the price of imported goods allowed for exchange rates :

$$\ln \bar{P} = a \ln P + (1-a) \ln P^* + (1-a) \ln E$$

where a is the relative weight of domestic prices (P) and (1-a) the weight of foreign prices (P^*), and money market equilibrium will be, using the lower case letters to denote logarithm.

$$m - ap - (1-a)p^* - (1-a)e = ky - \lambda r \qquad (6)$$

The supply of real balances equals the level of nominal money divided by the price level.

3.6.4 Goods market

To obtain an expression for a long-run equilibrium exchange rate, we turn to the goods market. The demand for domestic output (D) is related positively to real income, relative price competitiveness (through PPP) and negatively to the rate of interest.

$$\ln D = \delta(e+p^*-p) + \phi Y - \sigma \left[r - a\hat{p} - (1-a)\hat{e} \right] \qquad (7)$$

where $\hat{p}$ and $\hat{e}$ denote expected rate of price changes and exchange rate change, respectively.

The rate of inflation is then assumed to be proportional to excess demand : the price level now plays the role of clearing the goods market rather than the money market.

$$\Delta \ln P = \pi \ln (D/Y)$$

$$\dot{P} = \pi \left[\lambda (e+p^*-p) + (\alpha-1) Y \right] - \zeta (r-a\dot{p} - (1-a) \hat{e} \qquad (8)$$

3.6.5 Final Equation Forms

By appropriate substitution, the final equations expressing the exchange and the general price change in terms of the explanatory variables, will be as follows :

$$\dot{e} = - \left[m-ap-(1-a)e-(1-a)P^* \right]/\lambda - r_f - ky/\lambda \qquad (9)$$

$$\dot{p} = \left\{ \lambda d \pi (e+P^*-P) - a\pi \left[m-ap-(1-a)e-(1-a)P^* \right] \right\} /(1-a\lambda\pi) \qquad (10)$$

Footnotes

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18. Some economists recently argue that since the 1970's antonomous and induced changes in exchange rates have been considerably large, but they failed to improve trade balances which tend to respond sluggishly. These studies cited the cases of the appreciation of the yen and deutsche mark and the depreciation of the U.S. dollar that occurred in the early 1970s as cases in point; these cases have shown that for many years these exchange rate changes did not lead to any weakening of the current account of Japan and Germany or to strengtheing of the U.S. current account. For the assertion that devaluation might lead to contractionary and vice versa for appreciation, see Paul Krugman and Lance Taylor," Contractionary Effects of Devaluation," Journal of International Economics, Vol. 8 (August 1978), p. 445 - 56, Marc Miles, "The Effects of Devaluation on the Trade Balance and the Balance of Payments: Some New Results," Journal of Political Economy, Vol. 87 (June 1979), p. 600-20.

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Chapter IV

Transmission Channels of Inflationary Impacts To the Domestic Economy Under the Current Exchange Rate Regimes : A Theoretical Synthesis and Empirical Results

4.1 Some Summary Restatement About Exchange Rate Models

The purpose of this chapter is primarity to incorporate into an integral theme of thinking the theoretical elements implied by the various theories of exchange rate determination reviewed in the preceding chapter. The attempt is, however, constrained by serious controversy among economists over an interpretation of each of the exchange rate models and in particular by lack of empirical studies on developing countries which should serve as a point of departure for our investigation. Nonetheless, the central theme of the present chapter draws attention to the possibility of theoretical integration with a view to identifying and assessing the channels through which exchange rate impact effects and/or external shocks associated with wide and disproportionate changes in exchange rates, under other current rate regimes, have been transmitted and passed into the domestic economy.

The synthesis of the various exchange rate models, reviewed in the preceding chapter, attempts to explore the relationship between prices, interest rates and exchange rates, and other relevant variables. On the whole, our re-appraisal of the various theories of

exchange rate determination suggests that each of the models attributes to monetary developments and policy an influence on exchange rate, predicting that internal monetary expansion will lead to depreciating exchange rates and conversely. What distinguishes the more recent from the previously conventional models is the followings : the conventional theories of exchange rates emphasized the influence of the exchange rate on the current account, and the more recent models all focus on the role of the exchange rate in equilibrating asset markets. This view of exchange rate has been motivated partly by empirical evidence, such as the long lags which trade appears to respond to changes in prices and exchange rates, and the wide volatility of exchange rates in relation movements in relative prices and other real variables. In particular, the asset market equilibrium models view the relative yields on various assets as determining the equilibrium composition of wealth, changes in interest differentials inducing capital flows, and the exchange rate equilibrating asset markets.

One main stream of thinking underlying a monetary approach of exchange rates centers on the monetarist assumption that the domestic price level is sufficiently flexilble, with given flexibility in the exchange rate, to clear the money market; whereas the interest rate is determined elsewhere and not directly affected by monetary disturbances. In the Mundell-Flemming

analysis, the price level was given, and a monetary increase led to a fall in interest rates, an incipient capital account deficit and a resultant depreciation.[1]

In the asset market model the price level is given in the short-run; a monetary expansion brings about a fall in interest rates to equilibrate the domestic asset markets; and the fall in interest rates requires a depreciation for the demand for foreign assets to be restored to its original level.

In the Dornbusch dynamics model, the price level is also rigid in the short-run; an increase in money supply results in a fall in interest rates to reestablish money-market equilibrium; and the fall in interest rates requires an exchange rate depreciation for relative expected yields to be in equilibrium, given rational expectations.[2]

$$r - r^* = \hat{\bar{E}} = \lambda(\ln E - \ln \bar{E}) \qquad (4.1)$$

In all these cases, monetary increase means real monetary growth because of the stickiness of the price level, and implies a fall in interest rates which is the mechanism that triggers depreciation. A fall in interest rates in all these cases reflects easy domestic monetary conditions and requires an exchange rate depreciation to improve the balance of payments developments. Thus, the interest rate and the exchange rate are in each case positively related.

Nonetheless, the monetary model of exchange rate determination has its distinction of signficance which reflects its central analysis. With the price level being sufficiently flexible, interest rates are determined, through rate depreciation,[3] by the expected rate of inflation:

$$r - r^* = \dot{E} = \text{exp.}\ (P - P^*) \qquad (4.2)$$

that is, perfect capital mobility ensures the interest equality, and rational expectations of PPP ensures domestic and foreign price equalization. An increase in money supply affects interest rates only insofar as it affects inflation expectations, and if it does so it will tend to raise them. However, if inflation expectations depend on underlying monetary growth and are not sensitive to short-run disturbances, a monetary increase will fail to influence the interest rate; money-market equilibrium will be restored, with the real money supply at its initial value, by the rise in the price level via the fall in the value of the currency. Thus, the domestic interest (and expected rate of inflation) in this case will be inversely related with the exchange rate. In conclusion, then, it should be pointed out that in the analysis of monetary influences on the exchange rate it is the monetary model which is uniquely distinct from the rest. It will be pertinent to analyze the inflationary repercussions of exchange rate changes in the perspective of this approach, which incorporating into our framework the elements of the asset market view and the Dornbusch exchange rate dynamic adjustment.

4.2 Statement of Hypotheses of Exchange Rate Adjustment

For the purpose of assessing the transmission channels through which, and the extent to which exchange rate fluctuations generate an inflationary bias into the domestic economy, the theoretical perspective summarized in the preceding section will serve as our analytical and empirical framework. Moreover, the descriptive channels of inflation transmission reviewed in chapter 2, insofar as the discussions being relevant to our investigation, will be drawn upon to substantiate the main theme of our argument. Two major issues will be expanded on these theoretical and descriptive perspectives:

First, the pattern of adjustment of the economy depends upon the nature of the initial disturbance, but under certain circumstances, there will be a phase of adjustment process during wich the economy experiences rapid inflation of costs and prices, and exchange rate depreciation. In the absence of policies of monetary accommodation this phase will be marked by a period during which price and cost inflation will be abated, and output (and employment) begins to expand. Authority's policy priority is implementing high growth and recuding unemployment objective, the demand or supply of tradable goods will be validated by the policy of monetary accommodation, and it may be sustained during a phase of adjustment. The implementation of policy of accommodation will unavoidably result in domestic price increases and exchange depreciations. This statement epitomizes the theoretical elements

of all of the exchange rate models reviewed in Chapter 3, with an exception of the monetary model. It is this view of adjustment that Friedman (1970) could have put forward the statement : "Inflation is always and everywhere a monetary phenomenon".[4] The question as to how the exchange rate regime can impart price pressures at a given level of demand and in particular how exchange arrangements may affect the government's demand management policies so as to generate inflation, will be explored.

4.2.1 Transmission of Exogenous Shock to Domestic Economy

As a starting point, it will be suitable for the present analysis to follow the asset market equilibrium model, with some extension being allowed for. The most important extension is, by way of incorporating the Dornbusch exchange rate dynamics, to take the view that adjustment in portfolio composition is gradually achieved; this assumption enables us to derive a "capital flow". As stated in the Chapter 2, the exchange rate regime can exert an effect on the price level if it changes the supply or demand for goods. However, such price level effects would not, in themselves, have any continuing effect on the inflation rate; insofar as any upward movement in the supply or demand curves is validated by government policies of accommodation, it may well result in the long-run shift in the rate of inflation. The question of whether government's policy reaction will be systematically influenced by the exchange rate regime, however, is one that bears primarily on

the issue pertaining to the exchange rate effect on the domestic price level. In the discussion that follows, it will focus specifically on determining what type of adjustment process is triggered in motion following a disturbance (to be specified below) in the absence of monetary accommodation. Once this process is specified, the channels through with the exchange rate regimes can affect the adjustment process and the inflationary impacts fed into the domestic economy can be examined.

Second, the exchange rate regimes can affect the rate of inflation, either by changing the nature of the perceived trade-off between inflation and other policy objectives, or by altering the authority's preference for its various policy objectives.[5] The link between real variables and financial sectors is through interest rates, and interest rates, at a given level of income, are determined by money market conditions. The exchange rate is determined by the interest rate differials (via the interest rate parity condition) inducing capital flows.

A once-for-all monetary expansion will generate the following chains of responses. In the short-run adjustment, domestic interest rates fall relative asset yields abroad which induces an incipient capital outflow because portfolio substitution takes place overtime in anticipation of changes in actual or expected international yield differentials. The capital outflows result in an exchange rate depreciation. Exchange depreciation operates via the expenditure-switching role by changing the relative prices of

domestic and foreign goods, thereby, effectuating an improvement in the trade balance. In this connection, the magnitude of the depreciation must be sufficient to ensure that capital outflows are just counter-balanced by the extent of the trade surplus. The slow adjustment in portfolio composition constitutes the link between the current account and the exchange rate. The factors accounting for this slow adjustment are official restrictions on capital, institutional rigidities, and adjustment costs, and so on.

First, we focus on the money market conditions. As far as the expenditure-reducing role of the exchange rate is concerned, the once-for-all monetary expansion will lead to a fall in the domestic interest rate to clear the money market. In view of the interest differentials, the reduction in the domestic interest rate results in capital outflows, and the fall in real balances and the larger the proportion of foreign goods in total expenditure, the larger will be the fall in real balances required to equilibrate the demand and supply in the money market. For any given change in real balances, a lower interest elasticity of money demand will produce a larger change in the interest rate and therefore require a large movement in the exchange rate. Thus, a monetary expansion (in absence of accommodation) affect the exchange rate through the interest rate differials, as specified in the monetary model, the asset market view, and the exchange rate dynamics model reviewed in chapter 3. In essence, the transmission mechanism that lends support for empirical test is that a low interest rate elasticity of demand

for money will generate large fluctuations in the interest rate and large changes in the exchange rate. This hypothesis will be subject to empirical verification using relevant data of the sample countries over 1971-1979.

4.2.2 Transmission of Exchange Rate Regimes to Domestic Economy

Next, we turn to the transmission of exchange rate changes to domestic economy. As stated, the depreciation of domestic currency in the short-run operates through the expenditure-reducing role which puts upward pressure on the consumer prices and real output, and in the short-run adjustment the price of imported goods has risen. In this connection, some economists argue that the depreciation put pressure on the prices of traded goods, in general, namely, prices of imports which are denominated in the domestic currency, as well as prices of exports which are denominated in foreign curries; the feedback of depreciation on domestic price levels is referred to as the "pass-through" effect[6]. In short-run equilibrium, the size of individual country parameters determine whether a country's exchange rate will initially overshort its equilibrium value (e.g., the PPP principle as extended by Dornbusch). The elasticity of output with respect to the exchange rate, the income elasticity of money demand, and the size of expenditures on domestic goods in relation to total private spending, the elasticities of supply of export and demand for import, determine, at constant interest rates and capital flows, the magnitude of the pass-through effects, and whether the exchange rate will overshoot.

Small countries with the share of expenditure on domestic goods in aggregate private spending is low, will be less vulnerable to exchange rate over-shooting, but more vulnerable to over-shooting because the elasticity of output with respect to the exchange rate is rather low. Moreover, small countries could be more prone to over-shoot because of the speed with which exchange rates are fed into import and export prices, expecially in when these small countries are "price-takers" in the world commodity market, and in particular, the exchange rate effects will be greater, if prices react asymmetrically to positive versus negative changes in costs or demand, and if one exchange rate regime leads asymmetrically to larger or more frequent changes in exchange rates. This would hold to the contrary for large countries with some powers to exert on goods prices.

The existence of this asymmetry is the basic premise of the so-called "ratchet and asymmetries" or Mundell-Laffer hypothesis.[8] Generally interpreted, this argument implies that a regime of flexible exchange rates exert an inflationary bias compared with a regime of fixed rates. This inflationary bias arises firstly from the fact that flexible rates are associated with more frequent exchange rate changes than the fixed rate system; and secondly, in the regime of flexible rates, in a world of downward price inflexibility, depreciation in depreciating countries generates price increases that are greater than the corresponding price declines in appreciating countries. Thus, in contrast to a situation where

prices are flexible equally in both directions in which case exchange rate changes would have been neutral with respect to the price level, downward price rigidity is a sufficient condition for the ratchet effect of exchange rate changes. This Mundell-Laffer hypothesis is of important implication for the present regime of generalized floating and the recent experience of wide fluctuations of exchange rates. The argument seems to be based on the "law of one price" which in a world in which national economies are so closely integrated, all internationally traded goods, via goods arbitrage, will command the same price everywhere.[9] This argument is not widely accepted nowadays. An alternative view would argue that product differentiation characterizes the goods market in the short-run or even in the long-run, so that price adjustment is no longer a matter of arbitrage but becomes rather a question of substitution. A depreciation produces competitiveness in which the country's relative prices fall compared with this country's competitors with the result that demand shifts towards this country's exported goods occur; and this shift will put upward pressure on the country's costs and domestic prices, as indicated in the preceding paragraph.

In the foregoing discussion, the transmission of exchange rate changes to, and the role of exchange rate regimes on, domestic economy has been analyzed with a view to assessing what role adjustment in the domestic economy plays and what characteristics might make the economy more vulnerable to exchange rate fluctuations and inflationary pressure.

As regards the question of pass-through effects from exchange rate changes to the domestic prices of imports, it is an empirical one, and there are two important ways in which to obtain the magnitude of these effects : one from direct estimates of pass-through effects, such as studied by Kreinin (1977)[10], and the other from estimates of the relevant trade elasticities, and our study will adopt the second approach. Theoretically, the countries with lower trade elasticities, the more vulnerable they will be to greater pressure of inflation fed in through the large fluctuations (overshooting) in the exchange rate as a result of exchange depreciation.

In the similar vein, the Mundell-Laffer rachet hypothesis carries the empirical implication that it points to the size of both demand and supply elasticities for traded (and non-traded) goods as indication of the ratchet effects. In cases where the size of these parameters is not very different between domestic and foreign countries, both the appreciating and depreciating countries will bear the burden of price inflation resulting from an exchange rate change;[11] that is, both domestic (P) and foreign supply prices (P^*) will change (in opposite directions) by less than the magnitude of the exchange rate fluctuations ($\dot{E}'$), as discussed in chapter 2, namely,

$$\dot{P} = P^* + \dot{E}$$

where dots denote proportionate change of these variables. Furthermore, in cases where the absolute value of the price elasticity of demand for imports is large relative to the supply elasticity for imports or import-substituting goods, one would expect import prices to rise to a greater extent as a result of exchange depreciation.

In effect, the countries included in the sample are small economies which are reliant on foreign trade, and they faced particularly serious problems since the currency realignment in the 1970's. Rising import prices have been a source of domestic inflation and a deterioration in the terms of trade adds to balance-of-payments problems. Many of the sample countries have resorted to altering the price of foreign exchange, by a variety of formal and non-formal devaluations. This study analyzes the experience of the sample countries to investigate the inflationary effects of increases in the foreign price of import and alternative exchange rate policies. To expedite the analysis of the exchange rate and foreign price changes and the transmission channels through which these repercussions are imparted into the domestic economy, estimates based on three contending hypotheses are provided.

(1) Estimates of the parameters of interest rate elasticity of demand for money which isolate monetary impact effects on the exchange rate through the interest rate differential; (2) the transmission of exchange rate fluctuations to the domestic

economy is analyzed with reference to pass-through effects from exchange rate changes to the domestic prices of imports and exports; and (3) estimates of the relevant foreign trade elasticities provide the extent to which the countries under investigation may be more vulnerable to short-run J-curves and thereby experience a possible over-shooting from an equilibrium PPP as a result of an depreciation and/or changes in the foreign price of imports.

4.3 Empirical Evidence on Estimates of Interest Elasticities

The preceding section has indicated the theoretical framework for analyzing the exchange-rate-change hypotheses. This section sets out to present information on the magnitude of the important parameters and to assess the channels through which nominal exchange rate changes are transmitted to affect domestic prices and costs, under circumstance of non-accommodation policies. The adjustment process under policies of monetary accommodation is discussed in section that follows.

As regards the question of adjustment in foreign exchange markets, we hypothesize, that monetary repercussions affect the nominal exchange rate through the interest rate differential which specifically implies that a low interest rate elasticity of demand for money will generate large fluctuations in the interest rate and thereby require large changes in the exchange rate. Estimates of interest rate elasticities of the sample countries for the narrow definition of money (M_1), defined in the functional form well

established in the literature , as reviewed in chapter 3. For the purposes of making comparisons across the sample countries, empirical estimates of the income elasticities of the demand for money of these countries are also presented.

Table 4.1

Sample Countries : Estimates of Interest Rate and Income Elasticities for Narrowly Defined Money 1970 - 1979

Country	Interest rate elasticities	Income elasticities	Equational Form
Indonesia	-0.117	1.238	See Table 5.3 for detailed regression results.
Republic of Korea	-0.280	1.025	"
Malaysia	n.a.	n.a.	"
Singapore	-0.124	1.992	"
Philippines	-0.092	0.771	"
Thailand	-0.076	1.048	"

Note : Interest rates are not available for Malaysia.

The evidence in this table indicates a fairly low interest elasticity with respect to the demand for money for the sample countries, given precantions that these estimates may be biased and inconsistent to some extent. These low interest elasticity results imply that, give relatively comparable income elasticities, an expansion of the money supply (or a contraction of the demand for money) of these countries will exert slightly larger fluctuations in exchange rates and/or capital flows than would be required for countries with relatively high interest elasticities. While limited samples in this study preclude us to draw many conclusions, it is quite evident that for the countries implementing large discrete exchange rate changes, i.e. Indonesia and Korea, the parameters of their money demand functions bear on wide fluctuations in the nominal exchange rate as a result of a given change in real balances. For other sample countries, the relatively low interest elasticities indicate possible wide variations in the interest rates due to once-for-all changes in the money supply or money demand, and these conditions mean that a monetary expansion requires a relatively large movement in their exchange rates.

4.4 Parameters of Trade Elasticities of the Sample Countries

As regards the magnitude of trade elasticities of the sample countries, the empirical results are presented in table 4.2. These price elasticities of demand for imports and exports

are calculated by the conventional formulation of the form

$$\log Q_m = a_o + a_1 \log Y - a_2 \log {}^{P_m}/_{P_i} + u_1 \qquad (1)$$

$$\log Q_x = b_o + b_2 \log Y - b_2 \log {}^{P_x}/_{P_i} + u_2 \qquad (2)$$

where Q_m and Q_x are the indices of import quantity of the respective countries under investigation; Y denotes nominal GNP; P_m and P_x are the prices of imports and exports, respectively, and they are deflated by the domestic price level, P_i, to capture the degree of competitiveness between imports and import-substituting or non-traded goods. The estimation results of trade elasticities indicate that in almost all cases they have relatively low values. The low values of these short-run trade elasticities, along with low interest elasticities of the money demand, imply that these countries are vulnerable to wide variation in exchange rates and to high degree of inflation as a result of given changes in the real balances; the exchange rate would tend to overshoot its equilibrium value in the short-run, and the wide variation in the rate affects the price of imports which results in upward inflationary pressure fed into the domestic economy. An exogenous shocks to the foreign exchange cost of imports under low-value trade elasticities would add a strong impetus to the domestic inflation, given an exchange rate change. The trade elasticities are shown in table 4.2.

Table 4.2 Price Elasticities of Demand for Imports and Exports of the Sample Countries 1971 - 1979

Country	Price elasticities of demand for imports	Price elasticities of demand for exports
Indonesian	n.a.	0.079
South Korea	-.760	0.214
Malaysia	-.796	0.031
Singapore	-0.446	0.017
Philippines	-.488	0.241
Thailand	-1.133	0.164

4.5 The impacts of import prices and exchange rate changes on domestic price levels : estimation results.

As already emphasized, the domestic price of imports may rise either through increases in foreign exchange cost of imports, a factor exogenous to the small economy, or through formal currency devaluations. The official currency devaluations may take the form of changes in the rate of exchange which applied to all foreign exchange transactions, or the form of subsidies on exports and duties imposed on imports to achieve the same average devaluations. The latter non-formal components of exchange-rate manipulation will be ignored in the present analysis. To assess

the effects of price of import and exchange rate changes on domestic prices, we estimate the equations of the following specification of domestic rate of inflation:[13]

$$\dot{P}_d = a_o + a_1\dot{E}_d + a_2\dot{P}_m + a_3\dot{E} + u_3 \qquad (3)$$

where dots denote rate of change of the respective variables; $\dot{P}_d$ is the rate of change in domestic prices, $\dot{P}_m$ is the rate of change in the foreign price of imports, $\dot{E}$ is the rate of change in nominal exchange rate, and u_3 is the stochastic error terms; $\dot{E}_d$ stands for the excess demand in the goods market. To measure this a proxy for the excess supply in the money market is used: it is the difference between the rate of increase in the money supply ($\dot{M}_1$) and the rate of growth of income ($\dot{Y}$). The E_d variable captures the excess liquidity created by the government fiscal deficit and by changes in the money demand caused by income growth; it is $\dot{M} - \dot{Y}$, reported in the regression results.

The empirical results for the sample countries over 1971-1979 are presented in table 4.2. It is to be noted that the equation formulation does not distinguish between the two components of exchange rate. Alternative lag patterns were tried but the results consistently indicated that lagged variables should not be included for foreign price changes and excess demand, since they are all insignificant and their inclusions reduce the efficiency of the extimation. The exchange rate variables, however, are significant with lags. For the regression

results of the sample countries, the following summary statements may be offered.

For the case of South Korea, the various parameters have the right sign and plausible values. The excess demand variable has the a priori expectation and significant, implying the increase in the money supply contributes to, while income growth inhibits, the domestic price increase. A one percent increase in the price of imports, other things being equal, causes the domestic price rise of an order of 1.2 percent annually; and likewise, an official devaluation of the won of ten percent feeds in the inflationary pressure to the extent of 60.1 percent annually. For Malaysia, changes in the price of import produce a relatively larger effect on domestic inflation than the given rate of exchange rate changes for the current period, but the opposite holds true for the lagged exchange rate variable, given the significance of the excess demand parameter. For the case of the Philippines, a comparable results are obtained. All the varialbes have the right sign with plausible values. A 10 percent increase in the foreign price of imports leads to a 3.8 percent rise in the domestic price levels, while a depreciation of 10 percent of the peso in the previous year results in a 11.3 percent in the rate of domestic inflation, and the rate of inflation of 1.9 percent for the depreciation in the current year. It is notable that for Singapore, the results are similar to the case of the Philippines, the excess demand variable has the correct a priori sign and

significant. An increase in the foreign price of imports is associated with the rise of domestic prices of 0.46 percent; while the depreciation of the exchange rate of 10 percent in the current year reduces the inflation rate, that of the previous year triggers the inflationary pressure to the extent of about 90 percent. In view of the fact that three countries resorted to floating rates for almost all of the period under study, the interesting question arises : why is the price of imports not significant with logs whereas the exchange rate is an explanatory variable? That is,why is the exchange rate change different in timing from foreign price changes?

The apparent reason should be simply noted. Import prices (c.i.f.) includes freight and insurance which recorded at the time of entry of the goods which is normally at least several months after the decision to import was made at the prices then known to importers. On the other hand, the relevant exchange rate is that prevailing at the time of payment; and thus, lags for exchange rate are consistent with no lag for the import prices.

The other question of importance is : should we expect the inflationary impact to be the same regardless of what has caused the depreciation of exchange rate? From the empirical results for the sample countries in Table 4.2, it is evident that a discrete formal devaluation, i.e. the case of South Korea, produces relatively larger effects on domestic inflation. The reason is that since a formal devaluation applies to all foreign

exchange transactions, and not only to trade in goods, the discrete change in exchange rate would certainly have stronger demand effects than ordinary (non-formal) change of the rate. These relatively stronger effects may result from the increase in the domestic-currency value of other transactions, i.e. unilateral and capital transfers, and from the revaluation of assets denominated in foreign exchange. Moreover, an announced change in the formal rate of exchange is normally widely published and this makes it easier to pass on the price and cost changes. Finally, it should be noted that for Thailand the import prices have been a significant factor contributing to the domestic inflation but not the exchange rate changes, since Thailand had pegged the baht throughout the period of study; and the excess demand is not significant. Thus, the rate of inflation over the period can be explained by the price of imports but not by changes in the exchange rate.

4.6 Summary

In conclusion, the evidence that the excess demand variable is significant means that the short-run increase in monetary growth relative to the income expansion in all cases of the sample countries, except for Thailand, constitutes the important argument in the variation of the domestic price levels of these countries over 1971-1979. Since the interest rate elasticities of the demand for money have expected a prior signs and relatively low values, and the trade elasticities are also low, this means the fall in interest rates in the short-run reflects

easy domestic monetary conditions and requires an exchange rate depreciation to ristore the balance of payments equilibrium. There must be a phase of adjustment process during which the domestic economy experiences the rather rapid inflation of costs and prices which are attributed to the relative increase in the foreign price of imports and the exchange rate depreciation or devaluation. While available data for each country do not permit a breakdown of exchange rate changes into the formal devaluation and non-formal depreciation of the rate, comparisons across the sample countries allow us to make the following summary statement. First, changes in the formal rates of exchange have a significant inflationary effect only in the current period and lagged values are not significant, i.e. the case of South Korea. On the other hand, the effects of exogenously-determined changes in the rate appear to have effects only with lags, and thus the difference between formal devaluations and the exchange rate changes due to the currency realignments during the 1970's, lies in their time patterns required for adjustment. Secondly, the relative effects of import prices and exchange rate changes indicate that in all cases, again with the exception of Thailand, exchange rate depreciations and/or formal devaluations have a stronger impact on expectations and thus their effects can be more easily passed on to domestic prices and, therefore, is reflected faster in, and with a greater magnitude of, the rate of domestic inflation than an apparently comparative foreign price of imports. Finally, the

analysis in the present section does not provide evidence to conclude that the floating rate regimes are germane to more inflationary pressures than the fixed rate regimes, For Thailand the impact of foreign price of imports appears to explain the inflation rate over the period under investigation, and exchange rate effects have been, if any, negligible. It should be noted that the model presented here does not take into account the supply side, i.e. wage adjustment, which is a limitation of the analysis.

Table 4.3 Regression Results of the Pass-through Effects, 1971-1979.

Country			R^2	SEE
Indonesia		(no satisfactory results)		
South Korea		$\dot{P}_d = -1.574+0.592(\dot{M}-\dot{Y})+1.21\dot{P}_m+6.108\dot{E}$ (1.36) (1.90) (2.302)	.800	.92
Malaysia	(a)	$\dot{P}_d = 0.685+0.160(\dot{M}-\dot{Y})+0.39\dot{P}_m+0.041\dot{E}$ (1.56) (7.72) (0.66)	.928.	1.42
	(b)	$\dot{P}_d = 0.796+0.129(\dot{M}-\dot{Y})+0.380\dot{P}_m+0.053\dot{E}+2.76E_{t-1}$ (1.29) (7.73) (.33) (1.46)	.948	1.57
Philippines	(a)	$\dot{P}_d = 3.671+0.178(\dot{M}-\dot{Y})+0.40\dot{P}_m-0.24\dot{E}$ (1.16) (6.32) (1.54)	.815	3.9
	(b)	$\dot{P}_d = -2.156+0.112(\dot{M}-\dot{Y})+0.38\dot{P}_m+0.19\dot{E}+1.13E_{t-1}$ (1.74) (6.08) (1.82)(1.45)	.850	3.7
Singapore		$\dot{P}_d = 21.15+0.24(\dot{M}-\dot{Y})+0.46\dot{P}_m-0.64\dot{E}+9.999E_{t-1}$ (1.86) (2.29) (.82) (1.34)	.735	6.3
Thailand	(a)	$\dot{P}_d = 17.58-1.588(\dot{M}-\dot{Y})+0.52\dot{P}_m-0.77\dot{E}$ (3.43) (1.44) (4.31)	.828	4.3
	(b)	$\dot{P}_d = 11.21-0.95(\dot{M}-\dot{Y})+1.98\dot{P}_m-0.41\dot{E}-0.22E_{t-1}$ (1.00) (1.56) (0.46) (.24)	.54	7.4

Note: The period of regression is from 1971-1979. Figures in parentheses are t-statistics; goodness of fit is measured by coefficients of determination and SEE = standard error of estimate; dots over the variable denote percentage rate of change; all variables are based on annual observations.

Footnotes Chapter 4

1. See a review in chapter 3.
2. R. Dornbusch, "Expectations and Exchange Rate Dynamics," Journal of Political Economy Vol.84 (December 1976), p. 1161-76.
3. See the review on this question in chapter 3.
4. Milton Friedman, The Counter-Revolution in Monetary Theory, Institute of Economic Affairs, Occasional Paper No.33, (London, 1970), p.24.
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6. Stephen Magee, "Currency Contracts, Pass-through and Devaluation," Brookings Papers on Economic Activity, 1 : 1973), p. 300-25.
7. See the discussion in the first section of Chapter 3.
8. J. Wanniski, "The Mundell-Laffer Hypothesis--A New View of the World Economy" Public Interest No.39 (Spring 1975), p.31-52; arthur Laffer, "The Phenomenon of World Wide Inflation : A Study in International Market Integration," in Phenomenon of Warldwide Inflation, ed, by David Meiselman and Arthur Laffer, American Enterprise Institute for Public Policy Research (Washington 1975) p. 27-52.
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12. J.F. Bilson, "The Vicious Circle Hypothesis," IMF Staff Papers, vol.26 (March 1979), P. 30.

13. Michael Bruno, "Exchange Rates, Import Costs, and Wage-Price Dynamics," Journal of Political Economy, Vol.86, 1978, P. 383-84.

14. For the supply-side analysis of inflation, Michael Bruno, ibid., and, V.Argy and J.Salop, "Price and Output Effects of Monetary and Fiscal Policy Under Flexible Exchange Rates," IMF Staff Papers, (June 1979), P.224-255.

Chapter 5

Some Summary Statements

5.1 Some Economic Characteristics And Demand Management

The present study is concerned with the differential exchange rate regimes and the exchange policies with a view to assessing the real effects of exchange rate changes on domestic prices and external payments of certain Asian countries, namely, Indonesia, Malaysia, the Philippines, Singapore, Thailand and Republic of Korea, during 1971 - 1979. In pursuit of the issues under investigation, this study explores the mechanism whereby exchange rate changes are transmitted to affect domestic prices, and the analysis attempts to uncovers whether the shifts of unprecedented magnitude in the current accounts of the groups of countries under review can be explained by their respective exchange rate policies. In this connection, it will be useful to pose and sum up the main threads of the arguments.

First, economic characteristics of the sample countries need to be taken into account in the execution of a demand management package. For the purpose of our study, the following economic features of importance are distinguished :
(i) As developing economies there tends to be low substitutability between export goods, import goods and non-traded goods. In the export side, domestic demand for export good of these countries is small relative to total output. In the import side, most

manufactured imports do not compete with domestic output to a significant extent. What this feature means is that it is quite difficult for developing countries to restrain domestic demand with the object of redirecting existing output toward net export. Thus, demand management, per se, especially, exchange rate changes are less likely to be successful in fostering net export. (ii) Another distinguishing characteristic of developing countries is that supply elasticities of primary products and exports cause expenditure-switching, such as devaluation, to subject to high degree of uncertainties on the part of policy-makers; since export prices are determined exogenously in the world market, export earnings, such as by means of exchange rate changes, can come about only through induced increases in output supply which not only takes long gestation period but also depends on a number of complex factors (such as sources of exploitable new mineral resources etc.). These characteristics of LDC's are often referred to as "the small-country conditions." (iii) Lastly, but by no means least important, most developing countries under review except Singapore, have only the rudimentary capital markets. The rudimentary nature of capital market in the countries being studied have the following implications : firstly, internal finance tends to dominate investment financing; secondly, the only important source of financial intermediation is the

domestic banking system, and the only financial assets that the public can choose to hold are those created by the banking system; thirdly the banking system has been made attenuated by constraints imposed by the authorities, such as, lending ceilings and regulation of interest rates, the situation which exacerbates the financial system. Thus, the capital markets have been characterized by a state of financial repression, by which it means inefficiencies in mobilizing and allocating savings, and thus constrains the countries to depend on foreign borrowing; finally, the elasticities of demand for money with respect to interest rates under the mentioned circumstances will be relatively small and it means that some of the traditional instruments of monetary policy will be less likely to be effective in support of stabilization policy.

In effect, these considerations of the characteristics of the countries under study suggest that the design of demand management policy to bring about a balance of payments improvement through measures that impinge on exchange rate changes, must be made with utmost precautions. And, the present study concludes that the countries under investigation were prudent adequately to choose their respective exchange rate regimes rather effectively and the outcomes of their demand management scenarios reflect a successful development both in the real effect of their exchange rate changes on domestic prices and on improvement in their

external payments development.

5.2 The Exchange Rate Regimes

It is not possible and beyond the scope of the present study to provide reasons as to why the respective countries choose the different exchange rate regimes. However, in assessing the differential impacts of variation of the real exchange rates (defined as the relative price of imported and domestic goods) of the sample countries, one need to examine the exchange rate regimes and their subsequent developments since the breakdown of the Bretton Woods system in August 1971, the phenomenon which took on a far-reaching course in the exchange rate and monetary policy development of the countries reviewed in the study.

As indicated in the first chapter, a majority of less-developed countries maintained a fixed exchange rate regime, pegging to the key currencies, notably, the U.S. dollar, and the Pound Sterling, and so on. In the 1970's the situation holds true for the ASEAN member countries, with the exception of the Philippines. Republic of Korea was the only country that adopted a managed float over the period 1971-1974; but subsequently during 1975-1979 pegged the won to the U.S. dollar. On the other hand, two ASEAN member countries, namely, Malaysia and Singapore pegged their currencies to the Pound Sterling during 1971-1972, but changed their exchange rates into the "managed

float" regime after the currency realignment, during the period 1973-1979. Indonesia maintained a fixed rate system throughout the period, 1971-1979, pegging her currency to the U.S. dollar. Likewise, Thailand during 1971-1978 opted for a fixed rate standard, pegging the Baht to the U.S. dollar with a prescribed margin, in accordance with the International Monetary Fund's specification criteria; however, in late 1978, the baht was pegged to a basket of trading countries' currencies. The details are shown in Table 5.1.

Table 5.1

Exchange Rate Regimes of Certain Asian Countries, 1971-1979

Country	Exchange rate regime prior to 1973	After Currency Realignment	Inflation rate[1] (per cent)
Indonesia	Pegging to U.S.dollar (1971-1973)	Pegging to U.S.dollar (1974-1979)	17.3
Malaysia	Pegging to Pound Sterling (1971-1972)	Managed Float (1973-1979)	5.8
Philippines	Managed Float (1971-1974)	Pegging to U.S.dollar (1975-1979)	10.5
Singapore	Pegging to Pound Sterling (1971-1972)	Managed Float (1973-1979)	4.6
Thailand	Pegging to U.S.dollar (1971-1978)	Pegging to a basket of currencies (late 1978 to present)	8.5
Korea	Managed Float (1971-1973)	Pegging to U.S.dollar (1974-1979)	16.4

Source : IMF Annual Report, September 1979.

[1] Inflation rate is measured by percentage changes of consumer price index of respective countries, 1973-1979, IMF, International Financial Statistics, various issues.

From Table 5.1 the following considerations should be in order. Firstly, it should be apparent that the exchange rate regimes of the sample countries differed somewhat prior to and since the generalized floating of major currencies in March 1973. Essentially, those countries that are classified to have pegged their currencies to the United States dollar managed to monitor their exchange rate fluctuations within a margin of 2.25 per cent of officially announced parities. Those countries that pegged to an undisclosed basket were classified into a system of managed float in Table 1.

Secondly, it will be instructive to examine the relationship between the respective exchange rate regimes and inflation rates of the sample countries. From the information in the table, it reveals that countries that pegged their currencies to the intervention currencies, i.e. U.S. dollar, experienced relatively higher inflation rates, whereas those countries that adopted the managed floating system encountered relatively lower inflation rates. The consequences of selection of the exchange rate regimes may be unambiguously stated. For the countries with higher inflation rates, their effective exchange rates depreciated in lines with the U.S. dollar during the period.(the effective exchange rate is defined as the weighted average of the bilateral exchange rates. Finally that should be emphasized is the fact that the

foreign rates of inflation faced by these countries are very similar, because the commodity trade of these countries concentrated mostly on the some industrial countries. Over the 1973-1979 period, the inflation rates ranged from the annual rates of 4.6 per cent (in case of Singapore) to 17.3 per cent (in case of Indonesia). In effect, this study suggests to the view that insofar as each of these countries experienced a similar degree of foreign inflation rates, and as (see Table 2) the respective effective exchange rates of these countries vary only slightly, the implication is that the different domestic inflation rates in the sample countries could be attributed to the conduct of monetary and credit policy of the respective countries in question, and that the source of change in the trade accounts of these countries over the period must be explained by movements in the prices of internationally traded goods, or other factors. Moreover, the present study suggests that exchange rate changes, insofar as purchasing power parity frame of reference is of relevance, had no predictable effects on the trade balance of the sample countries in absence of the monetary accommodation policy.

5.3 Some Mathodological Viewpoints

If the foregoing considerations hold, that is, if changes in exchange rates of these countries had an

unpredictable effect on their trade balance domestic inflation and balance of payments developments in the countries being studied must be explained by the alternative "asset market" approach in general and the market for monies in particular. The monetary approach to the exchange rate determination is central to the present study. To reiterate, let M and M^* stand for the given domestic and foreign money supplies; and i denotes the rate of interest on bonds denominated in the domestic currency, and i^* be that on foreign country bonds; and suppose P and P^* are respectively the domestic and foreign price level, where Y and Y^* represent real domestic and foreign income, such that

$$M/P = L(Y, i) \qquad (1)$$

which characterizes the demand for domestic money, and

$$M^*/P^* = L(Y^*, i^*) \qquad (2)$$

which characterizes the demand for foreign money. And, in view of the purchasing power parity,

$$P = E \cdot P^* \qquad (3)$$

where P and P^* denote respectively the domestic and foreign price level, and E is the exchange rate, assuming absolute purchasing power parity holds. Thus, it has been shown in the preceding

chapter that an equilibrium exchange rate obtains

$$E = \frac{M.L(Y^*, i^*)}{M^*.L(Y, i)} \qquad (4)$$

That is, the exchange rate is determined by the relative demand and supply of the two currencies. Thus, if the supply of domestic money increases, exchange rates rise (depreciates) and domestic prices move upward; by contrast, the increase in the domestic demand for money, exchange rates fall (appreciates), and domestic prices would tend to movedownward.

The relative interest rates in Equation (4) are related to the exchange rate through the interest rate parity, especially under the situation of integrated money market,

$$\Delta E = i - i^* \qquad (5)$$

That is, the interest rate differential determines the extent of exchange rate changes, especially in the short run. When it is said that the financial markets including interest-bearing bank deposits and loans of the countries being considered are "integrated", it means only that private firms and governments in these countries can borrow on the same terms domestically and internationally. Definitely, nominal interest rates differed across currencies but the differences only

reflected different inflation rates and expected exchange rate fluctuations. It is these "regressive" expectations-----an anticipated depreciation sets up an expectation of an appreciation----back to equilibrium that caused the short-run wide variation in the rates. The justification of this allegiation relates to price-level stickiness. That is, a violatile exchange variation to an extent of 10 to 25 per cent may occur, but it produced a rather narrow rates of changes in terms of wholesale or consumer price indices. In summary, the domestic price inflation in the countries reviewed could not be explained by their effective or real exchange rate changes; the phenomenon that violated the law of one price in the short-run.

5.4 Exchange Rate Changes And Inflation

The foregoing theoretical framework based on the monetary approach provides for an understanding of the transmission process and policy scenario involved in exchange rate changes. The monetarist approach maintains that devaluation is a monetary instrument and it exerts its impulse through the real balance effect. That is, a devaluation in a country under a small-country condition would trigger increases in the price of internationally traded goods, and since the prices of traded goods enter into the domestic price level, the latter price also

increases. Consequently, the real value of cash balances in the country involved declines, causing an excess demand for cash balances matched by an excess supply of real goods. This excess supply of goods means, firstly, that the prices of non-traded goods must fall relative to the prices of traded goods, and secondly, that the excess supply of domestic goods induces the balance of payments improvement, given the initial money supply.

More specifically, the monetary approach to the excharge rate determination provides for criteria by which to analyze and to assess the role of devaluation and its relation to the authorities' choice of intermediate target variable, namely, the domestic component of monetary base. These would help the authoritics in choosing between when a devaluation should be employed and under what circumstances a monetary contraction should be used to achieve the same balance of payments effects. The following summary statements would be appropriate in this connection. First, there exists a rate of increase in the domestic component of monetary base that would completely neutralize any short-run balance of payments effect of the devaluation. Conversely, there is a rate of devaluation that will offset the domestic credit effect on the balance of payments. Second, the devaluation is a kind of lump-sum tax on cash balances. Thus, the mere fact that a

country has a balance of payments deficit is not sufficient to prove that devaluation must be a necessary weapon; a balance of payments deficit may be ascribed to, or viewed as a reflection of, an excess supply of money. The cure of external payments imbalances may be sought by other means, such as, limiting the central bank credit and/or increasing bank reserve requirements, and other measures designed to reduce the rate of expansion of the domestic component of the monetary base.

Nonetheless, insofar as devaluation is a pure monetary adjustment tool, under certain conditions some degrees of devaluation is particularly beneficial in the adjustment process. The conditions congenial to the case for devaluation are those where the gap between the money supply (M^s) and the demand for money (M^d) exists, and devaluation should help in augmenting the money demand so as to eliminate or reduce the gap, ($M^s - M^d$), and the greater the ($M^s - M^d$), everything being equal, the greater the case for devaluation, and the slower the growth rate of real output.

Table5.2

Exchange rate changes, inflation rates, and output growth rate 1968-1979

(units: average annal rates of change)

Country	(1) GNP growth rate	(2) Effective exchange rate		(3) Real exchange rate		(4) Domestic prices		(5) imported prices	
		Average	Variability	Average	Variability	Average	Variability	Average	Variability
Indonesia									
1968-72	8.3	-10.3	4.2	-5.4	6.7	9.1	5.8	3.7	1.5
1973-79	7.6	- 2.8	8.7	7.7	10.4	17.2	7.8	6.9	8.1
Malaysia									
1968-72	6.4	- 0.2	0.8	-2.0	1.8	2.1	1.3	3.7	1.3
1973-79	7.8	0.0	3.5	-2.3	2.8	5.9	3.8	7.9	7.0
Philippines									
1968-72	4.3	-17.5	10.5	-10.2	10.6	10.6	3.6	3.5	1.5
1973-79	6.7	- 3.7	3.5	- 0.4	3.4	10.7	7.0	7.3	7.7
Singapore									
1968-72	13.5	0.4	0.7	- 0.7	3.5	2.1	1.7	2.5	2.4
1973-79	7.8	0.0	2.7	- 3.5	3.9	5.0	6.4	8.2	7.2
Thailand									
1968-72	7.2	- 2.8	2.5	- 4.5	1.6	1.6	1.5	3.6	1.6
1973-79	7.8	- 1.9	6.2	- 0.5	3.6	9.0	4.6	7.0	7.8
Republic of Korea									
1968-72	10.2	-11.2	5.4	- 2.5	4.3	11.6	2.0	3.0	1.8
1973-79	11.2	- 5.4	5.1	3.5	6.8	16.3	5.2	6.8	8.5

Source : IMF International Financial Statistics, various issues; col.(2) is the weighted average of bilateral exchange rates; col.(3) the relative price of imports to domestic goods.

Let us turn to the empirical evidence, notably, the inflation-exchange rate nexus. From Table5.1,and Table5.2,it is apparently clear that the inflation rates in the sample countries were slightly affected by their respective changes in the exchange rate and this has certain important implications. First, insofar as the countries big considered experienced relatively small movements in their effective exchange rates over the sample period, it implies that imported inflation, altributed to the increase in the prices of internationally traded goods, especially the import prices, contributed mainly to domestic inflation in the sample countries. That is the domestic price of traded goods is determined on world markets converted into domestic currency at a the given exchange rate. This suggestion is consistent with the view that the commodity terms of trade of these countries declined markedly over the sample period.

Secondly, the relatively small movements of effective exchange rates in these countries imply that the governments of the sample countries were reluctant to undertake large adjustments in exchange rates, even when the domestic inflation rates were substantially different from foreign inflation rates. The reluctance could be explained by a number of factors commonly shared by the attitude of LDC's, summarized in chapter one; especially, (i) political reason and fears that a large discrete

adjustment in exchange rates would exacerbate domestic inflationary pressures; (ii) it would cause rather large burden on foreign debt payments; (iii) uncertainties about fluctuations in bilateral exchange rates among the major currencies could obscure future developments and the sample countries would do well to adopt a "wait-and-see" attitude; (iv) for those countries whose currencies were pegged to the U.S.dollar, the depreciation of the dollar would be indicative that it would be unnecessary to make further adjustment of their currencies.

Thirdly, if the sample countries experienced a similar imported inflation rates and relatively small movements in their effective exchange rates, the diversity of their domestic inflation could be explained mainly by differences in the techniques of these countries' monetary policy. The evidence that the elasticities of the money demand with respect to interest rates in the sample countries during the period under investigation were relatively low implies the followings. First, a given discrete change in the money supply might produce a rather wide variation in the short-run real exchange rates, although the effective exchange rates changed only slightly. Secondly there is the possibility of raising the rate of interest with a view to augmenting the demand for money at given price and income levels, as Korea did rather successfully. On the whole, the present study conjectures

that the growth of money supply and the inflation rates vary rather systematically accross the sample countries, and that the pattern of inflation developments in these countries follows closely the direction of their exchange rate movements. Specifically, ranking the sample countries according to the net inflation effect (defined as the difference between their domestic and foreign inflation impacts) corresponds to their ranking according to the extent of appreciation (or depreciation) of their real exchange rates, as shown in Table 5.3.

5.5 Exchange Rates, Inflation and Balance of Payments Developments

It should be made clear that the present study did not take into account the supply-side aspects and structural factors such as the wage and price rigidities which are treated in the literature as a source of inflationary pressures. For the small developing countries under review, the power of labour tends to be limited and the surplus labour exists, and thus, the neglect of the issue is justified. Given these supply factors, the inflation rates in the sample countries are specified as a function the excess demand (defined as the difference between the money supply and real output growth rates), the rate of change of foreign prices and the exchange rate variations.

An excess supply of money relative to real output growth exerts increases in demand for internationally traded

goods and contributes to a deterioration of the balance of payments (BOP). In fact, the essence of the monetary approach to balance of payments which posits that the BOP constitutes the channel through which the excess supply of money is eliminated in the open economy. Moreover, when account is taken of non-traded goods, part of the excess supply is spent on these goods, thereby pushing up domestic prices and changing the real exchange rate. The changes in the real exchange rate, in turn, influences the excess demand for traded goods and hence the BOP position of the countries involved. From Table 5.3, it bears out that the sample countries' BOP outcome was mainly attributed to domestic credit expansion and by changes in foreign inflation rates. In effect, in all cases of the sample countries, the changes in domestic credit were the primary factor resulting in the BOP developments.

Table 5.3

Money Supply, Inflation, Exchange Rates and International Reserves of the Sample Countries, 1973-1979.

(units: annual rates of changes in per cent)

	Money growth	Domestic inflation	Imported inflation	Net inflation effect	Real exchange rate	Reserves months of import
Indonesia	28.4	17.6	6.8	10.8	7.7	3.8
Korea	27.2	16.3	6.7	9.6	3.4	4.2
Philippines	21	10.5	7.3	3.2	-0.3	4.6
Thailand	18.5	8.7	6.9	1.8	-0.6	4.5
Malaysia	17.1	5.9	7.9	-2.0	-2.3	6.5
Singapore	12.3	4.7	8.1	-3.4	-3.5	6.9

Source : 1) IMF International Financial Statistics, various issues.

2) for real exchange rate, plus sign indicates percentage appreciation; negative values denote percentage depreciation.

5.6 Concluding Remarks and Suggestions

In summary, the following remarks should be stated about the exchange rate policies of the sample countries.

1. During and since the currency realignment in March 1973, the countries being studied whose domestic inflation rates were relatively higher than their trading partners, namely, Indonesia, Republic of Korea, the Philippines, and Thailand, adhered to pegging their currencies to the U.S.dollar, and during period under investigation the U.S.dollar pregnantly depreciated to some extent, thereby permitting these currencies to depreciate along with the dollar.

2. The second group of sample countries whose domestic inflation rates were relatively lower than their trading partners, notably, Malaysia and Singapore, made recourse to floating their currencies, which allows these currencies to appreciate against the U.S.dollar.

3. Over-all, the changes in the effective exchange rates in the countries being examined were rather small, indicating the fact that these countries made little use of exchange rate as an instrument in collaboration with monetary policy. In the other words, the monetary policy, particularly in respect of domestic credit expansion, dominated the demand management scenario of the various countries under review. And, it was the domestic credit component of monetary base

which contributed significantly to domestic price increases. and BOP outcomes of the sample countries. For the medium inflation countries, with changes in prices larger than their trading partners, pegging their currencies to the U.S.dollar or a basket of major currencies would be an appropriate choice and it would provide for relative stability in the countries' real exchange rates. For these countries, floating would be ruled out as an unsuitable option, because it might result in volatile real rate movements since the trading mechanism for risk-covering, i.e. forward markets, and so on - is not available. Pegging to the dollar would provide for exrate stability since holders of domestic currency are able to have access to the services provided to the dollar by the international markets at relatively low cost and with limited risk.

4. Pegging to a basket of major currencies had the advantage of reducing risk associated with variations of the major currencies. However, in view of the fact that forward cover is not developed for developing countries, the basket pegging had disadvantage because the cover cost would be higher than in case the currency is pegged to a single major currency, such as, the dollar.

5. For those high inflation countries, i.e. Indonesia and Korea, expansionary credit policies, along with an exchange rate policy of pegging to the dollar, would lead to a substantial appreciation of their real exchange rates. To overcome this, exchange rate policy should be closely coordinated with monetary policies. Only in Korea, exchange rate played an active role over the sample period, when it had been oriented towards strong incentives for exports, and the rates was adjusted in line with changes in changes in relative prices between domestic and foreign goods. For high inflation countries, therefore, pegging to the dollar would exacerbate inflationary pressures directly through imported inflation and indirectly through rises in non-traded goods prices. We suggest the countries in question, a crawling peg, whereby an exchange rate could be adjusted periodically and systematically on the basis of inflation rates and credit policies, should be a remedy.

For the low inflation countries, namely, Malaysia and Singapore, where domestic inflation rates were lower than their trading partners, the real exchange rates depreciated markedly during 1973-1979. Conservative credit policies pervaded the monetary scene in these countries during this managed float period. Here again, close coordination between exchange rate and credit policies should be essentially called

for, and crawling peg would probably be a more appropriate choice for these countries to maintain relative stability in their real exchange rates.

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หน่วยวิจัย คณะเศรษฐศาสตร์

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