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# Exchange Rate Arrangements and Monetary Policy

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## Abstract

This paper examines the relationship between monetary and exchange rate policies by considering the factors that have led the authorities in developed and developing countries in Asia to alter their use of monetary policy instruments and exchange rate arrangements since the mid-1970s. There is first consideration of the extent to which real and monetary shocks, country size, and the degree of goods and capital market integration can explain the evolution of exchange rate arrangements. There is then an examination of the factors influencing the choice of money and credit policy instruments. Finally, there is a discussion of integrating monetary and exchange policies with extensive trade and financial market reforms.

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## Summary

This paper examines the relationship between monetary and exchange rate policies by considering the factors that have led the authorities in developed and developing countries in Asia to alter their use of monetary policy instruments and exchange rate arrangements since the mid-1970s.

For these countries, this period has encompassed increased flexibility in exchange rate arrangements, the substitution of monetary for credit policy instruments, major reforms of domestic financial systems, and a growing integration of domestic and external financial markets.

The analysis first examines the extent to which real and monetary shocks, country size, and the degree of goods-market and capital-market integration can explain the evolution of exchange rate arrangements.

It then considers the factors influencing the choice of money and credit policy instruments in order to explain why some developing countries have continued to rely on credit instruments, while many other countries have increasingly relied on monetary instruments. Finally, there is an examination of issues involved in integrating monetary and exchange policies into programs designed to bring about extensive trade and financial market reforms.

## I. Introduction

In recent years, many countries have relied on monetary policy as the principal means not only for offsetting external and domestic cyclical shocks but also for containing secular inflation, especially when fiscal policies have been constrained by large structural deficits. However, it has been long recognized that the ability of monetary policy to achieve such objectives in an open economy is influenced by such factors as country size, the degrees of integration between domestic and international goods and financial markets, and the country's exchange rate arrangements. Since the current international monetary system encompasses countries of divergent economic sizes, with varying degrees of integration with international markets, and with sharply different degrees of exchange rate flexibility, it is difficult to make general statements about the effectiveness of monetary policy without specifying the particular economic and financial structures being considered.

There have traditionally been two alternative approaches to examining the issue of the effectiveness of monetary policy under alternative exchange rate arrangements: an examination of the effect on the economy of a change in a given monetary policy instrument, or consideration of the factors which lead a country to select a particular set of monetary policy instruments and exchange rate arrangements. The second of these approaches, the analysis of optimal monetary and exchange rate policies, is broader in the sense that it explicitly takes into account the authorities' objectives. This paper adopts this latter approach and examines the relationship between monetary and exchange rate policies by considering the factors that have led the authorities in developed and developing countries in the Pacific Basin to alter their use of monetary policy instruments and exchange rate arrangements during the past decade.

The paper has three sections. Section I examines the monetary policy instruments and exchange rate arrangements that have been used in selected Asian countries during 1975-85. This has been a period of substantial structural change for almost all of these countries, which has encompassed changes in exchange rate arrangements, the substitution of monetary for credit policy instruments, major reforms of the domestic financial systems, a growing integration of domestic and external financial markets (often accompanied by a relaxation of restrictions on capital flows), and the need to adapt to large external and internal macroeconomic shocks. Although these countries have generally adopted more flexible exchange rate arrangements and have moved from credit to monetary policy instruments, a number of the developing countries have continued to peg their exchange rates and relied to an important degree on credit policy instruments.

Section II focuses on the question of what changes in economic conditions would lead countries to substitute monetary for credit policy instruments and introduce a greater degree of flexibility into their exchange rate arrangements. Although the recent literature on the choice of optimal exchange rate regimes and monetary policy instruments offers some important answers to this question, the typical assumption

of perfect substitutability between domestic and foreign securities rules out consideration of a number of factors that have been especially important in the selection of policy instruments when there is less than perfect but increasing integration of domestic and international goods and financial markets, or when there are extensive structural changes. These factors are illustrated by examining the conditions that would influence the authorities' decision to make use of either credit ceilings or limits on the expansion of monetary aggregates as their principal monetary policy instruments under alternative exchange rate arrangements. In addition, the influence of on-going structural changes on the selection of policy instruments is discussed by considering the types of monetary and exchange rate policies that have been adopted by countries undertaking extensive trade and financial liberalizations.

The final section summarizes the main conclusions concerning the relationship between monetary and exchange rate policies.

## II. The Evolution of Exchange Rate Arrangements and Principal Monetary Policy Instruments in Selected Asian Countries

The extent of the changes in exchange rate arrangement and financial market policies that have occurred in a number of Asian countries since 1975 is summarized in Table 1. 1/ Since the specific experiences of a number of these countries are addressed in other papers being presented at this conference, this information on changes in exchange rate arrangments, principal money and credit instruments, capital controls, and structural policies relating to the domestic financial system is intended to provide only an overview of general developments.

Four key trends are evident. First, countries have increased the degree of flexibility associated with their exchange rate arrangements. In these tables, exchange rate arrangements have been classified according to the categories employed in the IMF's Annual Report on Exchange Arrangments and Exchange Restrictions. Countries are grouped into those pegged to the U.S. dollar, other currencies, the SDR, or composite indicators; those which follow a policy of managed floating; those which are independent floaters; and those which have adopted other flexible arrangements. 2/ These categories represent a spectrum of exchange rate arrangements ranging from those with little flexibility (e.g., the exchange rate peggers) to those allowing for considerable flexibility (the independent floaters). The divisions between these two extremes are necessarily somewhat arbitrary, but shifts in the distribution of

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1/ For more detailed information on individual countries, see Tables 2 through 12 in the Appendix.

2/ The Fund also identifies countries participating in cooperative arrangments such as those associated with the European Monetary system.

Table 1. Exchange Rate Arrangements, Monetary Instruments, and Financial Characteristics of Selected Asian Countries 1/

| | Exchange Arrangements 2/ | | | | | Money and Credit Policy Instruments 3/ | | | | | | | | Capital Controls 4/ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pegged to U.S. Dollar | Pegged to Other Currencies or Composits | Other Flexible Arrangements | Managed Flexibility | Independent Floaters | Required Reserve Ratio | Liquidity Ratio | General Discount Facility and Discount Rate | Open Market Operations 5/ | Announced Monetary Aggregates Targets or Projections | Ceiling on Overall Credit Expansion | Credit Allocation Rules | Sectoral Rediscount Facilities | Ceiling Interest Rate | Required Surrender of Export Proceeds | Advanced Import Deposits | Limitations or Advanced Approval on Payments for Invisibles | Limitations on Foreign Currency Deposits by Residents | Prior Approval Required for Foreign Lending or Borrowing by Financial Institutions | Tax or Special Reserve Requirement on Foreign Borrowing |
| 1975 | 2 | 7 | 1 | 2 | 1 | 12 (4) | 6 (2) | 13 (2) | 3 (1) | 0 | 10 (4) | 10 (2) | 3 (0) | 12 (1) | 11 | 4 | 9 | 11 | 10 | 2 |
| 1976 | 2 | 6 | 1 | 3 | 1 | 12 (4) | 6 (2) | 13 (2) | 3 (1) | 1 (0) | 10 (4) | 11 (2) | 3 (0) | 12 (1) | 11 | 5 | 9 | 11 | 10 | 1 |
| 1977 | 2 | 5 | 1 | 3 | 2 | 12 (4) | 6 (2) | 13 (2) | 3 (1) | 1 (0) | 10 (4) | 11 (2) | 3 (0) | 12 (1) 1R 6/ | 11 | 4 | 9 | 11 | 11 | 2 |
| 1978 | 1 | 5 | 2 | 3 | 2 | 12 (3) | 6 (2) | 13 (2) | 3 (2) | 2 (0) | 10 (4) | 10 (2) | 3 (0) | 12 (0) 2R 6/ | 10 | 3 | 8 | 10 | 11 | 2 |
| 1979 | 1 | 5 | 2 | 3 | 2 | 12 (3) | 6 (2) | 13 (2) | 4 (2) | 2 (0) | 10 (4) | 10 (2) | 3 (0) | 12 (0) 2R 6/ | 10 | 3 | 8 | 10 | 11 | 1 |
| 1980 | 0 | 5 | 2 | 4 | 2 | 12 (2) | 6 (2) | 13 (3) | 4 (2) | 2 (0) | 9 (4) | 10 (2) | 3 (0) | 12 (0) 4R 6/ | 10 | 3 | 8 | 10 | 11 | 1 |
| 1981 | 0 | 4 | 2 | 6 | 1 | 12 (0) | 6 (0) | 13 (2) | 5 (3) | 2 (0) | 9 (4) | 10 (3) | 3 (0) | 12 (0) 4R 6/ 1T 7/ | 10 | 2 | 8 | 10 | 11 | 1 |
| 1982 | 0 | 4 | 3 | 5 | 1 | 11 (0) | 6 (0) | 13 (3) | 6 (4) | 3 (0) | 6 (2) | 9 (2) | 3 (0) | 12 (0) 4R 6/ | 9 | 1 | 8 | 10 | 10 | 1 |
| 1983 | 0 | 4 | 1 | 7 | 1 | 11 (0) | 5 (0) | 13 (3) | 6 (4) | 4 (0) | 5 (1) | 8 (1) | 3 (0) | 10 (0) 5R 6/ | 7 | 1 | 8 | 9 | 8 | 1 |
| 1984 | 0 | 4 | 1 | 6 | 2 | 10 (0) | 5 (0) | 13 (3) | 9 (4) | 2 (0) | 5 (1) | 7 (1) | 3 (0) | 9 (0) 4R 6/ | 7 | 1 | 6 | 8 | 8 | 1 |
| 1985 | 0 | 5 | 0 | 4 | 4 | 9 (1) | 5 (1) | 13 (2) | 9 (5) | 1 (0) | 5 (1) | 7 (1) | 3 (0) | 9 (0) 4R 6/ | 7 | 2 | 6 | 8 | 8 | 1 |

1/ The countries are Australia, Burma, Fiji, Indonesia, Japan, Korea, Malaysia, New Zealand, the Philippines, Singapore, Sri Lanka, Thailand, and Western Samoa.
2/ Number of countries with given exchange rate arrangement.
3/ The first number represents the countries reported employing a given instrument; whereas the number in parentheses represents these countries for which this is a principal instrument.
4/ Number of countries utilizing a given capital control.
5/ Including foreign exchange swap operations and repurchase agreements.
6/ The number before the letter R denotes the number of countries with interest rate ceilings that had freed some deposit or lending rates (typically on longer term deposits).
7/ The number before the letter T denotes the number of countries reimposing interest rate ceilings on previously freed rates.

countries along this spectrum do provide a view as to whether the flexibility in exchange rate arrangements has increased or decreased. 1/

While there has been a general trend towards employing greater flexibility in exchange rate arrangments (Table 1), it is important to distinguish between the experience of certain subgroups of countries (Tables 2 through 12 in the Appendix). The industrial countries have employed greater exchange rate flexibility since Australia and New Zealand moved from initially being classified as pegged to a composite indicator to independent floaters. However, although the number of developing countries represented in Table 1 that were classified as employing some form of exchange rate flexibility rose from three in 1975 to five in 1985, five other developing countries pegged their exchange rates in some form throughout the period. This pattern of some developing countries continuing to peg their exchange rates while many other countries (especially industrial countries) introduced greater flexibility into their exchange rate arrangements is consistent with the changes that have occurred in other regions of the world (see Goldstein (1984) and Crockett and Goldstein (1987)).

A second major change has been the movement away from implementing monetary policy through credit market instruments toward the employment of monetary instruments (Table 1). In this paper, monetary instruments are taken as those instruments which principally affect the price and nominal quantity of base money and credit policy instruments are those which primarily affect the price and nominal quantity of credit to the private sector. By this criteria, ceilings on the expansion of commercial bank credit to the private sector, credit allocation rules, and ceiling interest rates are clasified as credit instruments; whereas, open market operations and discount window policies are treated as monetary instruments. Reserve and liquidity ratios fall between these two polar cases in that they can affect both the demand for base money and the availability of credit to the private and public sectors. In the mid-1970s, most of the countries represented in Table 1 implemented their monetary policies through the use of credit instruments, including limitations on the expansion of total bank credit, rules for the allocation of credit to particular sectors or borrowers, and ceiling interest rates on loans and deposits. By the mid-1980s, in contrast, monetary policy was most often implemented through open market operations, changes in the terms and conditions under which discount windows could be accessed, and the employment of intermediate targets or projections

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1/ To some extent, however, examination of changes in the spectrum of arrangements may either understate or overstate the degree of exchange flexibility employed by countries. For example, although a country could formally peg its exchange rate to a particular currency, this would not rule out the possibility that it would undertake frequent adjustments of that rate. In contrast, a country that was independently floating could still undertake extensive exchange market intervention designed to limit exchange rate movements.

for monetary aggregates. This change has been most evident in the industrial countries and those developing countries which have undertaken the most extensive financial reforms. Nonetheless, credit instruments have remained the principal monetary policy tools in a number of developing countries, especially those with pegged exchange rates.

Third, the greater flexibility of exchange rate arrangments and the increased use of monetary instruments has also been accompanied by some relaxation of restrictions on capital flows. While many of the developing countries represented in Table 1 still retain extensive controls on external financial transactions, the industrial countries and a number of the developing countries have either eliminated many of these controls or, where the controls have remained on the "books," have limited the types of portfolio and financial flows that are subject to controls. Where these controls have been relaxed, domestic residents have rapidly diversified their portfolios; and domestic financial conditions have been increasingly influenced by developments in international markets. The countries that have retained the most extensive controls over capital flows have also tended to peg their exchange rates and to rely on credit instruments in the conduct of monetary policy. Nonetheless, even where capital controls do not inhibit the arbitrage of financial market conditions, the linkages between domestic and international markets still appear to be far from perfect, with large borrowers or lenders from the industrial countries having much greater access to international markets than small- and medium-sized entities from developing countries, and with short-term markets being much more closely linked than medium- or long-term markets.

A final characteristic of many of these Asian countries has been their willingness to undertake extensive liberalization of their domestic financial systems. The extent of these reforms has naturally differed considerably across countries, but they have often involved removing or relaxing ceilings on loan and deposit interest rates, increasing the degree of competition through the entry of new domestic and foreign financial institutions, reductions in required reserve and liquidity ratios, the payment of interest on bank reserves, and the elimination of rules governing the allocation of credit or the provision of special credits at preferential rates. 1/ In some cases (e.g., Australia, Japan, and New Zealand), these reforms have been accompanied by significant relaxations of capital controls.

These structural changes in the Asian economies represented in Table 1 raise a number of questions relating to the effectiveness of monetary policy under alternative exchange rate arrangements. First, what domestic and international developments have led some countries to undertake such extensive changes in their exchange rate arrangements,

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1/ In some countries, these financial reforms were accompanied by changes in commercial policy and trade reforms designed to open domestic goods markets to external competition.

their mix of money and credit market instruments, their use of capital controls, and the structure of their domestic financial markets while other countries have shown much more limited structural change. Second, how have these changes altered the effectiveness of monetary policy in terms of its ability to help the authorities achieve their internal and external objectives? Finally, since real and financial structural changes seem likely to continue, how can monetary and exchange rate arrangements be designed not only to obtain the best performance out of a given economic structure, but also to cope with the problems encountered during periods of ongoing structural changes? In this paper, these issues will be considered from two traditional points of view: (1) that which focuses on a single country linked, to varying degrees, with exogenously determined conditions on international markets for goods, factors, and financial assets; and (2) that which focuses on the interdependent effects of countries' policies.

## III. The Choice of Monetary Policy Instruments and Exchange Rate Arrangements

Since countries select the policy instruments which best allow them to achieve their internal and external objectives, it is usually argued in the literature on the optimal design of monetary and exchange rate policies that the set of most effective instruments depends on each instrument's time pattern of effects on domestic and external variables (which will reflect the economy's real and financial structure and degree of openness), the disturbances or other factors which need to be offset by policy measures, and the relative importance the authorities attach to their objectives. This implies that the changes in the use of monetary policy instruments and exchange rate arrangements evident in Table 1 and Tables 2 through 12 in the Appendix should be explained as responses to shifts in the pattern of shocks affecting the economy, changes in the real and financial structures of the economy, and shifts in the weights that authorities attach to the attainment of individual internal and external goals. However, it has also been emphasized that the relative importance of each of these factors depends importantly on the degree of integration between domestic and international goods and financial markets. It is, therefore, useful to divide the discussion of the most effective monetary and exchange rate policies into those policies that should be adopted under perfect market integration and those that should be selected under less than perfect integration.

### 1. Monetary and exchange rate policies with highly integrated markets

It has been argued that, when domestic and international financial markets are highly integrated (i.e., domestic and foreign securities are perfect substitutes), monetary and exchange rate policies are not independent. However, this conclusion reflects a particular view of the potential monetary and exchange rate instruments available to the

authorities. 1/ The authorities' exchange rate arrangements are typically described in terms of a foreign exchange market intervention rule, which specifies the scale of the authorities purchases or sales of foreign exchange (for domestic base money) to the departures of the

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1/ Much of the recent work has focused on extending the earlier analyses by Fleming (1962) and Mundell (1962) to allow for a more complete portfolio specification, stochastic monetary and real disturbances, traded and nontraded goods, rational expectations, the possibility of asymmetric information and wage-price rigidities, and the implications of intertemporal budget constraints. See Marston (1985) and Branson and Henderson (1985) for comprehensive surveys of the development of this literature. The most recent models typically have four basic components. There is first a set of relationships describing the portfolio behavior and budget constraints facing the public and private sectors. For the private sector, this often consists of the specification of the demand for money, the degree of substitution between domestic and foreign securities, and any wealth and income constraints. In much of this literature, domestic and foreign securities are taken as perfect substitutes and uncovered interest rate parity is assumed to hold (i.e., the domestic interest rate equals the sum of the foreign interest rate plus the expected rate of depreciation of the exchange rate). The public sector is typically entered either very simply via a money supply rule (or alternatively via an exchange market intervention rule) or in a more complex manner via both a money supply rule and an intertemporal budget constraint representing the limitations imposed by international markets on the ability of the authorities to finance their budget deficits through borrowing. A second set of relationships describes both the linkages between external and domestic goods prices and the determinants of domestic output. Some form of purchasing power parity relationship usually links (apart from stochastic shocks) domestic and foreign prices. Output is either specified as an exogenous (stochastic) variable or is determined via a stochastic production function that depends on the amount of labor employed. As the third basic component of these models, the supply of labor is then taken as a function of the real wage, and wages are set to equate the expected demand and supply of labor. Finally, there is a specification of how expectations regarding prices and wages are formed. While earlier analyses used static wage-price expectations, more recent discussions have focused on rational expectations although certain types of contract rigidities have been incorporated into even this framework. Examples of the use of these models for analyzing either the choice of optimal exchange rate arrangements or exchange rate dynamics are provided by the articles by Aizenman (1985), Aoki (1985), Bhandari (1985a), Carlozzi and Taylor (1985), Driskill and McCafferty (1985), Flood and Hodrick (1985), Flood and Marion (1982), Frenkel and Mussa (1985), Gray (1976), Harkness (1985), Helpman (1984), Hodrick (1982), Marsten (1985b), Mussa (1985), Obstfeld (1983), Obstfeld and Rogoff (1984), Obstfeld and Stockman (1985), Turnovsky (1985a and 1985b), and Weber (1981).

exchange rate from a target level or to the movements in the exchange rate ("leaning against the wind"). 1/ Monetary policy is conducted through open market operations which alter the domestic component of base money. Thus, monetary and exchange rate policies are linked through their effects on domestic base money. Moreover, since it is often assumed that domestic and foreign assets are perfect substitutes and that interest rate parity conditions are satisfied, these two policies are collapsed into one policy and "... monetary policy is exchange rate policy." 2/ With perfect asset substitution across countries, open market purchases of either a domestic security or foreign exchange, both set in motion portfolio and spending adjustments of a comparable nature.

In this situation, the exchange rate intervention rule (or equivalently the money supply rule) that best allows the authorities to achieve their objectives depends on the nature of the internal and external shocks affecting the economy, the economy's structural rigidities, asymmetries in the information sets available to the authorities and the private sector, the country's size, and the degree of integration of its goods and financial markets with those in the rest of the world. The importance of these factors was indirectly illustrated by Helpman (1981) who showed that, in a frictionless world of perfect certainty with purchasing power parity and interest rate parity being attained, the consumption patterns associated with alternative exchange rate arrangements would be identical unless the arrangements involved a permanent transfer of resources from one country to another. 3/ While such a world is unlikely to ever exist, the analysis implies that the appropriateness of a particular mix of exchange rate arrangements and monetary policy will depend on the exact nature of the market failures and frictions that exist.

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1/ In addition to this "unsterilized" intervention, there have also been discussions of "sterilized" intervention where the effects on the domestic monetary aggregates are offset by open market operations. Such sterilized intervention has generally been regarded as ineffective.

2/ Daniel (1985), p. 253.

3/ Mussa (1983) has argued that such exchange rate system neutrality requires that: (1) Ricardian equivalence must hold with regard to the evaluation of government securities as wealth; (2) a pegged rate must not be maintained through foreign exchange operations that involve assets that are not part of the efficient portfolio that would be maintained by the private sector under a flexible exchange rate regime; (3) the redistribution of wealth that occurs because of unanticipated changes in nominal prices and the exchange rate in the presence of bonds must be absent or have no effect on world demands; (4) money must play no role in the real economy; and (5) problems with imperfect information must be absent. These issues are also discussed in Aschauer and Greenwood (1983), Helpman (1979), and Stockman (1983). Aschauer and Greenwood argue, in particular, that Helpman's neutrality conclusions do not hold when output is taken as endogenous rather than exogenous.

a. Real and monetary shocks

The nature of the real and monetary shocks affecting the economy have been viewed as especially important determinants of optimal exchange rate arrangements. The exact nature of the policy recommendations for dealing with these shocks, however, differ somewhat depending on the extent of the feedback between the domestic and external economies. One possibility is that the domestic economy is "small" and that domestic developments, therefore, have no impact on external prices or incomes. Alternatively, a two-country framework has been used in which the levels of income, prices, and interest rates are affected by the policies adopted in both countries. In the case of a small country, for example, Frenkel and Aizenman (1982) showed that the higher the variance of shocks to real output, the more desirable is a fixed exchange rate. With a fixed exchange rate, changes in the current account balance can cushion the effects of real shocks on domestic consumption. Countries faced with relatively large real shocks should hold large stocks of international reserves to allow for large variability in the balance of payments. However, the importance of this consideration diminishes as the economy's degree of integration with world capital markets increases since the same cushioning can be achieved through international borrowing or lending. In contrast, a greater variability of monetary shocks 1/ increases the desirability of exchange rate flexibility since exchange rate adjustments can offset these monetary shocks and prevent them from altering real output and consumption. When both types of shocks are present, the optimal exchange rate regime involves a system of managed floating with the degree of intervention being that which allows the external economy to serve as the most efficient buffer for the domestic economy.

If there are two economies of comparable size, the policy recommendations change somewhat since neither country will find it optimal to act as the sole buffer in the system. Moreover, a distinction must be made between high and low degrees of financial and goods market integration between the two countries. In a two-country context, the notion that a floating exchange rate insulates a country from foreign shocks is more likely to be true when capital mobility is low than when it is high. For example, with low capital mobility, an exogenous increase in foreign demand for money might raise the foreign interest rate sharply but still generate few capital flows. Flexible exchange rates would then only have to respond to offset the changes in trade flows induced by the adjustments in aggregate demand in the foreign country. With a high degree of capital mobility, the increased capital flows would necessitate a sharper exchange rate adjustment that would (at least in the short run) affect prices and output to a greater degree than with

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1/ In the Frenkel and Aizenman (1982) analysis, monetary shocks encompass not only shocks to the money demand or supply, but also shocks to foreign prices or purchasing power parity conditions.

low capital mobility. 1/ In particular, Obstfeld (1985, p. 405) has argued that under conditions of high capital mobility, 2/

> The risk-sharing argument suggests that the two regions will prefer a fixed exchange rate, together with appropriate international settlement arrangements, when monetary shocks are dominant, and especially when they are negatively correlated across regions, but will prefer a floating rate when aggregate demand shocks are the main concern.

In terms of explaining the evolution of the exchange rate arrangements for the countries represented in Table 1 and Tables 2 through 12 in the Appendix, these analyses suggest that one first needs to identify the nature of the shocks that have dominated during the period 1975-85 and the relative sizes and degrees of openness of the economies involved. With regard to the nature of the shocks that have occurred, Obstfeld (1985) has argued that the divergent fiscal trends across the major industrial countries, the extensive changes in oil and commodity prices, and the fact that exchange rates and stock market prices have not moved together in the way one would expect if the shocks were monetary in origin 3/ all point to the fact that the past decade has been one in which real shocks have dominated monetary shocks. 4/ If real shocks have dominated in the period since the mid-1970s, then the changes in exchange rate arrangements evident in Table 1 and Tables 2 through 12 in the Appendix are consistent with the predictions of the theoretical analysis. The dominance of real shocks would imply that a

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1/ Saidi (1980) has argued, however, that these conclusions have arisen out of models that assume the existence of price rigidities and/or agents that neglect available information in forming expectations that are crucial to current decisions. In the context of a general equilibrium model with rational expectations, he argued that a flexible exchange rate does not insulate domestic employment and output from foreign disturbances. The importance of the information sets of the authorities and private sectors have also been discussed in Bhandari (1985a), Eaton (1985), Flood and Hodrick (1985 and 1986), Frenkel (1981), and Glick and Wihlborg (1986).

2/ Hsief (1984) also examines this risk-sharing argument.

3/ Obstfeld examined the relative importance of real and monetary shocks by considering the correlation between changes in nominal exchange rates and in nominal stock prices. He argued that if domestic monetary shocks are the dominant source of disturbance, the nominal prices of stocks and foreign exchange should be highly positively correlated; whereas, if the shocks are real, the correlation should be much lower or even negative. In considering these correlations for the Federal Republic of Germany, Japan, and the United States for various subperiods between 1976 and 1985, he generally found low negative correlations.

4/ This does not rule out the possibility that unanticipated monetary policy changes were also important.

small country confronted with low capital mobility (due possibly to the presence of capital controls) would choose a pegged exchange rate, and the smaller developing countries with relatively restrictive capital controls represented in Table 1 and Tables 2 through 12 in the Appendix have tended to adopt pegged rates. In contrast, larger economies or developing economies more closely integrated with international capital markets have moved as expected toward greater exchange rate flexibility. However, since there is no information about the relative sizes of the real and monetary shocks affecting each country, one cannot specify the most appropriate degree of exchange rate flexibility. Moreover, the optimal degree of exchange rate flexibility would be expected to vary over time with changes in the authorities' perceptions regarding the nature and severity of these shocks.

b. Other considerations

In addition to real and monetary shocks, a number of other determinants of the most appropriate degree of exchange rate flexibility have been identified in the literature on optimum currency areas. Optimum currency area analyses have focused on the costs and benefits associated with expanding the area linked by fixed exchange rates. For example, Mundell (1961) first argued that a country should peg its exchange rate with another country if the two countries shared a high degree of factor mobility which would ensure real adjustment even without exchange rate adjustments. In contrast, McKinnon (1963) stated that the key factor determining whether a country should fix its exchange rate was the openness of the economy. In the short run, a relatively closed economy could use an exchange rate depreciation to switch expenditures from traded to nontraded goods, but a highly open economy would most likely just increase its price level. Subsequent analyses suggested that a country should be included in an optimum currency area if, relative to the existing members, it has a similar fiscal system, comparable size, limited geographic or commodity diversificaton of exports, a willingness to share a common rate of inflation, and close trade and financial relationship with the existing currency bloc. 1/ While it is generally recognzied that an optimum currency area would in most cases not correspond to the political boundaries of modern nation-states, these discussions do suggest that countries will tend to adopt greater exchange rate flexibility, the lower the degree of factor mobility between countries, the greater the divergence of fiscal systems, the more dispersed are inflation objectives, the less open are the individual economies, and the less they are associated with existing currency blocs.

2. Monetary and exchange rate policies with imperfect but increasing market integration

While the analysis of monetary and exchange rate policy under conditions of perfect asset substitution helps to identify factors

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1/ For a summary of these arguments see Tower and Willett (1976).

influencing the optimal combination of monetary and exchange rate policies, it provides little insight into the questions of why countries use different mixes of monetary and credit policy instruments and what considerations would lead the authorities to alter this mix over time. With perfect asset substitution, for example, a ceiling on the expansion of domestic commercial bank credit would have no effects on domestic activity if borrowers could immediately substitute foreign for domestic credit. As already noted, the set of monetary and exchange rate instruments included in most analyses of exchange rate policy is much narrower than that the authorities typically use (Table 1 and Tables 2 through 12 in the Appendix).

The changes in the mix of monetary policy instruments and exchange rate arrangements that have occurred in the past decade in part reflect a response to increasing but less than perfect degrees of integration of goods and assets markets. While international trade and financial transactions have become increasingly important for all countries, empirical studies (e.g., Isard (1977)) have found that purchasing power parity conditions can be violated for extended periods even among industrial countries. Moreover, Yuan (1986) recently argued that the overall degree of financial market integration across Asian countries is still low for most countries, especially for medium- or long-term credits. 1/ Nonetheless, the gradual relaxation of capital controls has resulted in increasingly close linked short-term financial markets, especially across the major countries. 2/

With less than perfect integration of domestic and international markets, monetary and exchange rate policies no longer can be represented by a single combined policy since many monetary and exchange rate policy instruments may have differential effects on the domestic economy and external transactions. 3/ This naturally makes the choice of the most effective instruments more complex, but some of relevant factors influencing that choice can be illustrated by considering the conditions under which a country would use as its principal monetary policy instrument either a ceiling on the expansion of commercial bank credit or controls over the growth of domestic monetary aggregates. While many other policy choices could be examined, this choice is most closely

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1/ Dooley, Frankel, and Mathieson (1987) found that the analysis of savings and investment patterns across both industrial and developing countries suggest that, while some financial markets are closely integrated, this integration does not extend to the markets for physical capital.

2/ The nature of these linkages, even in the presence of capital controls, are discussed in Canto (1985) and De Macedo (1986).

3/ The choice of policy instruments has been considered by Ahn and Jung (1985), Bryant (1980), Cottarelli, Galli, Reedtz and Pittaluga (1986), Gardner (1983), Mantel and Martirena-Mantel (1982), Rojas-Suarez (1987a), and Wickham (1985).

related to the switch from credit to monetary instruments that is evident in Table 1 and Tables 2 through 12 in the Appendix.

a. The choice of money and credit instruments

Whether the authorities' ability to achieve their domestic and external objectives will be enhanced by establishing and maintaining a ceiling on a given monetary or credit aggregate will depend on a number of characteristics of the domestic economy including the strength of linkages between domestic and external goods and financial markets, the structure of the domestic financial system, the state of the fiscal accounts, and the country's exchange rate arrangements. 1/

(1) Integration of domestic and external goods markets

The strength of the linkages between domestic and international markets for goods is a key factor influencing the use of ceilings for monetary or credit aggregates. If domestic and international traded goods markets are closely integrated, for example, movements in the domestic prices of tradable goods would be tied to changes in the exchange rate and international prices. If international traded goods prices are stable, domestic traded goods prices would then change only in response to an exchange rate movement. Stable domestic prices of tradable goods would also help stabilize the prices of nontraded goods. In this situation, inflation would generally be associated only with the changes in prices produced by an exchange rate depreciation regardless of the type of credit or monetary ceiling used. 2/

For most countries, however, the linkages between domestic and international goods markets are far less direct as a result of the existence of trade barriers, transactions costs, and shipping charges. These weaker linkages provide scope for extended periods of domestic inflation and create the possibility of a conflict between the attainment of the authorities' external balance and inflation objectives. Domestic prices would respond not only to exchange rate adjustments but also to such factors as increases in reserve money generated by the conversion of foreign exchange or issuance of domestic credit by the central bank. In this situation, a ceiling on domestic monetary growth could be an important element in limiting inflation.

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1/ A general discussion of the role of money and credit, especially in developing countries is presented in Rojas-Suarez (1987a and b).

2/ There is still the issue of whether a fixed exchange rate could remain fixed if there was excessive domestic credit expansion by the central bank. This possibility implies that the choice among monetary and credit instruments may have to be based on the authorities other objectives.

(2) Fiscal imbalances and the structure of domestic financial markets

A country's fiscal position and the structure of its domestic financial markets often interact to strongly influence whether a given monetary or credit aggregate will be effective and controllable. In particular, the absence of control over the fiscal accounts may mean that neither a monetary nor a credit ceiling would be effective. With regard to the former type of ceiling, a large fiscal deficit financed by the provision of central bank credit to the government would clearly make it difficult to maintain a reasonable rate of expansion for any monetary aggregate. Moreover, the maintenance of a ceiling on credit of the banking system could involve an extensive redistribution of credit within the economy since any increase in central bank credit to the government (which would also increase reserve money) would have to be matched by a reduction of credit to private borrowers by either the central bank or commercial banks. While an increase in central bank credit to the government matched by a reduction in commercial bank credit to the private sector is neutral in terms of satisfying the overall credit ceiling on the financial system, such a shift may still strongly affect the level and distribution of economic activity. In countries where credit is rationed more by administrative procedure than by market interest rates, firms that are excluded from their traditional sources of credit (e.g., central bank's special lending programs) may have considerable difficulty in finding new sources of funds. This would be especially true for firms that are already in serious financial difficulties. Thus, if an overall credit ceiling is maintained when there is a large government budget deficit, there could be a major redistribution of credit between the private and public sectors which could lead to a sharp crowding out of private spending and thereby a fall in real output and investment.

Another threat to the effectiveness of a ceiling on domestic credit of the banking system arises when an extensive system of unregulated financial intermediaries exists or develops. In this case, any increase in reserve money (from whatever source) would allow increased lending by the unregulated nonbank financial institutions even if credit from the banking system remained at the ceiling level. The existence of such an alternative source of credit naturally weakens the relationship between a ceiling on credit of the banking system and the levels of spending and real output.

(3) Integration with external financial markets

The strength of the linkages between domestic and international markets for financial instruments is also a key factor influencing the use of ceilings for monetary and credit aggregates. Access to international financial markets affects the economy's structure in at least two important ways: (1) it gives residents an opportunity to acquire net credit (and goods and services) from abroad; and (2) reserve money can expand as a result of the conversion of foreign exchange

acquired through current account imbalances or external borrowing. Depending on their size and sustainability, capital flows can weaken the effectiveness of credit ceilings both by providing a source of credit from outside the banking system and also by creating an incentive for the development of unregulated domestic sources of credit.

It has been suggested that the problems created by capital flows could be mitigated by a ceiling placed on the expansion of reserve money. Such a ceiling on reserve money would require the central bank to sterilize the impact of the capital inflows on reserve money by reducing the domestic credit of the central bank. While sterilization is always possible in a technical sense, the sustainability of such a policy depends on the cost of reducing central bank domestic credit and on the scope and persistence of the inflows. The domestic cost of sterilization is, in part, related to the fact that the firms obtaining credits from the external sector may be quite different from those economic units which obtain the central bank credits. In an economy where credit is rationed and interest rates are constrained, it has already been noted that it may be quite difficult for firms or enterprises that obtain credits from the central bank to obtain credits from any other foreign or domestic source. Thus, the sterilization of capital inflows may involve a sharp redistribution of credit within the private sector, and this could create serious financing difficulties for certain sectors of the economy. 1/

The feasibility of sterilizing capital inflows is also determined by the nature of the capital flows. In some situations, the capital inflow may represent a once-and-for-all movement of capital between domestic and international markets. For example, there could be a reflow of funds to the domestic market following a currency realignment. In cases where it was judged necessary to offset any price level effect of this inflow, either the credit ceilings could be adjusted in advance by the anticipated size of this inflow or a ceiling on reserve money could ensure that automatic sterilization takes place.

There is a far more serious problem when the capital flows represent the continuing arbitrage of financial market conditions between domestic and international markets. In economies with severe credit rationing, there are large incentives to obtain credit from international sources. In this case, sterilization of the capital inflow may not only involve a sharp redistribution of credit within the private sector (from those that obtain credits from the central bank to those with access to international financial markets) but also would not eliminate the original incentives for further capital flows. Thus, in the presence of distortions or other conditions that give rise to con-

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1/ It is also important to note that in economies where credit is rationed primarily by interest rates, such sterilization would be much less likely to have these sectoral effects since credit could flow from one sector to another in response to changes in relative interest rates.

tinuing capital inflow, a ceiling on reserve money could lead to continuing increases in the central bank's foreign exchange reserves and an ongoing redistribution of credit within the private sector. Alternatively, the absence of such a ceiling on reserve money could result in a rapid increase in reserve money and thereby in inflationary pressure. 1/

(4) Exchange rate policy

In general, a country's exchange rate arrangements will more strongly influence the use of a ceiling on a monetary aggregate rather than a credit aggregate. With a commitment to hold the exchange rate fixed, or to adjust it only gradually (e.g., to reflect inflation differentials), the authorities may find it difficult to control the growth of domestic monetary aggregates over any extended period. Even when the authorities limit the issuance of reserve money from domestic sources, portfolio and spending adjustments in the private sector would lead to external payments imbalances that could expand reserve money as the authorities intervene in the foreign exchange markets to maintain their exchange rate policy. In contrast, a flexible exchange rate would allow the authorities to control the growth of reserve money which would make a ceiling on a monetary aggregate a potentially effective instrument.

To an important degree, the effectiveness of ceilings on domestic credit depends more on the extent to which unregulated domestic and foreign sources of credit are available than on the nature of the country's exchange rate arrangements. If sources of credit other than through the domestic banking system are limited, then a ceiling on domestic credit of the banking system can be quite effective in affecting domestic spending and activity regardless of the exchange rate structure. As noted earlier, however, capital flows can create difficulties under a domestic credit ceiling, which may, therefore, require some degree of exchange rate flexibility. For example, if the exchange rate has been substantially depreciated in an effort to secure favorable trade balance, then substantial capital inflows could be generated by yield differentials which reflect, in part, the expectation that further large exchange rate depreciations are unlikely. If such flows occur, there could be substantial inflationary pressure in the economy. To limit this inflation, a greater degree of exchange rate flexibility may be required since a fixed exchange rate, relatively unrestricted capital flows, and the establishment of effective ceilings on credit or reserve money may at times be incompatible.

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1/ The potential inflationary effect of a continuing capital inflow would also depend on how the borrowed funds are used. For example, foreign borrowing that is used to purchase foreign capital goods that are employed in the domestic economy could yield a flow of resources more than sufficient to service any external obligations. Moreover, to the extent that this greater investment led to higher growth, it could be deflationary (with a flexible exchange rate and given money supply).

The combined influence of the above characteristics of an economy on the selection of a particular monetary or credit aggregate can be illustrated by comparing the conditions under which a ceiling on domestic credit would generally be preferred with the situation under which a ceiling on a monetary aggregate would be most appropriate. A ceiling on the domestic credit of the banking system would allow the authorities to have the greatest influence on domestic spending and activity and thereby the country's external balance when most domestic financial institutions are part of the banking system, when domestic tradable goods prices are closely tied to world prices, and when linkages between domestic and international financial markets are relatively weak. With no alternative sources of domestic or foreign credit, control over the nominal level of domestic credit could be maintained with most types of exchange rate arrangements. Moreover, with a fixed exchange rate, a ceiling on domestic credit would generally be more readily attained than a ceiling on a monetary aggregate. The effectiveness of a credit ceiling would also be enhanced by the existence of relatively close ties between domestic and international markets for goods. With such ties, there would be little possibility of extended periods of domestic inflation in the absence of continuing exchange rate or external price movements.

In contrast, a ceiling on a monetary aggregate would be most useful when the economy has a flexible exchange rate, domestic goods prices are not closely tied to world prices, there are stong linkages between the domestic and international financial markets, and there are a variety of unregulated domestic financial intermediaries than can provide credit that is not subject to the ceiling on credit from the banking system. Since credit ceilings are typically defined with regard to the lending of the banking system, the existence of significant credits either from abroad or from nonbank financial intermediaries could seriously undermine any relationship between the ceiling on banking system credit and economic activity or the current account balance. In addition, with a flexible exchange rate, control over the growth of domestic monetary aggregates would be feasible since the authorities would not be required to undertake exchange market intervention. Such monetary control would be especially important for limiting inflation if domestic goods prices were not very strongly linked to international tradable goods prices.

These considerations provide some explanation for the changing pattern of the use of monetary and credit policy instruments by the countries that is evident in Table 1 and Tables 2 through 12 in the Appendix. For example, those countries which have continued to use credit instruments typically have had the most extensive controls on both their domestic financial systems and foreign financial transactions and have some form of pegged exchange rate. Since the access of domestic residents of these countries to external financial markets is limited, credit instruments retain their effectiveness unless unorganized financial markets of significant size emerge. However, when domestic financial regulations have been liberalized and capital controls relaxed, countries have shifted toward greater degrees of exchange

rate flexibility and the use of monetary instruments. In such a situation, ceilings on credit from the organized financial sector can be readily evaded; whereas monetary instruments impose more effective constraints, especially under flexible exchange rates.

b. Monetary and exchange rate policies during periods of extensive structural change

Although the importance of real and monetary shocks in the determination of optimal monetary and exchange rate policies has been recognized, it has often been implicitly assumed that the underlying real and financial structure of the economy is unchanged when the choice of policy instruments is made. 1/ However, the period since 1975 has witnessed extensive and ongoing structural change.

The need to formulate monetary and exchange rate policies in the face of often unanticipated and rapid structural change has created a variety of problems. In particular, the effectiveness of traditional instruments has often been eroded, thereby creating the need to develop and employ new policy instruments. Moreover, even where a given instrument remains effective, the nature of its impact can vary over time as structural changes alter the channels through which the instrument affects spending and portfolio decisions. The authorities, therefore, have faced not only the traditional problem of identifying how to use their existing set of instruments to achieve the best performance of a given economic structure, but also how to use or modify the types of instruments that they employ over time.

While the optimal intertemporal pattern of monetary and exchange rate policies has recently been examined in a number of studies (e.g., see Eaton (1985), Frenkel and Razin (1986), and Helpman and Razin (1987)), the desire to arrive at closed-form solutions for the complex theoretical models needed to analyze the issues involved has necessarily limited the types of policies examined. Moreover, the problem of uncertainty regarding likely structural changes has not been addressed. However, many of the issues have been considered in a somewhat less formal framework dealing with the design of monetary and exchange rate policies during periods of extensive trade, fiscal and financial reforms (e.g., see Khan (1987), McKinnon (1986), Mussa (1987), and Lal (1987)). These analyses have often dealt with an inflationary and partially indexed economy that has an uncontrolled fiscal deficit and extensive distortions in goods, factor, and financial markets. It is generally argued that the optimal mix of exchange rate arrangements and monetary (or credit) policies that should accompany the structural reforms will

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1/ An exception to this has been the discussion (e.g., see Gray (1976) and Frenkel and Aizenman (1982)) of the optimal degree of wage indexation under alternative exchange rate regimes.

vary over time depending on the initial conditions facing the economy, the pace of the structural reforms, and the speed with which domestic and external markets integrate. 1/

While the long-run objective of the reform program is to remove policy induced distortions in order to achieve greater efficiency, the discussions of the sequencing of reform measures and stabilization policies have been most concerned with ensuring that the adjustment to the long-run equilibrium is stable. The policy recommendations have often reflected the view that complete and instantaneous liberalization of goods, financial, and factor markets in an environment of high inflation and general uncertainty about likely macroeconomic developments does not work well. If prices in all markets were fully flexible and expectations certain, then there would be no sequencing problem--the policy distortions could be removed immediately and prices would quickly adjust to establish a new equilibrium. 2/ However, since asset markets adjust more rapidly than goods or factor markets, it has been argued that the immediate removal of capital controls and interest rate ceilings could lead to capital inflows that result in a real appreciation of the exchange rate which would work against the reallocation of resources from the nontraded to traded goods sectors that the trade reform would be attempting to achieve. As a result, a more careful sequence of reforms is needed.

While there is far from a consensus about the most appropriate sequencing of policies, it is frequently recommended that the fiscal accounts should be brought under control at the beginning of the reform period. The rationale for first undertaking the fiscal reform is that the other reforms are unlikely to be successful if a large fiscal imbalance is generating rapid monetary growth and high inflation. It is also argued that trade reforms (the removal of quotas and lowering of tariffs) should be announced early in the reform period and should be phased in a preannounced manner. The objective in adopting this gradualist program is to provide factors of production with time to move between sectors and also to indicate to investors the types of relative prices (at least for traded goods) that are likely to prevail in the future. 3/

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1/ In a sense, however, even these analyses do not deal fully with the problems created by unanticipated structural changes: since they focus on policy-induced structural changes that are typically preannounced.

2/ Even with flexible prices, there could be a once-and-for-all capital inflow and a new equilibrium real exchange rate.

3/ There is also the question of whether the trade reforms are perceived to be permanent or temporary. A temporary trade reform may be worse than no reform at all.

Monetary and exchange rate policies have been viewed as pursuing three often contradictory objectives: (1) removing financial system distortions; (2) implementing a "forward looking" monetary policy designed to stabilize prices; and (3) establishing external payments balance and thereafter avoiding an excessive real appreciation of the exchange rate. While it is generally agreed that positive real interest rates should be established at an early stage, there has not been a consensus about how best to achieve this objective. Some have argued that this can best be accomplished by immediately removing interest rate ceilings, reducing required reserve ratios, eliminating portfolio selection restrictions, and allowing for more entry into the financial system; but others have favored a more gradual elimination of these distortions especially in a highly inflationary environment where past entry into the banking system was severely restricted. 1/ Moreover, while some have favored establishing a floating exchange rate (e.g., Lal (1987)), McKinnon (1986) has argued for a more managed exchange rate policy encompassing a "passive" crawling peg policy (adjusting the exchange rate to reflect inflation differences) that should be used during the initial stages of the reform program when inflation is still high and an "active" crawling peg that should be used when the budget deficit has been brought under control and inflation has slowed. The active crawl would be designed to provide an unambiguous signal around which private expectations about inflation could coalesce. However, to be successful, this active crawling peg policy would have to be supported by appropriate labor and financial market policies to prevent a real appreciation of the exchange rate. 2/

To support this managed exchange rate policy, it has been argued that the removal of capital controls should be delayed until the end of the reform period. Without such controls, high domestic real interest rates coupled with an improved prospect for the economy's future performance could induce a large capital inflow which would tend to appreciate the real exchange rate. The resulting changes in relative goods prices would induce inappropriate investments and distort the reallocation of resources across sectors, thereby helping to destabilize the reform process. However, Lal (1987) has argued that capital controls should be removed relatively early in the reform period (and the exchange rate

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1/ There is also the issue of whether the full institutional structure needed for the operation of competitive markets is likely to exist at the beginning of the reform and how they can be developed. The implications of this issue for the reform process have been discussed by Dooley and Mathieson (1987).

2/ The use of real exchange rate policies is also subject to a potential inflationary bias. See Adams and Gros (1986) for a discussion of this possibility.

floated) because it is unlikely that such immiserizing investment would take place when expectations are rational and announcements are credible. 1/

Three conclusions seem warranted regarding the roles of monetary and exchange rate policies during a period of structural reforms. First, there are a number of reasons why some differentiation exists between the effectiveness of exchange market intervention, provision of credit to the government, changes in interest rate ceilings, and modification of credit controls. These reasons include the fact that assets are imperfect substitutes; markets adjust at different speeds; wages, prices, and interest rates do not immediately adjust to their long-run equilibrium values (and may actually overshoot); and the expectations are uncertain (as opposed to irrational). Second, the optimal mix of stabilization policies adopted will vary over the reform program. For example, the exchange rate arrangements best suited for the turbulent period at the beginning of the reform would be expected to be quite different from that at the end of the reform period. Third, the optimal set of policy instruments would change over the course of the reform period as such instruments as credit controls and interest rate ceiling would be replaced by more market oriented instruments (e.g., open market operation in government securities). This change would be a response to the fact that adjustment in the economy would increasingly rely on changes in the relative prices of goods, factors, and assets rather than credit rationing or quantitative restrictions.

## IV. Conclusions

One common element in the experiences of almost all countries during the past decade has been the need to adjust their exchange rate arrangements and monetary policy instruments in order to respond more effectively to extensive external and domestic disturbances. In the Pacific Basin, these changes have encompassed the employment of greater exchange rate flexibility and a switch from credit to monetary instruments; and they have been accompanied by a growing but still incomplete integration of domestic and external financial markets and often substantial liberalizations of domestic financial systems. However, the

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1/ The issue in all reforms is how to make the announcements of policies credible in a situation where past reforms may have been reversed and the "staying power" of the current reform is unclear. Even if private sector participants have a complete understanding of the effects of the reforms (e.g., in the rational expectations sense they "know" the model), they may still be uncertain about whether the reforms will be sustained. In these circumstances, investors may significantly shorten the maturity of their investments, attempt to make investments or loans that they feel they can get out of quickly if things go wrong, and delay long-term investments that would be appropriate if the reform should be successful.

formulation of monetary and exchange rate policies was complicated by the need to undertake extensive structural changes in the real and financial sectors to improve economic efficiency and adapt to a changing international environment. Many of the adjustments in monetary and exchange rate policies have been consistent with the types of policies that recent theoretical analyses recommended when a country is confronted with a period in which real shocks have dominated monetary shocks.

Table 2. Australia: Exchange Rate Arrangements, Monetary Instruments, and Financial Characteristics of Selected Asian Countries 1/

| Year | Exchange Rate Arrangements | Monetary and Credit Policy Instruments | Capital Controls | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Required Surrender of Export Proceeds | Advanced Import Deposits | Limitations or Advanced Approval on Payments for Invisibles | Limitations on Foreign Currency Deposits by Residents | Prior Approval Required for Foreign Lending or Borrowing by Financial Institution | Tax or Special Reserve Requirement on Foreign Borrowing |
| 1975 | Pegged to composite indicator | During 1975-80, authorities initially focused on use of a required reserve ratio (Statutory Reserve Deposits), a liquidity ratio, controls on lending of financial institutions, and ceilings on interest rates. First public reference of possible outcomes for growth of broadly defined money (M3) was in 3/76. Open market operations and direct sales of government securities to nonbanks increasingly used to limit monetary expansion. | x | -- | x | x | x | -- |
| 1976 | Managed floating | | x | -- | x | x | x | -- |
| 1977 | Managed floating | | x | -- | x | x | x | -- |
| 1978 | Managed floating | | x | -- | x | x | x | -- |
| 1979 | Managed floating | | x | -- | x | x | x | -- |
| 1980 | Managed floating | Major reforms in the period 1980-85. In December 1980, most ceilings on deposit rates removed and those relating to loan rates relaxed. Quantitative bank lending guidance terminated at end-June 1982. Exchange controls liberalized, and there was a (December 1983) removal of portfolio restrictions on banks (e.g., minimum maturity of deposits) and other nonbank financial institutions. Reserve requirement little changed after 1981. Main instrument was open market operations. | x | -- | x | x | x | -- |
| 1981 | Managed floating | | x | -- | x | x | x | -- |
| 1982 | Managed floating | | x | -- | x | x | x | -- |
| 1983 | Managed floating | | -- | -- | -- | -- | -- | -- |
| 1984 | Independently floating | | -- | -- | -- | -- | -- | -- |
| 1985 | Independently floating | | -- | -- | -- | -- | -- | -- |

1/ A x (--) denoted the presence (absence) of a particular capital control. A blank indicates an absence of information.

Table 3. Burma: Characteristics of Selected Asian Countries, 1975-85 1/

| Year | Exchange Rate Arrangements | Monetary and Credit Policy Instruments | Capital Controls | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Required Surrender of Export Proceeds | Advanced Import Deposits | Limitations or Advanced Approval on Payments for Invisibles | Limitations on Foreign Currency Deposits by Residents | Prior Approval Required for Foreign Lending or Borrowing by Financial Institution | Tax or Special Reserve Requirement on Foreign Borrowing |
| 1975 | Pegged to SDR | The banking system has been principally concerned with supplying the financial resources needed to fulfill the authorities overall national economic plan. The volume and allocation of credit, interest rates, and foreign borrowing are determined so as to be consistent with the plan's objectives. The banking system has been the primary, often the sole, source of credit, and the banks are state owned. | x | -- | x | x | x | -- |
| 1976 | Pegged to SDR | | x | -- | x | x | x | -- |
| 1977 | Pegged to SDR | | x | -- | x | x | x | -- |
| 1978 | Pegged to SDR | | x | -- | x | x | x | -- |
| 1979 | Pegged to SDR | | x | -- | x | x | x | -- |
| 1980 | Pegged to SDR | | x | -- | x | x | x | -- |
| 1981 | Pegged to SDR | | x | -- | x | x | x | -- |
| 1982 | Pegged to SDR | | x | -- | x | x | x | -- |
| 1983 | Pegged to SDR | | x | -- | x | x | x | -- |
| 1984 | Pegged to SDR | | x | -- | x | x | x | -- |
| 1985 | Pegged to SDR | | x | -- | x | x | x | -- |

1/ A x (--) denoted the presence (absence) of a particular capital control. A blank indicates an absence of information.

Table 4. Fiji: Characteristics of Selected Asian Countries, 1975-85 1/

| Year | Exchange Rate Arrangements | Monetary and Credit Policy Instruments | Capital Controls | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Required Surrender of Export Proceeds | Advanced Import Deposits | Limitations or Advanced Approval on Payments for Invisibles | Limitations on Foreign Currency Deposits by Residents | Prior Approval Required for Foreign Lending or Borrowing by Financial Institution | Tax or Special Reserve Requirement on Foreign Borrowing |
| 1975 | Pegged to composite | Throughout this period, there have been both cash reserve and government security ratios. The allocation of credit has been affected by portfolio allocation rules for banks. In June 1981, ceiling on large deposit rates removed, and other steps taken during 1982-85 to gradual deregulation interest rates. Open market operations have not been used actively. | x | -- | 2/ | x | x | 3/ |
| 1976 | Pegged to composite | | x | -- | 2/ | x | x | -- |
| 1977 | Pegged to composite | | x | -- | 2/ | x | x | -- |
| 1978 | Pegged to composite | | x | -- | 2/ | x | x | -- |
| 1979 | Pegged to composite | | x | -- | 2/ | x | x | -- |
| 1980 | Pegged to composite | | x | -- | 2/ | x | x | -- |
| 1981 | Pegged to composite | | x | -- | 2/ | x | x | -- |
| 1982 | Pegged to composite | | x | -- | 2/ | x | x | -- |
| 1983 | Pegged to composite | | x | -- | 2/ | x | x | -- |
| 1984 | Pegged to composite | | x | -- | 2/ | x | x | -- |
| 1985 | Pegged to composite | | x | -- | 2/ | x | x | -- |

1/ A x (--) denotes the presence (absence) of a particular capital control. A blank indicates an absence of information.
2/ Generally free but large amounts subject to approval.
3/ Net foreign liabilities of banks subject to a 5 percent reserve requirement.

Table 5. Japan: Characteristics of Selected Asian Countries, 1975-85 1/

| Year | Exchange Rate Arrangements | Monetary and Credit Policy Instruments | Capital Controls: Required Surrender of Export Proceeds | Advanced Import Deposits | Limitations or Advanced Approval on Payments for Invisibles | Limitations on Foreign Currency Deposits by Residents | Prior Approval Required for Foreign Lending or Borrowing by Financial Institution | Tax or Special Reserve Requirement on Foreign Borrowing |
|---|---|---|---|---|---|---|---|---|
| 1975 | Independently floating | Throughout most of this period, broad money (M2) has been used as a monetary policy indicator. To influence M2, the central bank has relied on a complex mechanism of short-term money market operations to meet short-run changes in demand for reserve money and bond market operations to provide for trend growth in the demand. These operations were supported through discount policy, reserve ratios, and (during the period until 1980) window guidance policy. While most interest rates were controlled in 1975, there has been a gradual removal of such ceiling rates. As the proportion of financial instruments carrying market determined interest rate has increased, there has been increasing emphasis on control of monetary aggregates as opposed to bank credit. | -- | -- | 2/ | 3/ | x 4/ | -- |
| 1976 | Independently floating | | -- | -- | 2/ | 3/ | x 4/ | -- |
| 1977 | Independently floating | | -- | -- | 5/ | 3/ | x 4/ | x |
| 1978 | Independently floating | | -- | -- | -- | 3/ | x 4/ | x |
| 1979 | Independently floating | | -- | -- | -- | 3/ | 6/ | -- |
| 1980 7/ | Independently floating | | -- | -- | -- | 3/ | 6/ | -- |
| 1981 | Independently floating | | -- | -- | -- | 3/ | 6/ | -- |
| 1982 | Independently floating | | -- | -- | -- | 3/ | 6/ | -- |
| 1983 | Independently floating | | -- | -- | -- | 3/ | 6/ | -- |
| 1984 | Independently floating | | -- | -- | -- | 3/ | 6/ | -- |
| 1985 | Independently floating | | -- | -- | -- | 3/ | 6/ | -- |

1/ A x (--) denoted the presence (absence) of a particular capital control. A blank indicates an absence of information.
2/ Certain limitations on large payments.
3/ Foreign currency deposit overseas subject to prior approval if not carried out by authorized bank.
4/ Foreign exchange banks subject to controls over their overall net position in foreign currencies.
5/ Payments subject to verification but without limitation.
6/ Generally free but certain transactions require prior notice and waiting period.
7/ Since the Foreign Exchange and Foreign Trade Control Law became effective in December 1980, capital transactions are in general permitted unless specifically prohibited.

Table 6. Korea: Characteristics of Selected Asian Countries, 1975-85 1/

| Year | Exchange Rate Arrangements | Monetary and Credit Policy Instruments | Capital Controls | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Required Surrender of Export Proceeds | Advanced Import Deposits | Limitations or Advanced Approval on Payments for Invisibles | Limitations on Foreign Currency Deposits by Residents | Prior Approval Required for Foreign Lending or Borrowing by Financial Institution | Tax or Special Reserve Requirement on Foreign Borrowing |
| 1975 | Pegged to U.S. dollar | From 1975 to 1982, authorities relied on reserve ratios, ceilings on interest rates, limits on volume of bank credits, and rules governing allocation of credit. Interest rate ceilings were nonetheless used flexibly. As part of a financial reform in 1982, direct credit controls on lending by individual banks were replaced by indirect control through use of reserve requirements, open market operations, and the rediscount mechanism. Preferential interest rates were eliminated, but credit allocation rules were retained. Regular reserve requirements have been supplemented by monetary stabilization accounts (effectively a marginal reserve requirement). | x 2/ | x | x | 3/ | x | -- |
| 1976 | Pegged to U.S. dollar | | x 2/ | x | x | 3/ | x | -- |
| 1977 | Pegged to U.S. dollar | | x 2/ | -- | x | 3/ | x | -- |
| 1978 | Pegged to U.S. dollar | | x 2/ | -- | x | 3/ | x | -- |
| 1979 | Pegged to U.S. dollar | | x 2/ | -- | x | 4/ | x | -- |
| 1980 | Managed floating | | x 2/ | -- | x | 4/ | x | -- |
| 1981 | Managed floating | | x 2/ | -- | x | 4/ | x | -- |
| 1982 | Managed floating | | x 2/ | -- | x | 4/ | x | -- |
| 1983 | Managed floating | | x 2/ | -- | x | 4/ | x | -- |
| 1984 | Managed floating | | x 2/ | -- | x | 4/ | 5/ | -- |
| 1985 | Managed floating | | x 2/ | -- | x | 4/ | 6/ | -- |

1/ A x (--) denoted the presence (absence) of a particular capital control. A blank indicates an absence of information.
2/ Or deposited in foreign exchange accounts in domestic banks.
3/ Certain residents may hold foreign currency deposits at foreign exchange banks.
4/ All residents may hold foreign currency deposits at foreign exchange banks.
5/ Borrowing above certain minimum amounts require approval.
6/ Subject to ceilings on conversion of foreign borrowing. All outward bound capital requires approval.

Table 7. Malaysia: Characteristics of Selected Asian Countries, 1975-85 1/

| Year | Exchange Rate Arrangements | Monetary and Credit Policy Instruments | Capital Controls | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Required Surrender of Export Proceeds | Advanced Import Deposits | Limitations or Advanced Approval on Payments for Invisibles | Limitations on Foreign Currency Deposits by Residents | Prior Approval Required for Foreign Lending or Borrowing by Financial Institution | Tax or Special Reserve Requirement on Foreign Borrowing |
| 1975 | Pegged to composite | During 1975 and 1976, the authorities instruments included reserve and liquidity ratios, controls on interest rates, and credit allocation rules. Since October 1978, interest rates have been gradually liberalized. During the 1980s, open market operations, foreign exchange swap operations 4/ and the recycling of government deposits became important instruments, but the authorities continue to use reserve and liquidity requirements and credit allocation rules as instruments. | 2/ | -- | 3/ | | | -- |
| 1976 | Pegged to composite | | 2/ | -- | 3/ | | | -- |
| 1977 | Pegged to composite | | 2/ | -- | 3/ | | x | -- |
| 1978 | Pegged to composite | | 2/ | -- | 3/ | | 5/ | -- |
| 1979 | Pegged to composite | | 2/ | -- | 3/ | -- | 5/ | -- |
| 1980 | Pegged to composite | | 2/ | -- | 3/ | -- | 5/ | -- |
| 1981 | Pegged to composite | | 2/ | -- | 3/ | -- | 5/ | -- |
| 1982 | Pegged to composite | | 2/ | -- | 3/ | -- | 6/ | -- |
| 1983 | Pegged to composite | | 2/ | -- | 3/ | -- | 6/ | -- |
| 1984 | Pegged to composite | | 2 | -- | 3/ | -- | 6/ | -- |
| 1985 | Pegged to composite | | 2/ | -- | 3/ | -- | 6/ | -- |

1/ A x (--) denoted the presence (absence) of a particular capital control. A blank indicates an absence of information.
2/ Limited exchange control governing reporting and payments structure.
3/ Few restrictions.
4/ Swap of foreign exchange between central bank and financial institution at current exchange rate accompanied by agreement to unwind the transaction at a more favorable exchange rate for the financial institution at the end of one to three months.
5/ If above certain limits.
6/ Banks could borrow freely, but there was a limit on their net foreign currency position. Nonbanks could borrow freely from abroad sums which were less than M$100,000, but they also faced a limit on their net foreign currency position.

Table 8. New Zealand: Characteristics of Selected Asian Countries, 1975-85 1/

| Year | Exchange Rate Arrangements | Monetary and Credit Policy Instruments | Capital Controls | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Required Surrender of Export Proceeds | Advanced Import Deposits | Limitations or Advanced Approval on Payments for Invisibles | Limitations on Foreign Currency Deposits by Residents | Prior Approval Required for Foreign Lending or Borrowing by Financial Institution | Tax or Special Reserve Requirement on Foreign Borrowing |
| 1975 | Pegged to composite | During the period up to 1984, the authorities' instruments included reserve ratios, government security ratios, rules governing the allocation of expansion of credit and (at times) controls on the expansion of credit. While interest rate controls were relaxed during 1977-80, they were reinstituted during 1981-82. Monetary growth was also limited through market financing of the government deficit. In 1984, all ratio requirements were abolished, open market operations were used more actively, discount policy was tightened, guidelines on credit to private sector were abolished, interest rate ceilings were removed, and capital controls were liberalized. | x | -- | 2/ | x | x | -- |
| 1976 | Pegged to composite | | x | x | 2/ | x | x | -- |
| 1977 | Pegged to composite | | x | x | 2/ | x | x | -- |
| 1978 | Pegged to composite | | x | -- | 2/ | x | x | -- |
| 1979 | Pegged to composite | | x | -- | 2/ | x | x | -- |
| 1980 | Pegged to composite | | x | -- | 2/ | x | x | -- |
| 1981 | Managed floating | | x | -- | 2/ | x | x | -- |
| 1982 | Managed floating | | x | -- | 2/ | x | x | -- |
| 1983 | Managed floating | | -- | -- | 2/ | x | x | -- |
| 1984 | Managed floating | | -- | -- | -- | -- | 3/ | -- |
| 1985 | Independently floating | | -- | -- | -- | -- | -- | -- |

1/ A x (--) denotes the presence (absence) of a particular capital control. A blank indicates an absence of information.
2/ Certain payments required reserve bank approval.
3/ Limitations on borrowing by corporate entities.

Table 9. Singapore: Characteristics of Selected Asian Countries, 1975-85 1/

| Year | Exchange Rate Arrangements | Monetary and Credit Policy Instruments | Capital Controls | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Required Surrender of Export Proceeds | Advanced Import Deposits | Limitations or Advanced Approval on Payments for Invisibles | Limitations on Foreign Currency Deposits by Residents | Prior Approval Required for Foreign Lending or Borrowing by Financial Institution | Tax or Special Reserve Requirement on Foreign Borrowing |
| 1975 | Pegged to composite | Since a government budget surplus (especially for the retirement fund) has acted to reduce base money growth, rediscount operations have been the main domestic source of monetary growth. Balance of payments flows have also been a major source of monetary growth. While there were reserve and liquidity ratios, they tended to be changed infrequently. | 2/ | -- | 3/ | x | | -- |
| 1976 | Pegged to composite | | 2/ | -- | 3/ | x | | -- |
| 1977 | Pegged to composite | | 2/ | -- | 3/ | 2/ | | -- |
| 1978 | Pegged to composite | | -- | -- | -- | -- | -- | -- |
| 1979 | Pegged to composite | | -- | -- | -- | -- | -- | -- |
| 1980 | Pegged to composite | | -- | -- | -- | -- | -- | -- |
| 1981 | Pegged to composite | | -- | -- | -- | -- | -- | -- |
| 1982 | Pegged to composite | | -- | -- | -- | -- | -- | -- |
| 1983 | Pegged to composite | | -- | -- | -- | -- | -- | -- |
| 1984 | Pegged to composite | | -- | -- | -- | -- | -- | -- |
| 1985 | Pegged to composite | | -- | -- | -- | -- | -- | -- |

1/ A x (--) denoted the presence (absence) of a particular capital control. A blank indicates an absence of information.
2/ Above certain minimum amounts.
3/ Above certain maximum amounts.

Table 10. Sri Lanka: Characteristics of Selected Asian Countries, 1975-85 1/

| Year | Exchange Rate Arrangements | Monetary and Credit Policy Instruments | Capital Controls | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Required Surrender of Export Proceeds | Advanced Import Deposits | Limitations or Advanced Approval on Payments for Invisibles | Limitations on Foreign Currency Deposits by Residents | Prior Approval Required for Foreign Lending or Borrowing by Financial Institution | Tax or Special Reserve Requirement on Foreign Borrowing |
| 1975 | Pegged to sterling | Instruments have included interest rate ceilings, limits on access of individual banks to Central Bank credit and credit allocation rules. By 1978, principal instruments were the Bank rate, the amount the Central Bank would finance at that rate, and the penalty rate for further discounts. In June 1984, the Central Bank began auctions of Central Bank securities. | x | -- | x | x | x | -- |
| 1976 | Pegged to a composite | | x | -- | x | x | x | -- |
| 1977 | Independently floating | | x | -- | 2/ | x | x | -- |
| 1978 | Independently floating | | x | -- | 2/ | x | x | -- |
| 1979 | Independently floating | | x | -- | 2/ | x | x | -- |
| 1980 | Independently floating | | x | -- | 2/ | x | x | -- |
| 1981 | Managed floating | | x | -- | 2/ | x | x | -- |
| 1982 | Managed floating | | x | -- | 2/ | x | x | -- |
| 1983 | Managed floating | | x | -- | 2/ | x | x | -- |
| 1984 | Managed floating | | x | -- | 2/ | x | x | -- |
| 1985 | Managed floating | | x | -- | 2/ | x | x | -- |

1/ A x (--) denotes the presence (absence) of a particular capital control. A blank indicates an absence of information.
2/ Certain payments require exchange control permission.

Table 11. Thailand: Characteristics of Selected Asian Countries, 1975-85 1/

| Year | Exchange Rate Arrangements | Monetary and Credit Policy Instruments | Capital Controls | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Required Surrender of Export Proceeds | Advanced Import Deposits | Limitations or Advanced Approval on Payments for Invisibles | Limitations on Foreign Currency Deposits by Residents | Prior Approval Required for Foreign Lending or Borrowing by Financial Institution | Tax or Special Reserve Requirement on Foreign Borrowing |
| 1975 | Other flexible arrangement | Instruments have included ceiling interest rates, reserve and liquidity ratios, rediscount facilities, credit allocation rules, and occasional ceilings on credit expansion by banks. In 1979, a repurchase market for government securities was created. By 1985, unwanted fluctuations in reserve money were principally offset by operations in the government bond market. | x | -- | 2/ | x | x | -- |
| 1976 | Other flexible arrangement | | x | -- | 2/ | x | x | -- |
| 1977 | Other flexible arrangement | | x | -- | 2/ | x | x | -- |
| 1978 | Other flexible arrangement | | x | -- | 2/ | x | x | -- |
| 1979 | Other flexible arrangement | | x | -- | 2/ | x | x | -- |
| 1980 | Other flexible arrangement | | x | -- | 2/ | x | x | -- |
| 1981 | Other flexible arrangement | | x | -- | 2/ | x | x | -- |
| 1982 | Other flexible arrangement | | x | -- | 2/ | x | x | -- |
| 1983 | Other flexible arrangement | | x | -- | 2/ | x | x | -- |
| 1984 | Other flexible arrangement | | x | -- | 2/ | x | 3/ | -- |
| 1985 | Pegged to composite | | x | -- | 2/ | x | 3/ | -- |

1/ A x (--) denoted the presence (absence) of a particular capital control. A blank indicates an absence of information.
2/ Some limitation (e.g., on travel).
3/ A limit existed on financial institutions net foreign currency position.

Table 12. Western Samoa: Characteristics of Selected Asian Countries, 1975-85 1/

| Year | Exchange Rate Arrangements | Monetary and Credit Policy Instruments | Capital Controls | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Required Surrender of Export Proceeds | Advanced Import Deposits | Limitations or Advanced Approval on Payments for Invisibles | Limitations on Foreign Currency Deposits by Residents | Prior Approval Required for Foreign Lending or Borrowing by Financial Institution | Tax or Special Reserve Requirement on Foreign Borrowing |
| 1975 | Managed floating | Instruments have included interest rate ceilings, required reserve ratios, credit allocation rules, and controls over volume of bank lending. | x | 2/ | x | x | x | -- |
| 1976 | Managed floating | | x | 2/ | x | x | x | -- |
| 1977 | Managed floating | | x | 2/ | x | x | x | -- |
| 1978 | Managed floating | | x | 2/ | x | x | x | -- |
| 1979 | Managed floating | | x | 2/ | x | x | x | -- |
| 1980 | Managed floating | | x | 2/ | x | x | x | -- |
| 1981 | Managed floating | | x | 2/ | x | x | x | -- |
| 1982 | Managed floating | | x | -- | x | x | x | -- |
| 1983 | Managed floating | | x | -- | x | x | x | -- |
| 1984 | Managed floating | | x | | x | x | x | -- |
| 1985 | Managed floating | | x | 2/ | x | x | x | -- |

1/ A x (--) denoted the presence (absence) of a particular capital control. A blank indicates an absence of information.
2/ For motor vehicles.0

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