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The Choice of Exchange Rate Regime in Developing Countries: A Survey of the Literature

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I. Introduction

The transformation of the international monetary system since 1971 has provided the governments of member countries with a far wider range of choice with regard to their exchange rate regimes than had previously existed. Before 1971, most member countries of the Fund had a declared par value, with margins of 1 per cent and the obligation to maintain their par value unless a "fundamental disequilibrium" could be shown to have arisen. There were, however, a small number of countries which did not maintain stable par values: some member countries in Latin America experienced rapid rates of domestic inflation necessitating gradual depreciation of their exchange rates vis-à-vis their intervention currency, while both Lebanon and Canada had extensive experience with floating exchange rates. Since 1971, and especially since 1973, a number of different types of exchange arrangement have emerged, which were formally legalized as possible choices in the Second Amendment of the Articles of Agreement on April 1, 1978. Countries could adopt a link to an external standard by pegging to another currency, to the SDR, or to a self-selected basket of currencies. Those countries wishing for greater flexibility could permit "clean" floating, or "managed" floating with various degrees of intervention, or choose a rule for officially controlling the movement in the exchange rate according to objective indicators. Variants of those schemes have also appeared, such as pegging to an undisclosed basket of currencies but with the authorities reserving the right to make occasional shifts in the rate or to operate the scheme within fairly wide margins.

With the emergence of a variety of exchange rate regimes, increasing attention has been given to the rationale for choosing one type of regime over another. With the major industrial countries adopting a system of floating either singly or jointly, a number of the studies have focused on the problem of the developing countries in choosing their regime. It is the purpose of this paper to survey these studies and to suggest directions in which future research might most usefully be pursued.

II. An Overview of Principal Issues

The selection of an exchange rate regime by a developing country in a world of floating among the major convertible currencies is typically viewed as involving a sequence of choices or considerations. In the first instance, the question addressed is whether a developing country can and should let its currency float independently. Floating in this context is generally considered as a "clean" or at least moderately "clean" float, that is, where the exchange rate is primarily the outcome of a market-clearing process for foreign exchange among domestic and foreign residents. With the emphasis on the role of the market in the

determination of the exchange rate, the question then posed by a number of authors is whether conditions exist in developing countries which would allow an independent float. Black (1976) and Branson and Katseli-Papaefstratiou (1981), for example, argue that while the potential benefits of a floating exchange rate are not necessarily limited to industrialized countries, certain characteristics found in many developing countries rule out floating as a feasible or realistic option. Other authors proceed directly to consider whether a fixed or flexible exchange rate regime is preferable, in light of such characteristics as the susceptibility of the economy to internal and external disturbances, the "openness" of the economy, and attitudes towards inflation. Much of this discussion of feasibility and optimality springs directly from the extensive literature on the choice between fixed and flexible exchange rate systems for maintaining internal and external balance, and from the classic studies on optimum currency areas and monetary integration by Mundell (1961), McKinnon (1963), Kenen (1969), and Corden (1972). It is perhaps significant to point out that flexible exchange rates are considered synonymous with floating rates in most of this literature and so is oriented towards countries with financial markets that are well developed internally and integrated internationally. Flexibility, however, does not necessarily imply that the exchange rate is determined by the interaction of market forces without official intervention, i.e., a "free" or "clean" float. The authorities may control or directly determine the exchange rate and have to decide on the form and substance of their exchange rate management policies. It is primarily from this standpoint that this part of the literature is chiefly deemed relevant to the choice of exchange regime by developing countries.

The next stage in the choice of regime proceeds if and when a determination is made on feasibility or on optimality grounds that a floating exchange arrangement is ruled out. The monetary authorities of the developing country must then decide on the link between the national currency and some external standard and the problem to be analyzed is whether a single currency peg or some form of basket peg should be chosen. One approach is to choose a peg in order to reduce or offset as far as possible the impacts or costs of exchange rate variability among foreign currencies on the economy of the developing country, while the level of the exchange rate may be chosen or changed in light of other targets or policy objectives. Another approach is to consider that the choice of peg involves broader policy considerations than those related to short-term currency fluctuations, in particular, that the choice of peg can be used as an instrument to help maintain an appropriate level of the exchange rate, and thus obviate or reduce the need for the monetary authorities to make discretionary changes in the peg.

The sequential approach generally adopted in the choice of regime literature provides a convenient way in which to organize a more detailed consideration of the principal contributions and issues. The following

section discusses the arguments concerning the feasibility of floating and the state of foreign exchange and financial markets in developing countries. Section IV examines how some of the ideas and criteria advanced in the literature on optimum currency areas have been considered applicable to the problem of how a developing country should choose its exchange rate regime. Particular attention is paid to the issue of monetary independence, and the fact that countries with significant differences in inflation rates cannot maintain fixed exchange rates but must instead adopt some form of flexible exchange rate regime. Section V considers additional arguments concerning exchange rate flexibility and the link to exchange rate management policies. Section VI concerns the choice of peg, and empirical studies on the choice of regime are the subject of Section VII. The paper concludes with some suggestions on the most promising areas for future research.

III. Floating: Exchange Market Structure and Domestic Financial Markets

One major factor stressed as preventing or militating against a policy of floating for a developing country is the inadequate development of domestic financial markets and their lack of integration with world markets. Black (1976) and Branson and Katseli-Papaefstratiou (1981, hereafter abbreviated to B-K), for example, cite as a feasibility condition for floating the existence of asset markets integrated into the international system. In the latter analysis, there are in fact two conditions; first, that domestic financial markets of some minimum depth exist, and second, that domestic and foreign currency assets are substitutes in the private portfolios of wealth holders. B-K argue that if these conditions are satisfied, then in the short run the exchange rate will be determined by equilibrium conditions in financial markets, and the stability of the exchange rate will depend on the overall stability of these markets. Countries with integrated financial asset markets can expect a floating rate to be stable in the short run. This is an application of the asset-market approach to exchange rate determination, in which the exchange rate in the short run is explained primarily in terms of the relative demands for and supplies of domestic and foreign financial assets.

In terms of the flow market for foreign exchange, the asset-market approach emphasizes the importance of capital account transactions resulting from asset holders adjusting or attempting to adjust, their portfolios in response to factors affecting the desired stocks of domestic and foreign currency assets. B-K argue that if asset markets in a developing country are not integrated with international markets, then the exchange rate will be determined by current account flows, that is, by demand and supply of foreign exchange emanating from the goods market. The short-run stability of the foreign exchange market will, therefore, depend on the satisfaction

of the Marshall-Lerner conditions on trade elasticities. The feasibility problem, as put forward by B-K, is that countries having any degree of market power would be unlikely on theoretical grounds to satisfy these conditions in the shortest of runs. They also point to empirical evidence from trade models that suggests the absence or low values of contemporaneous price terms. More generally, it is argued that prices for traded goods may change gradually and that lags operate in the adjustment of trade and service account flows to relative price changes. In the period immediately following an exchange rate change, the terms of trade may move against a country whose currency has depreciated and may offset any short-run effect on trade volumes of the exchange rate change, i.e., the so-called J-curve effect.

The issue of exchange market stability and speculative capital flows in the presence of lags in price and quantity adjustment has been examined more closely by Driskill and McCafferty (1980). 1/ The assumption made in their model is that the volume of trade in any given market period depends on prior expectations held about the exchange rate, embodying the idea that lags occur in the adjustment of trade volumes to their desired levels. An unanticipated change in the exchange rate arising from a random disturbance in the trade balance may have no impact on current trade volumes and a possibly perverse influence on the trade balance due to price effects, i.e., via the terms of trade. Speculators are assumed to have a stock demand for net foreign assets that is sensitive to expected capital gains, and thus desired changes in the stock arise from changes in the expected appreciation or depreciation of the exchange rate. Walrasian or short-run instability of the foreign exchange market may arise when there is insufficient speculative demand. Using a rational expectations framework, Driskill and McCafferty show that stability is more likely, the lower is the degree of risk aversion by speculators relative to the variance of the stochastic disturbance and the higher the response of trade volumes to anticipated exchange rate changes. The conclusion reached is that some minimum level of responsiveness of short-term capital flows to expected relative asset yields is needed for Walrasian and dynamic stability in a foreign exchange market otherwise rendered unstable by J-curve effects. 2/ This model can be used to illustrate the central point made by B-K, which is that if financial market separation prevents the possibility of speculative capital flows, then in the short run the floating rate will be unstable. The central bank will have to intervene and make the market for foreign exchange, thereby eliminating free floating as a feasible regime.

1/ Earlier theoretical contributions on this subject are Britton (1970) Williamson (1973), and Niehans (1975).

2/ It should be noted that Walrasian and dynamic stability do not necessarily imply that the exchange rate will necessarily be stable in the common sense meaning of not moving up and down considerably over time.

A potential weakness of the feasibility argument considered by B-K is that developing countries that are strictly price-takers for their imports and exports could satisfy the Marshall-Lerner conditions. 1/ B-K suggest, other things being equal, that these countries could float even without integrated asset markets. A network of foreign exchange traders or dealers could conceivably hold transactions or working balances in foreign exchange, 2/ perform the important function of clearing international payments for goods and services, and effectively make a market for foreign exchange which would display intra-period and dynamic stability. In response to disturbances over time, the exchange rate would move so as to keep the trade balance close to zero with only transitory changes in the private sector's (i.e., foreign exchange dealers') holdings of transactions balances. The problem for such countries, B-K argue, is that floating may not be feasible on other grounds, namely that they are typically highly "open" economies in terms of the structure of their trade and production. A floating exchange rate would be volatile and would undermine the domestic currency, an argument from the literature on optimium currency areas which will be considered further below in Section IV.

Another important limitation to the main thrust of the argument as a guide to policy choice is the implicit conclusion that a fairly clear-cut distinction can be drawn between countries whose financial markets are internationally integrated from those whose are not. If it is determined that most developing countries fall into the second category, then it is fairly clear on this criterion that the policy choice is what to peg to and how to adjust the peg. If, on the other hand, attention is focused on the degree of financial integration, then policy choice in a number of cases becomes less of a dichotomy, and more one of the appropriate amount and kind of exchange rate management.

Black (1976) examines more extensively the characteristics of developing countries' exchange and financial markets in comparison with those present in industrialized countries. The features of an advanced financial system emphasized by Black are the presence of institutions that efficiently and competitively intermediate the demands and supplies of various financial assets on behalf of the residents of the countries concerned. The intermediaries and other agents deal in short-term government and/or private paper, bank deposits, currency, bank loans, and spot and forward foreign exchange. There is, in sum, a highly developed

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1/ That is countries which have non-zero short-run export supply and import demand price elasticities. It should be noted that the Marshall-Lerner condition is satisfied in the Driskill and McCafferty model but only with a lag for unanticipated disturbances.

2/ Assuming that international transactions are conducted in foreign media of exchange.

market for short-term financial capital, the efficiency and depth of which permit rapid portfolio adjustment and arbitrage in financial assets so that a portfolio-balance model again provides an appropriate framework for analyzing the short-run determination of interest and exchange rates.

The exchange and financial markets of developing countries, Black argues, typically do not have similar breadth and depth or such range of institutional development. Forward exchange facilities are often absent, and markets for common stocks, securities, and bills are often poorly developed, thin, or nonexistent. The predominant source of financial intermediation is the banking system offering a small range of financial instruments and whose size and structure is limited relative to that found in developed financial systems.

In a number of developing countries there may indeed be insufficient participation to ensure the effective functioning of competitive markets for foreign exchange and for domestic financial assets and liabilities. Import and export transactions may be concentrated in relatively few hands, the bulk of foreign capital flows are often public, and economies of scale may limit the number of domestic financial intermediaries which can also act as dealers in the foreign exchange market. This type of situation is often found in small island states and in certain African countries, where the market structure of financial intermediation tends to be concentrated and would not provide for effective competition in determining interest rates or the exchange rate. Under such circumstances, allowing the exchange rate to be determined by market forces is not a realistic option and it is appropriate that the authorities directly manage the exchange rate by setting the price (often including margins for intermediaries) at which foreign transactions are to take place and around which intervention policies can be organized.

Relatively low levels of financial and associated institutional development are, however, often found in conjunction with restrictions on current and capital account transactions and controls on the yields from available financial instruments. Black argues that the successful introduction of a floating rate regime would require in many developing countries a substantial commitment of real resources to the development of adequate exchange and financial markets, and a willingness by the authorities to eschew exchange and payments restrictions and devices used to intervene in domestic financial markets. The development, for example, of an active forward market in foreign exchange depends heavily on allowing free movement of short-term capital. 1/ As Crockett and Nsouli (1976) have also pointed out, there is likely to be an important relationship between policies adopted by a particular country and the ability and willingness of the nongovernment sector to commit resources towards the development of well functioning

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1/ See McKinnon (1979).

foreign exchange and financial markets. Lack of institutional structure and efficient intermediation may be less the result of particular characteristics (e.g., a low level of overall economic development, small scale of markets, high transaction and information costs) than of government controls and restrictions.

An attempt, therefore, can be made to distinguish between economic factors that may favor a particular type of exchange arrangement and institutional features that may result from the types of policy followed by the authorities. It is sufficient to remark here that in a number of developing countries, attempts to directly control prices and quantities in the economy are prevalent, and are particularly manifest in foreign exchange and financial transactions. Freedom to make and receive current payments is often curtailed by import quotas and restrictions on access to foreign exchange; inward and outward capital movements are controlled; and governments attempt to centralize foreign exchange transactions in the central bank or use the commercial banks as heavily regulated agents to enforce the exchange control and payments regime. The monetary authorities determine the exchange rate or rates at which various transactions are officially to take place and at which foreign exchange will be made available to transactors deemed eligible. In the domestic financial markets, banks' deposit and loan rates are often fixed and subject to ceilings that are low relative to the inflation rate and are combined with selective credit controls. Government budget deficits are frequently financed through direct borrowing from the central bank and/or by the sale of bills and securities at pegged interest rates to captive intermediaries and institutions. The extent to which these features are found in developing countries clearly varies widely, but in such a policy environment it is not surprising that the development of organized foreign exchange and financial markets is retarded and that such markets remain rudimentary in comparison with those found in industrialized countries.

It cannot be implied that in any particular developing country well-organized markets for foreign exchange and various financial instruments would emerge rapidly if only governments would lift restrictions and controls. The point to be made is that government policies can often over time influence the development of foreign exchange and other financial markets, and the extent to which such markets are separated from international money and capital markets due to barriers to international trade in financial assets. Whether, therefore, underdevelopment of exchange markets and separation of financial markets per se are legitimate arguments against floating would seem to depend not only on the existing state of such markets but also on their potential to become broader, more developed, and better integrated within a favorable policy environment.

McKinnon (1979), for example, considers that in order for a competitive and unified foreign exchange market to emerge, substantial freedom must be afforded non-bank residents to make and receive payments

on current account, and the financial institutions must be in a position to efficiently intermediate these demands and supplies. In a number of developing countries, particularly in Latin America and Asia, restrictions and controls on current transactions have been much reduced in scope or effectively eliminated. Financial reforms have been undertaken which have stimulated competition between, and development of, the financial intermediaries. At the same time, domestic financial markets have been opened up to international influences through the partial relaxation of controls and other restrictions on trade in financial assets. These types of policy changes can be expected to yield significant benefits in the form of improved resource allocation and are, in most instances, complementary. 1/ Elimination of quantitative controls and exchange restrictions on current account transactions (including associated trade financing), for example, will usually require for the efficiency of the payments-clearing process that greater freedom be given to the financial intermediaries to engage in domestic interbank foreign exchange transactions, to hold foreign exchange assets, and to negotiate lines of credit and other such facilities with foreign banks. And if financial institutions are to be permitted increased freedom to undertake such activity and to broaden the scope of both domestic and international intermediation, liberalization of the domestic interest rate structure and regulatory system is required.

With interest rate reforms and current account liberalization, non-bank residents may also gain more direct access to international short-term capital markets through open account financing and other trade-related instruments. In most cases, some degree of market segmentation is likely to continue. Some parts of the domestic financial markets may remain controlled or subject to different reserve or liquidity requirements, and the link between foreign and domestic financial markets circumscribed by the regulations and restrictions related to the acquisition of foreign assets and the incurring of foreign debt. 2/ Nevertheless, there is likely to be sufficient freedom in the trade and payments regime and depth of participation and institutional development that the monetary authorities no longer perform the key intermediary role in the payments clearing process. Floating may well constitute, therefore, a feasible exchange rate regime for a number of developing countries; some of these countries with relatively advanced financial systems have, in fact, experienced periods in which the exchange rate has floated.

1/ The period of transition, however, may be far from smooth and present significant problems for macroeconomic management. For an analysis of the dynamics of these types of policies, see Khan and Zahler (1982).

2/ It is worth noting that few industrialized countries have completely eliminated controls over exchange and capital transactions between domestic and foreign residents.

One further point that links the issue of controls and the feasibility of floating should be considered. A number of developing countries have found that if the domestic financial system remains repressed, continuing incentives are provided to residents to evade controls through illegal transactions at official exchange rates and/or through the operations of an unofficial parallel market for foreign exchange. Through such means, domestic residents can often acquire outside the official financial system significant stocks of foreign exchange as substitutes for domestic currency assets. In black markets, the exchange rate is, of course, floating, and the existence of such markets indicates that some form of official floating rate may well be possible, even if restricted to certain transactions as in a dual market system. Such a step would help draw foreign exchange resources held outside the official financial system into the open and pave the way for the development of a unified market for foreign exchange.

IV. Choice of Exchange Rate Regime and Optimum Currency Areas

Systematic attempts to define the characteristics of areas for which it is optimal to have a single currency regime began with the classic article by Mundell (1961), who suggests the extent of factor mobility as the principal criterion determining the domain of the optimum currency area (OCA). McKinnon (1963) advances the criterion of the openess of the economy, while Kenen (1969) argues that product diversification in trade should be considered a major determinant of whether a country should opt to form an independent currency area or not. Other contributions to the literature suggest additional criteria such as the similarity of inflation rates and the degree of policy coordination between potential members of a currency area. Surveys of the OCA literature by Ishiyama (1975) and Tower and Willet (1976) present the various issues and considerations that have been advanced to determine whether a particular country should or should not join with others to form a common currency area.

OCA theory sets out to address the question of which areas or countries should adopt genuinely fixed exchange rates among themselves, allowing variability of their exchange rate vis-à-vis other currency blocs. When exchange rates between major currencies are floating, a peg by a developing country to one of the foreign currencies results in what can be considered a currency area; the OCA literature would appear, therefore, to be of immediate relevance to the choice of regime. It is necessary to point out, however, that by and large the theoretical analysis surveyed by Ishiyama and by Tower and Willet confines itself to the major factors determining whether it is desirable for two countries or areas to join together in a currency area. The focus is almost exclusively on intra-area relationships, either assuming stability (including exchange rate stability) in the rest of the world or leaving the interaction between members of the potential currency area and other currency blocs outside the scope of the analysis.

Heller (1978) and Bird (1979), for example, invoke OCA considerations as relevant to the decision of a developing country whether or not to adopt a fixed link between the domestic currency and an external standard, where the link is either in the form of a single currency peg or a peg to a basket of currencies. From the point of view of OCAs, however, it clearly makes a difference what form the peg takes. While a peg to a single foreign currency gives rise to a form of currency area where the exchange rates of the currencies concerned float jointly against other foreign currencies, the adoption of a basket peg in general will not. With the latter, the value of the domestic currency floats against the major currencies, and rather than reflecting acceptance of OCA arguments in favor of a link to a single currency, such a decision may be interpreted as their rejection. 1/

Perhaps the most frequent reference to the OCA literature in discussions of exchange regimes for developing countries is the argument that such countries, characterized by small open economies, must or should peg in order to secure the monetary value of their currencies. The OCA literature, Mundell (1961) for example, stresses the benefits of currency area formation in terms of the impact on the usefulness of money. The essence of the case for a full currency union is the extension to economic relations between two countries of the real resource savings yielded by the use of a single money as the medium of exchange, unit of account, and a store of value. McKinnon (1963) argues that if a small open economy issues its own currency and allows its value to float against the currency of its larger trading partner, the likely amplitude of fluctuations in the exchange rate would tend to undermine the domestic currency in performing its monetary functions and would encourage agents in the economy to substitute foreign currency for the domestic currency. In such an economy, which is highly open in terms of the ratio of tradables to nontradables output, the variability of a floating exchange rate would result in corresponding fluctuations in the domestic currency price of tradables. With monetary policy perhaps capable only of affecting the price of nontradable output, the result would be considerable variability in both the price level and relative prices. This would not only make the real rate of return on domestic currency holdings uncertain compared with that of the foreign currency but would also make the latter preferable as the numeraire in domestic accounts and contractual obligations.

It is through a broad appeal to the arguments of openness and currency substitution that B-K (1981) and Connolly (1982) consider that floating may not be a feasible exchange rate regime for many developing countries. A floating rate would undermine the local currency, and domestic residents would want contracts effectively denominated in terms of a foreign currency; thus, apart from legal requirements, there would be no basis for the demand for local currency. As openness increases, the more likely is it that a floating rate would lead to the erosion of the demand for local currency.

1/ See Ishiyama (1975).

In assessing the importance of these arguments, there are a number of considerations to take into account. The original argument of McKinnon largely abstracts from differences in inflation rates and concentrates on the instability of the domestic price of traded goods due to exchange rate fluctuations. Corden (1972) notes that in order to sustain McKinnon's argument, it is necessary to assume that the foreign price index for tradable goods is stable, and that a floating rate would display a high degree of variability even if other currencies in the system are supplied in a stable fashion. The latter possibility may, however, be associated with other characteristics found in conjunction with openness in developing countries, such as the dependence on particular primary product exports subject to price cycles or the incidence of real domestic supply shocks. Nevertheless, the argument for a peg is that the domestic price level and relative prices will be more stable than they would be under a floating exchange rate. The variance in the real rate of return on domestic currency holdings would be similar to that on foreign currencies under a peg, and the stability of relative prices and the price level would secure the continued use of the domestic currency.

On a theoretical level, however, there are unresolved issues about the conditions under which direct displacement of one national currency by another is likely to occur. 1/ Most models of currency substitution, for example, do not explicitly treat the service benefits of the national currency in internal transactions, and thus it is difficult to explain satisfactorily why the domestic currency generally remains the accepted medium of exchange and unit of account within a country's borders despite often significant variability in the real rate of return on domestic currency when compared with that on some foreign currencies. Nevertheless, it is not uncommon to find that residents in some developing countries do hold significant stocks of foreign currency, that the prices of some goods are quoted in foreign currency terms, and that foreign currencies are also used in internal transactions. The problem appears most serious in developing countries where inflation rates are high and variable and where the exchange rate changes frequently, and there is uncertainty about future government policy and exchange rate movements. A compounding factor is when nominal yields on less liquid assets are repressed, in which case foreign currency and other assets denominated in foreign currency terms can substitute for interest-bearing domestic stores of value as well as transaction balances. 2/

Thus, while there may be reservations about whether the arguments of openness and currency substitution will make floating an infeasible exchange rate regime, the considerations just cited do raise important questions as to difficulties the authorities in a developing country may face in

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1/ See, for example, Girton and Roper (1981).
2/ See Tanzi and Blejer (1981).

managing domestic currency and monetary policies under a flexible exchange rate. The issue is related to the constraints on macro-economic policy cited in the OCA literature implicit in the choice between floating and pegging. The maintenance of an unchanged peg over time between the currency of a developing country and a foreign currency or basket of currencies implies that domestic authorities import on a secular basis the monetary policy or policies of the standard to which the domestic currency is pegged, and, in absence of recourse to restrictions, control of the domestic money supply may be largely subordinated to the balance of payments constraint.

In the fixed vs. flexible exchange rate and related literature prior to the Bretton Woods breakdown, it was argued that the chief long-run benefit of a floating rate was the ability to achieve monetary independence, that is the ability to choose the inflation rate independently. 1/ The pursuit of a domestic monetary policy, for example, that yielded a lower secular rate of inflation than that prevailing in the rest of the world would allow the country in question to have a more efficient medium of exchange and unit of account, thereby achieving a better intertemporal allocation of resources. More important, however, is the argument that a country would have the freedom to choose an optimum point on its Phillips curve. It has been argued, however, that this freedom might be more limited, the smaller and more open the economy is. 2/ This question is related to the more general issue of whether persistent money illusion is likely to exist, and thus whether it is possible in the long-run to lower the path of real wages by adopting a higher rate of inflation. The prevailing view now seems to be that if policy makers cannot be sure of the nature and extent of the long-run trade-offs ,then they are not in a good position to exploit the putative benefits of monetary autonomy.

One reason that a developing country might still seek to inflate at a faster rate than that ruling in the rest of the world would be in order to increase the yield of the tax on money balances (i.e., a different rate of seignorage than that chosen by trading partners or the rest of the world.) Nevertheless, the currency substitution literature suggests the potential difficulties of attempts to over-utilize this source of taxation 3/ and of the welfare costs to the economy of high inflation rates, even if inflation is fully anticipated. Expectations about future inflation rates, however, are not likely to be held with certainty; this factor, in turn, may cause undesirable shifts in resource allocation and income distribution, difficulties in establishing indexing schemes and procedures, and impose other costs on the economy. The potential resource costs are therefore significant, while the long-term benefits of a high inflation rate may be considered uncertain or illusory.

1/ See, for example, Johnson (1972).
2/ See Tower and Willet (1976).
3/ See Khan and Ramirez-Rojas (1984).

Finally, and most importantly, there are the not inconsiderable risks of inflation getting out of control, particularly in view of the difficulties of bringing down wage and price increases once inflationary expectations become embedded in the economy. For a number of developing countries, the constraints on internal policies implicit in the maintenance of a fixed link to an external standard may not be unwelcome, providing a framework within which to organize consistent monetary, fiscal, and demand management policies. Thus it may well be easier to define policies in terms of keeping wages, prices, and the level of economic activity consistent with the fixed link to an external standard than to set up independent policy objectives. It can, however, be argued that if the average externally given inflation rate is significantly positive and variable, a domestic target for a lower and more stable inflation rate is likely to be regarded as a legitimate objective of policy.

The incidence of and attitude towards the benefits and costs of different inflation rates does vary across countries, not least in the developing countries. For those developing countries that wish to pursue or, in the case of certain countries (e.g., in Latin America), seem forced to accept inflation rates substantially different from the world norm, an exchange rate regime offering nominal exchange rate flexibility should and must be chosen. While in much of the fixed vs. flexible rate literature it was implicitly assumed that the required degree of nominal flexibility would be achieved by letting the exchange rate float, a number of high-inflation developing countries have introduced various forms of exchange rate, interest rate and wage indexation to cope with the external and internal consequences of high domestic inflation rates. Crawling pegs or gliding parities, which are qualitatively different forms of exchange rate regime from a fixed (or occasionally adjustable) peg or a float, could be used for inflation targeting or to offset the external consequences of a high domestic inflation rate; discussion of such regimes forms part of a distinct subset of literature on the choice of regime of particular relevance to developing countries. To this and other aspects of the flexibility of exchange rates, particularly those related to stabilization and adjustment policies, we now turn.

V. Exchange Rate Flexibility and Developing Countries

While there are generally well-recognized difficulties associated with considering floating exchange rates for many developing countries, floating is not the only form of exchange rate flexibility that can be envisaged. Two questions therefore arise: first, whether in response to various shocks and disturbances facing developing countries, flexibility in the exchange rate (as opposed to a fixed link to an external standard) provides some degree of insulation, assists in economic stabilization,

and facilitates adjustment; and second, if it does, how the appropriate degree and timing of flexibility are to be achieved. In particular, the latter question concerns the role that might be played by a crawling peg regime.

There is, of course, an extensive literature on the source of disturbances and insulation under fixed and flexible exchange rates, and on the factors affecting the process and ease of adjustment under different exchange rate regimes. 1/ And it has been widely recognized that the size and nature of the shocks which an open economy faces may be important determinants of the optimal degree of exchange rate flexibility. 2/ Attention in recent years has, however, tended to focus on the developed industrialized economies, extending the work of Mundell and Fleming and using models characterized by well-developed and integrated financial capital markets. For many developing countries the appropriateness of this framework comes into question. The departure point for a number of contributions considered here concerning the issue of exchange rate flexibility is to abstract from arbitrage in financial assets and from net private capital flows.

A strong restatement of arguments in favor of exchange rate flexibility in response to certain disturbances is made by Flanders and Helpman (F-H 1978). They consider exchange rate policy for an economy that is a price-taker for tradable goods but that also produces nontradable goods. Commodity arbitrage is assumed to be perfect, thereby permitting price and exchange rate aggregation across foreign countries, and the only financial asset explicitly treated in the model is the local money, which is not traded internationally. The country faces external disturbances in the form of shifts or fluctuations in the world price of tradables and internal relative demand shocks caused by a switch or fluctuations in preference between tradable and nontradable goods. With the exchange rate floating, the authorities determine the money supply and the exchange rate moves perfectly to maintain external balance; under a fixed exchange rate, external balance is maintained by the authorities implementing a well-organized policy that equates the money supply to money demand at each point in time. 3/ The latter assumption implies that there is an adjustment to a real domestic supply shock (for example), either under a flexible exchange rate or a fixed exchange rate. 4/ If, in the F-H model,

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1/ A review of major issues is presented in Artus and Young (1979).

2/ An early analysis of the optimum foreign exchange market in terms of the structural characteristics of the economy can be found in Stein (1963).

3/ i.e., the domestic component of the monetary base is adjusted perfectly to changes in the demand for base money.

4/ This is called by F-H a "pure" comparison of exchange rate regimes. If reserves change under a fixed exchange rate regime this constitutes a movement of capital and a departure from external balance whereas under a flexible rate there are by assumption no capital flows and the current account balance is zero.

wages and the price of nontradable goods are flexible, full employment is maintained and there is nothing to choose between the two regimes in response to shocks, except that in the case of fluctuations in world prices a flexible exchange rate will result in greater price stability, thereby enhancing the "moneyness" of the domestic currency. 1/

The case for exchange rate flexibility rests on the familiar argument of the downward inflexibility in domestic wages and the price of nontradables. F-H show that for a foreign price shock, flexibility in the exchange rate ensures full employment in their model. For a fall in the foreign currency price of tradables, the impact on the domestic price of tradables and relative prices (and hence price-cost relationships in the two sectors) is offset by a change in the exchange rate; exchange rate flexibility counters the rigidity in the domestic price of nontradables, thereby permitting the equilibrium relative price ratio and full employment to be maintained. Under a fixed exchange rate, however, a downward foreign price shock results in a fall in the domestic price of tradables and conflict between internal and external balance. If monetary policy is consistent with external balance, unemployment will result; full employment may only be attainable at the cost of a balance of payments deficit (which is not sustainable) or of implementing particular types of government expenditure or tax-subsidy policies. In the case where domestic relative demand disturbances take place, the results depend on whether preferences shift in favor or against nontradable goods. The general proposition advanced is, however, that domestic monetary policy can be so adjusted in the model under a flexible exchange rate so as to attain full employment; a flexible exchange rate is always as good as, or better than a fixed exchange rate in the presence of downward price and wage rigidities. 1/

While F-H concentrate on the effects of particular types of shocks on the levels of output and employment, Black (1976) emphasizes the stability of domestic relative prices and the production and consumption structure. The economy remains on its production possibility frontier, though possibly with underemployment and inefficient use of resources. At the initial relative price ratio, the economy is in internal and external balance, i.e., the markets for nontradables and tradables are both in equilibrium. Optimal exchange rate policy depends on the type and nature of the shocks that the developing country faces. The impact of a fall in the world price of tradables decreases the domestic price of tradables with a fixed exchange rate and leads to a departure of relative

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1/ A counter-example, therefore, to the argument that a floating rate undermines the local currency (p. 10 above).

2/ This result would seem to be critically dependent on the assumption that price changes in the model are strictly temporary, thereby permitting expected inflation to be ignored.

prices from the initial equilibrium ratio and to money market disequilibrium. The impact effects and the resulting process of internal and external adjustment can be avoided, if as foreign prices fall, the exchange rate changes to offset the fall. For transitory domestic supply shocks, Black considers that the optimal policy is to peg the exchange rate through reserve use and/or foreign official borrowing, thus providing some insulation to the domestic economy. This degree of insulation would reduce the incidence of domestic relative price movements and resource shifts when compared to those that would be required if the exchange rate were flexible. 1/

Whereas F-H and Black are interested in the effects of certain shocks on domestic relative price stability and internal and external balance, Lipschitz (1978) is primarily concerned with internal balance in terms of the stabilization of real absorption in a one good model. For the economy in question, output is exogenously determined but is subject to domestic supply shocks, considered of particular importance for primary producing developing countries; the economy also faces domestic money demand shocks. The authorities' objective is to stabilize real absorption, a function of the level of real output and the excess supply of real money balances. There is no international trade in financial assets (except by the authorities) and under a fixed exchange rate changes in the foreign component of the monetary base reflect the output-absorption gap. Lipschitz finds that for a domestic supply (output) shock, fixing the exchange rate is superior for stabilizing absorption, since with a flexible rate absorption will be constrained to output. The reason for this superiority is clear; with a fall in real output, absorption can only be prevented from falling similarly if real resources are forthcoming from abroad, and in the model this is done by running a balance of payments deficit financed by the monetary authorities' dishoarding or borrowing at the fixed exchange rate. 2/ On the other hand, a money demand shock will have no effect on absorption with a flexible exchange rate, but under a fixed rate will cause a departure from internal and external balance, unless the authorities have perfect foresight and can appropriately manipulate the domestic component of the monetary base. In a dynamic extension of the

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1/ Black also considers the implications of different exchange rate regimes for domestic price behavior when the shocks come from terms of trade shifts but the results are not clearcut.

2/ The authorities follow a passive monetary policy i.e., they follow "gold standard" rules and do not change the domestic component of the monetary base. If, however, they followed the monetary policy of the Flanders and Helpman variety, absorption under a fixed rate would be constrained to the reduction in output. Alternatively, they might attempt to sterilize the effect of the shock on the monetary base, considered by Lipschitz as pursuing 'active' monetary policy.

model, where, for example, reserve movements in one period must subsequently be reversed, the prescriptions hold with respect to reducing the variance of absorption over time. The conclusion reached is that optimal exchange rate policy should depend on the type of transitory disturbances likely to be encountered by the particular developing country.

In principle, strong conclusions about exchange rate flexibility emerge from these types of simple abstract models, but considerable caution must be exercised in drawing similarly strong policy implications about the choice of exchange rate regime. In F-H, for example, the bases for comparison are the polar cases of a "pure" floating exchange rate and a permanently pegged rate. The objection to the latter is more that with price and wage rigidities the policies required to achieve external balance in the face of certain types of shocks may be too costly in terms of domestic output and employment. 1/ The model also restricts itself to potential conflicts between internal and external balance under a fixed exchange rate if policies are directed towards the latter target. External balance (i.e., the current account balance) is generally regarded as a medium-run rather than a short-run objective, so that the analytical framework does not consider the circumstances under which it may be optimal to depart from short-run external balance in response to certain shocks or cyclical disturbances through the use of reserves or official borrowing.

It is these latter considerations that are central to the conclusions reached by Lipschitz. In his model, optimal exchange rate policy, when shocks are readily identifiable, is to allow the exchange rate to correct for domestic money demand shocks but not for temporary supply disturbances. The impact of transitory domestic supply shocks on the economy should be cushioned at a pegged exchange rate by reserve use and/or official borrowing to finance the temporary current account imbalances. In addition, there may be the possibility, if sufficient resources are available, of reducing the impact of reserve movements on the monetary base through sterilized intervention, thus further cushioning the real impact of the shock.

Domestic supply shocks are of particular concern to a number of developing countries producing exportable or importable primary agricultural products subject to variable harvest conditions, disease, etc. In addition, many primary product markets are subject to periodic price shocks and to cyclical movements in export prices due in large measure to output fluctuations in the rest of the world. Because of lack of diversification in the composition of exports and in production patterns, such disturbances significantly affect the amount of real absorption that given levels of real

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1/ The reasoning, therefore, is the same as that used to argue that parity changes (as in an "adjustable" peg) can play an important role in the process of adjustment by reducing output losses and unemployment.

output can finance. Assistance to such economies to finance temporary balance of payments deficits and to help the authorities in their efforts to stabilize real expenditure relative to real output over time is, after all, the rationale for the EEC's Stabex scheme, the Fund's export-shortfall and cereals facilities, and other forms of compensatory financing extended to developing countries that have limited access to international capital markets.

The conclusions relating to domestic monetary disturbances are subject to greater qualification in the Lipschitz model. All goods are tradable and the focus of attention is only on real absorption; exchange rate flexibility costlessly eliminates disequilibrium in the money market and constrains absorption to output. There is no relative price structure to be altered, output is exogenously determined, and there is no particular importance attached to the price level or the exchange rate; the necessary changes in the price level required to eliminate monetary disequilibria are achieved immediately and without any real effects via the exchange rate. As pointed out by Lipschitz, there is no room in his simple model to analyze the interaction between various types of shocks, relative prices, and exchange rates. This, he suggests, might weaken the case put forward for exchange rate flexibility in response to domestic monetary disturbances. In Black's model, on the other hand, monetary or price disturbances at home and abroad manifest themselves in domestic relative price changes at a fixed exchange rate, and it is the undesirability of these relative price changes in terms of internal and external balance which recommends exchange rate flexibility.

The conclusion that has generally been drawn from these and other simple theoretical models is that the optimum exchange rate regime in the face of various types of disturbances may be an intermediate one between fixed and fully flexible exchange rates. 1/ The policy problem is to determine the appropriate degree and type of exchange rate management consistent with the amount and kind of information available and with the financial and administrative abilities of the authorities in the developing country concerned. It is important in this respect to take into account the institutional features and development of the foreign exchange market, and the fact that these elements also influence demands made on the skills of the monetary authorities concerned.

In developing countries where foreign exchange markets are not well developed, the monetary authorities set and announce the exchange rate at which transactions are to take place and at which they will buy and sell foreign exchange to the financial intermediaries. The monetary authorities directly determine the value of the domestic currency vis-à-vis the intervention currency by adopting a price-setting rule or convention. The issue of flexibility for policy makers in many developing countries concerns

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1/ This conclusion is put forward by Frenkel and Aizenman (1981).

the content and form of this price-setting rule. With an adjustable peg, the price-setting rule applied is relatively straightforward; the exchange rate of the domestic currency is kept constant against a single foreign currency or average of foreign currencies. Departures from the rule (i.e., a change in the level of the rate against the chosen standard) may be made occasionally and in a discrete or step fashion in response to signals or cumulative evidence that adjustment in the underlying current account position is required. An alternative is to include in the price-setting rule more continuous reference to some set of variables or indicators, as in, for example, a form of crawling peg or gliding parity exchange rate regime.

As Williamson (1981) indicates, most of the original proposals for the operation of a crawling peg concern the use of such an exchange rate regime to facilitate payments adjustment among the industrialized countries; while in practice, such regimes have primarily been used by a relatively small number of developing countries with atypically high inflation rates in order to neutralize the effects of domestic inflation on their external accounts. Although there have seldom been explicitly stated rules for the crawls, the most accurate description is that the authorities in these countries have principally managed the domestic price of foreign exchange on the basis of a relative purchasing power parity calculation. Both foreign and domestic price performance are taken into account in making frequent and small adjustments in the exchange rate. 1/

The management of exchange rate policy as noted earlier in this paper should also be related in part to the inflation objective or "target" of the authorities; if this "target" is in excess of inflation rates prevailing elsewhere, the exchange rate should be depreciated to offset the inflation differential. For countries with such inflation preferences or propensities, large devaluations or jumps in the exchange rate at infrequent intervals as in an adjustable peg arrangement do not prevent the exchange rate from moving out of alignment in the interim (with attendant repercussions on the competitiveness and performance of the traded goods sectors), may add to the uncertainty surrounding prospective economic developments, and generally lead to highly disruptive speculative fluctuations in the supply of and demand for foreign currency. Even in countries where there are strict exchange controls, such speculative disturbances can be sizable and are likely to increase in importance as the domestic financial system becomes more developed. 2/ In contrast, a crawling peg arrangement, by adjusting the exchange rate frequently and in small steps, can avoid many of the disadvantages inherent in large and abrupt devaluations.

1/ Blejer and Leiderman (1981), for example, examine the implementation of the crawling peg in Brazil.

2/ The case of Israel is analyzed by Bruno and Sussman (1979).

The adoption of some form of crawling peg need not necessarily be restricted to those developing countries where economic policies result in inflation rates that are exceptionally high by international standards. Developing countries following conservative monetary policies could affect a gradual appreciation of the domestic currency via a crawling peg based on an assessment of underlying price and cost trends. In any event, the authorities would be applying some form of relative PPP rule or convention in the management of exchange rate policy, thereby avoiding trend movements away from an initial value of some real exchange rate indicator. It should be noted, however, that, as in the case of countries with high inflation rates, it is the differences in longer-term monetary policies and inflationary trends that argue for a crawling peg regime rather than short-term macroeconomic stabilization considerations arising from the incidence of various random shocks or disturbances.

The extent to which it may be desirable for more developing countries to adopt some form of PPP-type convention or rule remains an open question. Williamson (1982) strongly recommends an overall exchange rate policy that is dedicated to preserving the constancy of the real exchange rate, except when there is a perceived need to change the real exchange rate in order to promote external payments adjustment. He argues that the most efficient way of doing the former is to use a crawling peg based on a relative inflation rate indicator. An inflation rate differential also forms part of the policy rule for exchange rate management articulated by Black (1976); the rule, which Black refers to as "government-managed floating," implicitly focuses on the more or less continuous stabilization of some real effective exchange rate index. A more explicit theoretical treatment of the rule in terms of real effective exchange rate indices is presented in B-K (1982). 1/

The policy rule has given rise to some controversy in the literature on exchange arrangements and "optimal" currency baskets. The rule is sometimes referred to, somewhat anomalously, as "pegging" the real effective exchange rate index or as "pegging" to a "real" currency basket. Lipschitz and Sundarajan (1980) argue that while under certain conditions stabilization of some real effective exchange rate index can be considered an appropriate policy objective, a policy rule of the Black/B-K type, which in the limit implies continuous stabilization of a real exchange rate index, cannot be implemented in practice because the pertinent price data are only available discretely and usually with a considerable time lag. Whether the absence

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1/ The rule gives the exchange rate between the domestic currency and some numeraire currency or the intervention currency as being determined by a weighted average of exchange rates between the numeraire currency and other foreign currencies and by the differential between a weighted average of foreign price indices and the domestic price index. The rule holds the real effective exchange rate index constant.

of contemporaneous price data is an insurmountable obstacle to the implementation of this type of policy rule has been questioned by Williamson (1982). His conclusion is that the high degree of serial correlation in inflation rates can be exploited, together with other available information, to make reasonable estimates of current inflation rates, and hence price performance at home compared with that in competitor/partner countries. 1/ The implementation of a reasonable approximation to this kind of policy rule would thus be possible. 2/

A related issue is whether more developing countries should attempt to implement a policy rule of this type using the kind of price indices that usually are the most readily available. Consumer price indices, for example, suffer from a number of limitations in determining changes in competitiveness in the traded goods sectors. Over time, differential productivity growth in traded and nontraded goods sectors is often a principal source of trend movements in the CPI; in the short-run, the indices are often affected by temporary factors and by feedback effects from exchange rate changes. In many instances, CPIs and WPIs suffer from coverage limitations and the presence of price controls and subsidies which make evaluation of the underlying rate of inflation and cost trends more difficult. More generally, the assessment of price and cost trends in many developing countries is likely to be surrounded by a measure of uncertainty and to be made in circumstances which may not lend themselves to an unambiguous or precise estimate. For these reasons, the practical wisdom of uncritically adopting a policy rule based on a simple objective indicator, such as relative CPI or WPI performance, is questionable. A more prudent approach recognizes that important elements of judgment are required of the monetary authorities in using available price and cost data to operate this kind of exchange rate management policy.

Apart from these important practical and technical issues, there is general agreement on a theoretical level that an exchange rate management policy oriented towards the stabilization of some real exchange rate index will be insufficient to maintain external balance. Changes in economic conditions or circumstances that a developing country confronts, such as a terms of trade shock that is not expected to be transitory, may call for a change in exchange rate and other policies in order to affect an alteration in the real exchange rate for external balance adjustment. A number of possible external balance indicators that could be used in exchange rate management are examined by Kenen (1975), and theoretical aspects of Kenen's analysis are followed up in an optimal control framework by Branson and

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1/ Rodrik (1984) examines the question in relation to CPIs and WPIs, two of the most commonly used measures in relative price comparisons.

2/ The best description of the implementation of the rule would be that the country in question adopts a crawling basket arrangement.

de Macedo (1980). Williamson (1981) discusses a proposal along similar lines for managing the real exchange rate in order to cure or prevent the emergence of underlying current account disequilibrium.

The area of exchange rate management and the use of indicators continues to be an important area for further theoretical and applied research of particular importance to developing countries. Reflecting some of the considerations outlined, there has been a movement towards the adoption of more active exchange rate management in developing countries. 1/ At the same time, there has been growth in the number of countries whose exchange arrangement is based on a link between the domestic currency and a basket of foreign currencies. Where the precise composition and margins are not publicly announced, there can be elements of flexibility or management in these types of "pegged" exchange arrangements. 2/

VI. The Choice of Peg

The previous section considered a number of arguments that have been or can be invoked in favor of a flexible exchange arrangement for a developing country. Notwithstanding those arguments, many developing countries opt to determine the value of their currencies by adopting a price-setting rule of the adjustable peg type. The substantive issue is what objective(s) are to be realized through the choice of peg, and correspondingly, what problems and circumstances should be viewed as relevant for the specification of the objective(s).

A characteristic of the period since the demise of the Bretton Woods system has been the variability of exchange rates between major currencies. As well as showing considerable short-run volatility (daily, weekly, monthly), the bilateral exchange rates between at least some of the major currencies have also exhibited fluctuations or swings over longer time periods that frequently have not demonstrated a close relationship with corresponding relative price and cost performance. There have been, therefore, significant departures in both the short- and medium-term from relative purchasing power parity indicators among the currencies of major industrialized countries, and this behavior cannot be adequately explained in terms of changes in "underlying" conditions or "fundamental" determinants such as the apparent need for current account adjustment and emerging differences in the relative rates of expansion of national money supplies.

Concern about repercussions of these types of exchange rate fluctuations has been central to much of the discussion on how a developing country

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1/ See International Monetary Fund, Annual Report, 1982 and 1983.
2/ See Aghevli (1979).

should choose its peg. The choice of peg is thus seen as the appropriate policy instrument to minimize or avoid at least some of the harmful consequences of exchange rate variability among foreign currencies. 1/ In a number of studies, the undesirable consequences are seen as the induced instability or variability of particular target variables, so that the choice of peg concerns insulating or stabilizing these variables to the extent possible from the effects of exchange rate fluctuations among foreign currencies. A common element is to utilize an effective exchange rate index (EER) to consider the impact of exchange rate movements between the domestic currency and foreign currencies. 2/ Although originally an outgrowth of exercises designed to isolate the impact over a medium-term period of a vector of exchange rate changes on a country's trade balance, the index can, in principle, be concerned with any variable affected over various time horizons by exchange rates. Ideally, such an index attaches weights to a country's bilateral exchange rates vis-à-vis foreign currencies to provide in summary and convenient form an indicator of the net effect of changes in exchange rates on a selected variable in the chosen time period. When exchange rate movements are considered in isolation, the measure is often referred to as a nominal EER index; if allowance is made for different rates of price or cost inflation at home and abroad, the index is usually referred to as a real EER index (REER). In principle, the solution to choosing a peg with the objective of stabilizing or insulating a variable in the event of exchange rate fluctuations between foreign currencies appears straightforward; the country should peg to a basket of currencies where the weights utilized in constructing the basket are the same as used in the EER index. 3/ 4/

The weights used in calculating an EER index relevant to one particular variable or time period may well be different from those appropriate for another; hence, as B-K (1981) point out, choosing a peg following this type of methodology may involve potential trade-offs. In practice, there are likely to be considerable difficulties to be faced with determining weights for particular variables and evaluating trade-offs. Nevertheless, the fact a number of variables have been suggested in the literature is indicative of

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1/ Williamson (1982) surveys in detail much of the literature.

2/ See, for example, Black (1976), Flanders and Helpman (1979).

3/ It should be emphasized, however, that if the country's own exchange rate policy does not influence the variable being considered, there will be no solution for the basket peg.

4/ Developing countries which choose flexible arrangements for the reasons discussed in the previous section obviously also face the impact of exchange rate fluctuations elsewhere in the system. The rule or convention of the Black/B-K type, for example, calls for the stabilization of a real EER, and thus the determination of the appropriate weights in the index. The close approximation to stabilization involves a crawling basket arrangement.

different views on what the consequences of currency fluctuations are that should or can be minimized by pegging to a currency basket. It is useful, to review the objectives that have been considered to guide the choice of peg.

1. Exchange rate uncertainty and risks

Exchange rate fluctuations among the major currencies under the present system have elicited widespread concern that exchange rate uncertainty imposes risk burdens, and therefore costs, on individuals, firms, and other agents in the economy engaged in international transactions. These burdens, as Helleiner (1981) argues, may be especially heavy for individuals and firms in developing countries. A particular example is short-run exchange risk faced by traders; the domestic currency is seldom used as the unit of account or denomination in contracts and the opportunity to obtain forward cover or otherwise hedge exchange rate risk is often limited. With trade and other contracts typically denominated in one of the major currencies or the currency of a particular trading partner, individual suppliers and purchasers face the risk that the domestic currency value of receipts and payments may change if the domestic currency is not pegged to the foreign currency in which the contract is specified. The risk arises not because the level of the exchange rate against a chosen peg changes, although this can also be an important contributory factor, but because when there are unpredictable short-run fluctuations in exchange rates between foreign currencies the country cannot avoid movements in its bilateral exchange rates against at least some foreign currencies. The exposure to risk may be considered as imposing a cost on traders. Frankel (1975) suggests that the choice of peg should be directed towards reducing this type of short-run exchange rate risk and cost faced by traders and other transactors in the economy.

While Frankel suggests the objective of trying to minimize risks associated with contracts, most other writers argue that choosing a peg should be made with other objectives in mind. This position reflects the judgment that other repercussions of exchange rate fluctuations are of greater importance, and that alternative instruments or means, rather than the choice of peg, should be directed towards reducing the type of risks that concern Frankel. Black (1976), for example, argues that currency contract risk is fundamentally less significant than the longer-term risks of engaging in trade rather than the production of non-traded goods, and that to deal with the former problem, the authorities in a developing country should seek to improve the opportunities for individuals and firms in the economy to cover forward or otherwise hedge exchange risk. The type of risks considered by Black are those that cannot be virtually eliminated by forward cover or other means of hedging. Outside of the contract period, suppliers and purchasers are concerned about the future behavior of prices for exports and imports, which will be influenced (among other factors) by exchange rate

developments through their effect on profitability. Unexpected exchange rate fluctuations or swings over short and medium-term time periods will be important elements in generating uncertainty about profit streams, and this uncertainty faced by enterprises could be expected to inhibit trade and to bias decisions relating to the structure and level of output and investment. A possible objective, therefore, is to choose a peg in order to reduce the uncertainty about profit streams faced by agents and firms in the traded goods sectors.

Whether the objective is the reduction of the costs of very short-run exchange rate risk or the uncertainty about profit streams generated by exchange rate fluctuations, there remains the question of finding a reasonable measure or indicator and determining how the choice of peg is likely to influence the behavior of the indicator. For short-run exchange rate risk, it is the unpredictability of the bilateral exchange rate relevant to the transaction over the contract period that is the principal source of risk, and the choice of peg affects the stability of each bilateral rate. If most of a developing country's contracts are denominated in one major currency, such as the U.S. dollar, then a peg to this currency will be the most suitable option; such a peg will eliminate short-run exchange risk for most transactors and transactions, although traders with contracts in other currencies will be exposed to risk if they cannot or do not hedge. Where one foreign currency is not clearly dominant in transactions, Frankel considers the possibility that it may be preferable to peg to a basket of currencies reflecting the importance of various major currencies in a particular country's transactions. Such a step could be considered as an attempt to compromise and reduce some measure of average exposure to risk. However, while it is clear that pegging to a basket of currencies will stabilize an equivalently weighted average of bilateral exchange rates (i.e., the associated EER), each individual bilateral rate will vary; what matters for short-run exchange risk is the relative importance of stability in each bilateral rate. Frankel devises an aggregate indicator called the "effective variation" of exchange rates, which measures the variability of individual bilateral exchange rates and then aggregates across currencies, with weights reflecting the importance of the currencies in a country's transactions. In a simulation analysis, using historical exchange rate data, the implications for the indicator of different pegs, including various single currency pegs and a trade-weighted basket peg, are examined, and in a number of instances the effective variation (also using bilateral trade-weights) is minimized by one of the single currency pegs rather than the basket peg considered. There are considerable shortcomings in using bilateral trade weights as a guide to the use of various foreign currencies in contracts and transactions, but the results illustrate the point that stability of a weighted average exchange rate is not necessarily to be preferred to stability of the exchange rate against a single foreign currency. The case for pegging to a specific leading currency is strengthened if the importance of the major convertible

currencies (particularly the U.S. dollar) in third country trade and capital account transactions is recognized. Such a peg may also make easier the reduction of risk associated with contracts in non-peg currencies through access to forward cover and other facilities available in the major financial centers.

Outside of the contract period, exchange rate variability may contribute to uncertainty about the profits to be realized on future foreign sales and purchases. It is difficult, however, to isolate the role that exchange rate fluctuations may have in changing traded goods prices, and thus altering sales revenues relative to costs. If the prices of export goods are inelastic over the relatively short term with respect to exchange rate changes and costs are also relatively inflexible, a measure of nominal exchange rate variability may provide a reasonable indicator of profit uncertainty. It can, however, be argued that the assumptions are not tenable, and that a better indictor for profit uncertainty is a measure of the variability of the exchange rate adjusted to take into account changes in the relevant prices and costs. Whether the effective variation of real exchange rates or the variability of real effective exchange rates is a more appropriate indicator is open to debate. The suitability of the latter is often taken for granted, 1/ in which case the best peg may be considered from the point of view of reducing the variability of the REER; it is possible, however, that a single currency peg might be expected to perform better in reducing the effective variation. 2/

2. Macroeconomic objectives

While considerable attention has been paid to effects of exchange rate fluctuations in generating various types of risks and costs for agents in the economy, more attention has been paid to the choice of peg as it influences the attainment of macroeconomic objectives. The concern is again largely with unpredictable exchange rate fluctuations between foreign currencies, but the costs are seen as undesirable variability in macroeconomic target variables which can be reduced by an appropriately chosen peg.

Exchange rate changes between currencies influence the behavior of a number of macroeconomic variables over varying time horizons. A currency depreciation, for example, can be expected to affect the demand for money, aggregate demand and the levels of prices and output, as well as inducing external and internal relative price shifts which alter the composition of

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1/ For example, Helleiner (1981).

2/ See also Frenkel (1982) who questions the advisablility of basket pegging for Latin American countries on closely related grounds.

expenditure and output. The desire to highlight different aspects of the adjustment process is often reflected in the various approaches (elasticity, absorption, monetary) employed to analyze the impact of exchange rate changes. These differences are also apparent in the literature concerning the choice of peg and macroeconomic objectives. B-K (1981, 1982) and L-S (1982) use the elasticities approach; F-H (1979) adopt a form of Keynesian-short-run expenditure model in which supply elasticities are infinite, while Connolly (1982) focuses on inflation and its variability using a simple monetary framework. The time dimension of the analysis is also important, although this aspect has received relatively little explicit attention. Short-run impact effects of exchange rate changes will reflect the presence of certain rigidities and differences in the response speeds of particular variables, whereas medium-term effects allow for certain lags to have worked themselves out. Currency appreciation or depreciation may lead to short-run terms of trade and trade balance effects in the period before volume effects begin to be realized; these effects may be qualitatively and quantitatively quite different from changes in these variables that might be expected to obtain over the medium-term. If, therefore, the focus of the attention is on the implications of exchange rate fluctuations between foreign currencies for the stability of macroeconomic variables, it is important to consider the time dimension of the fluctuations. Exchange rate realignments among currencies, stemming in large measure directly or indirectly from exchange rate movements between the major convertible currencies, which persist for a considerable period of time (measured perhaps in years rather than months) before possibly being reversed, will have different macroeconomic implications for exchange rate policy and the choice of peg than movements between currencies which are reversed relatively quickly.

In a number of instances it is apparent that attention is being focused on the type of swings in exchange rates that lead to realignments among countries which tend to persist for periods long enough to change resource usage, allocation, and trade flows. The simple elasticities model of trade used by B-K (1981, 1982) (and subsequently by L-S (1982)) provides an example. This type of model abstracts from short-run effects that may be associated with the currency denomination of trade contracts or from factors that may give rise to such phenomena as J-curve effects; rather, the focus is on the role of exchange rates in inducing price and quantity changes viewed at a more advanced stage in the process of adjustment. The methodology is to consider the comparative static results generated by the model if a set of exchange rate changes between foreign currencies were to occur and to examine how those results are influenced by the country's choice of peg. 1/ Changes in the country's bilateral exchange rates, determined by the choice

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1/ The discussion, in a sense, parallels that relating the role of exchange rate flexibility in attaining macroeconomic objectives when various shocks occur.

of peg and exogenously given exchange rate movements between foreign currencies, are the source of disturbances to equilibria in the country's import and export markets. When these markets again clear, the outcome will be new levels of prices and volumes for imports and exports. In the interests of tractability, the markets for non-traded goods and money, as well as the expenditure and output effects, are not explicitly treated in the model, the simplifications permitting the emphasis to be placed on the role of exchange rates and relative prices in the developing country's traded goods markets. Within the comparative static framework, the model can be solved for an alternative peg that would have kept the trade balance unchanged or for the unilateral change in the level of the exchange rate against the original peg which would achieve the same result. The equivalence does not suggest in itself any particular advantage to one option or the other, but this type of result must be interpreted in terms of uncertainty and a medium-term perspective. In terms of the latter, the maintenance of external balance can be considered an appropriate objective of macroeconomic policy, so the analysis suggests that pegging to a suitably chosen basket of currencies would avoid the necessity of making discretionary changes in the level of the exchange rate vis-à-vis an alternative peg, such as a peg to a single foreign currency. By choosing to peg to the basket, the authorities can avoid the burden of having to enter into judgments at future dates about the persistence or otherwise of appreciations and depreciations between foreign currencies while at the same time helping to guard against the possibility that payments disequilibria may arise from this source.

An alternative way of viewing the argument is in terms of the expected behavior of a REER index designed to indicate changes in a country's average level of competitiveness, and hence the prospective effect (if sustained) on export, trade, or current account performance. The basket peg would be chosen in preference to a single currency peg on the expectation that, faced with uncertainty concerning the direction and duration of future exchange rate movements among foreign currencies, it would perform better as a non-discretionary means of exchange rate management in keeping the indicator of competitiveness from moving and possibly remaining for considerable periods outside certain limits.

VII. Empirical Studies

Since over a decade has passed since the breakdown of the Bretton Woods system and significant changes have been monitored in exchange arrangements adopted by member countries of the Fund, it is not surprising that efforts have been made in the interim to examine the factors or considerations that have actually influenced the choice of exchange arrangement. To try to answer this question, a number of attempts have been made to see whether the kind of advice proferred has been taken into account by decision makers

in choosing their exchange arrangements or regimes. Heller (1978), Dreyer (1978), and Holden and Holden (1976) use a variety of statistical techniques with cross-section data, to test hypotheses that the choice of regime has been determined by the considerations advanced in theoretical analyses. The explanatory variables used are generally based on ideas drawn from the literature on optimum currency areas, such as indicators of relative openness and country size. A major problem faced in these studies is the difficulty in giving numerical values to different exchange regimes; as a result, the statistical techniques used must rely on assigning countries in the sample into one of a small number of groupings. The groupings used follow the classification published in the Fund's Annual Report, which until 1982 was based members' declared exchange arrangements. The classification was subject to a number of shortcomings: some countries, for example, declared as being pegged to the SDR in practice kept the value of their curency closely linked to the U.S. dollar, while other countries not classified as peggers included countries with market-determined floating rates as well as those with non-convertible currencies adopting forms of direct exchange rate management. 1/ Despite these problems, attempts were made to test the association between types of exchange regimes and economic characteristics found in the sample group of countries. Heller finds that the peg-"float" choice is largely explained by the openness of the economy (the ratio of imports to GNP), size (GNP), and a measure of geographical trade concentration. For peggers, trade concentration was found to be the principal factor affecting the choice between pegging to the U.S. dollar, the French franc, and a currency basket, although the ability of the function to predict the choice between a dollar and a basket peg was considerably weaker than functions concerning choices between the franc and a basket and between the dollar and the franc. Dreyer also finds that pegging is associated with the small size and openess of the economy, but not necessarily with trade concentration. Holden and Holden, like Heller, use discriminant analysis and similar explanatory variables to predict choice between regimes but consider a more differentiated classification of regime, including as separate regimes those countries with cooperative arrangements and those officially classifed as adjusting their exchange rates according to a set of indicators. The results of this study were not clearcut, and like the other statistical analyses suggest either that there are weaknesses in the theoretical literature in specifying how structural criteria should be used in making the choice of regime or that the assumption that the actual choice is made on the basis of full economic information is incorrect.

An alternative to the wide ranging statistical approach is to examine the experience of individual countries or groups of countries. Aghevli (1979) examines the exchange regimes and exchange rate policies of eight

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1/ It was to redress some of these deficiencies that an expanded and revised classificaton was introduced. See IMF, Annual Report, 1982.

Asian countries during the 1973-78 period. Some of the countries maintained a de facto peg to the U.S. dollar during most of the period, while countries which had pegged to sterling before 1971 changed their arrangement and instead linked their currency to a composite of foreign currencies. Aghevli finds evidence that all the countries were reluctant to make adjustments in their pegged exchange rates to take into account differences in inflation performance at home and abroad, policies that tended to result in real effective appreciation in high inflation countries and real effective depreciation in low inflation countries. The choice of peg did, however, influence how the real and nominal effective exchange rates of the countries evolved over the time period. The dollar peggers all had inflation rates higher than those of their trading partners, and the trend depreciation of the dollar over the period helped to offset the inflation differential. Where the inflation differential was relatively small, the choice of a dollar peg helped to keep the real effective exchange rate relatively unchanged, but for higher inflation countries the nominal effective depreciation associated with the dollar peg was not sufficiently large to avoid relatively large discrete adjustments in the value of these currencies vis-à-vis the dollar. Real effective depreciation was recorded by those countries pegging to a basket of currencies, for while their nominal effective rates were stable, their inflation rates were lower than those of their trading partners or competitors. After the period covered by Aghevli's study, the secular depreciation of the dollar began to be reversed so that, other things being equal, the maintenance of dollar pegs would have exacerbated the external balance difficulties of the group of higher inflation countries, and thus would have reinforced Aghevli's argument that exchange regimes affording more flexibility should be chosen by these countries. In fact, in the post-sample period at least one of the high inflation countries (Korea) did alter its exchange arrangement from a dollar peg to a government-managed flexible rate. Such analysis sheds further doubt on whether empirical work on the actual choice of regime based on cross-section data should be used in any prescriptive way by an individual country in determining its exchange regime.

VIII. Concluding Remarks

This paper has reviewed what have been seen as the principal issues to be considered by a developing country in choosing its exchange rate regime. One general remark that can be made is that a developing country's choice of regime cannot be discussed adequately in terms of the simple float-peg dichotomy. Independent floating is often considered infeasible for many developing countries because of the underdevelopment of domestic financial markets. However, while inadequate development of such markets may be viewed as a structural characteristic from an analytical viewpoint, it may not or need not be so considered for policy purposes. In addition, ruling out some form of "clean" or "managed" floating does not remove the possibility

of adopting other types of flexible exchange rate arrangement, particularly as a means of dealing with inflation differentials. And, despite earlier somewhat disappointing attempts to link the choice of regime to structural characteristics discussed in the optimal currency literature, some of the more recent theoretical research has been attempting to pursue the link between macroeconomic stability, economic structure, and exchange rate management. Hence, the optimal degree of exchange rate flexibility would seem to be an important area for further research. Such research can be expected to provide valuable insights into the extent to which the authorities of a developing country can or should modify simple rules or assignments for determining exchange rates in the present international monetary environment.

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