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Fixed or Floating Exchange Regimes:  
Does It Matter for Inflation?\*

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Abstract

This paper reviews recent experience with the choice of floating or fixed ("anchor") exchange regimes in industrial and developing countries. It concludes that desirable differences between the two sets of regimes have narrowed, owing to the useful operational role of exchange rate margins and unavoidable medium-term rate adjustments in the context of fixed regimes. A survey of recent empirical cross-country literature also suggests little unambiguous association of the choice of exchange regime with macroeconomic performance, inflation in particular. Stability of the exchange rate has generally been a by-product of other policy choices. Even announcement effects of the regime on inflation-fighting credibility depend on the country-specific assignments of policy instruments to more than one institution--central bank, government, or regional and multilateral institutions.

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### Summary

Issues of fixed versus floating exchange rates are addressed by an extensive literature and are not as black and white as frequently implied. This paper deals with implications of exchange regime choices for inflation, focusing on two issues: the operational distinctions between regimes and the empirical evidence. The usefulness of a market-driven exchange rate as a monetary indicator is clear when structural changes limit the usefulness of monetary aggregates, or when observations on real interest rates and yield curves are blurred, owing to inflation or insufficient depth of domestic financial markets. The paper concludes that, because the exchange rate can be such a useful indicator, even fixed rate regimes should normally allow short-run market flexibility, within relatively wide margins. Fixed-rate regimes should also allow sufficient medium-term flexibility to deal with shocks that are not reversible.

Recent cross-country experience with fixed and market-driven exchange rate regimes is examined in the paper. Evidence is presented that, in industrial countries, inflation has tended to lead exchange rate volatility (which declined on an annual basis in the 1980s). A survey of the recent empirical literature suggests a mixed record in the attempts to associate exchange regimes with inflation. One-shot, anchor-type adjustments of the Bretton Woods variety appear to have had little success in stabilization, except when inflation was initially low. However, this empirical outcome might have been attributable to the incompleteness of the traditional adjustments, owing to uncertainty about the equilibrium rate level and related monetary and fiscal policy shortcomings. Very recent, but as yet inconclusive, evidence on strict rule-based monetary and exchange rate policies under the currency-board approach has been more positive. Other anchor-type adjustments have often been preceded by considerable exchange rate flexibility, which re-established international reserves, or have been followed by flexibility, so that their characterization as an anchor is questionable.

Independently floating regimes, a relatively new but by now widespread phenomenon in developing countries, have been demonstrably successful in the available studies. Such regimes have almost always been adopted in the context of comprehensive programs of stabilization and liberalization, and most have been aimed at addressing the effects of the debt crisis. However, the overall conclusion of the paper is that there is no automatic linkage between exchange regime choice and inflation. Whether additional credibility could be gained by anchoring both the exchange rate and monetary policies depends on whether the two sets of responsibilities are vested in more than one institution--central bank, ministry of finance, or regional, multilateral institutions. Usually, responsibilities are not effectively split this way in developing countries. Moreover, the important issue is how the responsibilities are actually discharged and the track record that is established.



## I. Introduction

Many lessons have emerged from the crucible of the 1980's debt crisis, at great cost. In the area of exchange rate policies, one is that unrealistic exchange rates cannot be sustained even for short periods of time without serious consequences throughout the economy. In many countries, preceding and in the early stages of the debt crisis, official exchange rates were fixed without regard to market levels, and it was assumed that controls on the demand for foreign exchange could prop up these exchange rates and help to stabilize inflation while basic adjustment was gradually introduced. However, the responses are now all too clear. The controls did not work, and the overvalued exchange rates contributed to flight from domestic currency, and a breakdown of tax systems as parallel currency markets flourished. <sup>1/</sup> This was a brutally cumulative process; the deterioration in fiscal policy, monetized, resulted in even greater disequilibrium and an absence of foreign exchange with which to pay even maturing obligations, let alone new ones, thus external arrears, loss of international creditworthiness, and a further worsening of the balance of payments, a more unrealistic exchange rate, and so on. Many commentators have pointed to the implications of this experience, heightened by increasingly integrated international capital markets, in the need for more frequent and smaller increments in exchange rate adjustment, whether by fixed regime adjustments or by continuous floating. Given that the delayed rate adjustments leading to large step devaluations are now out of style, what then remains of the differences between the two sets of policies?

Assuming that there continues to be a significant difference between the two polar regimes, a largely operational question, there is the issue of what can be said about the performances of the two regimes. This is especially topical in the area of inflation, where there has emerged in recent years a renewed debate about the role of floating versus fixed ("anchor") regimes in the stabilization of developing economies. Issues for the industrial countries have tended to have a somewhat different focus--the possible impact of increased exchange rate volatility in slowing international trade and direct investment flows.

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<sup>1/</sup> It is no coincidence that governments maintaining unrealistic exchange rates have chosen to set the rates so that they are overvalued against the market, as indicated by parallel market developments. If they had tried to tax by selling foreign exchange at an overdepreciated exchange rate, rather than subsidizing, then the disintermediation losses to the parallel market could have been even greater. The policy of selling at an overvalued rate required, of course, that the foreign exchange also be purchased at an overvalued rate, with a negative impact on surrender and a corresponding loss of foreign exchange receipts from the official to the unofficial system. In many countries, only captive sources, such as state enterprises, remained within the official receipts system.

The present paper aims to review the connection between the regimes of fixed or floating rates and inflation on these two levels: operational distinctions between the regimes, and the implications for inflation. It is organized as follows: Section II looks at the nuances of classifying regimes as fixed or floating, and the role of supporting policies in determining the optimal operation of either regime; Section III reviews main issues in the performance of regimes. Empirical evidence on the inflation linkages is presented in Section IV, focusing on recent cross-country studies for economy of discussion, given the very extensive analytical and country literature on the subject.

## II. Defining the Terms

### 1. Issues of regime classification

The blurring of operational concepts of fixed and floating that arises from recent experience with supporting policies has been evident for some time to those involved on a day-to-day basis in trying to classify members' policies in the exchange regime area. The present IMF system of classification was introduced in 1982 and distinguishes between five basic categories: fixed to a single currency, fixed to a currency basket, limited flexibility (ERM and quasi-peggers), <sup>1/</sup> managed flexibility, and independently floating. There is the qualification that the IMF's system depends upon policy notifications by members, i.e., statements of intention as to how exchange rate policies are to be conducted. In cases where there is an obvious mismatch between intention and outcome, the IMF staff will seek a reclassification, but often the member then says that the policy adjustment is about to be taken so that as a statement of intention the classification remains valid.

Even if the policy is carried out as intended, there are intermediate shadings of flexibility that make it difficult to characterize the international system as simply one dichotomized on the basis of fixed versus flexible exchange rate regimes.

- How is the system to be classified when the central bank manages the exchange rate with considerable flexibility, but sets it daily or weekly on the basis of certain indicators such as the balance of payments, estimated supply and demand conditions in the market, major currency movements, etc.? Obviously, this is not a market-determined exchange rate that would be classified under free floating.

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<sup>1/</sup> Quasi-pegs arise because some members declare pegs to SDR baskets within margins for political sensitivities, but in practice peg to the dollar.

- The case of the ERM presents certain ambiguities. Currencies of ERM members are, at least in principle, declared fixed against one another within margins, but float against the rest of the world (except for those countries that also peg to ERM currencies, such as the CFA Franc Zone and Estonia).
- Real fixity is nominal movement, so does an inflation-adjusted peg qualify as a form of fixed exchange rate or is it simply another form of indicator arrangement whereby the exchange rate is flexibly managed? (The latter is the approach taken in the IMF's classification.)
- How much foreign exchange market intervention constitutes smoothing intervention consistent with the free ("independently") floating category?

Unless the entire international system is fixed, there is considerable ambiguity in classifying any individual country as fixed, a point that is often made. Ideally, the character of exchange rate policy would be defined as an  $n \times n$  matrix <sup>1/</sup> of intended bilateral relationships. But, of course, no country authorities actually formulate policy that way. Taking this approach, one could get a better idea of the prevalence of transactions conducted under fixed versus floating systems. Virtually all developing country trade is with the industrial world or with other developing countries to whose currencies they are not pegged bilaterally, and apart from within the ERM itself, the industrial world floats. A simple calculation reflecting these facts, using the IMF *Direction of Trade*, shows that two thirds of world trade examined bilaterally is conducted under floating exchange rates, compared to one half in 1980. However, in terms of the standard multilateral classification of regimes, the shift for developing countries has been much more radical. In 1980 only one developing country had an independently floating exchange rate system, but as of mid-1994, 38 developing countries had such floating systems. Virtually all of these markets were private-sector based, in that they did not rely on official auction arrangements to set the rate. Another 38 developing countries have managed floating exchange rates. Together, the two floating groups account for three quarters of developing countries' trade.

## 2. Role of policies supporting the regimes

If exchange controls are largely ineffective, as now seems to be generally agreed, then a fixed or anchor <sup>2/</sup> exchange rate must be validated by monetary and fiscal policies. Incomes and structural policies

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<sup>1/</sup> In fact, with  $n$  members and  $r$  dual or multiple exchange rates, an  $n \times n \times r$  matrix (over 20,000 elements under the present IMF membership).

<sup>2/</sup> In a certain sense, the use of the term "anchor" begs the question of the effectiveness of the policy.

can play something of a supporting role, but mainly to free up the transmission process for monetary and fiscal policies. What then would be the difference between a stable floating rate and a fixed rate when they are both supported by the same set of domestic policies? The answer in a nutshell is: not very much.

The only simple answer can be in the announcement effect that is claimed for a fixed or anchor exchange rate regime. The argument is made that by having the government commit to a (permanently) constant exchange rate, credibility of monetary policy is enhanced. In effect, there are two commitments rather than one, to run a conservative monetary policy and to maintain a fixed exchange rate. But who is making these two commitments; is it the same group of people? In some countries, the monetary policy decisions are vested in central banks, whereas exchange rate policy is vested in governments. In such cases there might well be a gain in the strength of the commitment by having the two institutions commit independently of one another to ensure policy consistency. <sup>1/</sup> But in many countries, and particularly in developing countries, central banks lack a significant degree of independence, and fiscal deficits are more or less automatically monetized. Even in countries with nominally independent monetary authorities, the broad parameters for policy performance are either set by prior contract or by close coordination with the government, including ministries of finance. So whether or not the character of the institutional arrangements is likely to add significant credibility by assigning separate authorities for monetary, fiscal, and exchange rate policies, must be examined in the light of the specific institutions in each country.

There is yet another level on which credibility of anchor-type policies can be examined. As a result of rapid financial innovation in the 1980s and early-1990s, historical relationships have shifted and credit and money aggregates have to some degree lost their value as indicators of the monetary policy stance. This is true in industrial countries where a burgeoning variety of financial instruments, of ever-increasing sophistication, and the geographic dispersion of markets, has softened the traditional monetary indicators. In developing countries, a similar process has been underway with the increasing introduction of market-based indirect monetary policy instruments and rapid shifts in exchange rate and structural policies. In these circumstances, financial asset prices have increasingly played a role as both an intermediate target and indicator of monetary policy. However, where inflation is significantly nonzero, interest rates are difficult to interpret because the real interest rate (adjusted for inflation expectations) is not directly observable. Yield curves or forward interest rates provide additional information, but to be reliable require

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<sup>1/</sup> There could also be a strengthening of commitment signalled by passing some sovereignty to an extra-national (regional or multilateral) institution. See Papi (1994) for discussion of an associated "honeymoon" effect on inflation.



considerable depth of financial markets, which is often absent. The exchange rate therefore becomes the primary indicator, and in the case of fixed exchange rates the objective, of monetary policy.

There is the alternative of reading market signals through the amounts of foreign exchange market intervention required to sustain a fixed exchange rate in the very short run. Intervention can in certain circumstances represent excess demand in the market at the time, which then must be cleared by the authorities to sustain the fixed rate. However, there are several drawbacks to using foreign exchange market intervention as a monetary indicator, relative to the monitoring of financial asset prices. First, intervention is another aggregate, and movements cannot be read directly as excess demand pressures, for several reasons. There is the problem that international reserves movements reflect not only market pressures, but also regular and semi-regular fluctuations in foreign exchange availability that would normally be discounted by markets, and the discount reflected in the price. In order to correct the intervention numbers for these fluctuations, the authorities would need to be able to assess the market's views on seasonality and other regular patterns in foreign exchange flows. Second, there is another problem similar to that connected with the effects of financial innovation on other financial aggregates. Intervention will be viewed by the market as effective only to the extent that it is not seen as temporary. Therefore, the effect of the authorities' foreign exchange market purchases and sales will be variable, depending upon the market's assessment of their temporariness. To the extent that the reaction function is widely known, or that data enabling a fair assessment of intervention magnitudes is available to forex traders, the extent of intervention required to achieve the same effect will be larger. Again, the authorities would need to know the market's views on those magnitudes. The essential point is that intervention is not a direct reading of the market, but of the authorities' reaction to the market and the market's reaction to the authorities' reaction. Third, a problem arises because in many developing countries reserves movements are conducted for a number of official purposes, which can include both official purchases and sales to affect the exchange rate and other transactions affecting foreign exchange market flows such as those on account of state enterprises, or to rebuild reserves levels. These latter official actions may be reversible by their very nature, rather than in accordance with some form of time pattern. To the extent that this reversibility is known to the authorities, but not to the market, there will be problems in assessing intervention as an indicator of excess demand in the foreign exchange market. For all these reasons, intervention is a questionable indicator of foreign exchange market pressures in a number of circumstances. Moreover, the use of forex intervention in such a way runs counter to the philosophy of using indirect monetary policy instruments in conventional western banking settings, which is based on the day-to-day monitoring of rates in open market operations and forex market operations.

A market-determined exchange rate can therefore be of considerable value and even fixed exchange rates should permit some short-term freedom in order to allow policymakers to pick up on incipient short-run financial pressures and to make the corresponding short-term policy corrections. It is notable that attempts to fix exchange rates in industrial countries, within the ERM, have used margins for this short-term flexibility. In contrast, most developing countries that fix to a single currency (rather than to a basket or an inflation-indexed basket) do not employ margins, and therefore the scope for assessing monetary conditions through short-term variations in foreign exchange market conditions is lost.

This leads to the conclusion that, if fixed/anchor exchange rates are to be maintained, then they will need to be at least partly responsive to short-run market forces. But how does this differ from a floating exchange rate under which the same short-term monetary variations are used in an effort to stabilize, but not fix, the floating exchange rate? 1/ It could be said that there are different priorities for exchange rate management, and that the stability of the exchange rate under a flexible rate system could be abandoned, e.g., for purposes of inflation control, whereas stability under a fixed rate regime is by definition not abandoned. But this again does not distinguish between the two sets of policies in any fundamental sense, and certainly not in any desirable sense, for an exchange rate that is kept fixed irrespective of changes in the policy environment, including desirable changes, is itself an undesirable policy. Moreover, most proponents of fixed rate regimes do not rule out the possibility of devaluation in the medium term, should the domestic policy environment or other circumstances require it. So, if as dictated by the heightened integration of capital markets and the experience of the debt crisis, fixed exchange rates require short-term variability within margins, and also require some scope for longer-term adjustment--for instance, should the policy environment shift--the difference between the two polar exchange regimes can be seen as narrow, largely a matter of announcement.

It could be argued that there have been clearly observable differences between the variability of exchange rates under fixed and floating regimes. But there are two responses: one, this does not necessarily define the nature of the regime. Variability is not always a bad thing; in many cases it represents "adjustment". Two, the forms of fixity and floating that existed in the past were not necessarily optimal within the respective regimes. It does not help much to compare the performances of badly-executed regimes in order to ascertain the properties of the regimes themselves.

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1/ Speculative bubbles are handled by smoothing intervention, consistent with both fixed and floating regimes.

### III. Issues in Regime Performance

The case against floating is summarized in Williamson (1982): "There appears to be wide agreement that independent floating is infeasible or undesirable for most developing countries due to factors such as limited capital markets, restrictions on capital flows, thin foreign exchange markets, and a prevalence of real shocks that should be financed from the reserves". Much of the focus of the literature in the period surveyed by Williamson is on stabilizing competitiveness, i.e., ensuring a constant real effective exchange rate as defined by some form of trade or similar weights. It reflects the preoccupation prior to the 1980s with the current account of the balance of payments, and in particular with the elasticity approach. In favor of floating, it is now often argued that it permits monetary policy independence in the present environment of widespread capital mobility, and the rapid elimination of emerging arbitrage incentives for capital flight. The experience of the 1980s has also shown that independent floating by developing countries is not, as previously accepted in the literature, infeasible due to limited, thin, or restricted markets. Guitián (1994) questions the value of monetary policy independence for countries that see themselves needing such independence to pursue more inflationary policies. There would be clear benefits of pegging to a successful policy country. In general, the independence is only an independence to issue less than optimal policies, mainly reflecting political constraints in the country concerned. The problems of putting in place optimal domestic policies are emphasized by Svensson (1993), who notes that monetary stability and credibility have to be built at home and cannot easily be imported from abroad. Fixed exchange rates are more fragile and difficult to maintain than previously thought, largely because of the heightened role of external capital account flows. Svensson, however, points to the value of fixed rates in reducing relative price volatility and thereby promoting trade and investment. A new strand of thinking promotes the use of a currency board arrangement--full foreign exchange backing of the domestic currency--to underpin the credibility of the fixed exchange rate, vis-à-vis the chosen currency. This arrangement embraces some of the strictest forms of both rule-based monetary and rule-based exchange rate management.

Aghevli et al. (1991) observe that, although the average rate of inflation was lower in countries with pegged exchange rates than in countries with more flexible rates, many of the countries with a pegged regime have experienced high rates of inflation owing to a lack of adherence to appropriate financial policies, while many of the countries with a flexible arrangement have recorded low rates of inflation by adopting prudent financial policies. Contemporary analytical work has tended to reinforce such an inconclusive view. Bruno (1991) notes that even with an exchange rate anchor, tying policy also to a monetary anchor (multiple anchors) would seem to be a prudent policy. Some, such as Calvo and Végh (1993), conclude that, in a stabilization effort, lack of credibility may be more disruptive under fixed exchange rates than under floating exchange rates, because real disruptions are magnified. Corden (1990) states that "The true anchor is the belief by the policy makers--usually

rooted in and backed by widespread community beliefs--in the undesirability of inflation. Perhaps a fixed exchange rate has a role in signalling this anti-inflationary commitment to private agents. But they will always be alert--as they were in Argentina--to the possibility that the signal is a false one. If they are rational, they will look out for the underlying commitment." Dornbusch et al. (1990) argue that an adjustment program should start with a fixed exchange rate to establish a focal point for price expectations, but if inflation is not brought fully under control an adjustment of the rate should take place soon, and should be followed by a crawling peg aimed at maintaining external competitiveness. In a similar vein, Fischer (1986) notes that "There is no analysis that shows the exchange rate is a better nominal target than monetary aggregates in all circumstances.... There is no argument in this paper that the exchange rate should always be held constant.... But money targets are no more credible in this regard, for they are as sure to be abandoned if they produce too large a recession."

A comparatively recent development in a number of industrial and developing countries is that the move to a floating exchange rate regime has been accompanied by adoption of capital account convertibility. As noted in Section 1, there is a close relation between convertibility and the exchange rate, because the exchange controls are often used in an attempt to mask fundamental exchange rate disequilibrium. The question that arises is whether or not the exchange rate regime has had different implications for inflation when it has been accompanied by convertibility.

Quirk (1994b and 1994c) summarizes the experience with recent moves by industrial and developing countries to convertible exchange regimes. He notes that the experience in industrial countries has been somewhat mixed, even inconclusive, as the changes have been simultaneous with other important macroeconomic developments. Nevertheless, there is some evidence that the adoption of convertibility has been associated with greater balance of payments variability which has been successfully sterilized by monetary policies, as evidenced in a lessening of the volatility of monetary aggregates. In developing countries the position has been clearer, in that virtually all convertibility packages have been followed quickly by strong inflows of capital. 1/

In the case of the industrial countries, all of which have adopted convertibility, there is no obvious connection with inflation to be derived from the diverse experiences. In the case of the developing countries, the unambiguous association of convertibility, and in most cases floating

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1/ Not all developing countries have adopted floating exchange rates along with convertibility. Two currency board countries, Argentina and Estonia, also adopted full convertibility, but alongside the fixed-rate, rule-based monetary and exchange rate regimes. In Lithuania, the adoption of convertibility and some improvement in the balance of payments preceded the introduction of the currency board arrangement.

exchange rates, with inward capital surges raises issues of the possible impact of the surges on inflation. However, a review of countries that have adopted these regimes 1/ shows that higher inflation has not been associated with combined currency convertibility and floating regimes. There are several reasons for not expecting such a connection. In those countries, prior to convertibility there had been large-scale capital flight that reflected substitution out of domestic currency by residents. The initial incoming reflows of capital have also been largely of resident capital, and have therefore represented reconstitution of demand for domestic money balances. In view of their impact on excess demand for money, other things being equal, the reflows have not exerted an upward impact on prices. In terms of their goods impact, the existence of liberal or fairly liberal trade regimes has allowed increased absorption of imported goods, improving the aggregate supply/demand balance at a given level of output. Given that there was also considerable excess capacity in many depressed economies prior to stabilization, the direct goods markets effects are also likely to have been minimal. A problem could arise if countries allow overconfidence in the face of the improved capital account of the balance of payments to dominate monetary policy decisions. This would be indicated by a growing *nonresident* capital inflow that would be unsustainable and out of line with debt servicing capabilities. However, thus far the impacts appear to be within the range of existing stabilization capabilities.

#### IV. Recent Empirical Evidence

In part because of the ambiguities discussed in the preceding sections, it is not surprising that measurement of comparative performance under the various exchange rate regimes has proven difficult, and has given rise to conflicting approaches. To start with, there is the fundamental problem of assessing performance in a counterfactual way. The influence of the exchange rate is diffused throughout the economy (accounting for the importance given to it in this and other fora), and modelling the individual countries' systems with sufficient accuracy to capture the role of the exchange regime under alternative scenarios is a tough job. Perhaps for this reason, studies have focused on either: (1) the stochastic properties of the exchange rate itself to assess the internal efficiency of the market, and (2) before/after comparisons of major economic variables under alternative exchange rate systems. Even studies which do not use specific econometric methodology have tended to fall into these two categories.

##### 1. Global aggregates

At the broadest level, Chart 1 shows aggregate exchange rate variabilities and inflation rates for the separate groups of industrial and developing countries. To the extent that the variability of the exchange

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1/ See Quirk (1994b).

rate can be identified with the changing international regime, the series can provide some evidence as to the relationship between regimes and inflation. In the case of the industrial countries, it is clear that greater variability of exchange rates was preceded in virtually all instances by rising inflation. For example, variability increased sharply with the devaluation of the pound sterling and associated adjustments in 1967, but inflation was rising before that date--from about 2 percent in the early-1960s to 3 percent by the mid-1960s. As inflation rose even further through to 1970, exchange rate variability actually fell. The 1973-74 oil shock increases in variability were simultaneous with, but smaller than, the inflation effects. Similarly, the downturn in inflation in 1975-76 was reflected in a lagged response by variability, while rising inflation from 1978 through 1980 was reflected in more rapid exchange rate adjustments from 1979 through to the peak of exchange rate variability in 1982. Broadly, throughout the 1980s the exchange rate variability *measured on an annual basis* fell sharply in the industrial countries, returning to its 1972 level by 1991. <sup>1/</sup> Perhaps reflecting gradually rising inflation in the 1986 to 1990 period, there appears to have been a very delayed response in a renewed increase of exchange rate variability in 1992-93. Overall, the two series suggest a lagged response of exchange rate variability to inflation, with the implication that the regime has not caused inflation.

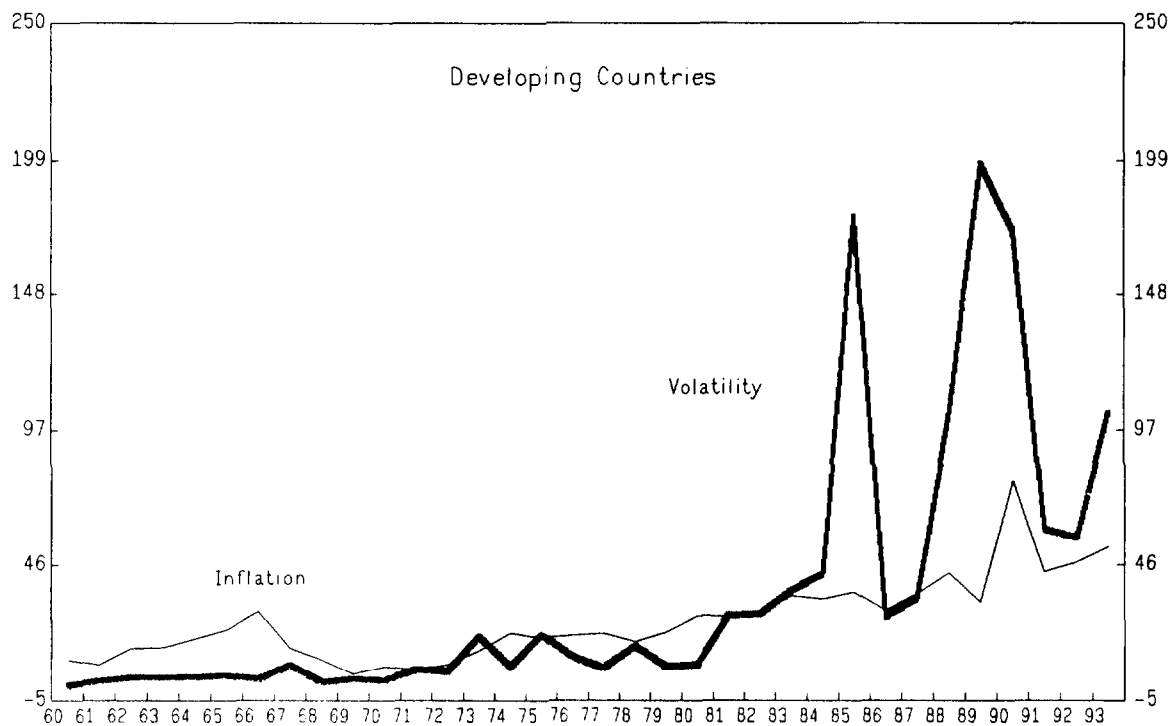
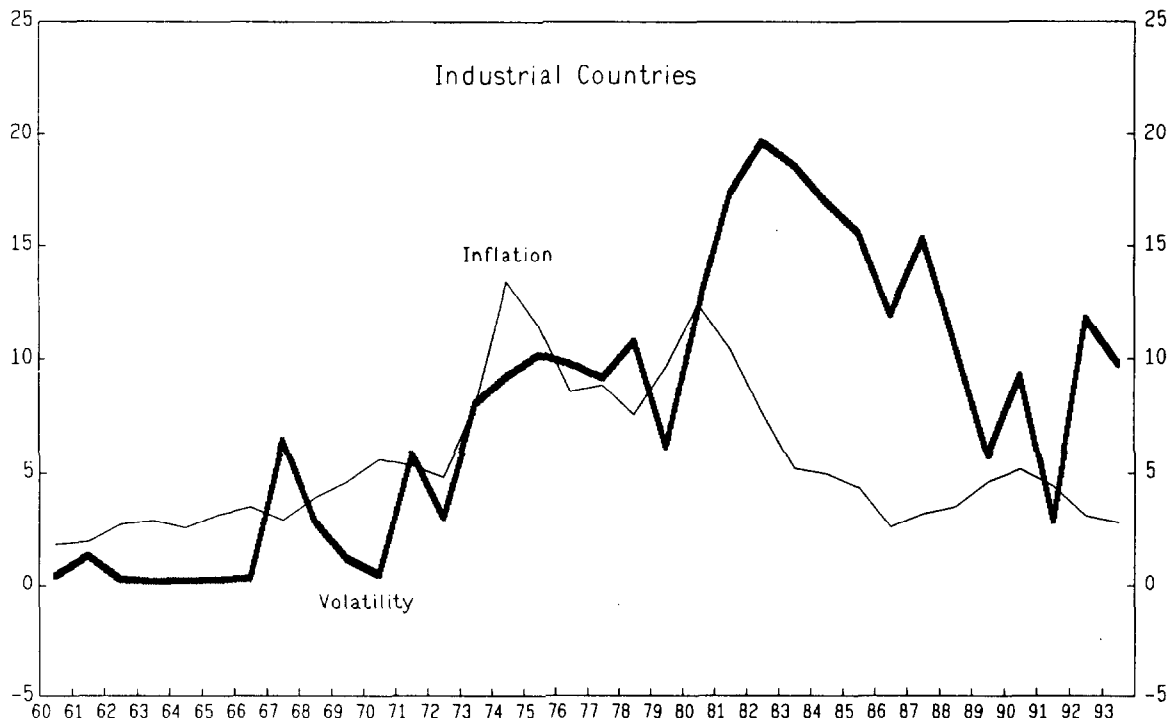
The picture for the developing countries is simpler. Throughout most of the period through to the early 1980s, exchange rate variability remained below inflation, reflecting the prevalence of fixed exchange rate regimes and delayed rate adjustments. Since 1984, exchange rate variability (mainly one-way) has increased sharply, although inflation has continued its secular upward trend. Of particular interest is the marked difference between exchange rate adjustment and inflation in the 1980s, indicating very little responsiveness of the overall rate of inflation to the massive exchange rate adjustments. The reasons for this are probably to be found in the pent-up disequilibria that the market-led devaluations and regime changes of the 1980s released in a number of developing countries. In many countries, the black markets had already priced imports at the retail level, so that inflation indices measured in terms of consumer price indexes had already reflected the official devaluations.

Summary measures of higher frequency exchange rate volatility (monthly and quarterly), corresponding to major groups of exchange rate regimes, are reported in Table 1. The measures relate to 96 member countries that did not switch their exchange rate regimes between 1985 and 1992, and are expressed as effective exchange rates, which capture better the diversity of

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<sup>1/</sup> The decline in exchange rate volatility in the 1980s recorded in Chart 1 runs counter to most observers, probably because of the unusually low (annual) frequency used here. Annual movements have greater macroeconomic, as against market efficiency, significance.

*Chart 1. Exchange Rate Volatility and Inflation  
(Average annual absolute percentage changes)*







trade transactions. 1/ 2/ The variety of international trade transactions does not permit the use of one universal proxy for exchange rate volatility. In simple transactions a proxy for uncertainty could be the exchange rate volatility of the nominal exchange rate. But in a more sophisticated trading environment, in which a firm has to make long-term commitments, the real exchange rate will be a better proxy since it reflects relative price changes.

Table 1. Volatility of Nominal and Real Effective Exchange Rates by Regime, 1985-92 1/

	<u>All Countries</u>		<u>Industrial Countries</u>		<u>Developing Countries</u>	
	M	Q	M	Q	M	Q
Pegged						
Nominal	1.07	2.30	0.33	0.68	1.08	2.33
Real	1.40	2.60	0.39	0.67	1.42	2.64
Managed floating						
Nominal	2.11	5.03	...	...	2.21	5.20
Real	1.85	3.72	...	...	1.93	3.90
Independently floating						
Nominal	4.68	14.35	1.65	3.18	7.27	17.11
Real	2.66	5.12	1.66	3.16	3.66	5.83

Source: IMF, *International Financial Statistics*.

1/ M = month-to-month and Q = quarter-to-quarter average absolute percentage changes.

1/ I am grateful to Hernan Cortés for these observations.

2/ Although ideal, it is not practical or possible to develop a measure defining volatility as a deviation from the anticipated trend that would be a reflection of the unanticipated movements of the exchange rate and thus the true uncertainty facing economic decision makers. But since evidence from forward markets indicates that most exchange rate movements are unanticipated, period-to-period movement of the exchange rate can serve as a reasonable proxy.

As expected, the very short-term volatility of nominal effective exchange rates is higher under the more flexible exchange regimes. A more interesting result is that the volatility of the real effective exchange rates under the less flexible regimes is not significantly different from the volatility exhibited by the nominal effective exchange rate. This indicates that the arrangements chosen are aimed at minimizing relative price changes vis-à-vis trading partners. <sup>1/</sup> Under the more flexible arrangements, the real effective exchange rate displays a much lower volatility than the nominal effective exchange rate, indicating that exchange rate movements tended to react to offset price movements.

## 2. Unambiguous anchors

Step devaluations against a major currency are the least ambiguous of all fixed rate policies. There is no continuing element of flexibility in exchange rate management, other than indirectly through the currency against which the peg is maintained. In terms of the perceived benefits of anchors in stabilizing expectations, it is absolute fixity following a one-time change which yields unambiguous benefits.

The use of nominal exchange rates as nominal anchors in stabilization programs is analyzed empirically by Edwards (1992). The credibility of the anchor policy is tested for Chile, Mexico, and the former Yugoslavia, as a structural break in the parameter estimate for the lagged inflation variable (indicating that the inflation inertia has declined), but the results are mixed. Analysis of a larger cross-country data set suggests that a fixed exchange rate regime has been associated with financial discipline. However, the financial discipline effect found by Edwards depends also upon the past history of inflation, which suggests that the financial policy discipline predates the exchange rate regime.

Fajgenbaum and Quirk (1991) examine medium-term inflation and balance of payments performances in the 15 Western Hemisphere countries which undertook step devaluations in the period 1960 through 1990 followed by a constant exchange rate for at least 18 months. The study finds unambiguously successful medium-term outcomes from step devaluation under such anchor regimes in 5 cases out of 28 (Table 2). In four of these cases (Bolivia, 1972-78; Ecuador, 1961-67; Peru, 1967-70, and Trinidad and Tobago, 1989-90) the devaluations took place at a time when inflation was low. These devaluations and the associated economic programs were successful in bringing about both balance of payments adjustment and more stable prices, but except in the case of Ecuador they did so only after an initially sharp rise in domestic inflation requiring a deflationary monetary and fiscal response that had adverse consequences for growth. Overall, the study finds

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<sup>1/</sup> Lanyi and Suss (1982), studying optimal peg arrangements for the period 1973 to 1980, concluded that in most cases a policy aimed at minimizing volatility of either the nominal or the real effective exchange rate will also minimize the other.

Table 2. Selected Western Hemisphere Countries: Medium-Term Inflation and BOP Performances Following Introduction of Different Exchange Rates or Regimes

	Anchor	Managed Flexibility	Market-Determined <u>1/</u>
Inflation and BOP Improved	Bolivia, 72-78, <u>2/</u> , <u>3/</u> Ecuador, 61-67 <u>2/</u> Peru, 67-70 <u>2/</u> , <u>3/</u> Trinidad and Tobago, 89-90 <u>2/</u> , <u>4/</u> Chile, 75-79 <u>5/</u>	Chile, 83-90, <u>4/</u> Colombia, 86-90 <u>4/</u> Ecuador, 89-90 <u>4/</u> Mexico, 86-90 <u>3/</u> , <u>4/</u> , <u>5/</u> Uruguay, 76-81 <u>5/</u>	Bolivia, 85-90 El Salvador, 90-91 Jamaica, 83-86 Paraguay, 89-90 Uruguay, 82-90 Venezuela, 89-90
BOP improved but not inflation	Ecuador, 71-76 Jamaica, 87-90 <u>4/</u>	Guatemala, 90-91 Honduras, 89-90	
Inflation improved but not BOP	Argentina, 67-70 Argentina, 79-81 <u>5/</u> Brazil, 64-68 Chile, 59-62 <u>2/</u> Chile, 79-82 Colombia, 62-66 Costa Rica, 74-78 Guatemala, 86-89 Jamaica, 78-82 Uruguay, 67-71	Brazil, 68-78 Costa Rica, 83-90	
Inflation and BOP worsened	Argentina, 71-75 Argentina, 85-86 <u>6/</u> Argentina, 89-90 Bolivia, 79-85 Brazil, 86-87 <u>7/</u> Dominican Republic, 88-90 Ecuador 82-83 Ecuador, 85-87 El Salvador, 86-89 Peru, 85-88 Trinidad and Tobago, 86-88	Brazil, 88-90 Colombia, 67-85 Mexico, 76-81 Paraguay, 82-88 Peru, 75-78	Dominican Republic, 85-87

Source: Fajgenbaum and Quirk (1991).

1/ Too early to assess; Dominican Republic 1991 to date, Jamaica 1991 to date, and Peru 1990 to date.

2/ Low-inflation context.

3/ Initial sharp rise in inflation.

4/ Small black market discount.

5/ Tablita (from 1977 in the case of Chile, from 1988 for Mexico, and from 1978 for Uruguay).

6/ Austral plan.

7/ Cruzado plan.

that the programs embodying anchor devaluations tended to favor inflation performance at the expense of continuing balance of payments difficulties. Of the 12 cases in which either the balance of payments or price performance deteriorated, 10 erred toward a negative balance of payments. In a number of instances, progress was made in bringing down inflation from an initially unsatisfactory level, but the shortcomings on the external side or unsustainable economic policies ultimately undercut this, as each country slipped into successive incomplete exchange rate adjustment (sometimes involving a shift to another form of exchange rate regime). However, the largest group of anchor cases in the study (11) is made up of countries that achieved neither inflation nor balance of payments objectives. These include several major devaluations by Argentina over the three decades, including those under the Austral plan, and one by Brazil under the Cruzado plan adopted in 1986. Virtually all of the policy failures occurred in the 1980s when the magnitudes of both balance of payments deficits and inflation were historically high.

The Fajgenbaum-Quirk study concludes that anchor policies through 1990 did not seem to have been successful in Western Hemisphere developing countries. They had some success in dealing with external deficits when inflation was low at the outset. However, there appears to have been a generalized problem in obtaining sufficient policy effort to support the devaluation and then to sustain it through the medium term in order to turn the balance of payments around. The success of the fixed exchange rate approach in situations of pre-existing low inflation suggests that the approach may well be useful at a later stage of stabilization, when inflation has already been brought down to a satisfactory level. However, in such situations of low inflation, balance of payments difficulties are likely to have occurred as a result of external shocks, many reversible in nature, rather than monetary policy errors that result in excessive absorption affecting both inflation and the balance of payments. The successes may therefore have reflected the short-term reversible nature of the problem to begin with. More generally, there is the caveat on the conclusions that the study covers a time when step devaluations were not necessarily complete, in the sense that a sizable parallel market continued to exist in most cases, and the attempt was made to sustain an official rate in the presence of stringent exchange controls. Moreover, the study predates the recent experience with currency board-backed stabilization.

The experience with performance from the earlier period of anchor policies must be qualified in the light of the lessons of the 1980s that are now being applied in the application of anchor/fixed rate regimes. More recently, a new genre of fixed rate regimes has emerged with the aim of rule-based stabilization. These are the currency board-backed fixed rate regimes, adopted by Argentina in 1992, Estonia in 1993, and Lithuania in early 1994. The initial experience with these arrangements has been positive, although not completely monotonic. In Estonia, a rapid turnaround in the balance of payments brought about by capital inflows could not be sterilized because of the nature of the currency board policy, and inflation emerged for a while, although this appears since to have been brought under

control. In Lithuania, the move to a currency board followed signs of emerging success under the previous conventional central banking arrangements with an appreciation of the market exchange rate. Closer to home, the arrangements in Argentina have been sustained and have been accompanied by reduced inflation. Guitián (1993) notes that the establishment of a currency board requires an appropriate stock of international reserves, although the percentage of currency backing can be progressively lowered as price stability allows a less passive monetary policy.

### 3. Unambiguous floating

Recent experiences with floating exchange rates in developing countries in the 1980s and early 1990s are examined in Corden (1993) and Quirk (1994a). These studies focus on the group of countries that have adopted market-determined flexible rate systems, and do not include the group of managed floaters in which the central bank sets the rate flexibly in accordance with certain indicators. However, there is the qualification that in some of the independently floating countries exchange controls have remained and the authorities have conducted sterilized intervention.

Corden (1993) compares average inflation rates for ten countries between two periods in which there had been a regime switch. In three cases he finds the average rate to have been markedly higher in the second period, suggesting that there had been a loss of discipline along with the switch to a flexible regime. But in the other seven cases, five from Asia, he found that there clearly was not a loss of reasonable discipline. The study emphasizes the role of trade restrictions, noting that in the shift to the flexible rate regimes the response was hardly ever to tighten restrictions, but more commonly to liberalize. The added room for import absorption that the liberalization provided may also have contributed to the inflation performance by freeing up the aggregate supply constraint.

A clear outcome of the periods of floating is that the countries have tended to maintain floating systems as long as a balance of payments problem has persisted. In some cases, they have ceased to float and have pegged, but only when the international reserves level has been restored in the period of floating. Quirk (1994a) notes that floating was accompanied by dual (but not fixed rate) exchange markets in only two programs in the recent 1985-92 period, as against some six in the period from 1982 to 1985 surveyed earlier in Quirk et al. (1987). In many countries, the new independently floating arrangements continued a process of real effective depreciation to improve competitiveness that was already underway (Guyana, Nigeria, Philippines, South Africa, Uruguay, Venezuela, and Zaire). The exceptions were Brazil and Peru where inflation was particularly rapid, El Salvador and Guatemala where a small appreciation in the one or two years following floating reflected strengthening of economic policies, and Paraguay owing to large depreciations in neighboring countries. In Bolivia the shift to floating reversed the deterioration of competitiveness beforehand. The study notes surprising growth performance; in the eleven

countries surveyed, six experienced faster GDP growth after floating and in only two countries did growth performance deteriorate. In the other countries, growth was virtually unchanged. The results are similar for inflation, which declined in one half of the countries following the float and accelerated in only one, Nigeria. In the group of independently floating countries surveyed in Fajgenbaum and Quirk (1991), with the exception of the Dominican Republic, all stabilization episodes of floating (Bolivia, El Salvador, Jamaica, Paraguay, Uruguay, and Venezuela) were found at the time to have been unambiguously successful, in that both inflation and balance of payments performance improved.

In the new economic climate, characterized by sizable inward surges of capital responding to better economic policies in developing countries, including currency convertibility, it can no longer be assumed that exchange rate policy is associated only with weak a balance of payments. Exchange rate policy has become highly relevant for developing countries with a strong balance of payments, and it is precisely in these circumstances that the traditional link of exchange rate anchor to low inflation is broken because an exchange regime that is flexible enough to permit the market-driven appreciation of the exchange rate can contribute to lower inflation.

In the group of industrial countries, a study by Mills and Wood (1993) examines linkages of changes in the exchange rate regime of the United Kingdom since 1913 to economic performance. It finds some evidence of dampened inflation under the gold standard, but concludes that the form of exchange rate regime since the 1930s, both fixed and floating, has not been associated with inflation developments.

#### 4. Ambiguous regimes

While some degree of management characterizes most views of what constitutes an anchor exchange rate mechanism, there are differing views on the precise form or sequence of regimes involved. Moreover, as discussed in Section II, there is an important difference between targeting monetary policy at the exchange rate level and using the exchange rate as an indicator of monetary policy when the demand for money is unstable. In the literature, real effective exchange rate pegs are viewed by some as anchors, although they are indexed to domestic inflation. Similarly, some see exchange rate anchors as consistent with considerable flexibility--moving the initial peg quickly if necessary to avoid a real appreciation, or even abandoning the peg within a matter of months for a floating regime.

It is interesting that a number of the countries sometimes cited as adopting exchange rate anchor policies since 1989 had experienced floating and other forms of exchange rate flexibility beforehand (Argentina, Egypt, Honduras, Mexico, and Trinidad and Tobago). Only in Poland and Estonia was the exchange rate anchor used to eliminate large exchange rate disequilibrium prevailing at the onset of the process of stabilization. Another qualification relating to the anchor cases, noted above, is that for countries experiencing strong pressure on the exchange rate to appreciate,

the adoption of the anchor can mean more rather than less inflation. In the case of Egypt, which has experienced strong capital inflows, in part associated with debt restructuring and aid following the Gulf War, the exchange rate has been held at an undervalued level. The result has been a higher than otherwise inflation rate, because the alternative of tightening domestic monetary policy would have raised interest rates and perpetuated capital inflows. On the other hand, fiscal adjustment need not have raised interest rates while absorbing the balance of payments shock. In Egypt, the exchange rate had been initially switched onto a floating arrangement (to about the prior black market level) and unified, giving rise to considerable market-based rate adjustment before the period of exchange rate stability. Mexico is another case where ambiguous policies with regard to the exchange rate regime make it difficult to interpret regime performance more generally. Following a period of rapid exchange rate flexibility, depreciation of the peso settled down to a more or less constant rate. However, the predictability of the exchange rate movement in this period was looked upon by some commentators as setting a floor for the inflation rate. In the circumstances, the constant crawl may have been less optimal than either a float, which would have quickly taken the exchange rate to its equilibrium level, or to a fixed one-time adjustment, which could have done the same without ongoing inflation expectations being generated. Among the other countries, Poland adjusted its exchange rate, after a one-and-a-half year period of stability, as did Honduras. Trinidad and Tobago has since moved to independently floating arrangements, but with sizable intervention.

##### 5. Extreme cases

Extreme cases make bad law, and possibly also poor tests of hypotheses, owing to hysteresis effects. Dornbusch et al. (1990) include a discussion of the inflation process with high and explosive levels of inflation, offering evidence that exchange rates play a causal role in hyperinflation, as the high inflation process creates a probability that a collapse of the exchange rate may well trigger explosive inflation. However, Dornbusch et al. note that a collapse of the exchange rate must ultimately be linked to changes in fundamentals whether they be reparations, debt service, or capital flight. In recent years there have been a few instances of countries that have had annual inflation rates exceeding 1,000 percent, a definition of explosive inflation (Argentina in 1990-91, Bolivia in 1984-85, Brazil in 1989-93, Nicaragua in 1988-91, Peru in 1989-90, the former Yugoslavia in 1989, and several transition economies). Of those that have since brought inflation down, Argentina used a fixed rate currency board-based approach, Bolivia an auction-based float, Brazil and Peru floating interbank markets (with an exchange rate floor in the case of Brazil), and Nicaragua a combination of a crawl and a floating dual market.

Corden (1993) analyzes the outcome of various episodes of tablitas <sup>1/</sup> in high inflation episodes in Argentina, Chile, and Mexico. He concludes that making such an exchange rate commitment is risky, because there may be a loss of discipline or of credibility, or both, leading to an exchange crisis. This makes it necessary to preserve some potential exchange rate flexibility to allow for exogenous shocks requiring real depreciation, as in the Chilean and Mexican cases.

Shirvane and Wilbratte (1993) conclude that, only in the high-inflation countries within a sample of 24 countries they tested are inflation and exchange rate change generally cointegrated, which may be attributable to the fact that prices are more flexible in such countries and thus conform more closely to the conditions of PPP. McNown and Wallace (1994) conduct tests for three high inflation country episodes, Argentina (1977-86), Chile (1973-85), and Israel (1979-88). They find some evidence that money supply and demand conditions dominate exchange rate determination (and by implication a joint linkage of exchange rate movement and inflation to the monetary fundamentals). However, the models in both studies use official exchange rate data that may be variably lagged in adjustment to monetary conditions and thereby biased against cointegration. <sup>2/</sup>

#### 6. Indirect evidence

Tests of the relationship between exchange rates and inflation provide only indirect evidence for exchange regimes. There is often ambiguity about the role of expected depreciation as against actual depreciation of the exchange rate. Actual depreciation resulting from greater flexibility can serve to relieve expectations and focus the inflationary impact of an exchange rate change solely on cost channels. Unrealized exchange rate expectations, on the other hand, feed directly into inflation psychology (with the lack of credibility made clear by comparisons with the parallel exchange rate), and also into costs through parallel market pricing. It is for this reason that policies aimed at a quick adjustment of the exchange rate, either to a predetermined fixed level with sufficient room to compensate for uncertainty about the extent of existing disequilibria, or to a floating level, are likely to have the most success.

In the group of industrial countries, various studies of the time interdependence of the exchange rate and inflation find relatively little evidence of cointegration. <sup>3/</sup> Even if they had, the implications for regimes would be inconclusive, because two-way exchange rate volatility does

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<sup>1/</sup> A tablita is an exchange arrangement whereby a phased schedule of spot exchange rates is set in advance by the authorities (i.e., a form of dynamic peg with predetermined step adjustments).

<sup>2/</sup> A close one-year lagged relationship from money to exchange rate is found in Quirk (1994a) for a sample of 13 countries, using black market rather than official exchange rate data.

<sup>3/</sup> For a discussion of this literature, see Chinn (1991).



not necessarily translate into unidirectional price movement. There is clear evidence that short-run (monthly and quarterly) volatility of exchange rates has risen sharply since the introduction of generalized floating in 1973. There is also the coterminous emergence of high inflation after the energy-price shocks of the 1970s, but the correlations at this level are not translated into discernable evidence at the country level. For example, Papell (1994) finds that, for G-7 industrial countries the broader measures of inflation are little affected in the short-run by exchange rate depreciation. This would tend to suggest little impact of exchange rate regimes on inflation, unless the regime itself had a direct impact on the conduct of monetary policy.

For developing countries, the testing of relationships between exchange rate regimes and inflation is considerably more difficult. One, the developing countries did not as a group shift to floating exchange rates in the decisive way that most of the larger industrial countries did. Instead, there has been persistent movement over the 1980s and early 1990s toward floating regimes. Second, there is the problem of price controls and poor quality of price indices. Third, there is a question of the relationship between the regime and the observed exchange rate, which then translates into inflation. In many developing countries with fixed exchange rates foreign exchange is cleared at the margin through parallel exchange markets. It is these markets that form the basis for much of the pricing at the retail level in the economy, certainly outside urban areas. Therefore, the impact of domestic policies on inflation would need to be tested in the parallel market rather than the official market. The problem with using the official exchange rate is that it responds with a variable lag as a reaction function to movements in the parallel rate (Agenor and Taylor, 1993). The variable lags and magnitudes of response make it difficult to appraise the effect of the regime on inflation. However, the author is not aware of a specific study of the relationship between the degree of black market exchange rate stability and inflation. 1/

At an even more basic level, hysteresis can affect the transmission of exchange rate movement under different regimes. 2/ Under floating regimes, the movement of the exchange rate is continuous. Under fixed regimes the movement occurs, but it tends to be highly discontinuous and larger in magnitude. There is a reasonable inference to be made that floating exchange rates serve more like small slippages along geographic fault lines. If the slippages occur, a large earthquake is avoided. Under fixed exchange rates, the cumulative disequilibrium of large magnitude can tend to ratchet itself into inflation: (1) because of labor and goods

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1/ While there is no available evidence on the association with inflation, two studies using the black market premium for foreign exchange, Fischer (1993) and Quirk (1990), find significance for the variable in explaining growth.

2/ For a discussion of exchange rate hysteresis, see Baldwin and Lyons (1994).

market inflexibilities, and (2) because large devaluations tend to signal weakness, while depreciation tends to be taken as an indication of the government's adherence to a domestic policy course. Especially in developing countries there are structural inflexibilities and governments tend to be judged more by the exchange rate. Any ratchet effects are therefore likely to be more pronounced.

Because of the surges in capital inflows leading to appreciation pressures in countries that have liberalized exchange controls, it is interesting to consider this traditional argument in reverse. When a country has a large shock revaluation, does this tend to ratchet itself into spiralling deflation of prices? The author has not seen a test of this hypothesis, but suspects that the response is probably asymmetrical because of downward wage and price rigidity. There is a question whether special considerations would apply in the case of developing countries with floating rates and continuous but relatively small exchange rate adjustments following, of course, any one-time adjustment to an equilibrium level at the time that the float was introduced. For example, would the uncertainties introduced by more continuous exchange rate movement result in risk premia being added to financial asset and goods market prices? The evidence from industrial countries would seem to suggest that even very high short-term volatility is not easily translated into stickiness in transactions. The evidence tends to be mixed regarding effects on trade and direct investment (Chowdhury, 1993).

Bahmani-Oskooee (1993) finds little evidence of exchange rate determination by relative prices in conformity with PPP. Using cointegration tests of effective exchange rates, he concludes that PPP has failed as an explanation in a sample of 25 high inflation and low inflation LDCs. However, when he tested PPP using bilateral exchange rates, there was evidence of cointegration in 7 out of 16 countries. Such mixed results have been found generally in studies of exchange rate determination. Studies focused on financial asset prices rather than real asset prices such as PPP also tend to find little cointegration, e.g., uncovered interest rate differentials. Simple theories of exchange rate determination therefore do not appear to apply, although such variables generally find a place in multivariate equations of exchange rate determination. It is therefore not surprising that the role of the exchange regime in inflation performance is difficult to trace.

#### IV. Concluding Remarks

The decision to adopt a floating exchange rate and not to fix the exchange rate can be seen in the context of a comprehensive economic program in two ways. First, it can be seen as a decision to reconcile the internal inconsistencies of a demand management program, by allowing an adjustment of the exchange rate to act as a safety valve for the program. Viewed from this perspective, the use of the floating rate represents an admission of failure, because it implies that there is a good chance that the program is

insufficiently tight to eliminate excess demand at the projected level of inflation. Second, the adoption of the floating rate might also be seen as a signal that other policy indicators are too difficult to assess in a period of rapid structural and institutional change, so that the signals provided by the floating exchange rate are necessary to assess the short-run variations about the stabilization path.

A case made for exchange rate anchors is similarly based on uncertainty, i.e., that uncertainty regarding program targets for money and credit aggregates implies the need to set another nominal anchor in terms of a fixed target for the exchange rate. Both approaches are similar in that the stability of the exchange rate is the objective. However, what is lost in the absolutely fixed exchange rate scenario is the ability to read short-run supply-demand pressures, which could make the operation of monetary policy extremely difficult if adequate interest rates are not available for this purpose, noting that the assessment of real interest rates in periods of rapidly-changing prices or insufficient depth of markets can be difficult. Use of exchange rate margins about a fixed exchange rate does not fully resolve this problem. When the exchange rate is at, or comes close to, the margin--which will occur more often the narrower the margins--the resulting intense foreign exchange market intervention will tend to confuse the signals coming from the exchange rate and interest rates.

### References

- Agenor, Pierre Richard, and Mark P. Taylor, "The Causality Between Official and Parallel Exchange Rates in Developing Countries," *Journal of Financial Economics* (1993).
- Aghevli, B., Mohsin S. Khan, and Peter J. Montiel, "Exchange Rate Policy in Developing Countries: Some Analytical Issues", International Monetary Fund, *Occasional Paper*, No. 78 (Washington, March 1991).
- Bahmani-Oskooee, Mohsen, "Purchasing Power Parity Based on Effective Exchange Rate and Cointegration: 25 LDCs' Experience with its Absolute Formulation", *World Development*, Vol. 21, No. 6 (New York, Oxford, June 1993).
- Baldwin, Richard E., and Richard K. Lyons, "Exchange Rate Hysteresis?: Large Versus Small Policy Misalignments," *European Economic Review*, Vol. 38, No. 1 (January 1994).
- Bruno, Michael, "High Inflation and the Nominal Anchors of an Open Economy," *Essays in International Finance*, No. 183 (Princeton University, June 1991).
- Calvo, Guillermo, and Carlos Vegh, "Exchange Rate-Based Stabilization Under Imperfect Credibility," in *Open Economy Macroeconomics*, eds. Helmut Frisch and Andreas Worgotter (London: MacMillan Press, 1993, Chapter 1).
- Chinn, M., "Some Linear and Nonlinear Thoughts on Exchange Rates," *Journal of International Money and Finance* (June 1991).
- Chowdhury, Abdur R., "Does Exchange Rate Volatility Depress Trade Flows: Evidence from Error Correction Models," *The Review of Economics and Statistics*, Vol. LXXV, No. 4 (November 1993).
- Corden, W. Max, "Exchange Rate Policies for Developing Countries," *The Economic Journal*, No. 103 (January 1993).
- \_\_\_\_\_, "Exchange Rate Policy in Developing Countries," Working Paper, No. 412, The World Bank (April 1990).
- Dornbusch, Rudiger, Fredrico Sturzenegger, and Holger Wolf, "Extreme Inflation Dynamics and Stabilization," *Brookings Papers on Economic Activity*, Brookings Institution (Washington, 1990).
- Edwards, Sebastian, "Exchange Rates as Nominal Anchors," *NBER Working Paper*, No. 4246, National Bureau of Economic Research (Cambridge, 1992).

Fajgenbaum, Jose, and Peter J. Quirk, "Experiences in Western Hemisphere Developing Countries with Exchange Rate Anchors," Mimeo, International Monetary Fund (Washington, April 1991).

Fischer, Stanley, "The Role of Macroeconomic Factors in Growth," *NBER Working Paper*, No. 4565, National Bureau of Economic Research (Cambridge 1993).

\_\_\_\_\_, "Exchange Rate Versus Money Target in Disinflation," in *Indexing, Inflation and Economic Policy*, MIT Press (1986).

Guitián, Manuel, "The Choice of Exchange Rate Regime," in *Approaches to Exchange Rate Policies: Choices for Developing and Transition Economies*, ed. Richard C. Barth and Chornng-Huey Wong, International Monetary Fund (Washington, 1994).

\_\_\_\_\_, "Exchange Rate Management in the Reform Process," Paper presented for a Seminar on Coordination of Structural Reform and Macroeconomic Stabilization, International Monetary Fund (Washington, June 17-25, 1994).

Lanyi, A., and E. Suss, "Exchange Rate Variability: Alternative Measures and Interpretation," *IMF Staff Papers*, Vol. 29 (Washington, December 1982).

Mills, Terrence C., and Jeffrey E. Wood, "Does the Exchange Rate Regime Affect the Economy?," *The Federal Reserve Bank of St. Louis Review*, Vol. 75, No. 4 (July/August 1993).

McNown, Robert, and Myles S. Wallace, "Cointegration Tests of the Monetary Exchange Rate Model for Three High-Inflation Economies," *Journal of Money, Credit and Banking*, Vol. 26, No. 3 (August 1994, Part 1).

Papell, David H., "Exchange Rates and Prices: An Empirical Analysis," *International Economic Review*, Vol. 35, No. 2 (May 1994).

Papi, Laura, "How does Learning Affect Inflation after a Shift in the Exchange Rate Regime?," *Working Paper*, No. WP/94/70, International Monetary Fund (Washington, June 1994).

Quirk, Peter J., Benedicte Vibe Christensen, Kyung Mo Huh, and Toshihiko Sasaki, "Floating Exchange Rates in Developing Countries: Experience with Auction and Interbank Markets," *Occasional Paper*, No. 53, International Monetary Fund (Washington, 1987).

\_\_\_\_\_, "Exchange Rate Policies and Management: A Model for Successful Structural Adjustment," in *Strategies for Structural Adjustment: The Experiences of Southeast Asia*, moderator Ungku A. Aziz, International Monetary Fund and Bank Negara Malaysia (1990).

- \_\_\_\_\_ (1994a), "Recent Experience with Floating Exchange Rates in Developing Countries," in *Approaches to Exchange Rate Policy: Choices for Developing and Transition Economies*, eds. Richard C. Barth and Chorng-Huey Wong, International Monetary Fund (Washington, 1994).
- \_\_\_\_\_ (1994b), "Capital Account Convertibility: A New Model for Developing Countries," in *Frameworks for Monetary Stability*, eds. Tomás J.T. Baliño and Carlo Cottarelli, International Monetary Fund (Washington, 1994).
- \_\_\_\_\_, (1994c), "Adopting Currency Convertibility: Experiences and Monetary Policy Considerations for Advanced Developing Countries," *SEACEN Occasional Paper* (forthcoming), South East Asian Central Banks (Kuala Lumpur, 1994).
- Shirvani, Hassan, and Barry Wilbratte, "The Monetary Approach to Exchange Rate Determination: New Evidence Based on Cointegration Theory," *The Journal of International Finance*, Vol. 5, No. 2 (Autumn 1993).
- Svensson, Lars E.O., "Fixed Exchange Rates as a Means to Price Stability: What Have We Learned?," *Working Paper*, No. 4504, National Bureau of Economic Research (Cambridge, October 1993).
- Williamson, John, "A Survey of the Literature on the Optimal Peg," *Journal of Development Economics*, No. 11 (1982).