

On Becoming More Flexible:
Exchange Rate Regimes in Latin America and the Caribbean

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1. Introduction

Following the collapse of the Bretton Woods System of fixed exchange rates in 1973, most developing countries continued to peg the value of their currencies to the currency of their major trading partners. Since then, there has been a dramatic shift toward more flexible exchange rate regimes among countries in Latin America and the Caribbean (LAC). In 1978, 73% of these countries maintained pegged exchange rates relative to the U.S. dollar. This percentage had fallen to just 23% by mid 1994.

The primary objective of this paper is to examine why countries in the region have shifted between fixed and more flexible regimes. A simple model of exchange rate regime choice is developed, and estimated using probit analysis for 26 countries during 1978-92. The approach followed here is to distinguish between two broad types of exchange rate regime: fixed and more flexible, where the latter category includes a variety of regime types. However, problems with exchange regime classification introduce important caveats to all of the empirical analyses of regime choice, including this one, as discussed further below. The paper also takes a preliminary look at whether choice of exchange rate regime "matters" for macroeconomic performance -- and especially for economic growth -- in developing countries. Because available data make a systematic analysis difficult, the discussion highlights potential pitfalls in drawing conclusions about the linkages.

There is an extensive theoretical literature on the optimum choice of exchange regime. Early contributions focused on the conditions under which membership in a currency union was optimal as a function of various structural characteristics such as openness, labor mobility and size. Mundell's (1960) classic analysis focused on the optimal exchange regime to maintain external balance, while McKinnon (1962) emphasized maintenance of price stability.

More recently, a large theoretical literature has examined the optimal choice of exchange regime so as to stabilize macroeconomic performance in a world with different types of shocks. The basic conclusion of these studies is that the optimal choice of regime depends on the nature and size of these shocks, as well as on the structure of the economy. (For example, see Flood (1979), Frenkel and Aizenman (1982) and Turnovsky (1983) and the survey by Aghevli et. al (1991).) These analyses tend to imply that countries which

experience large foreign price shocks should choose flexible exchange rates, while domestic monetary and demand shocks should be financed out of reserves, with no need for exchange rate adjustment. However, it should be noted that these models are somewhat sensitive to exactly what is specified as the policy maker's objective function: stabilizing prices, output or aggregate consumption. (See Melvin (1985) for a discussion of this point.) Some of the models focus on the optimal degree of exchange market intervention, with less intervention being associated with more flexible regimes. Not surprisingly, these studies tend to find that intermediate options are preferable to purely fixed or flexible regimes.

A few papers have empirically examined the choice of exchange rate regime. These studies all use the IMF classification of exchange regimes to create the dependent variable. An early study, Dreyer (1978), focuses on the role of structural characteristics. More recent studies have incorporated different types of shocks as well. Melvin (1985) and Cuddington and Otoo (1990, 1991) find some support for the view that the size of recent domestic and foreign shocks influences a country's choice of exchange rate regime.

However, the now standard approach to the analysis of choice of exchange rate regime does not capture important real world features of the decision for developing countries¹ for at least four reasons. (In contrast, see Frankel (1992) for a balanced discussion of the choice of exchange rate regime for Asian economies. Aghevli et. al (1991) and the papers in Barth and Wong (1994) provide comprehensive overviews of exchange rate policy issues for developing countries in the 1990s.)

First, the theoretical models discussed above often assume that the critical difference between fixed and more flexible regimes is that nominal exchange rates can not be adjusted under a fixed regime. In fact, countries with fixed exchange rates typically do maintain the option of nominal adjustments.² Indeed, the

¹ This is not to suggest that formal tests of models of optimal regime choice are uninteresting. Such tests are appropriate and worthwhile. It would be interesting in future work to test these traditional models against the alternatives suggested here.

² The sample of LAC countries contains two for which exchange rate adjustments would be very difficult. Panama uses the U.S.dollar as its currency. Grenada is a member of the eight country Organization of East

1980s saw major adjustments of the nominal values of many of the LAC countries' currencies that maintained a fixed regime.³

Second, the traditional model does not incorporate the political economy of exchange rate adjustments. The central point here is that it may be more politically costly to adjust a fixed exchange rate than to undertake a similar nominal adjustment to an exchange rate that is managed, because the latter is much easier to disguise. This point was made in a recent IMF survey of exchange rate policy in developing countries:

"given the political stigma attached to devaluation under a pegged regime, an increasing number of countries have found it expedient to adopt a more flexible arrangement for adjusting the exchange rate on the basis of an undisclosed basket of currencies. Such an arrangement enables the authorities to take advantage of the fluctuations in major currencies to camouflage an effective depreciation of their exchange rate, thus avoiding the political repercussions of an announced devaluation." (Aghevli et. al., 1991)

Caribbean States -- which share a common currency and central bank. Panama presumably could decide to create its own currency. While unlikely, recent events such as the division of the Czech and Slovak Republics -- which now have separate currencies -- suggests that it is not inconceivable. Further, the recent devaluation of the CFA franc suggests that an adjustment of the Eastern Caribbean dollar is also conceivable.

³ See Collins (1995), Klein and Marion (1994) and Flood and Marion (1994) for empirical descriptions and analysis of exchange rate adjustments among countries with fixed exchange rate regimes.

This perspective points to a very different distinction between a fixed exchange rate and one that is more flexible. In a fixed regime, any nominal exchange rate change is very visible, and is clearly identifiable as a government decision, with potential ramifications.⁴ In a more flexible regime, it can be difficult for the public to distinguish between exchange rate adjustments within the existing regime, and ones that reflect government decisions, for example to depreciate the currency. A devaluation makes the newspaper headlines. An adjustment of a more flexible regime may not. This implies that the decision to move to a more flexible exchange rate is partly a decision to de-politicize exchange rate adjustments. Instead of the focus on the nature and size of shocks implied by the traditional models as the key determinants of exchange regime choice, these political economy considerations suggest that factors which influence the perceived degree of exchange rate misalignment (and thus the likely size and frequency of adjustments under a fixed rate regime) should be key determinants of the decision to fix or not. Countries that anticipate needing large and/or frequent changes should tend to choose more flexible regimes.

Third, traditional models do not incorporate the evolution of the "climate of ideas" -- based largely on research findings and assessments of country experiences -- regarding the appropriate exchange rate regime for a small open economy. During the 1970s, there seemed to be a pervasive view that a small country with poorly developed financial markets should peg to its main trading partner. One concern was that the market for its currency would be thin, creating a volatile exchange rate that would be disruptive for economic activity. As noted by Quirk (1994), in his discussion of exchange rate regimes in developing countries, "Prior to the 1980s, it was widely believed that operating a competitive floating exchange rate regime required a level of institutional development these countries did not possess." (p. 135) Williamson (1982) states that

⁴ Reasons for such political ramifications include the fact that devaluation typically entails a cut in domestic real incomes, and that a strong domestic currency can be a source of national pride. Conventional wisdom suggests that devaluation hurts a national leader's chances of getting re-elected.

"There appears to be widespread agreement that independent floating is either 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." (p.39) Williamson goes on to examine how countries should decide which currency to peg to, given that they would decide to peg.

Since the mid 1980s, however, this view appears to have all but disappeared. Quirk (1994) observes that the IMF's 1987 review of the early experience with floating exchange regimes concluded that these systems could be operated satisfactorily, even by developing countries with a wide range of structures. Many developing economies were encouraged to abandon fixed rates during the 1980s. In fact, many countries that adopted more flexible regimes during since 1985 -- especially freely floating ones -- appear to have done so in the context of an IMF program. In many instances, this regime change was an explicit performance criteria. Further, there are now many experiences within LAC of small open economies that have done quite well with more flexible regimes. A country that adopts a more flexible regime is now in very good company. As stressed by Burton and Gilman (1991) the more recent IMF view is that there is no single exchange rate regime prescription. While it is difficult to measure the evolution of "conventional wisdom", the increasing acceptance of flexible regimes for developing countries may have had significant influence on decision-making.

Finally, a related issue is the new rationale for fixed exchange regimes as a means of disciplining domestic policy makers. This view gained prevalence during the 1980s. Many analysts have argued that the clearest role for the exchange rate as a nominal anchor can be made in cases of very high, or hyper inflation. There has been extensive theoretical and empirical work on exchange rates as nominal anchors, and as a means of establishing credibility for stabilization programs.⁵ While my own view is that the evidence does

⁵ See Giavazzi and Pagano (1988) for a clear theoretical exposition of how this discipline might work. The extent to which it has worked in practice remains the subject of considerable debate. For developing

not support the conclusion that fixing the exchange rate helps a country to lower its inflation rate, the jury is still out. However, there does seem to be a consensus in cases of very high and hyper inflation. In these cases, many analysts have argued that a fixed exchange rate (perhaps following an initial maxi-devaluation) is a constructive part of a stabilization program, and that flexible exchange rates make it very difficult to alter domestic price and wage setting behavior so as to reduce inflation. In any case, this element was not featured in the traditional models of exchange regime choice, and has not been a central feature of the related empirical analysis.

The paper is composed of four remaining sections. Section 2 develops a stylized model of determinants of exchange regime choice that reflects the considerations discussed above. The empirical analysis is presented in Section 3. Section 4 discusses the links between exchange rate regime and economic growth. Concluding remarks are presented in Section 5.

2. Choice of Exchange Rate Regime - A Stylized Framework

Since 1978, there has been a trend movement from fixed to more flexible regimes. During the past decade, a number of countries have also gone back and forth between the two. This section describes a simple model of exchange rate regime choice, as well as the measure of regime, and of potential determinants of regime choice used in the empirical analysis.

2.1 Classifying Exchange Regimes

countries, see Cordon (1994) and Edwards (1992).

The IMF provides a classification of exchange rate regime for all member countries. Like other empirical studies in this area, these IMF data are the basis for the classification used here.⁶ (Additional details, as well as the annual classifications of the 26 LAC countries during 1978-94 are provided in the Appendix.) The categories are: pegged (to a particular single currency, or to a basket), limited flexibility (against a single currency or group of currencies) adjusted according to indicators, other managed float or free float. Of course, there are a number of difficulties with these data, and in some cases, knowledgeable observers might dispute the accuracy of the "official" IMF classification.

Countries that have moved away from pegged regimes have tried a variety of more flexible ones. In principle, it is sensible to think of a continuum of possibilities, corresponding to the degree of intervention required. Thus, a pegged rate could require infinite amounts of intervention, while a freely floating regime would require no intervention. Intermediate regimes could be placed between these two extremes. This approach has been used fruitfully in modelling regime choice.⁷ However, the official classifications may be misleading. As stressed by Aghevli et. al (1991), "arrangements are often officially described as "adjusting to indicators," "managed floating" or "independently floating" but these terms do not accurately reflect the arrangements in place, as in the overwhelming majority of cases, the exchange rate is effectively set by the authorities, albeit adjusted frequently." (p. 2) Available classifications do not provide detailed enough information to distinguish the actual degree of flexibility (ie. extent of intervention) among countries that

⁶ It is also worth noting that the IMF classification refers only to the main official rate for the relevant country and that a significant fraction of developing countries in the region have experimented with multiple currency systems of various different types during the 1980s. Interestingly, none of the 26 countries in the sample was engaged in multiple rate practices in 1978 and by June 1994, all of them had unified exchange rates once again.

⁷ Some recent empirical studies have divided regimes into three groups: pegged, intermediate flexibility (including pegged to a basket, or limited flexibility against a single currency) and more flexible. However, Cuddington and Otoo (1991) have been unable to distinguish between the intermediate and more flexible regime categories in their empirical analyses. In the sample of LAC countries used here, very few observations (one country -- Guyana -- for three years) would fall into the intermediate category. These regimes were classified as more flexible in the probit analysis.

have various types of more flexible regimes. In this analysis, we simply distinguish between fixed and more flexible regimes.

An unfortunate problem with these data is that countries such as Mexico that maintained exchange rate bands are classified as "managed float". The collapse of the Mexican band system in December 1994 graphically illustrated the similarities between this regime and a fixed rate system. It should also be noted that the small Caribbean countries comprise a large share of the countries that continued to maintain fixed rates in the 1990s.

2.2 The Framework

The estimation below is based on a simple model of the choice of exchange rate regime. Define Z^* as a latent variable that measures the relative attractiveness of a pegged versus a more flexible regime. In particular, consider two (intertemporal) loss functions. $P(\cdot)$ is the minimized loss given a pegged (fixed-but-adjustable) exchange rate regime, and $M(\cdot)$ is the minimized loss function given a more flexible regime. If Z^* were positive, greater losses would be incurred under a more flexible regime than under a pegged regime and pegging would be the preferred option. On the other hand, if Z^* were negative, a policy maker would choose the more flexible regime.

$$(1) \quad Z^* = M(\cdot) - P(\cdot)$$

$$(2) \quad \text{if } Z^* > 0 \quad \text{Then } F = 1 \quad (\text{fixed rate regime})$$

$$Z^* \leq 0 \quad F = 0 \quad (\text{flexible regime})$$

In specifying determinants of the losses incurred under each regime, we make two key assumptions. First, policy makers would like to minimize deviations from a target real exchange rate, which may change over time. Second, they have a choice between two exchange rate regimes: pegged or managed flexibility, as discussed further below.

Suppose that policy-makers can identify a target real exchange rate, Q^T . (For simplicity, a bilateral rate is assumed here, but this is not essential.) This target might come from an intertemporal maximization. In any case, the target would be a function of domestic and external conditions as shown in equation (3).⁸

$$(3) \quad Q^T = SP^*/P = f(X)$$

$$(4) \quad S^T = f(X) P/P^*$$

where S is the domestic currency (peso) price of foreign currency (dollars), and P and P^* are domestic and foreign price levels. X includes relevant domestic and foreign factors. Time subscripts have been omitted. As shown in equation (4) the target real exchange rate implies a target nominal exchange rate S^T . This target nominal rate will change over time in response to inflation differentials at home and abroad and to changes in underlying conditions that affect the target real rate Q^T .

What exchange rate regime should this country choose? The answer depends on the perceived characteristics of alternative regimes, which are now discussed in turn.

Fixed Rate Regime

One option is to peg the value of the peso to the dollar and to adjust it periodically. The underlying assumption is that, in a fixed regime, policy makers choose the optimal timing and size of nominal exchange rate changes, recognizing that they must trade off between two types of "costs":

- $c(S-S^T)$ are costs due to exchange rate misalignment. Deviation of S from S^T implies a deviation of the real exchange rate from its target, which could influence both internal

⁸ Note that there are other measures of the real exchange rate, including the price of tradeables relative to nontradeables. A target nominal exchange rate could be defined using any of these real exchange rate indicators.

balance (domestic output and employment) and external balance (the current account).

-- K is the (political) cost of undertaking an exchange rate devaluation, as discussed above. (Potential costs associated with increased inflation from abandonment of a nominal exchange rate anchor are discussed below.) While the size of the political cost could depend on the magnitude of the exchange rate adjustment, the assumption here is that there is also some fixed component, so that even a very small devaluation entails a discrete cost to policy makers under a fixed rate regime.

Hence, the nominal rate is not adjusted all the time. Policy makers tolerate some misalignment to avoid incurring the fixed political cost of adjustment. They undertake a (discrete) exchange rate adjustment when the misalignment costs become large enough relative to the political adjustment cost. It is possible to derive the optimal size and timing of these exchange rate adjustments formally by interpreting the policy problem in terms of an S-s model.⁹ For the purposes of this paper, the central issue is the components of the policy makers' loss function if she adopts fixed exchange rates. Even in an intertemporal framework, both K and the current degree of misalignment will be critical determinants of the overall "losses" incurred under the optimal fixed exchange rate path.

More Flexible Regime

The alternative choice is a more flexible exchange rate regime, which is assumed to have the following characteristics. First, unlike the fixed rate regime in which the government directly sets the nominal exchange rate, policy makers are now assumed to have imperfect control over the nominal exchange rate. The actual exchange rate S^{Flex} cannot simply be managed to equal the target rate S^{T} . Here again, policy makers incur a cost $c(S-S^{\text{T}})$ due to exchange rate misalignment.

More specifically, policy makers are assumed to have some influence over the actual rate (captured by the term $g(S^{\text{T}})$ in equation (5) below). As $g' \rightarrow dg/dS^{\text{T}} \rightarrow$ increases from zero towards one, their attempts to

⁹ For example, see Flood and Marion (1994) and Collins (1995).

attain the target become more and more successful. However, the actual exchange rate is also influenced by other shocks, both at home and abroad. This is captured by the term: v , (assumed to have zero mean). The greater the variance of these shocks, the less control policy makers will have over the actual nominal (and real) exchange rate.

$$(5) \quad S^{\text{Flex}} = g(S^T) + v$$

Note that what really matters for the choice of exchange rate regime is policy makers' perceptions of how difficult it is to manage the nominal exchange rate. As additional countries adopted more flexible exchange rate regimes during the 1980s, perceptions about g' and about v have presumably evolved.

As under a fixed regime, therefore, there is a cost from misalignment under a more flexible regime, because the nominal exchange rate cannot be maintained at its target level. However, nominal exchange rate changes are depoliticized, so there is no longer a political cost, K , to adjustments. But the recent literature has highlighted another potential cost to exchange rate movements. More flexible exchange rate regimes may result in higher equilibrium levels of inflation because they do not effectively discipline central bankers. Thus, exchange rate adjustments, particularly in cases of very high inflation, may be costly in the sense that they help to fuel inflation. This could be written as:

-- $d(S - S_1)$ is the cost due to "lack of discipline" that arises as a result of exchange rate adjustments. (Note that devaluations in a fixed rate regime could cause a similar cost.)

Pulling these pieces together, we can now describe the determinants of the two loss functions: $P(\cdot)$ under a pegged regime and $M(\cdot)$ under a more flexible regime:

$$(6) \quad P = P(K, c(S^{\text{Peg}} - S^T))$$

$$(7) \quad M = M(c(S^{\text{Flex}} - S^T), d(S - S_1))$$

$$\text{where } S^{\text{Flex}} = g(S^T) + v$$

Note that $d(\cdot)$ could enter in $P(\cdot)$ as well as in $M(\cdot)$.

When would the policy maker opt for a fixed rate regime? When she anticipated small misalignment costs from maintaining the existing peg; when she believed that discrete nominal exchange rate adjustments have only small political costs; when she perceived her ability to manage a flexible exchange rate as low; and/or when she was attempting to stabilize very high inflation. In contrast, she would choose a flexible exchange rate when she anticipated large misalignment costs from maintaining a pegged rate; when she perceived high political costs to discrete nominal adjustments; when she believed her ability to manage a flexible rate was high; and/or when she was not attempting to stabilize very high inflation. Before turning to an empirical analysis based on this stylized framework, we briefly discuss explanatory variables.

2.3 Determinants of Regime Choice

The next step is to identify determinants of Z^* . As discussed above, there are four types of variables: those that influence the perceived (1) extent of exchange rate misalignment, (2) political cost of devaluation, (3) difficulty of managing a more flexible rate and (4) disciplinary effect of a nominal exchange rate anchor, in cases of very high inflation. The rationale behind each explanatory variable used in the estimation is discussed below. Data sources and variable construction are discussed in the Data Appendix.

A number of variables are taken as potential measures of exchange rate misalignment. Because a large external deficit or slow real GDP growth are potential indicators of an overvalued exchange rate, current account balance as a percentage of GDP and real GDP growth are included. Domestic inflation in excess of inflation abroad could cause the target nominal exchange rate to depreciate, increasing exchange rate misalignment and making a pegged regime relatively costly. Of course, concerns about discipline could offset the implied losses from misalignment. To allow for the possibility that inflation enters nonlinearly, a dummy variable for very high inflation countries was also considered. An alternative indicator of misalignment is the

percent change in the real exchange rate during the previous year. Ideally, changes in a real effective exchange rate (REER) index would be used, however, REERs were only available for a subset of the countries in the sample. Therefore, bilateral real exchange rate indices (RER) were also computed for each country relative to the U.S. Terms of trade (TOT) shocks should influence the underlying target exchange rate. To the extent that a TOT improvement causes the target to appreciate, a previously overvalued exchange rate would become less so. The percentage change in the TOT during the previous year is included. A dummy variable indicating multiple exchange rate regime was also considered as a potential indicator of exchange rate misalignment.

The perceived cost of exchange rate adjustment under a pegged regime is simply taken to be a constant. It would be interesting to explore the role of political variables (such as the type of political regime and where relevant, the timing of elections). This is left for future work.

Five variables were considered as indicators of the perceived difficulty of managing a flexible exchange rate regime. The first three are size (GDP in constant U.S. dollars), development level (Summers-Heston measure of real per capita income in 1988) and openness (exports plus imports as a percentage of GDP). The presumption is that countries which are smaller, less developed and less open will have thinner markets for foreign exchange, and that policy makers in these countries will find it more difficult to manage a flexible exchange rate regime. In fact, what is really assumed here is that these characteristics are associated with the perception that a flexible regime would be difficult to manage. Fourth, during much of the period, the IMF encouraged developing countries with balance of payments difficulties to adopt flexible regimes. Therefore, a dummy variable is included to denote whether or not an IMF program (Stand-by or Extended Fund Facility) was in effect. (Note however, that this IMF dummy could also be interpreted as an indicator of exchange rate misalignment in the previous year.) Fifth, the intellectual climate appears to have evolved over the past fifteen years away from the presumption that fixing was appropriate for small developing countries. A time trend is included to capture this evolution.

Finally, there are assumed to be unobserved factors for a given country in a given year that affect the perceived losses under the two alternative exchange rate regimes. These factors are assumed to be randomly distributed.¹⁰

As discussed above, the dependent variable is qualitative, equal to one for countries with fixed exchange rate regimes and 0 for other types of (more flexible) regimes. The sample includes 24 countries¹¹ observed annually (usually in June) during 1978-1992. The analysis discussed below looks first at the entire period. It then looks separately at the early years which include the debt crisis and response (1978-86) and at the more recent period (1987-92) in which many countries in the region have implemented far-reaching economic reforms, and have moved beyond crisis response to focus on longer term growth. The explanatory variables all refer to the previous year.

Table 1 shows the means and standard deviations for the explanatory variables over the entire sample period, as well as the two sub-periods. (For 0/1 variables, the mean represents the percent of the sample for which the variable is equal to one. No standard deviations are reported.) The table shows that half of the observations in the earlier period had fixed exchange rates compared to a little more than a third in the second period. The table also shows that the mean growth rate rose from 1.7% per annum during 1978-86 to 2.1% during 1987-92. In the first period, fully a third of the observations showed negative growth compared with slightly less than a quarter in the second period. However, the difference between the two sample means is not statistically significant. Average current account balances were also smaller in the

¹⁰ I would have liked to test the appropriateness of random versus fixed country effects. However, the short sample makes this very difficult. Note that previous empirical work on choice of exchange rate using panel data has also maintained the assumption of random country effects.

¹¹ Panama and Grenada are not included in the probit analysis.

Table 1

Means and Standard Deviations of Variables

	1978-92	1978-86	1987-92
Fixed	0.462 (-)	0.499 (-)	0.346 (-)
Growth	1.840 (5.471)	1.656 (6.131)	2.096 (4.406)
Growth < 0%	0.294 (-)	0.330 (-)	0.244 (-)
Inflation	246.439 (1163.713)	117.608 (890.543)	424.976 (1445.356)
50% <= Inflation < 500%	0.195 (-)	0.188 (-)	0.205 (-)
Inflation >= 500%	0.059 (-)	0.023 (-)	0.110 (-)
Log (GDP)	22.934 (1.525)	22.874 (1.503)	23.016 (1.558)
Log (PCI)	7.949 (0.575)	7.962 (0.594)	7.930 (0.549)
CA/GDP	-5.350 (7.770)	-5.976 (7.005)	-4.484 (8.675)
Openness	55.245 (35.449)	55.466 (37.393)	54.938 (32.707)
% change in TOT	0.022 (0.125)	0.028 (0.099)	0.015 (0.154)
% change in RER	0.045 (0.260)	0.041 (0.191)	0.051 (0.334)
IMF	0.360 (-)	0.347 (-)	0.378 (-)
Multiple	0.472 (-)	0.477 (-)	0.465 (-)
Number of Observations	303	176	127
<u>Memo</u>			
% Change in REER	0.001 (0.167)	0.026 (0.155)	-0.029 (0.176)
Number of Observations	196	106	90

See Appendix A for sources and construction of variables.

Standard deviations are given in parentheses, except for 0-1 variables.

second period, but again the difference is not significant. The mean changes in real bilateral exchange rates

and in the terms of trade are quite similar across the samples. The only variable that does change significantly across subsamples is inflation. Average inflation rates were considerably higher in the second period. In part, this reflects a general rise in inflation rates. However, it is largely due to a few countries with very high inflation.

3. Estimation Results

The determinants of exchange regime choice were estimated using probit analysis. Results are reported in Table 2. Because neither the percent change in the terms of trade nor the measure of development level entered any of the equations significantly, both are excluded from the reported specifications. The goodness-of-fit statistics reported at the bottom of these tables show that the model fits quite well, correctly predicting over 80% of the exchange regime choices.

We look first at the results for the entire sample (1978-92). As shown in the first column of Table 2, small, less open countries with external surpluses were most likely to choose fixed exchange rates. No significant role emerges for recent changes in the real exchange rate.¹² Countries with moderate to high inflation rates were less likely to select fixed exchange rates. This is as expected since, other things equal, such countries should anticipate more rapidly growing misalignment of their real exchange rates under fixed rate regimes unless the fixed rate is adjusted frequently. However, there is some evidence that countries with very high inflation were more likely to choose a peg, consistent with the view that fixed rate regimes provide discipline and credibility.

Surprisingly, countries with negative growth rates appear more likely to select fixed exchange rates, other things equal. The result is not consistent with the view that negative growth is an indicator of perceived exchange rate misalignment, controlling for other aspects of performance. To the extent that this variable

¹² Using the real effective exchange rate for the sub-sample of countries did not change this result.

Table 2

Choice of exchange rate regime probit results. Dependent variable: Fix = 1 if fixed exchange rate regime, Fix = 0 otherwise.

	1978-1992	1978-1986	1987-1992
Constant	231.128 (5.298)	365.181 (3.162)	481.392 (2.823)
Growth < 0%	0.432 (2.125)	0.319 (1.197)	0.897 (2.336)
50% <= Inflation < 500%	-0.955 (-3.373)	-1.009 (-2.595)	-0.856 (-1.909)
Inflation >= 500%	0.816 (1.917)		0.789 (1.358)
Log (GDP)	-0.670 (-6.733)	-0.849 (-5.551)	-0.451 (-2.985)
CA/GDP	0.031 (2.224)	0.058 (2.926)	
Openness	-0.009 (-2.672)	-0.012 (-2.654)	-0.007 (-1.096)
% change in RER	-0.307 (-0.878)	-0.776 (-1.018)	
IMF	-0.915 (-4.841)	-0.856 (-3.074)	-0.837 (-2.692)
Multiple		0.347 (1.380)	
Year	-0.108 (-4.981)	-0.174 (-3.013)	-0.237 (-2.762)
Number of Observations	325	176	127
% Fixed=1	47.385	54.545	34.646
Log Likelihood	-145.626	-75.345	-53.477
R Squared	0.432	0.449	0.447
% Correct predictions	80.923	82.386	87.402

See Appendix A for sources and construction of variables.
t-statistics are given in parentheses.

was pre-determined, the negative relationship should not reflect endogeneity. (Recall that this variable measures growth in the previous year.) However, the hypothesis that countries which choose fixed exchange rates grow more slowly than those that choose flexible exchange rates is an interesting one, explored further below.

We next ask whether there is any evidence of a change in the determinants of exchange regime choice. The model is estimated for each sub-sample: 1978-86 and 1987-92 and results are reported in columns 2 and 3 of Table 2. A likelihood ratio test of structural change, using the Log Likelihoods for the constrained model (column 1) and the unconstrained models (columns 2 and 3) strongly rejects the null

hypothesis of no structural change (at the 0.01% significance level). Thus, it does seem that the determinants of regime choice shifted between the early 1980s and the late 1980s.

What, then, are the determinants of exchange regime choice during each period? In 1978-86, indicators of misalignment and measures of the difficulty of managing a flexible rate explain exchange regime choice quite well. In particular, countries with moderate to high inflation and with larger current account deficits (greater misalignment) were significantly less likely to choose a fixed exchange rate regime. Smaller and less open economies were less likely to select a flexible regime. Countries involved in IMF programs were significantly more likely to choose flexible regimes. Finally, there is a strong time trend, consistent with the "intellectual climate" evolving so as to reduce the perceived difficulty of maintaining flexible regimes.

While there are similarities between the determinants of regime choice in 1987-92 and 1978-86, there are also important differences. Having moderate to high inflation still increases the likelihood that a country will choose a flexible regime, but there is also weak evidence in the later period that very high inflation reduces the relative losses under a fixed rate regime, making these countries more likely to peg. The other indicator of misalignment -- current account imbalances -- no longer matters for regime choice. However, it is possible that the IMF dummy is a proxy for balance of payments difficulties, and thus this aspect of misalignment. Small countries are still more likely to peg, but size is less important as a determinant of regime choice after 1986. Openness is no longer statistically significant. The time trend continues to enter significantly.

The surprising link to growth rates comes from the later period. After 1986, economies with poor recent growth records were more likely to select a fixed rate regime. This has important implications for any empirical study of the effects of regime choice on economic growth, as discussed further in the next section. While the issue warrants further analysis, it is of some interest to suggest one possible interpretation: the low growth rates may proxy for omitted country characteristics that are correlated with the perceived difficulty of

maintaining a flexible regime. Suppose that countries which undertake major stabilization and liberalization programs tend to be "dynamic", and to have relatively good growth performance under normal circumstances. These countries have been more likely to experiment with non-pegged exchange rate regimes. During 1987-92, the negative growth rate dummy may tend to identify countries that do not fall into the "dynamic" group and thus that are more likely to peg. However, in the aftermath of the debt crisis, growth rates plummeted throughout the region, with over half of the countries experiencing negative growth during 1981-83. During 1978-86, the negative growth dummy poorly distinguishes between "dynamic" and other economies. It does not appear to be a determinant of regime choice.

Overall, the empirical results suggest that misalignment indicators became much less important in the second half of the 1980s and that the perceived difficulty of maintaining a flexible regime declined. This work suggests that countries which continued to peg in the 1990s were primarily small economies that have not gone to the IMF for support (ie. had not encountered balance of payments difficulties), but that had poor growth records.

4. Exchange Regime and Economic Growth

Does exchange regime choice matter for macroeconomic performance, and in particular for economic growth? The discussion below cautions against drawing strong conclusions about the effect of exchange regime on prospects for growth. Unfortunately, existing data for LAC countries does not provide enough spells under different regimes for a definitive empirical analysis. However, available data make it quite easy to draw misleading conclusions about the links between growth and regime choice among LAC countries that could be used to advocate one regime in favor of another. I make the points by debunking two such arguments: one that concludes that fixed exchange rates lead to reduced growth, and the second that concludes exactly the opposite.

First, during 1987-92, the mean real GDP growth for LAC countries with fixed regimes was just

1.09%, compared with a mean growth rate of 3.27% for countries with more flexible regimes. (These means are significantly different at the 5% level.) This suggests that fixed regimes tend to foster slower growth, and that the shift towards increased flexibility has been a good thing for countries in the region because it will foster more rapid growth.

However, as the analysis in the previous section made clear, the choice of exchange rate regimes should be viewed as endogenous. Countries with fixed rate regimes and those with more flexible rate regimes are not drawn randomly from the same "urn". Evidence discussed above suggests that countries with poor recent growth performance have been more likely to choose a fixed regime. Therefore, the fact that the sample of countries observed with fixed regimes has lower average growth than the countries observed with flexible regimes does not imply that a given country would have grown more quickly if it had adopted a flexible regime than if it had adopted a fixed regime. A formal analysis that adjusted for this sample selection problem would require many more (and longer) spells of fixed and flexible exchange rate regimes than are currently available.

Interestingly, it is also easy (although I will argue incorrect) to make the case that becoming more flexible has compromised the prospects for economic growth among LAC countries. Let me begin by spelling out the arguments, and then explain why I believe the conclusion is flawed. The argument could be built on two stylized "facts". First, real exchange rate stability tends to be associated with more rapid economic growth. Second, moving from fixed to flexible exchange rate regimes has been associated with increases in the volatility of real (and nominal) exchange rates.

Does real exchange rate stability indeed foster growth? (Exchange rate stability here refers not to very short term volatility, but to medium term misalignment from some equilibrium level.) Contributions to the growing recent empirical literature on determinants of economic growth find a strong negative relationship between real exchange rate variability and growth. (See for example Bosworth et. al (1995) and Hausmann et. al. (1995).)

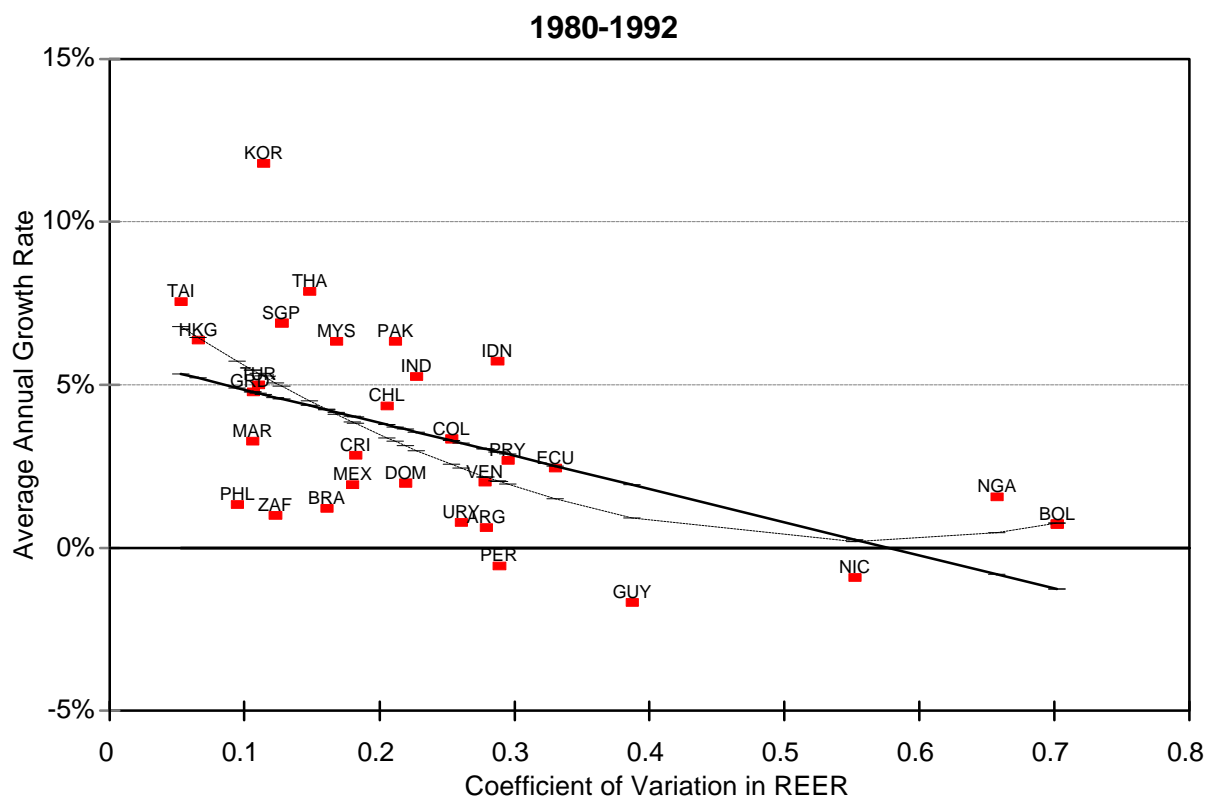


Fig. 1. GDP Growth and REER variability, 1980-92. * Grenada calculations, 1984-92.
 Source: Variation in REER calculated from J.P. Morgan and IFS Quarterly REER; growth rates calculated from World Tables 1994 data.

Casual empiricism also suggests a negative relationship between real exchange rate stability and economic growth. For example, Chart 1 plots the standard deviation of the (quarterly) REER and average annual growth rate of real GDP during the period 1980-92 for 30 developing economies. (Variable sources and construction are discussed in the Appendix.) The solid line plots a simple linear regression of growth on exchange rate volatility. However, the data suggest a nonlinear relationship -- and both volatility and volatility squared enter the regression with significant coefficients. (Dashed line.) While many other factors are also at work, this evidence suggests that exchange rate stability does indeed help to foster economic growth.

Are real exchange rates less stable (more likely to be misaligned) under flexible than under fixed exchange rate regimes? Many studies have claimed to document such a relationship. One of the classics is Mussa's (1986) study of industrial countries under fixed (1954-70) and flexible (1973-84) regimes. He finds that (bilateral) real exchange rates exhibit substantially greater short term volatility and a higher degree of persistence under flexible regimes. More recent studies reach different conclusions, suggesting that the Mussa findings arise from differences pre and post Bretton Woods, not from fixing versus floating per se. For example, Baxter and Stockman (1989) find that although the post-1973 period is characterized by increases in real exchange rate volatility overall, "countries on fixed rates (or cooperative schemes like the EMS) appear as likely as those with pure floats or other intermediate regimes to experience these increases in volatility." (p. 390) Quirk's (1994) discussion of the experience with independently floating exchange rate regimes in developing countries emphasizes that underlying macroeconomic policies determine the behavior of a market determined exchange rate, not exchange regime per se. He states that "a striking feature of exchange rate movements after floating is that they are broadly similar to those that occurred before floating." (p. 140)

As an additional illustration of this point, consider the behavior of real effective exchange rates for Venezuela and Argentina. Both countries shifted exchange rate regimes since the late 1980s, and have (to date) achieved a striking reduction in the volatility of their REER. However, Venezuela achieved this increased stability after a shift from a fixed (multiple currency) exchange rate regime to a flexible one in March 1989. Argentina achieved the increase in REER stability after a shift from a more flexible exchange rate regime to a fixed one in early 1991.¹³ Of course, there are also important differences between the two

¹³ On March 13, 1989, Venezuela replaced its system of multiple exchange rates by a unified exchange rate, to be determined by market forces. The official IMF classification of the multiple currency system had been "pegged to the U.S. dollar." Argentina had an exchange regime classified as freely floating in December 1990. It announced a target zone for exchange rate intervention in January 1991. The width of the band was subsequently narrowed. On March 19, 1991, the floating regime was replaced by a peg to the U.S. dollar. (IMF, Exchange Arrangements and Exchange Restrictions, 1990 and 1992)

countries. For example, Argentina was grappling with extremely high inflation, while Venezuela was adjusting to a severe balance of payments crisis.¹⁴ Thus, it is not at all clear that fixed exchange rate regimes are associated with greater real exchange rate volatility, or more persistent misalignments than flexible exchange rate regimes. The suggested link between real exchange rate variability and economic growth has no obvious implications in terms of exchange rate regime.

5. Concluding Remarks

There has been a striking shift from fixed to more flexible exchange rate regimes among countries in Latin America and the Caribbean (LAC). This paper first seeks to identify determinants of the choice of exchange rate regime, and thus to explain the shift. It then cautions against attributing to the choice of exchange rate regime, differences in macroeconomic performance.

The empirical analysis is based on a framework that differs from traditional models of optimal exchange regime choice which assume that the ability to adjust the nominal exchange rate is assumed to be the key -- indeed the only -- difference between fixed and flexible regimes. Such models tend to ignore a number of real world features that are important for developing countries. In particular, fixed exchange rates are rarely irrevocably fixed, but can and often are adjusted. Regimes classified as "flexible" typically involve extensive management. It is not at all clear that the main distinction between officially fixed and officially more flexible exchange regimes is the extent to which the nominal exchange rate can be adjusted in response to a given shock. Instead, a central distinction is that fixed exchange rate adjustments are more visible (less easily camouflaged) than adjustments under more flexible rate regimes. We argue that policy makers incur

¹⁴ See Perez (1994) for a brief discussion of the Venezuelan crisis.

(political) costs from these visible exchange rate adjustments under fixed regimes.

The paper also suggests a role for the evolving conventional wisdom about exchange regime choice. In the 1970s, there appears to have been a presumption that flexible exchange rate regimes required levels of institutional development beyond that of most developing countries. Thin markets, and other factors were thought to imply that LDCs which chose this route would experience nominal exchange rates with high short term volatility and persistent misalignment. By the mid to late 1980s, this view had eroded. Small open economies with balance of payments difficulties were encouraged to "become more flexible" while those with high inflation were often urged to take advantage of the added "discipline" thought to come from fixing.

Thus, the paper develops a stylized model of regime choice based on the perceived relative losses incurred under fixed versus more flexible regimes. It argues that policy makers would choose fixed exchange rates when the perceived losses incurred under a fixed (but adjustable) regime were smaller than the perceived losses incurred under a more flexible regime. More specifically, countries should be more likely to float when their nominal exchange rates are misaligned, so that they can undertake needed adjustments without incurring the political costs of exchange rate adjustment (devaluation) under fixed regimes. They should also be more likely to float when the perceived difficulty of managing a flexible regime declined.

Estimation results for a sample of 24 LAC countries over 1978-92 are quite supportive. Misalignments (proxied by current account deficits and moderate to high rates of inflation) were associated with a move to more flexible rates during 1978-86. Misalignment indicators appear to have mattered less during 1987-92. However, there appears to have been a major reduction in the perceived difficulty of managing flexible rates during this period. There is also some evidence after 1986 that countries with very high inflation opted for fixed rates. The empirical analysis also finds that countries with poor growth performance were more likely to select fixed exchange rates during 1987-92. One possible explanation is that unobserved country characteristics are correlated with both poor growth and with the choice of a fixed exchange rate. This is an interesting area for additional work.

Section 4 cautions against attempts to relate exchange regime choice to macroeconomic performance -- especially growth. Countries can undertake sensible macroeconomic policies under either a fixed or a flexible exchange rate regime, helping to foster economic growth. In some cases, circumstances (such as history) may make it easier to implement or sustain a particular set of policies under a particular regime. This may call for introducing a new policy package along with a new exchange rate regime -- one that is different from whatever went before. Thus, countries in LAC that had previously maintained fixed rates often chose to adopt more flexible rates as they undertook major reform programs. (In a few cases, such as Argentina, countries with more flexible regimes moved back to fixed rates in conjunction with major policy changes.) We should be careful about attributing differences in macroeconomic performance across the two groups to exchange rate regime per se.

References

- Aghevli, Bijan B., Mohsin S. Khan, and Peter J. Montiel. 1991. "Exchange Rate Policy in Developing Countries: Some Analytical Issues." Occasional Paper No. 78, International Monetary Fund.
- Barth, Richard C. and Chorng-Huey Wong, eds., Approaches to Exchange Rate Policy: Choices for Developing and Transition Economies. International Monetary Fund.
- Baxter, Marianne, and Alan C. Stockman. 1989. "Business Cycles and the Exchange-Rate Regime." Journal of Monetary Economics (March): 377-400.
- Bayoumi, Tamim, and Barry Eichengreen. 1992. "Macroeconomic Adjustment under Bretton Woods and the Post-Bretton-Woods Float: An Impulse-Response Analysis." Working Paper No. 4169, National Bureau of Economic Research, Inc.
- Bosworth, Barry, Susan M. Collins and Yu-chin Chen. 1995. "Accounting for Differences in Economic Growth." Working Paper, The Brookings Institution, (September).
- Burton, David and Martin G. Gilman. 1991. "Exchange Rate Policy and the IMF." Finance and Development, Vol. 23, No. 3 (September): 18-21.
- Collins, Susan M. 1995. "The Timing of Exchange Rate Adjustment in Developing Countries." April, Georgetown University and Brookings Institution.
- Corden, W. Max. 1994. "Exchange Rate Policy in Developing Countries," in Richard C. Barth and Chorng-Huey Wong, eds., Approaches to Exchange Rate Policy: Choices for Developing and Transition Economies. International Monetary Fund.
- Cuddington, John T., and Samuel K. Otoo. 1990. "The Choice of Exchange Rate Regime: A Multinomial Logit Model." Working Paper No. 90-18, Georgetown University.
- _____. 1991. "An Analysis of the Choice of Exchange Rate Regimes in the 1980s." Working Paper No. 91-02, Georgetown University.
- Dreyer, Jacob S. 1978. "Determinants of Exchange-Rate Regimes for Currencies of Developing Countries: Some Preliminary Results." World Development 6 (April): 437-45
- Easterly, William. 1994. "How much do distortions affect growth?" Journal of Monetary Economics.
- Edwards, Sebastian. 1992. "Exchange Rates as Nominal Anchors." Working Paper No. 4246, National Bureau of Economic Research, Inc.
- _____. 1993. "Exchange Rates, Inflation and Disinflation: Latin American Experiences." February, University of California, Los Angeles and National Bureau of Economic Research.

- _____. 1994. "Macroeconomic Stabilization in Latin America: Recent Experience and Some Sequencing Issues." January, Institute for Policy Reform Paper No. 79.
- Fischer, Stanley. 1993. "The Role of Macroeconomic Factors in Growth." Journal of Monetary Economics, Vol. 32 (3) (December): 485-512.
- Flood, Robert P. 1979. "Capital Mobility and the Choice of Exchange Rate System." International Economic Review 20 (June): 405-16.
- _____ and Nancy P. Marion. 1994. "The Size and Timing of Devaluation in Capital-Controlled Developing Economies." NBER Working Paper No. 4971 (December).
- Frankel, Jeffrey A. 1992. "Monetary Regime Choices for a Semi-Open Country." Prepared for a November 6-7 conference: "Monetary Policy in Semi-Open Economies," Bank of Korea.
- Frenkel, Jacob and Joshua Aizenman. 1982. "Aspects of the Optimal Management of Exchange Rates," Journal of International Economics, 13: 231-56.
- Hausmann, Ricardo et. al. 1995. "Overcoming Volatility in Latin America," in Inter-American Development Bank Report on Economic and Social Progress in Latin America, 1995, Washington, DC: Johns Hopkins Press.
- Giavazzi, Francesco and Marco Pagano. 1988. "The Advantage of Tying One's Hands: EMS Discipline and Central Bank Credibility," European Economic Review, Vol 32, No 2:1055-75.
- Klein, Michael W., and Nancy P. Marion. 1994. "Explaining the Duration of Exchange-Rate Pegs." Working Paper No. 4651, National Bureau of Economic Research, Inc.
- McKinnon, Ronald I. 1962. "Optimum Currency Areas." American Economic Review 53 (December): 717-25.
- Melvin, Michael. 1985. "The Choice of an Exchange Rate System and Macroeconomic Stability." Journal of Money, Credit and Banking 17 (November): 467-78.
- Mundell, Robert A. 1960. "A Theory of Optimum Currency Areas." American Economic Review (December): 657-65.
- Mussa, Michael. 1986. "Nominal Exchange Rate Regimes and the Behavior of Real Exchange Rates," in Karl Brunner and Allan Meltzer (eds.) Real Business Cycles, Real Exchange Rates and Actual Policies, Carnegie-Rochester Conference Series on Public Policy. North-Holland.
- Perez, Lorenzo. 1994. "Case Study of Venezuela," in Richard C. Barth and Chorng-Huey Wong, eds., Approaches to Exchange Rate Policy: Choices for Developing and Transition Economies. International Monetary Fund.
- Quirk, Peter. 1994. "Recent Experiences with Floating Exchange Rates in Developing Countries," in Richard C. Barth and Chorng-Huey Wong, eds., Approaches to Exchange Rate Policy: Choices for

Developing and Transition Economies. International Monetary Fund.

Turnovsky, Stephen. 1983. "Exchange Market Intervention Policies in a Small Open Economy," in J. Bhandari and B. Putnam (eds.) Economic Interdependence and Flexible Exchange Rates, MIT Press.

Williamson, John. "A Survey of the Literature on the Optimal Peg." Journal of Development Economics 11 (August): 39-61.

Data Appendix

A. Sources

The classification of the exchange rate regime was taken from the IMF Annual Report, for 1979-81, 1986 and 1989-93, from the IMF International Financial Statistics for 1978 and 1994 and from the IMF Annual Report on Exchange Arrangements and Exchange Restrictions. Data are as of March 31, except for 1979-81 and 1986, in which they are as of June 30. The IMF Annual Report also provides information about whether countries were participants in an IMF Program (Stand-by or Extended Arrangement) each year.

The following data came from the World Bank, 1994 World Tables: Population, Consumer Price Indices, Terms of Trade Indices, Current Account (both before and after official transfers), GDP (real and nominal GDP in U.S. dollars and in local currency), and nominal exchange rates (local currency per U.S. dollar).

Real Effective Exchange Rate indices were obtained from J.P. Morgan for the following countries. Argentina, Brazil, Chile, Colombia, Ecuador, Hong Kong, India, Indonesia, Korea, Malaysia, Mexico, Nigeria, Pakistan, Philippines, Singapore, South Africa, Taiwan, Thailand, Turkey, and Venezuela. These indices are monthly. Data from the 1993 IMF International Financial Statistics Yearbook were used for the following countries: Bolivia, Costa Rica, Dominican Republic, Grenada, Guyana, Nicaragua, Paraguay, Uruguay, and the U.S. These indices are quarterly, and annual.

Per Capita Income are the 1988 figures from Summers, Robert and Alan Heston (1991) "The Penn World Table (Mark 5) An Expanded Set of International Comparisons, 1950 - 1988", Quarterly Journal of Economics, May. pp.327-68.

B. Variable Construction

Growth in GDP was calculated as percentage change from the previous year's real GDP, in the local currency. Inflation was calculated as the percentage change in the Consumer Price Index for each country. Openness was calculated as Exports plus Imports as a percentage of GDP. (Exports, Imports and GDP were in local constant 1987 currency.) The Bilateral Real Exchange Rate Index was calculated from the nominal rates (local currency per U.S. dollar), the U.S. CPI and the local currency CPI. The monthly real effective exchange rate indices for from J.P. Morgan were averaged to create the annual series used in the probit analyses, and to create the quarterly series used to calculate coefficients of variation. Current Account Percentage (before and after official transfer): These were calculated by dividing the current account surplus (or deficit) before or after official transfers by GDP. Both the current account surplus (or deficit) and the Gross Domestic Product were in current U.S. Dollars, except for the Bahamas and Grenada. For these two countries the series for GDP in Current U.S. dollars were not available, and were calculated by inverting the conversion rate (local currency per U.S. Dollar) and multiplying the GDP, in current local currency, by the inverted conversion rate, to arrive at the GDP in current U.S. Dollars. Gross Domestic Product in constant U.S. Dollars: Note that these data were not directly available in World Tables for the Bahamas and Grenada. For these countries it was constructed by dividing the GDP in constant local currency by the conversion rate (local currency per U.S. Dollar).

