

November 19, 1999

**Exchange Rate Regimes of Developing Countries:  
Global Context and Individual Choices \***

by

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\* This paper is derived from a larger study that also considers the exchange rate regimes of industrial countries, and which is to be published as an IMF Occasional Paper. The authors are grateful to a number of their colleagues, in particular to Andy Berg, Michael Mussa, and Alexander Swoboda, who participated in the larger study. The views expressed are those of the authors and do not necessarily represent those of the IMF or other official institutions.

## I. INTRODUCTION

The exchange and payments crises of the 1990s, the general increase in capital mobility, and the boom-bust character of capital flows to developing countries have raised anew the issue of appropriate exchange rate arrangements. In response to these developments, one popular view is that there should be a general move toward floating regimes. Another increasingly fashionable view is that countries should either let their exchange rates float freely, or peg them firmly to a stable currency, with some authors advancing the proposition that in many developing countries only currency boards or dollarization would be sensible choices. Yet another view is that on this issue not much has changed, i.e., that intermediate regimes between the extremes of pure floating and rigid fixity generally continue to be appropriate.

This paper reviews the choice of exchange rate regime of developing and transition countries in the context of the present economic and financial characteristics of these countries and of the world economy. The countries whose exchange arrangements are the subject of this paper cover a very broad range of economic development, from the very poorest to newly industrialized economies with relatively high per capita incomes. Correlated with the level of economic development, but not perfectly so, are both the degree of domestic financial sophistication and the extent of involvement with the global economic system, especially the extent of involvement with modern global financial markets. The 30 or so countries that are most advanced in this last regard are what are commonly referred to as the “emerging markets.”

The paper argues that, in analyzing the choice of exchange rate regimes in developing and transition countries in the present global economic context, it is essential to distinguish between those countries with substantial involvement in international financial markets and those where involvement is limited. For developing countries with important linkages to modern global capital markets, an important lesson of the recent crises in emerging market countries is that the requirements for sustaining pegged exchange rate regimes have become significantly more demanding. For many emerging market countries, therefore, regimes that allow substantial actual exchange rate flexibility are probably desirable. If supported by the requisite policy discipline and institutional structures, however, hard currency pegs may also be appropriate for some of these countries.

Beyond the emerging markets countries, for many developing countries with less linkage to global capital markets, traditional exchange rate pegs and intermediate regimes are more viable and retain important advantages. Exchange rate pegs can provide a useful and credible nominal anchor for monetary policy and avoid many of the complexities and institutional requirements for establishing an alternative anchor (such as a credible inflation target backed by an operationally independent central bank). In addition, in the absence of sophisticated financial systems, many of these countries lack a deep and broad market for

foreign exchange, which can provide reasonable exchange rate stability in the absence of official guidance. Exchange rate pegs can also be particularly attractive for countries with a dominant-trading partner that maintains a stable monetary policy. Finally, the few developing countries that still confront the problem of stabilizing from very high inflation may also find virtue in exchange rate based stabilization plans, while giving due attention to timely implementation of an exit strategy.

The remainder of this paper is organized as follows. Section II considers key changes in the economic situations of developing and transition countries that have implications for exchange rate regime choice. Section III discusses the recent foreign exchange and financial crises that have affected many emerging market countries, and seeks to draw lessons from these experiences for exchange rate policy. Section IV considers the characteristics of countries for which some form of pegged exchange rate may be desirable, and examines the relative virtues of alternative exchange rate regimes along the spectrum from hard pegs to free floats. The role of the exchange rate as a nominal anchor under various forms of pegged rate regimes, and the need for an alternative nominal anchor under loosely managed or free floats are also discussed, along with the use of intervention and controls for countries that do not practice benign neglect toward their exchange rates. Exchange arrangements for countries that are in regional groups (notably the ASEAN and Mercosur groups) with substantial intraregional trade and diversified economic linkages to the major industrial countries pose particular concerns, which are discussed separately. Section V concludes, summarizing the main implications for exchange regime choice by developing and transition countries in the present global economic environment.

## **II. THE ECONOMIC ENVIRONMENT FACING DEVELOPING AND TRANSITION COUNTRIES**

Adapting both to expanding opportunities from deeper involvement in an increasingly integrated global economy and to changes in their own economic situations, developing and transition countries have been shifting their exchange rate regimes towards greater flexibility, accompanied by a generalized move to current account convertibility and a somewhat less dramatic removal of capital account restrictions (Figure 1).<sup>1</sup> This section considers key changes in the economic situations of developing and transition countries associated with these policy developments.

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<sup>1</sup> Since the concept of transition countries has only become relevant during the last decade or so, Figures 1 through 9 concentrate on developing countries.

### III. INCREASED CAPITAL MOBILITY

Gross capital flows to developing countries have risen considerably as a share of GDP since the early 1980s (Figure 2), reflecting greater capital account liberalization and capital market integration, especially of emerging market economies. Higher gross flows have created the potential for large and sudden reversals in net flows, particularly in the case of private flows. Net private flows to developing countries, after hovering around ½ percent of GDP throughout the 1970s and 1980s, rose sharply to 3 percent of GDP in the mid-1990s, only to drop back to 1½ percent of GDP in 1998. Similar developments are also evident in the case of outstanding bank claims, which fell abruptly in Asia, Latin America, and Eastern Europe in the context of the recent emerging market crises (Figure 3), discussed in the next section.<sup>2</sup> As is well known, capital flow reversals have been associated with currency crises and these crises have had large real economic costs. However, this phenomenon of the boom/bust cycle in private capital flows and its attendant costs is relevant primarily for the emerging market economies, which have important involvement in modern global financial markets. It has not directly affected the wide range of developing countries with little or no such involvement.

#### A. Exposure to Exchange Rate Risk

As previously noted, residents of developing and transition countries generally find it difficult to borrow abroad in their own currencies, and nonresidents are generally reluctant to take net long positions in those currencies. In net terms, the foreign currency liabilities of residents of developing and transition countries usually exceed their assets in foreign currencies, implying that they are exposed to exchange rate risk on their balance sheets as well as through trade. Issues of both sovereign and corporate bonds on international markets are overwhelmingly in foreign currencies, even in the case of an advanced economy such as Korea, or a country whose exchange rate is strongly pegged to the U.S. dollar, such as Argentina. While part of this exchange rate risk can be hedged, this can only be done (in the aggregate for a given developing country) to the limited extent that nonresidents are willing to hold local currency exposure.<sup>3</sup> Moreover, few of these countries have organized markets for currency futures and options, and those located in industrial countries deal mainly in the currencies of industrial countries (IMF, 1995a).<sup>4</sup> Also, while forward foreign exchange

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<sup>2</sup> Developments in capital flows are analyzed in greater detail in Mussa, Swoboda, Zettelmeyer, and Jeanne (1999).

<sup>3</sup> Hedging can take many forms, including nonresidents holding local-currency-denominated equities. For example in 1996, the share of total market capitalization held by nonresidents in the stock markets of Argentina, Korea, Mexico, Thailand, and the Philippines ranged between 15 percent and 40 percent (The World Bank, 1997, page 306).

<sup>4</sup> However, currency futures are available in the United States for the Brazilian real, the Mexican peso, and the Russian ruble.

contracts are allowed in many emerging markets (IMF, 1995b, page 22), there is no indication of significant net capacity to shift foreign exchange risks abroad at a reasonable price.

### **B. Portfolio Diversification**

Another consequence of globalization has been a greater internationalization of balance sheets, with the private and public sectors of emerging market countries holding an increasing quantity and variety of foreign currency assets and liabilities. For instance, 28 percent of the international bonds issued by emerging market countries in 1996-98 were denominated in a currency other than the U.S. dollar, with the recent launch of the euro contributing to further increase the share of the nondollar sector to 33 percent during the first half of 1999.<sup>5</sup> However, discussions with market participants (by staff in the IMF's capital markets group) reveals that the market of dedicated investors in the liabilities of emerging market countries is, at best, very limited.

### **C. Increased Openness to International Trade**

The developing economies' degree of openness to international trade has increased over the past few decades. The average developing country's share of external trade (measured by exports plus imports, divided by two) in GDP rose from about 30 percent in the late 1960s to about 40 percent in the late 1990s (Figure 4). This trend has been more marked in the case of the East Asian countries—mirroring their export-led growth.<sup>6</sup> As imports and exports have come to represent a larger share of developing countries' GDP, given changes in the exchange rate have a greater impact on output and prices.

### **D. Shift of Exports Toward Manufactures**

At the same time, the composition of developing countries' trade by type of product has changed considerably, with a move away from commodity exports and toward manufactured exports (Figure 5), especially for the emerging market economies. This shift in composition has made developing countries' terms of trade more stable, but it has also made those countries with growing manufactured exports more sensitive to exchange rate fluctuations. Prices of most commodities are set in global markets, and supply and demand for individual exporters are largely independent of the exchange rate. In contrast, supply and demand for exports of manufactured products show significant sensitivity to exchange rates.

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<sup>5</sup> Source: Capital Data Ltd.

<sup>6</sup> See Ito and others (1996).

### **E. Trade Diversification**

Consistent with the trend toward globalization, many developing and especially the emerging market economies now trade with a wide range of partner countries. With the notable exception of Mexico where four-fifths of trade is with the United States, a typical mid-sized developing country's share of trade with a single currency area is below one-half in the case of Africa, Middle East and Europe, and below one-third in the case of Asia and Latin America. Trade shares are usually sizable with at least two of the major currency areas (the United States, the euro area, and Japan), implying that developing countries with single-currency pegs remain significantly exposed to the wide fluctuations among major currencies.

### **F. Greater Intra-Regional Trade**

The importance of intraregional trade for developing countries, though still moderate compared with their trade with industrial countries, is increasing, especially for key regional groups of emerging market economies. Table 1 illustrates this by considering several regions, including Mercosur, five East Asian countries most affected by the recent emerging market crises, ASEAN, the countries in central and eastern Europe that initiated accession negotiations with the EU in March 1998, and the CFA franc zone (for comparison purposes, data on the euro area and NAFTA are also presented). As shown in Table 1, intraregional trade in each of these regions has increased substantially during the last decade.<sup>7</sup> The growing importance of intraregional trade for key developing countries has increased the magnitude of the real effects of the fluctuations in the bilateral exchange rates between neighbor (or near-neighbor) developing countries.

### **G. Reduced Inflation**

Another important development in recent years has been the fall in inflation in most developing countries. The median inflation rate has fallen to about 5 percent in the late 1990s from the 10 percent or more prevailing between the early 1970s and the early 1990s (Figure 6).<sup>8</sup> While the widespread decline of inflation in developing and transition countries has benefited from positive supply shocks (in particular lower petroleum prices) and the anti-inflationary environment in industrial countries, it also reveals the broad acceptance now among the public of these countries that the key objective of monetary policy should be to deliver low inflation, that prudent macroeconomic policies are beneficial, and correspondingly that fiscal policy should not rely on the inflation tax.

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<sup>7</sup> Data for CEEC countries negotiating EU accession cover too short a period to draw any firm conclusions, and in any case, this set of countries has no particular significance as a regional trading group. More important is the strength of their trade linkages with the EU.

<sup>8</sup> The recent decline in inflation worldwide is analyzed in the October 1996 World Economic Outlook (IMF, 1996, Chapter 6).

#### IV. LESSONS FROM RECENT EMERGING MARKET CRISES

Recent crises involving emerging market economies, from the tequila crisis of 1995 through the Asian/Russian/Brazilian crises of 1997-98, carry important lessons for exchange regimes of developing and transition countries. Indeed, these experiences have led qualified observers, such as Eichengreen (1999), to conclude that pegged exchange rate regimes are inherently crisis-prone for emerging market economies and that these countries should be encouraged, in their own interest and for the broader interests of the international community, to adopt floating rate regimes.

There is little doubt that, for those emerging market countries that were most severely affected by recent crises, their exchange rate regimes were clearly important factors in their vulnerability.<sup>9</sup> The most severely affected countries all had *de jure* or *de facto* exchange rate pegs or otherwise substantially limited the movement of their exchange rates. In contrast, emerging market economies that maintained greater flexibility in their exchange rate regimes generally fared much better. For example, Chile, Mexico, Peru, South Africa and Turkey all seem to have benefited from the flexibility of their exchange rates during the recent international crisis.

Indeed, for the countries most adversely affected by recent crises there was an intrinsic perversity in the interactions between their exchange rate regimes and other problems in these economies, especially weaknesses in their financial sectors. When the exchange rate is pegged or tightly managed and it is believed that this will continue, there is often little perceived risk for domestic firms or financial institutions to borrow in foreign currency. If domestic-currency interest rates rise above foreign-currency rates (because of efforts to contain domestic overheating by tighter monetary policy together with sterilized intervention to resist exchange rate appreciation), then there is a positive incentive to borrow foreign currency. As international credits are generally most cheaply and easily available for short maturities, foreign-currency borrowing tends to be short term.

If because of adverse domestic or international developments, market sentiment turns and the exchange rate comes under downward pressure, the authorities are understandably reluctant to resist by raising domestic interest rates, as this will further undermine already weak banks and businesses. Adjustment of the exchange rate is also resisted—through sterilized official intervention—because a substantial depreciation would raise the burdens

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<sup>9</sup>Argentina and Mexico were the most severely affected countries in the tequila crisis; Indonesia, Korea, Malaysia, Thailand, and (to a lesser extent) Hong Kong SAR were most severely affected in the Asian crisis; Russia was most severely affected in the Russian crisis; and Brazil and Argentina were most severely affected in the Brazilian crisis. Colombia, Ecuador, and Venezuela are presently feeling primarily the effects of their own difficulties rather than the spillovers from the broader crises affecting emerging markets.

of foreign-currency denominated debts.<sup>10</sup> Once it becomes clear that the authorities are caught in a situation where they want to defend the exchange rate, but dare not raise domestic interest rates (credibly and substantially), and are running short of reserves, then speculative pressures against the exchange rate become overwhelming. If the peg is broken, depreciation is likely to be substantial as private agents rush to cover their remaining foreign exchange exposures and as foreign and domestic capital attempts to flee the developing crisis. The authorities, with limited remaining reserves, are in a poor position to help stabilize the rate, and the market, which is not used to operating without official support tends to become illiquid and move erratically. Downward pressures build as recognition of the adverse consequences of financial disruption associated with massive depreciation become mutually reinforcing. Thus, pegged or quasi-pegged exchange rates (or heavily managed floats) do tend to contribute to other problems that make them prone to damaging financial crises. The likelihood of prolonged speculative attack and indeed of a downturn in sentiment is reduced to the extent that the credibility of the peg is high; this is most obvious in the case of a currency board.

A genuine floating exchange rate, by contrast, allows greater flexibility for monetary policy at times of exchange rate pressures and economic difficulty. Also, provided that the exchange rate really does move up and down in response to market forces, businesses and financial institutions are forced to recognize the risks inherent in foreign-currency borrowing and other exposures to foreign exchange risk. Floating does not preclude the use of official intervention and adjustments of monetary policy to influence the exchange rate. However, efforts to manage tightly the exchange rate primarily through (sterilized) official intervention tend to recreate the risks and problems of a pegged exchange rate. If the exchange rate is managed, interest rates should be a primary tool so that private sector behavior will be appropriately attuned to situations where aggressive interest rate adjustments may occasionally be required to support the exchange rate objective. For countries that are substantially involved in modern global financial markets, policy regimes that seek to provide a high degree of stability of both exchange rates and interest rates, and that induce private risk taking on the presumption that both are simultaneously possible, are an invitation to trouble.

However, a reasoned judgment on the desirable exchange rate regime needs to be based not only on how it performs in a crisis, but how it performs on average over time. For instance, Argentina, with its currency board, has had strong growth in the 1990s, despite the negative effects of the tequila and Russia crises. That said, it must be emphasized that the

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<sup>10</sup> Beyond normal intervention, the authorities may resort to the forward market (Thailand in 1997) or futures market (Brazil 1997-98), or they may exchange domestic-currency debt for foreign-currency linked debt (Mexico 1994 and Brazil 1997-98), or they may loan official reserves to domestic institutions experiencing financing difficulties (Korea 1997). These strategies may help to forestall a crisis, but if the crisis breaks they can also make it much more damaging.

costs of recent crises to the most affected countries have been very large, and especially so for those countries whose pegged or quasi-pegged exchange regimes broke down in the crisis. There is an undeniable lesson here about the difficulties and dangers of running pegged or quasi pegged exchange rate regimes for emerging market economies with substantial involvement in global capital markets, as evidenced by the fact that only the emerging market countries with the hardest pegs were able to maintain their exchange rates.

In considering this conclusion, it is also important to stress a critical caveat: while recent crises have directly and adversely affected many emerging market economies with important links to modern global financial markets, these crises have only indirectly affected (through movements in world commodity prices and trade flows) the majority of developing and transition countries. Accordingly, lessons for exchange rate regimes from these crises relate primarily to emerging market countries (and to countries that may soon join this group) and not necessarily more broadly.

## V. EXCHANGE REGIME CHOICE: EMERGING MARKETS AND BEYOND

The preceding discussion strongly suggests that for emerging market countries with substantial involvement in modern global financial markets, floating exchange rate regimes should be an increasingly relevant choice. Looking beyond the emerging market economies to the large number of developing and transition countries that do not yet have important involvement with modern global financial markets, the rigors of maintaining a pegged exchange rate regime are less demanding. For such countries, and especially those without a well-developed financial infrastructure including sophisticated financial institutions and broad and deep markets for foreign exchange, pegs can provide a simple and credible anchor for monetary policy. While the precise requirements for a successful float are not the subject of this paper, it can safely be said that many developing and transition economies do not satisfy them. Indeed, while an increasing number of these countries (together with the emerging market countries) officially describe their exchange rate regimes as “managed floating” or “independent floating” (see Figure 1), the fact is that most of these countries do maintain some form of *de jure* or *de facto* exchange rate peg or otherwise narrowly limit fluctuations of the exchange rate. The economic criteria usually thought to influence the appropriateness of adopting a fixed, as opposed to a flexible, exchange rate regime provide at least a partial explanation of this phenomenon. Specifically, the following conditions are likely to influence whether some form of pegged exchange rate regime is judged to be appropriate:<sup>11</sup>

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<sup>11</sup> For reviews of the literature on the choice of exchange rate regime, see among others Wickham (1985), Genberg (1989), Argy (1990), Edison and Melvin (1990), Aghevli, Khan, and Montiel (1991), Isard (1995), Obstfeld (1995), Obstfeld and Rogoff (1995), IMF (1997, Chapter 4), Appendix I of Eichengreen, Masson, and others (1998), and Frankel (1999).

The degree of involvement with international capital markets is low;  
The share of trade with the country to which it is pegged is high;  
The shocks it faces are similar to those facing the country to which it pegs;  
It is willing to give up monetary independence for its partner's monetary credibility;  
Its economy and financial system already extensively rely on its partner's currency;  
Because of high inherited inflation, exchange-rate-based stabilization is attractive;  
Its fiscal policy is flexible and sustainable;  
Its labor markets are flexible;  
It has high international reserves.

### **A. Countries with Pegged Exchange Rate Regimes**

Applying these criteria, one group of countries for which pegged exchange rates would seem to remain sensible are small economies with a dominant trading partner that maintains a reasonably stable monetary policy. For such countries, there is generally little point in incurring the costs of attempting to run an independent monetary policy. As shown in Table 2, countries with annual GDPs of less than \$5 billion overwhelmingly have pegged exchange rate regimes. For most of these countries, it is clear not only that they should peg; it is also clear what they should peg to. Small Caribbean Island economies, some small Central American countries, and some Pacific Island economies peg to the U.S. dollar. The CFA franc zone countries peg to the French franc (and now to the euro). Lesotho, Namibia, and Swaziland peg to the South African rand. Bhutan and Nepal (which has an annual GDP slightly above \$5 billion) peg to the Indian rupee. Brunei Darussalam pegs to the Singapore dollar. Other small countries, generally with more diversified trade patterns, peg to currency baskets.

On the basis of the above criteria, another group of countries for which pegged exchange rate regimes would appear relevant, for the future if not necessarily for the near term, are the more advanced transition economies of central and eastern Europe that aspire to membership in the European Union and to eventual participation in EMU. The criteria of dominant trading partner (and the benefits of closer economic integration with that partner), as well as willingness to give up monetary independence are clearly relevant, indeed controlling, in the longer term. For the near to medium term, however, various considerations argue against hard pegs and in favor of more flexible exchange arrangements. Time is needed to strengthen fiscal policies and to address weaknesses in financial sectors and thereby better prepare for full capital market opening. It is also important to allow for a possible conflict between exchange rate stability and price stability that may arise because of substantial differences in productivity growth as the transition countries continue to catch up with their more mature partners (Masson, 1998). Nevertheless, with a view toward their ultimate objective, these countries will want to lay the firm foundations that are demanded for successful exchange rate pegs by countries substantially open to global financial markets.

Yet a third group for which exchange rate pegs are relevant is that of developing countries that face the difficult problem of stabilizing from a situation of high inflation. As discussed in Appendix I, and contrary to widespread beliefs, exchange rate based stabilizations have been used quite successfully by a number of countries in this situation. The key to success in many cases, however, has been in knowing when and how to exit from an exchange rate peg that has done its job in helping to achieve (often dramatic) disinflation with comparatively little economic cost, but which is not sustainable in the longer term.

Beyond these specific groups (which together account for a substantial number of countries), there are a significant number of large, mid-sized, and smaller developing and transition countries for which some form of pegged exchange rate, tight band, crawling band, or heavily managed float is the relevant exchange rate regime. One important example is the largest developing country, China.

China's official exchange rate policy is a managed float, but within that policy, the exchange rate of the yuan has been tightly linked to the U.S. dollar since mid 1995. With a substantial (but recently declining) current account surplus, with large foreign exchange reserves, and with controls that sharply limit short-term capital inflows and outflows, China has maintained its *de facto* exchange rate peg through all of the turmoil of recent emerging market crises, thereby making an important contribution to the restoration of financial stability in the region. The authorities have indicated that the stability of the currency will be maintained through the end of 1999, but have not made any commitment beyond that point. The financial infrastructure for a broad, deep, and resilient foreign exchange market for the Chinese currency does not now exist and would take time to develop. A gradual move to more flexibility in the future, combined with development of the financial infrastructure, would be consistent with other desirable reforms in the Chinese economy.

Other developing countries (of varying economic size) are in situations not too different from that of China, at least with respect to their exchange rate regimes. Without significant involvement in global financial markets, especially for short-term flows, these countries are generally less vulnerable than most emerging market economies to a rapid and massive build-up of speculative pressures against a pegged exchange rate. Often lacking the relevant infrastructure for a viable foreign exchange market that would operate with reasonable stability in the absence of guidance from the authorities, these countries typically have either pegged or heavily managed exchange rates.

Many of these exchange rate regimes can, and do, function reasonably successfully provided that some key conditions are met. The most important ones concern the nexus between exchange rate policy and monetary policy—the subject of the next subsection. While monetary policy may have some limited flexibility to pursue other objectives, it is essential that the expansion of domestic money and credit not undermine the exchange rate regime. If significant disequilibria begin to develop between the actual exchange rate and its economically appropriate level, it is important that decisions to adjust the exchange rate be taken before the necessary adjustment becomes seriously destabilizing. To contain the potential damage from exchange rate adjustments when they are needed, it is also important

to assure that domestic businesses and financial institutions do not take on substantial net foreign-currency liabilities under the incentives created by the quasi-insurance suggested by a pegged exchange rate—a task that is presumably easier in countries with only limited access to modern global financial markets.

### **B. Exchange Rate Pegs as Nominal Anchors**

It is important to recognize that for centuries up until the 1970s, the values of all national monies, except for occasional periods of war or other substantial disruption, were fundamentally defined by linking their values to some external asset. Gold and silver were the key external assets through the early part of this century. After World War II, under the Bretton Woods system, nations pledged to maintain the values of their currencies within narrow bands of central parities defined against the U.S. dollar; and the dollar was pegged (somewhat tenuously) to gold. Only since 1973 have we had an international monetary system in which exchange rates of the national currencies of the three largest industrial countries and some of the mid-sized industrial countries float in response to market pressures without much official guidance. Indeed, most of the mid-sized industrial countries in Europe have not liked free floating and have instead fastened their exchange rates increasingly tightly to the deutsche mark, and have now moved on to monetary union.

For many developing countries, particularly those with less sophisticated financial systems, it may simply be unreasonable to think that there can be a credible anchor for expectations about monetary policy and for the exchange rate if the authorities do not establish some guide for the value of the money that they create in terms of some readily available alternative asset of stable value. Pegging the exchange rate, or tightly managing its range of variability is a simple, transparent, and time-honored way of providing such an anchor, and for many developing countries there may be no readily available alternative.

### **C. Pegs, Baskets, Bands, and Crawls**

The general characteristic of pegged exchange rate regimes is that the policy authorities undertake an explicit or understood commitment to limit the extent of fluctuation of the exchange rate to a degree that provides a meaningful nominal anchor for private expectations about the behavior of the exchange rate and the requisite supporting behavior of monetary policy. There is a broad range of regimes with this general characteristic, in terms of the degree of permissible exchange rate flexibility, from very hard, single-currency pegs, to basket pegs, to bands, to adjustable pegs and bands, to crawling pegs and bands, and to managed floats.

Aside from outright adoption of another country's currency, the hardest form of a pegged exchange rate regime is a currency board.<sup>12</sup> Under a currency board, monetary policy is entirely subordinated to the exchange rate regime; and expansions and contractions in the supply of base money (and, therefore, movements in domestic interest rates) are determined by a foreign exchange inflows and outflows. These arrangements leave no room for adjustments in the real exchange rate through changes in the nominal exchange rate. Accordingly, adjustments to changing economic conditions affecting the equilibrium real exchange rate, including temporary shocks, must be made by other means, including changes in the levels of domestic prices and costs and (usually short-run) changes in the levels of economic activity and employment. Thus, among the criteria that make a pegged exchange rate regime economically sensible, countries with currency boards need to be particularly mindful of the desirability of flexibility in their economies and in their economic policies (other than exchange rate and monetary policy). The key conditions for the successful operation of a currency board, in addition to the usual conditions deemed desirable for a fixed exchange rate regime, are a sound banking system, because the monetary authorities cannot extend credit to banks experiencing difficulties; and a prudent fiscal policy, owing to the prohibition of central bank lending to the government.

Even for countries that adopt currency boards, as well as for less stringent forms of pegged exchange rate regimes, one way to retain the main anchor properties of an exchange rate peg while gaining some adaptability to one potentially important source of external disturbances—fluctuations among the exchange rates of the major international currencies—is to peg to a currency basket. The weights of the various currencies in the basket could reflect, for example, the geographical composition of the country's trade pattern, or the currency weights of the SDR. Relative to a single-currency peg, this alternative has the advantage of reducing the volatility of the nominal and real effective exchange rate, especially for countries with diversified trade patterns vis-à-vis the major currency areas. Basket pegs, however, may reduce the microeconomic and informational benefits of maintaining constant at least one, typically the most important, bilateral exchange rate relevant for price comparisons and economic transactions. Also, basket pegs may be less transparent than single-currency pegs. This may be particularly the case in countries where there is widespread use of a foreign currency, and pegging to that currency has immediate popular understanding. In practice, basket pegs are not used as often as single-currency pegs, and their popularity, which peaked in the first half of the 1980s, has been declining during the 1990s (Figure 7). This decline probably is related to the fact that basket pegs share many of the characteristics of single-currency pegs, which have also been in decline in the officially reported exchange rate regimes.

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<sup>12</sup> Currency boards have been in operation in several countries, including Djibouti (since 1949), Brunei Darussalam (since 1967), Hong Kong China (since 1983), Argentina (since 1991), Estonia (since 1992), Lithuania (since 1994), Bulgaria (since 1997), and Bosnia and Herzegovina (since 1997). For further discussion of currency board arrangements, see Baliño and Enoch (1997).

Most countries with pegged exchange rate regimes do not fix the rate absolutely, but rather undertake an official commitment to keep the exchange rate from fluctuating beyond some permissible band.<sup>13</sup> This commitment can take the form of a public announcement of a band of admissible values for the exchange rate which the authorities will defend by buying or selling in the market, or there could be a *de facto* band where the public learns of the government's policy through its actions in the market.<sup>14</sup>

When the inflation rate in a country is substantially above that in the major industrial countries (and an immediate effort to reduce inflation to very low rates is not feasible or desirable), a crawling peg or crawling band becomes a relevant exchange regime option. A crawling peg or crawling band where the parity is adjusted for past inflation has the virtue that it avoids a tendency for the real exchange rate to appreciate out of line with economic fundamentals, and adjustments to the rate of crawl to correct emerging current account imbalances can be made to deal with changes in real economic fundamentals. The disadvantage of such a regime, however, is that while it may help stabilize the behavior of the exchange rate in the relatively short-run, it provides no medium term nominal anchor. The tendency is to have not a crawling, but rather a "galloping," peg or band that keeps inflation running at a high rate. A strategy that has been used to deal with this problem and to help bring about a gradual disinflation (for example, in Israel since the late 1980s and 1990s and in Poland since the mid 1990s), is to preannounce the rate of crawl for up to a year in advance, with the objective of influencing expectations and price setting behavior.

For a band or crawling band to be useful in stabilizing expectations, however, it is necessary that the authorities be perceived to have a serious commitment to the arrangement. This, in turn, requires that the authorities face significant costs from abandoning their

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<sup>13</sup> The distinction between a peg and a band is somewhat arbitrary, but a peg is usually understood as a band in which the margins on either side of its central parity are less than or equal to one percent. In addition, note that a peg or a band can be fixed, or can be reset periodically in a series of mini devaluations. In the latter case, it is customary to label the peg or band as a "crawling" or a "sliding" peg or band.

<sup>14</sup> In the words of Frankel (1999, p. 5), "[when a central bank] announces a band around a crawling basket peg, it takes a surprisingly large number of daily observations for a market participant to solve the statistical problem, either explicitly or implicitly, of estimating the parameters (the weights in the basket, the rate of the crawl, and the width of the band) and testing the hypothesis that the central bank is abiding by its announced regime. This is particularly true if the central bank does not announce the weights in the basket (as is usually the case) or other parameters. By contrast, market participants can verify the announcement of a simple dollar peg instantly."

commitment—costs that are well illustrated by some initially successful exchange-rate-based stabilizations that subsequently broke down.<sup>15</sup>

Indeed, the principal difficulty of band arrangements, including crawling bands, is that when the exchange rate is driven to the limits of the band (particularly the most depreciated limit), these arrangements work pretty much as standard exchange rate pegs, and thus can face the same type of problems. The currencies of Mexico before December 1994, Indonesia before August 1997, and Russia before August 1998 were all in crawling band arrangements. In fact, an exchange rate band may be less credible than a peg, especially a hard peg such as a currency board, which typically conveys the impression of stronger commitment of monetary policy to the exchange rate regime. Bands typically function best as regimes of policy compromise when there is the readiness to adjust the central parity (or rate of crawl) in a timely manner in response to changing economic fundamentals.

Somewhere along the spectrum of regimes of increasing exchange rate flexibility lie regimes of “managed floating”. Unfortunately this has a sufficiently ambiguous meaning that it seems to cover a range from *de facto* pegging to something close to a free float. For those managed floats that lie close to the pegging end of the spectrum, the comments that have already been made about various forms of pegged exchange rate regimes continue to apply. There can be some flexibility in the exchange rate, but there must also be a meaningful commitment to defend what the public understands to be the authorities’ commitments regarding the exchange rate and related policies. Tightly managed floats provide a nominal anchor and help to stabilize exchange rates and expectations concerning exchange rates, inflation, and monetary policy; but they are subject to market pressures, potential crises, and costly breakdowns. Monetary policy arrangements with floating exchange rates under a loosely managed float, market forces are allowed substantial latitude to influence the exchange rate in the short-term and in the longer-term. Through official intervention and adjustments of monetary policy, the authorities may seek to limit exchange rate fluctuations in the near term, but there is no policy commitment, explicit or implied to keep the exchange rate within some range or crawling band. The exchange rate in this case is not a nominal anchor. In these critical respects, loosely managed floats are in the same basic category of exchange rate regimes as free floats. Under the evolving conditions described in Section II, especially the increasing involvement in global capital markets, a number of developing countries have moved to exchange rate regimes in this category.<sup>16</sup>

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<sup>15</sup> For a discussion of these issues, see Eichengreen, Masson and others (1998).

<sup>16</sup> For analyses of the float of the Mexican peso, see Edwards and Savastano (1998) and Carstens and Werner (1999).

It is important to emphasize that, for floating rate regimes to function effectively, exchange rates should actually be allowed to move—in both directions—in response to market forces, sometimes by significant amounts in short periods. Only such movement can persuade private economic agents to recognize and to manage prudently the foreign exchange risks that are inescapable for countries open to global financial markets. This does not imply a policy of benign neglect toward the exchange rate. For emerging market countries that are generally quite open to international trade as well as to global finance, movements in exchange rates have important economic consequences, and it is often appropriate for economic policies, including monetary policies and official exchange market intervention, to take account of and react to exchange rate developments. However, tight management of the exchange rate that provides the convenience of limited exchange rate volatility in normal times also tends to foster dangerous complacency about foreign exchange risks that can suddenly become quite large, as was dramatically illustrated in the Asian crisis. Thus, for emerging market countries that cannot or choose not to undertake the very strict regimen necessary to sustain pegged exchange rate regimes in an environment of international capital mobility, it is essential that floating exchange rates really do float.

As the exchange rate does not fulfill the role of nominal anchor in these floating rate regimes, a key issue is how to establish a credible alternative nominal anchor. Institutional arrangements are important in this regard. In particular, central bank independence is important to help to mitigate fears that the lack of exchange rate anchor could let loose the money-printing demon.<sup>17</sup> The central bank need not have goal independence, but it should have substantial operational independence (and tenure protection) to pursue an appropriate nominal target that is independent from the financing needs of the public sector and/or from short-sighted considerations associated with the political cycle. The fact that most developing countries have brought inflation down suggests that there may be a growing political consensus in these countries on the need to liberate monetary policy from these inflationary pressures.

The successful adoption of floating exchange rate arrangements also requires definition of the objective that is to guide the conduct of monetary policy and, accordingly, provide the foundation for private sector expectations. For this purpose, inflation targeting frameworks such as those adopted in several industrial countries since the early 1990s are likely to receive increasing attention. Under these frameworks, monetary policy is characterized by the announcement of targets for the rate of inflation at some low level or range, the periodic assessment of expected inflation over a medium-term horizon, and the systematic adjustment of the monetary policy instrument in order to maintain the relevant inflation measure in line with the target. In addition, inflation targeting frameworks have

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<sup>17</sup> Many developing countries already have increased the degree of independence of their central banks. See Cottarelli and Giannini (1997).

often been characterized by increased transparency and accountability of monetary policy, though these features are in principle independent of them and are desirable in themselves.<sup>18</sup>

An inflation targeting framework allows a degree of discretion and flexibility in the conduct of monetary policy. On the one hand, in practical inflation targeting frameworks, monetary policy decisions are made on a day-to-day basis with no precise rules for the setting of the level of the monetary policy instrument. Also, the inflation targets only are set for a medium-term horizon, the targets are often specified in terms of bands rather than point estimates, and in some cases, the central bank reserves the right to make ad-hoc adjustments to the inflation measure being targeted (see Bernanke and others, 1999). On the other hand, the emphasis on inflation as the overriding objective of the central bank, and the increased transparency and accountability of monetary policy that often have accompanied the adoption of inflation targeting frameworks, can help to put some checks or limits on the degree to which the discretionary powers of the central bank may be used in practice.

The fact that actual inflation targeting frameworks do not tie tightly the hands of the monetary authority, however, implies that the adoption of such a framework could deliver the costs of discretion rather than the benefits of flexibility. For this reason, the importance of the institutional preconditions mentioned above, particularly central bank independence, cannot be exaggerated. Technical expertise is also of key importance for the successful implementation of an inflation targeting framework.<sup>19</sup> In particular, since there are considerable lags in the effect of monetary policy on inflation, it is important to have an effective forecasting procedure, which will signal when changes in the monetary stance are needed to avoid deviations from the target. In addition, many developing countries suffer from large supply shocks and have a substantial number of administered prices. Since on occasion it may be difficult to disentangle the effects on inflation of those shocks from those implied by monetary policy mistakes, the accountability of monetary policymakers under inflation targeting may thus be lower in these countries than in the advanced countries. Notwithstanding these difficulties, several advanced developing and transition countries are putting in place inflation targeting frameworks as part of a move away from the use of the exchange rate as nominal anchor. These countries include Brazil, Chile, the Czech Republic, Israel, Mexico, and Poland.

An alternative to an inflation target as a nominal anchor under a floating exchange rate regime is to announce targets for the growth rate of some monetary aggregate (or group of aggregates). Such arrangements would presumably be attractive in countries where the

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<sup>18</sup> Countries with inflation targeting regimes include New Zealand, Canada, the United Kingdom, Sweden, and Australia. Analyses of these and some other experiences with inflation targeting are provided in Bernanke and others (1999).

<sup>19</sup> The preconditions for the successful adoption of an inflation targeting framework are discussed in Masson, Savastano, and Sharma (1998).

relation between monetary growth and inflation is reasonably reliable and where the monetary authorities have relatively good control of the targeted aggregate. However, these conditions seem rarely to be met in developing countries. Nevertheless, money growth targets may still be useful if they are an effective means of communicating the intentions of the monetary authorities, with the understanding that the authorities have a responsibility to explain deviations from their announced targets as an essential part of their public accountability. Thought of in this way, money growth targets can be used as a supplement to, rather than a replacement for, inflation targets.<sup>20</sup>

#### **D. Benign Neglect, Intervention, and Controls**

Under all exchange regimes other than absolute free floating, ancillary policies to affect the foreign exchange market through official intervention and controls merit attention. Here, the key point to recognize is that, even for those developing and transition countries for which it is reasonable and appropriate to move toward the floating rate end of the spectrum of exchange arrangements, benign neglect of the exchange rate is unlikely to be a desirable policy. If the foreign exchange market is thin and dominated by a relatively small number of agents, it is likely that the exchange rate will be volatile unless the authorities provide some guidance and support. This problem is compounded if, as is often the case, there is no long track record of stable macroeconomic policies that can firmly anchor market expectations about the future monetary and exchange rate policy. Also, underdeveloped and incomplete financial markets imply that hedging against exchange rate risk is usually costly and sometimes impossible.<sup>21</sup> As a result, the costs of exchange rate volatility can be substantial for individual agents and for the economy as a whole. In particular, economies with weak financial sector regulation and supervision, and where banks and corporations have a large exposure to foreign currency borrowing, can be highly vulnerable to unexpected fluctuations in the exchange rate.

Indeed, the facts reveal that developing countries with floating exchange rate regimes generally do not practice benign neglect of the exchange rate. Compared to the G-3 countries, these developing countries tend to put much more of the weight of the adjustment to macroeconomic shocks on variations in interest rates and in international reserves than on variations in the exchange rate. This is illustrated in Table 3, which reports the volatility of the monthly exchange rates, interest rates and international reserves in selected developing and developed countries between January 1995 and December 1998. The typical developing

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<sup>20</sup> A recent survey the use of explicit targets for monetary policy conducted by the Bank of England (see Sterne 1999) reports that countries that had both inflation and money targets (and sometimes exchange rate targets as well) substantially exceeded the number of countries that had either only an inflation target or only a money target.

<sup>21</sup> Pegged rates may also in the past have discouraged the development of hedging instruments by underplaying the risk of exchange rate fluctuations.

country with a floating regime showed during this period a volatility of the exchange rate which was not very different from that observed in industrial countries with floating regimes. However, the volatility of interest rates in developing countries with floats was substantially larger than in the G-3, and typically larger than in other industrial countries. Also, the volatility of international reserves of the developing countries with floats tended to be higher than those in the G-3. Thus, facing generally larger macroeconomic shocks than the industrial countries, developing countries with floating exchange rates placed substantially greater importance on the stability of their exchange rates than did the G-3 or other industrial countries with floating rates. That developing countries care more about exchange rate fluctuations is also reflected in the fact that, when measured relative to imports, GDP, and especially broad money, their demand for international reserves tends to be much larger than for industrial country floaters.

In the absence of a policy of benign neglect of the exchange rate, an important issue is the extent to which sterilized interventions may help to deal with temporary perturbations in the foreign exchange market. In general, this type of intervention is likely to be more effective in countries with limited access to international capital markets and, therefore, where the authorities have relatively greater capacity to influence conditions in the foreign exchange market by directly buying or selling foreign exchange. For emerging market economies characterized by high international capital mobility, the effectiveness of sterilized interventions is likely to be more limited, or larger interventions will be required to achieve a given effect. The willingness of the central bank and the treasury to support the commitment to defend the exchange rate using their own resources, however, may help to modify the expectations of other market participants (the “signaling channel”), thus affecting also the level of supply and demand in the market. On the other hand, if private agents come to the conclusion that official efforts to control an exchange rate through intervention—especially intervention unsupported by monetary policy—are unsustainable, large resources to carry out intervention may be viewed as a profit opportunity.

Another important issue concerns the usefulness of controls as an element of exchange rate policy by countries that do have significant links to global capital markets. Here, it is relevant to distinguish between controls on capital outflows, which are put on to resist downward pressures on the exchange rate and controls on capital inflows which are intended to discourage particular forms of inflows. In the case of the former, success has been limited in the face of substantial and sustained pressures.<sup>22</sup> Concerning controls on inflows, for countries that maintain substantial openness to global financial markets (despite such controls), it is unclear whether they can have much effect in relieving upward pressures

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<sup>22</sup> The recent experience of Malaysia which imposed outflow controls on September 1, 1998, is analyzed in IMF (1999). In this case, the controls were never really tested in the sense that the exchange rate of the ringgit (like that of the other Asian crisis countries that did not impose controls) was not under significant downward pressure at the time the controls were imposed, since it came after the period of large depreciation.

on the exchange rate. They may, however, be able to influence the composition of capital inflows—for good or ill. Controls that discourage foreign direct investment or longer-term credit inflows may indirectly encourage short-term credit inflows. Controls that sought to discourage short-term credit inflows (which are usually denominated in foreign currency) would tend to shift the composition of inflows in the reverse direction. As discussed in IMF (1995a) and IMF (1999a), short-term credit inflows pose particular risks of financial crises and of possible systemic defaults, so that measures to shift the composition of international capital flows away from these inflows can help to diminish risks of crisis. In addition, to the extent that these measures raise the cost of short-term external indebtedness, they might also facilitate the defense of the exchange rate from the upward pressure stemming from the temporary inflows, while maintaining a degree of independence in the conduct of monetary policy.

### **E. Regional Exchange Rate Arrangements**

Some important regional groups of emerging market economies, namely the ASEAN and Mercosur countries, are in the situation of having both diversified linkages to the industrial countries and significant intraregional trade.<sup>23</sup> These regional groups face the problem that substantial exchange rate fluctuations within the group, as well as vis-à-vis the industrial countries, can have destabilizing effects and can tend to undermine regional economic cooperation.

One option to address this problem is to consider some form of regional monetary and exchange rate arrangement, following the example of various arrangements (leading up to the creation of EMU) designed to help meet similar concerns of many European countries. The objective of such arrangements would presumably be to avoid or mitigate the sharp swings recently experienced in exchange rates among key members of these regional groups (see Figure 8).

The immediate applicability of the European example to ASEAN or Mercosur, however, is questionable. Neither of these regional groups presently has either the institutional structures or the political consensus needed for regional economic integration, including integration of monetary and exchange rate policies, of the kind that took many years to develop in Europe. With less political consensus on the virtues of closer economic integration, and with weaker institutional structures to build upon and develop the implications of such a consensus, it seems doubtful that formal mechanisms for effective intraregional coordination of exchange rate and monetary policies, similar to the EMS in Europe, could be made to function in ASEAN and Mercosur at the present time. More ambitious efforts at regional cooperation, such as creation of a common regional currency, are an even more distant prospect.

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<sup>23</sup> The case of ASEAN is also analyzed in Bayoumi, Eichengreen, and Mauro (1999).

As recent crises abate, what are the prospects—and the risks—of re-establishing a form of *de facto* regional exchange rate policy coordination? In the case of Mercosur, Argentina remains dedicated to its convertibility plan, while Brazil has moved to a floating exchange rate regime, with monetary policy oriented toward an inflation target. This probably means that the exchange rate between the currencies of the two largest Mercosur members will be more volatile than before January of this year, but not as volatile as it was immediately after Brazil's depreciation or as it has been for most of past twenty years before 1994. Pending developments that may strengthen the basis for regional cooperation on exchange rate policies and other issues in the years to come, the participants in Mercosur will need to adapt to a fundamental difference in the exchange rate (and related) policies of the two largest participants.

In ASEAN, the prospects for—and the risks of—returning to implicit exchange rate policy coordination by a return to explicit or *de facto* pegs (or quasi-pegs) of national currencies to the U.S. dollar appear greater than in Mercosur. Malaysia established a formal peg of the ringgit to the U.S. dollar on September 1, 1998. After great turbulence at the height of the Asian crisis, since late last year the exchange rate of the Thai baht has been relatively stable against the U.S. dollar. In view of the still substantial real depreciations of both of these currencies from just before the Asian crisis and of the large current account surpluses of these countries, it seems reasonably likely that their exchange rates will be subjected to upward market pressures, especially if the U.S. dollar corrects downward against other major currencies. The Philippines and Indonesia (as well as Korea, which is not in ASEAN) may well be in similar situations.

To avoid recreating the problems that led to the Asian crisis, it is important for the ASEAN countries (and other east Asian economies including Korea, China, and Taiwan) to recognize and take appropriate account of their mutual interdependence in the particular context of their exchange rate (and related) policies. If there are general upward pressures on the exchange rates of these economies and only one or two respond by allowing their exchange rates to appreciate, they will tend to lose competitive position relative to those regional partners who aggressively resist exchange rate appreciation. Recognizing this possibility, all will be encouraged to resist exchange rate appreciation even when economic fundamentals point in this direction. In contrast, if there is a general understanding that exchange rates will be allowed to adjust in response to market pressures, then one country should be less concerned that in responding to such pressures it will be disadvantaged relative to its regional partners and competitors.

There is no easy way of writing formal rules for this loose form of regional cooperation on exchange rate policies. Because different Asian economies were affected differently by recent crises, are recovering in different ways and at different speeds, and remain subject to different domestic and external shocks, market pressures on their exchange rates are unlikely to be uniform. However, it should be feasible to take some account of common factors that are likely to influence these economies in a similar if not identical fashion. In particular, movements in major currency (especially dollar/yen) exchange rates might be taken into account by shifting, on a regional basis, from exchange rate policies that

focus heavily on the U.S. dollar to more of a currency basket approach. Also, or alternatively, agreement might be sought to limit exchange market intervention (or the pace and scale of reserve accumulation) in order to assure that market forces are allowed reasonable latitude, by all of the regional partners, to move exchange rates up and down in response to changing economic conditions. Beyond such possibilities, and pending consideration and possible development of more ambitious efforts at regional exchange rate coordination, regional cooperation in the near-term will need to take a flexible approach, based on mutual understanding and trust, and backed up by mutual, regional, and international surveillance.

#### **F. IMF Advice on Exchange Rate Policy**

Advice of the International Monetary Fund to members (including the emerging market countries) on their exchange rate policies reflects this ambiguity and diversity. Consistent with its Articles of Agreement, the Fund generally respects the member's choice of exchange rate regime and advises on policies needed to support that choice. In the context of Fund-supported programs, changes in exchange rates (such as in the CFA franc countries in 1994), and even changes in exchange rate regimes (such as Bulgaria's adoption of a currency board in 1997), have sometimes been needed, along with other policy adjustments. Contrary to some popular misconceptions, recent Fund-supported programs (with Mexico in 1995, and with Asian countries in 1997-98) have typically not involved financing a defense of currency pegs. In cases where a peg was judged sustainable, however, the Fund has provided support (such as recently in Argentina). There have also been cases in which pegs were initially judged sustainable but subsequently had to be abandoned (Brazil in 1999, and Russia in 1998, both of which had crawling pegs). With increased capital mobility, as countries approach emerging market status, the requirements for sustaining exchange rate pegs become more demanding. This suggests that for some countries an exit strategy from pegged rates may need to be considered earlier than has typically been the case in the past.

### **VI. SUMMARY AND CONCLUSIONS**

For the broad range of developing and transition countries, exchange rates are typically very important macroeconomic variables, and increasingly so because of the trends toward greater involvement of these countries in the global economic system. Reflecting wide differences in levels of economic and financial development and in other aspects of their economic situations, no single exchange rate regime is most appropriate for all of these countries, and the regime that is appropriate for a particular country may change over time.<sup>24</sup>

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<sup>24</sup> This is consistent with the conclusion of Jeffrey Frankel in his recent Graham Lecture on the subject, "...no single currency regime is right for all countries at all times." It is also consistent with most empirical research which shows ambiguous effects of alternative exchange regimes on key aspects of economic performance; see, for example, Ghosh and others (1995), IMF (1997), and Edwards and Savastano (1998).

Despite the diversity of possible arrangements, however, the following general conclusions can be stated.

First, for most emerging market countries, primarily in Asia and Latin America (but also some in Eastern Europe and South Africa), floating exchange rate regimes appear to be the increasingly relevant choice. For these emerging market countries, the tequila crisis of 1995 and the Asian/Russian/Brazilian crises of 1997-98 forcefully illustrated what was demonstrated for the industrial countries in the ERM crises of 1992/93—that the policy requirements for maintaining a pegged exchange rate can be very demanding in circumstances of high international capital mobility. In this situation, several emerging market countries (including Mexico, Peru, and South Africa) successfully maintained floating exchange rate regimes. This provides evidence that floating rates are often the most workable regimes for many emerging market countries.

Second, for certain emerging market countries, pegged exchange rate regimes and their required supporting policies and institutions can be workable, despite substantial involvement with global financial markets. Notable in this category are countries that have already put in place the policies and institutions needed to support a pegged exchange rate, have established the credibility of those policies and institutions, and have induced appropriate behavior of the economic and financial system to the characteristics of the regime. For such countries, in general, the harder and more credible the peg, the better. In contrast, a pegged exchange rate regime that is adopted (*de jure* or *de facto*) when conditions are favorable, but without adequate policy commitment and institutional foundations, can become an invitation to costly crisis when conditions turn less favorable. An environment of capital mobility allows massive pressures to be exerted against a pegged exchange that, for whatever reasons, has become suspect in the market. To defend the peg, monetary policy must be able to respond forcefully, and the economy and financial system must be able to withstand the strain if the regime is to be credible. And, even for countries with strong foundations, maintenance of pegged exchange rates in a crisis environment can be a demanding endeavor.

Third, beyond the thirty or so "emerging market" economies, the majority of developing and transition economies do not have highly sophisticated domestic financial systems, are not deeply integrated into world capital markets, and (in many cases) maintain fairly extensive controls on capital account (and current account) transactions. These countries presently include a number of the larger and mid-sized developing countries. If inflation in these countries is high because of needs for monetary finance of the fiscal deficit or for other reasons, then exchange rate pegs cannot be sustained for long periods. However, if monetary policy can maintain reasonable discipline, then pegged exchange rate regimes (or bands or crawling pegs or crawling bands) can be viable for extended periods; and, if adjustments are undertaken in a timely manner, they need not be associated with costly crises. Nevertheless, as they become more developed, more financially sophisticated, and more integrated into global financial markets, these countries also will need to consider regimes of greater exchange rate flexibility.

Also in the group of peggers are many smaller countries that account for only a modest share of world output but are a substantial fraction of the countries in the world. Even for the most advanced of these small countries that want to maintain pegged exchange rates, moderate constraint on the development of financial instruments and practices that might facilitate speculation against the peg can probably help, along with disciplined monetary policy, to sustain the exchange rate regime. Moreover, for the many small countries that do maintain pegged exchange rates, the currencies to which they peg generally have a sensible and clearly understandable rationale.

Yet another group of countries for which pegged exchange rates offer important attractions are countries that need to stabilize from situations of high inflation. The main challenge in these endeavors is to recognize that while an exchange rate peg may initially be very useful in the stabilization effort, the exchange rate peg (or crawling peg or band) may not be sustainable in the longer term. Thus, it is very important to know when, and under what circumstances, it may be appropriate to move away from a peg to forestall risks of a major future crisis. This is the issue of "exit" from an exchange rate peg that was discussed intensively in Eichengreen, Masson and others (1998).

Finally, regional groups of emerging market countries that have both diversified economic linkages to the major currency areas and significant intraregional linkages to other emerging market countries (specifically the ASEAN and Mercosur groups) face particular challenges in devising and managing their exchange rate regimes. Joint pegging of exchange rates to a single major currency (*de facto* or *de jure*) has the advantage of coordinating the exchange rate policies among the group, so long as the exchange rate pegs are sustainable. But, as illustrated in recent crises, in addition to the general difficulties of sustaining exchange rate pegs for countries substantially open to global financial markets, this solution is vulnerable both to pressures arising from fluctuations of exchange rates among the major currencies and to the contagion that can arise when the collapse of one country's exchange rate peg calls into question the sustainability of the pegs of other members of the regional group. A joint peg to a basket of major currencies reflecting the trading pattern of the regional group would arguably be a better choice than a single currency peg. More flexible arrangements that use currency baskets as reference points for regional cooperation (rather than as the basis for exchange rate pegs), however, may be better suited to regional groups of countries that are substantially open to modern global financial markets. More ambitious efforts at regional cooperation on exchange rate arrangements, such as those that have evolved in Europe, merit consideration, but also require a degree of political consensus and institutional development that suggest that they are relevant primarily for the longer term.

### RECENT EXPERIENCE WITH EXCHANGE-RATE-BASED STABILIZATIONS<sup>25</sup>

Since the late 1980s, a significant number of developing countries have undertaken *exchange-rate-based stabilization programs*, that is, disinflation programs that included pre-announced limits on nominal exchange rate movements. Major programs of this type were implemented in several Latin American economies with histories of chronically high inflation, as well as in many transition economies that had suffered dramatic increases in inflation following the collapse of central planning. A list of these stabilization programs for the countries where 12-month inflation at the beginning of the program exceeded 100 percent is presented in Table 4.

As shown in Table 4 and Figure 9, the experiences with these programs have tended to confirm the benefits and pitfalls of using the exchange rate as the nominal anchor for reducing high inflation.<sup>26</sup> Indeed, all of these programs had remarkable success in reducing inflation from extremely high levels. Also, as in earlier exchange-rate-based stabilization programs, disinflation during recent programs was generally accompanied by rapid real economic growth. In all the countries implementing these programs, however, there was a marked tendency during the first three years of the program for the domestic currency to appreciate in real terms, with a concomitant increase in the external current account deficit. This increase was generally financed by substantial capital inflows, which made the economies implementing these programs increasingly dependent on international capital markets and more vulnerable to sudden reversals in capital flows.

In this context of heightened external vulnerability, inconsistencies between economic policies and the exchange rate regime led in some cases to severe currency crises, including the collapses of the Mexican peso in December 1994, the Russian ruble in August 1998, and the Brazilian real in January 1999. In each of these cases a combination of domestic and external factors led to the attack on and subsequent devaluation of the domestic currency, but policy slippages invariably played an important role. All these crises were very costly in their effects on the credibility of the authorities and following the devaluations were accompanied by rising inflation and plummeting output.

Most of the recent programs, however, did not end in a currency crash. In half of the countries that did not experience a currency crash, the consistency of economic policies and the exchange rate regime was ensured by the constraints imposed by the adoption of currency board arrangements. This type of monetary and exchange rate arrangement was adopted by Argentina, Estonia, Lithuania, and, more recently, Bulgaria. In the other half of the countries

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<sup>25</sup> A more detailed version of this appendix can be found in IMF (1999b).

<sup>26</sup> For a recent review of the theoretical and empirical literature on exchange rate-based stabilization, see Calvo and Végh (1999). Most of that literature focuses on stabilizations undertaken until the mid-1980s. See also IMF (1996).

that did not experience a currency crash, the consistency of macroeconomic policies was attained in part by accepting some degree of exchange rate flexibility, either by design of the exchange rate regime adopted at the beginning of the stabilization or by subsequent revisions of the original regime as stabilization progressed. This was the case in Poland, Uruguay, Nicaragua, and Croatia. Without supporting economic policies, however, the introduction of some degree of exchange rate flexibility was generally insufficient to prevent a currency crash. Before their collapse, the exchange rate regimes in Mexico, Russia, and Brazil had all been made more flexible, although not sufficiently so to avoid a crisis as a result of other policy shortcomings.<sup>27</sup>

To summarize, recent experiences with exchange-rate-based stabilization programs confirm that they can be very effective in stopping high inflation, and that economic performance can improve significantly soon after the launching of the program. It is key, however, that disciplined macroeconomic policies be implemented while the exchange rate anchor is in place. In addition, a decision needs to be made on whether a longer-term binding commitment should be made to a fixed exchange rate, or whether some degree of exchange rate flexibility should be allowed after a while. In the latter case, the degree of flexibility should be sufficient to be consistent with the fiscal and monetary policies being implemented.

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<sup>27</sup>For a discussion of methods for moving to greater exchange rate flexibility under alternative circumstances, see Eichengreen, Masson, and others (1998).

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Table 1. Regional Trade Patterns, 1980 - 1998 (selected years)  
(in percent of total regional trade)

	1980		1985		1990		1995		1998	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
<b>Mercosur<sup>1</sup></b>										
Within Mercosur	15.8	11.3	8.2	13.8	11.6	17.5	22.6	20.2	26.8	22.7
With US	14.7	20.3	22.8	19.1	20.4	19.3	15.0	20.6	15.1	21.6
With Euro Area	27.4	17.8	24.4	15.9	28.8	20.1	21.3	22.3	21.3	22.0
With Other Industrial Countries	13.3	14.7	12.1	12.8	14.6	15.4	14.3	13.7	10.6	13.3
With Other Developing Countries	27.1	35.2	30.0	36.5	23.2	26.6	26.0	22.1	25.0	19.5
<b>Asian 5<sup>2</sup></b>										
Within Asian 5	4.9	6.0	6.4	7.8	6.7	6.6	8.4	8.1	10.2	12.5
With Japan	29.9	25.1	24.7	23.8	22.2	26.1	15.9	25.8	11.6	17.8
With the US	20.8	18.3	26.1	18.4	23.9	18.2	19.5	17.3	20.2	14.4
With Euro Area	11.8	8.7	8.6	9.7	11.8	11.3	10.4	11.6	10.7	8.6
With Other Industrial Countries	5.8	9.7	7.9	10.9	8.3	10.6	6.6	9.4	8.1	7.4
With Other Developing Countries	25.6	31.0	24.7	26.2	25.0	24.1	36.9	26.1	36.5	36.6
<b>ASEAN<sup>3</sup></b>										
Within ASEAN	17.4	14.6	18.6	17.2	19.0	15.2	24.6	18.0	22.1	24.1
With Japan	29.6	22.3	25.1	20.5	18.9	23.1	14.2	23.8	11.1	16.9
With the US	16.3	15.3	19.5	15.2	19.4	14.4	18.6	13.8	20.6	13.8
With Euro Area	10.4	9.6	8.4	10.0	11.7	11.2	10.8	11.1	11.9	8.9
With Other Industrial Countries	6.1	10.3	6.2	9.7	7.6	9.8	6.9	8.1	8.6	6.7
With Other Developing Countries	20.2	28.6	21.5	26.7	23.1	25.2	24.3	24.3	25.2	28.5
<b>CFA franc Zone<sup>4</sup></b>										
Within CFA Franc Zone	6.6	6.1	6.8	6.7	8.1	9.3	6.7	6.9	8.5	8.5
With Euro Area	56.7	57.6	53.2	53.9	50.9	52.0	46.1	45.8	40.7	45.6
With Other Industrial Countries	18.1	14.7	22.8	18.1	20.9	14.3	22.5	14.7	21.1	12.5
With Other Developing Countries	18.9	21.2	14.0	18.7	18.0	21.1	21.7	29.2	26.2	29.6
<b>CEEC 5<sup>5</sup></b>										
Within CEEC 5	...	...	...	...	...	...	5.9	4.7	6.5	4.7
With Euro Area	...	...	...	...	...	...	56.7	54.5	57.4	60.4
With Other Industrial Countries	...	...	...	...	...	...	11.9	16.3	14.2	12.9
With Other Developing Countries	...	...	...	...	...	...	23.7	23.9	21.7	21.6
<b>Euro Area<sup>6</sup></b>										
Within Euro Area	50.6	44.2	47.1	46.1	54.1	52.8	51.2	50.7	48.7	48.5
With Japan	0.9	2.3	1.2	3.1	2.0	4.1	2.0	3.8	1.6	3.8
With the US	4.7	7.8	8.9	7.2	6.1	6.7	5.9	6.8	7.6	7.8
With Other Industrial Countries	18.5	15.6	20.2	17.2	19.5	16.7	18.3	16.8	18.9	16.6
With Other Developing Countries	23.5	29.7	21.0	25.8	17.2	19.1	21.3	21.0	22.0	22.4
<b>NAFTA<sup>7</sup></b>										
Within NAFTA	33.6	32.8	43.9	34.4	41.4	33.9	46.2	38.4	51.0	40.4
With Japan	8.3	10.6	8.8	16.9	10.5	15.2	8.6	13.7	6.4	10.9
With Euro Area	17.4	10.3	13.5	13.7	15.6	13.2	11.7	11.6	11.3	12.4
With Other Industrial Countries	10.1	7.9	8.4	7.9	9.4	7.8	7.2	6.2	7.6	6.2
With Other Developing Countries	28.8	37.0	23.9	26.4	23.0	29.1	26.1	29.8	23.6	29.7

Source: International Monetary Fund, Direction of Trade Statistics.

<sup>1</sup> Mercosur: Argentina, Brazil, Paraguay, Uruguay, and associate members Bolivia and Chile.

<sup>2</sup> Asian 5: Indonesia, Korea, Malaysia, Philippines and Thailand.

<sup>3</sup> ASEAN: Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Viet Nam (Brunei data are not available).

<sup>4</sup> CFA franc Zone: Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Republic of Congo, Cote d'Ivoire, Equatorial Guinea, Gabon, Guinea-Bissau, Mali, Niger, Senegal and Togo.

<sup>5</sup> CEEC 5: Czech Republic, Estonia, Hungary, Poland and Slovenia - the countries that initiated accession negotiations with the EU in March 1998, a group chosen purely for illustration purposes.

<sup>6</sup> Euro Area: Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Portugal and Spain.

<sup>7</sup> NAFTA: Canada, Mexico and the United States.

Table 2. Small Economies<sup>1</sup>: Exchange Rate Arrangements and Selected Indicators  
(1998 unless otherwise indicated)

	Size of Economy (bil U.S. dollars)	Trade as Share of GDP <sup>2</sup>	Largest Export		Tourism Receipts in percent of Exports <sup>5</sup>	Controls On <sup>5</sup> Current Account
			Share <sup>3</sup>	Partner <sup>4</sup>		
Pegged Arrangements: Pegged to a Single Currency						
Pegged to the U.S. dollar						
Antigua and Barbuda	0.61	87.0	18.8	Spain	...	1
Bahamas, The	4.12	52.0	22.7	United States	80.0	1
Barbados	2.33	58.4	14.3	United Kingdom	...	1
Belize	0.67	53.0	28.9	United States	27.8	1
Djibouti	0.53	51.4	38.3	Somalia	1.7	0
Dominica	0.25	56.8	22.5	United Kingdom	31.4	1
Grenada	2.30	10.3	30.0	United States	...	1
Liberia <sup>6</sup>	3.07	30.4	27.4	Singapore	...	0
Maldives <sup>6</sup>	0.40	117.0	32.4	United States	68.7	0
Marshall Islands	0.10	...	...	...	...	0
Micronesia, Fed. States of	0.21	...	...	...	0.0	0
Netherlands Antilles	2.51	66.5	17.5	United States	...	1
St. Kitts and Nevis	0.29	60.9	60.3	United States	50.7	1
St. Lucia	0.68	70.1	51.9	United Kingdom	...	1
St. Vincent and the Grenad	0.30	57.9	31.3	United Kingdom	...	1
Suriname <sup>6</sup>	0.82	83.7	16.2	United States	...	1
Pegged to the French franc						
Benin	2.32	27.8	23.4	Brazil	5.5	1
Burkina Faso	2.54	38.4	67.2	Cote d'Ivoire	7.8	1
Central African Rep.	1.06	27.2	42.5	Belgium	2.3	1
Chad	1.67	25.8	24.4	Germany	3.3	1
Comoros	0.19	28.6	62.1	France	46.0	1
Congo, Rep. of	1.99	96.2	86.7	United States	0.2	1
Equatorial Guinea	0.46	88.7	87.6	United States	0.5	1
Gabon	4.57	70.6	75.0	United States	0.2	1
Guinea-Bissau	0.20	62.5	85.0	India	...	1
Mali	2.65	28.7	21.8	Italy	3.3	1
Niger	2.01	18.9	68.3	France	6.0	1
Senegal	4.86	34.5	21.5	France	10.8	1
Togo	1.51	37.1	11.3	Canada	2.1	1
Pegged to Other Currency						
Bhutan <sup>7</sup>	0.36	53.7	...	...	4.9	1
Brunei Darussalam <sup>8</sup>	4.86	50.2	51.4	Japan	...	1
Cape Verde <sup>9</sup>	0.50	46.7	89.3	Portugal	11.4	1
Kiribati <sup>10</sup>	0.06	72.6	21.3	Japan	15.4	0
Lesotho <sup>11</sup>	0.83	116.1	...	...	10.9	0
Namibia <sup>11</sup>	2.99	60.0	...	...	11.1	1
San Marino <sup>12</sup>	...	...	...	...	...	0
Swaziland <sup>11</sup>	1.18	99.8	12.8	South Africa	3.4	1
Pegged Arrangements: Pegged to a Currency Basket						
Botswana	5.11	40.3	...	...	...	0
Burundi	0.98	10.2	34.9	Germany	1.0	1
Fiji	2.33	58.5	32.1	Australia	25.6	1
Malta	3.99	96.3	18.0	United States	23.2	1
Samoa	0.21	43.0	51.1	Australia	50.3	1
Seychelles	0.56	69.5	22.1	United Kingdom	34.2	0
Tonga	0.17	49.4	50.3	India	28.6	1
Vanuatu	0.25	53.6	30.5	Japan	39.5	0
Flexible Arrangements: Other Managed Float						
Azerbaijan	4.10	42.5	23.7	Iran	13.8	1

Table 2. Small Economies<sup>1</sup>: Exchange Rate Arrangements and Selected Indicators  
(1998 unless otherwise indicated)

	Size of Economy (bil U.S. dollars)	Trade as Share of GDP <sup>2</sup>	Largest Export		Tourism Receipts in percent of Exports <sup>5</sup>	Controls On <sup>5</sup> Current Account
			Share <sup>3</sup>	Partner <sup>4</sup>		
Kyrgyz Rep.	1.87	48.8	25.0	Germany	0.6	0
Lao PDR	1.11	51.5	13.0	Thailand	12.9	0
Macedonia FYR	3.25	52.0	20.5	Germany	...	1
Malawi	1.69	40.2	14.4	South Africa	1.1	1
Mauritania	0.90	71.9	18.2	Japan	2.4	1
Mauritius	4.03	62.4	30.5	United Kingdom	18.0	0
Nicaragua	2.07	30.2	54.5	United States	9.3	0
Solomon Islands	0.32	82.4	36.0	Japan	5.4	1
Tajikistan	0.98	83.8	46.4	Uzbekistan	...	1
Turkmenistan	1.64	201.2	22.0	Iran	0.9	1
Flexible Arrangements: Independent Float						
Albania	3.94	20.1	59.4	Italy	4.5	0
Armenia	1.86	37.1	23.2	Belgium	3.6	0
Eritrea	0.65	34.1	...	...	37.2	1
Gambia, The	0.41	54.5	72.8	Belgium	9.6	0
Guinea	3.83	21.5	14.9	United States	0.7	1
Guyana	0.74	103.4	25.2	Canada	...	0
Haiti	3.89	15.3	86.3	United States	36.6	0
Madagascar	3.75	25.0	45.7	France	8.7	0
Moldova	2.25	55.6	50.5	Russia	3.3	1
Mongolia	1.06	52.2	49.5	China, PR Mainland	4.4	0
Mozambique	3.89	28.7	17.1	Spain	...	0
Papua New Guinea	3.70	63.7	18.7	Australia	2.9	1
Rwanda	2.08	13.8	32.9	Belgium	0.7	1
Sao Tome and Principe	0.04	66.6	85.9	Netherlands	32.3	1
Sierra Leone	0.65	26.7	33.5	Belgium	10.9	1
Somalia	2.16	16.4	59.8	Saudi Arabia	...	1
Zambia	3.35	33.8	10.3	Saudi Arabia	5.1	0
<u>Memorandum Item: Fraction of countries with controls</u>						
Small Economies						0.67
Industrial Countries						0.00
Other Developing Countries						0.59
Other Transition Countries						0.44

Sources: International Monetary Fund, World Economic Outlook, Direction of Trade Statistics and Annual Report on Exchange Arrangements and Exchange Restrictions and country desks; World Bank, World Development Indicators.

<sup>1</sup> Countries with estimated nominal GDP less than 5 billion U.S. dollars in 1998 (subject to availability of data from the WEO).

<sup>2</sup> Average of exports and imports in percent of GDP.

<sup>3</sup> Country's largest exports as a share of total exports.

<sup>4</sup> Partner country for largest exports.

<sup>5</sup> As of 1997.

<sup>6</sup> Country officially reports a managed or independent float.

<sup>7</sup> Pegged to the Indian rupee.

<sup>8</sup> Pegged to the Singapore dollar.

<sup>9</sup> Pegged to the Portuguese escudo.

<sup>10</sup> Pegged to the Australian dollar.

<sup>11</sup> Pegged to the South African rand.

<sup>12</sup> Pegged to the Italian lira.

Table 3. Selected Countries with Floating Exchange Rate Arrangements: Volatility of Exchange Rate, Interest Rate and International Reserves, January 1995-December 1998

	Volatility <sup>1</sup> of			Ratio of Exchange Rate Volatility to		International Reserves		
	Exchange Rate <sup>2</sup>	Interest Rate	International Reserves	Interest Rate Volatility	International Reserve Volatility	in Months of Imports	in Percent of GDP	in Percent of Broad Money
Developing Countries								
Bolivia <sup>3</sup>	0.3	1.2	6.7	0.3	0.0	5.2	10.9	25.1
Chile <sup>3</sup>	1.6	3.6	3.0	0.4	0.5	8.9	22.2	55.5
Colombia <sup>3</sup>	2.5	6.5	3.0	0.4	0.8	6.0	9.9	49.1
Gambia	0.8	0.1	3.7	6.6	0.2	5.7	25.7	103.1
Ghana	1.8	1.5	11.0	1.2	0.2	2.9	9.5	57.7
India	1.8	0.4	3.9	4.2	0.5	6.8	5.5	12.5
Mauritius <sup>3</sup>	1.8	0.6	4.4	3.2	0.4	3.6	18.7	25.4
Mexico	4.6	9.1	19.7	0.5	0.2	2.5	6.1	23.5
Peru	1.0	4.2	3.4	0.2	0.3	14.2	15.8	73.5
Singapore <sup>3</sup>	2.4	1.0	2.6	2.4	0.9	7.1	81.3	95.2
South Africa	3.2	0.9	20.2	3.6	0.2	1.1	2.4	3.9
Sri Lanka <sup>3</sup>	0.5	13.6	4.7	0.0	0.1	4.3	14.4	45.6
Tanzania	2.4	5.2	19.9	0.5	0.1	3.3	5.5	29.4
Turkey <sup>3</sup>	2.0	9.1	8.1	0.2	0.3	4.7	9.3	36.8
Uruguay <sup>3</sup>	0.7	9.7	6.2	0.1	0.1	3.7	7.1	18.0
Zambia	4.0	2.7	113.1	1.5	0.0	1.9	6.8	42.8
Zimbabwe	5.2	3.9	28.9	1.3	0.2	1.7	5.7	23.6
G-3 Countries								
Germany	2.6	0.1	2.3	22.4	1.1	2.1	3.6	6.3
Japan	4.3	0.1	3.0	35.9	1.4	7.5	4.7	4.2
United States	1.5	0.1	3.6	11.2	0.4	0.9	0.8	1.5
Other Industrial Countries								
Australia	2.5	0.2	6.8	15.9	0.4	2.5	3.7	5.8
Canada	1.4	0.4	7.2	3.3	0.2	1.2	3.1	5.2
Israel <sup>3</sup>	2.2	0.6	5.5	3.5	0.4	2.8	15.9	19.2
New Zealand	2.7	0.7	6.5	4.0	0.4	3.9	7.7	9.2
United Kingdom	1.9	0.3	3.5	5.5	0.5	1.5	3.0	3.0

Sources: International Monetary Fund, International Financial Statistics, World Economic Outlook.

<sup>1</sup> Volatility is defined as the standard deviation of the monthly growth rate of the series for the exchange rate and for international reserves and as the standard deviation of the difference for the interest rate.

<sup>2</sup> Bilateral versus the U.S. dollar for all countries except the United States; nominal effective exchange rate for the United States.

<sup>3</sup> Managed floaters.

Table 4. Major Exchange-Rate-Based Stabilization Programs Since the Late 1980s<sup>1</sup>

Country	Beginning Date	Exchange Rate Arrangement <sup>2</sup>	Twelve-Month Inflation:			Did the Program End in a Currency Crash?
			At Start of Program	Third Year of Program	In 1998	
Mexico	December 1987	Peg, crawling peg, widening band	143.7	29.9	18.6	Yes (December 1994)
Poland	January 1990	Peg, crawling peg, crawling band	639.6	39.8	8.6	No
Uruguay	December 1990	Crawling band	129.8	52.9	8.6	No
Nicaragua	March 1991	Peg, crawling peg	20234.3	3.4	...	No
Argentina	April 1991	Currency board	267.0	4.3	0.7	No
Estonia	June 1992	Currency board	1085.7	29.2	4.4	No
Croatia	October 1993	Asymmetric peg, managed float	1869.5	4.0	5.3	No
Lithuania	April 1994	Currency board	188.8	8.4	2.4	No
Brazil	July 1994	Peg, crawling peg	4922.6	6.1	0.4	Yes (January 1999)
Russia	July 1995	Band, crawling band	226.0	5.5	66.8 <sup>3</sup>	Yes (August 1998)
Bulgaria	July 1997	Currency board	1471.9	...	3.2 <sup>3</sup>	No

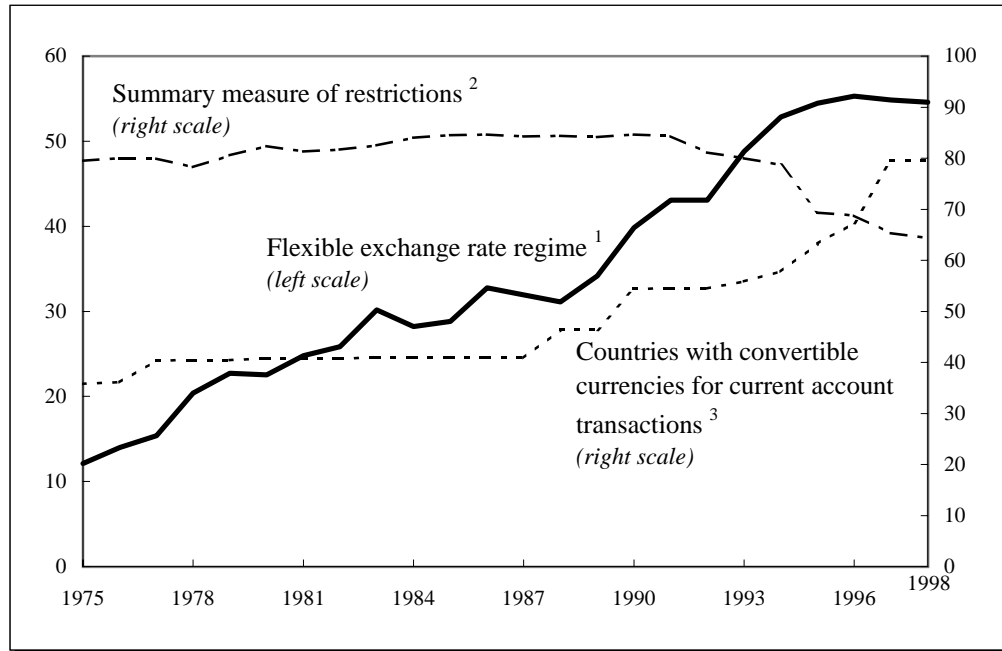
Source: National Authorities, and IMF staff estimates.

<sup>1</sup>In countries where the 12-month inflation rate was above 100 percent at the beginning of the stabilization program.

<sup>2</sup>Where more than one arrangement is listed, the sequence of arrangements is indicated.

<sup>3</sup>November 1997-November 1998.

Figure 1. Developing Countries: Evolution of Exchange Rate Regimes and Exchange Restrictions, 1975 - 1998  
(in percent)



Source: International Monetary Fund, Annual Report on Exchange Arrangements and Exchange Restrictions.

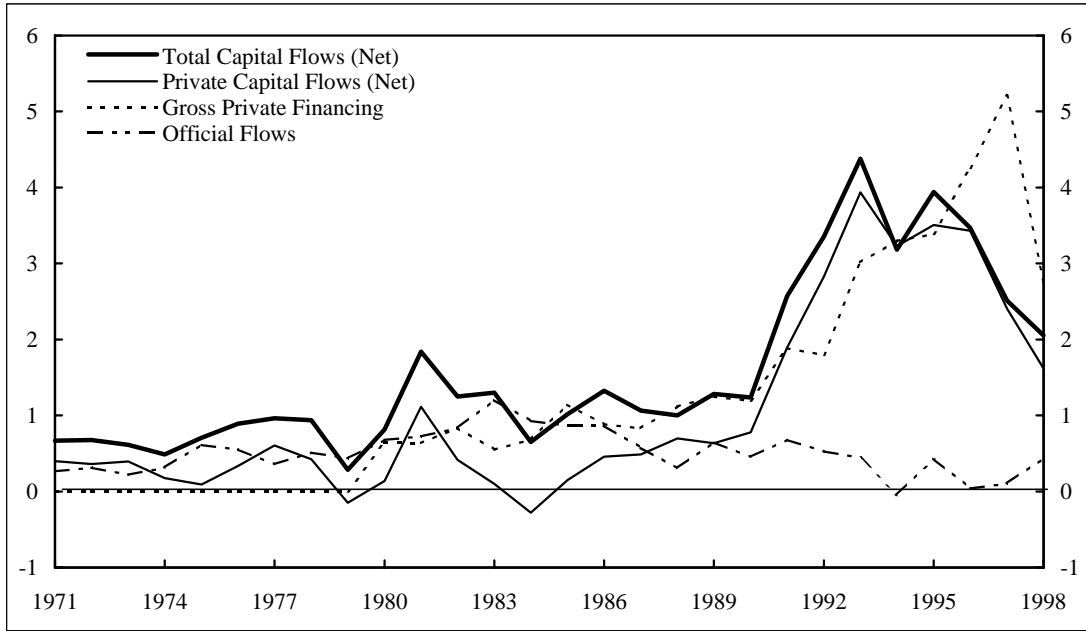
Notes:

<sup>1</sup> In percent of total number of developing countries. Flexible exchange rate regimes include arrangements in which the exchange rate has limited flexibility with respect to another currency, is adjusted according to a set of indicators, follows a managed float or is independently floating. The number for 1998 is preliminary.

<sup>2</sup> Cross-country average of an index reflecting restrictions on capital account transactions, multiple exchange rates, and surrender of export proceeds. The index ranges from 0 when no restrictions are present to 100 when all restrictions are present. To reflect a change in methodology in 1996 for restrictions on capital account transactions, the 1996 and 1997 capital account restrictions indicators are re-scaled so that the value in 1996 is the same as that in 1995. It is likely, however, that capital account liberalization took place between 1995 and 1996.

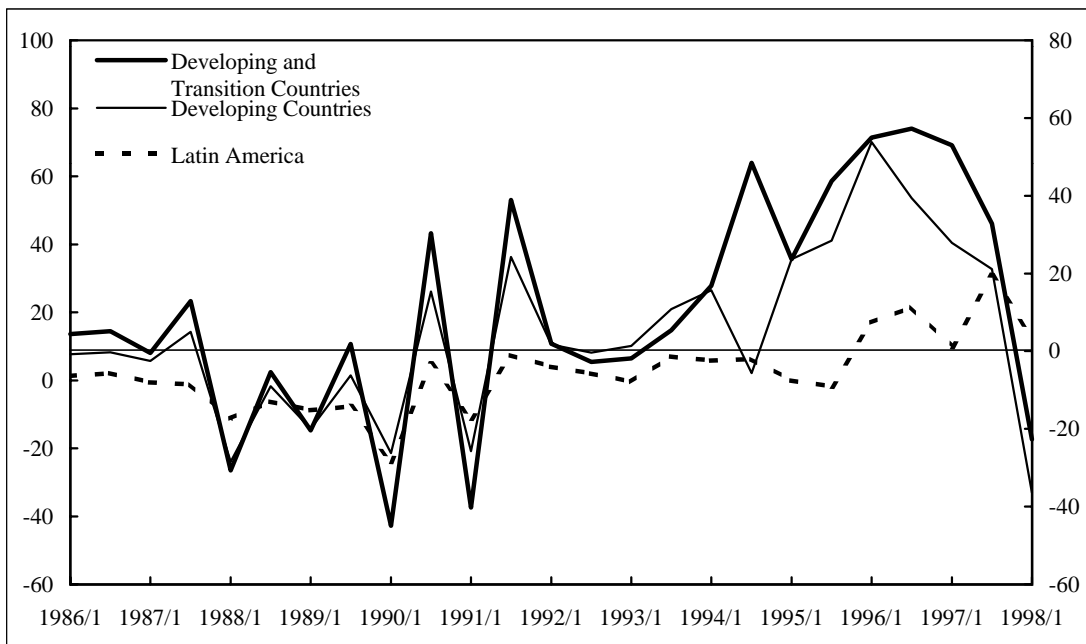
<sup>3</sup> Percent of developing countries that have accepted Article VIII of the IMF's Articles of Agreement; countries are weighted by their 1990-95 share of aggregate exports of all developing countries.

Figure 2. Developing Countries: Total, Private and Official Capital Flows, 1971-1998  
(in percent of GDP)



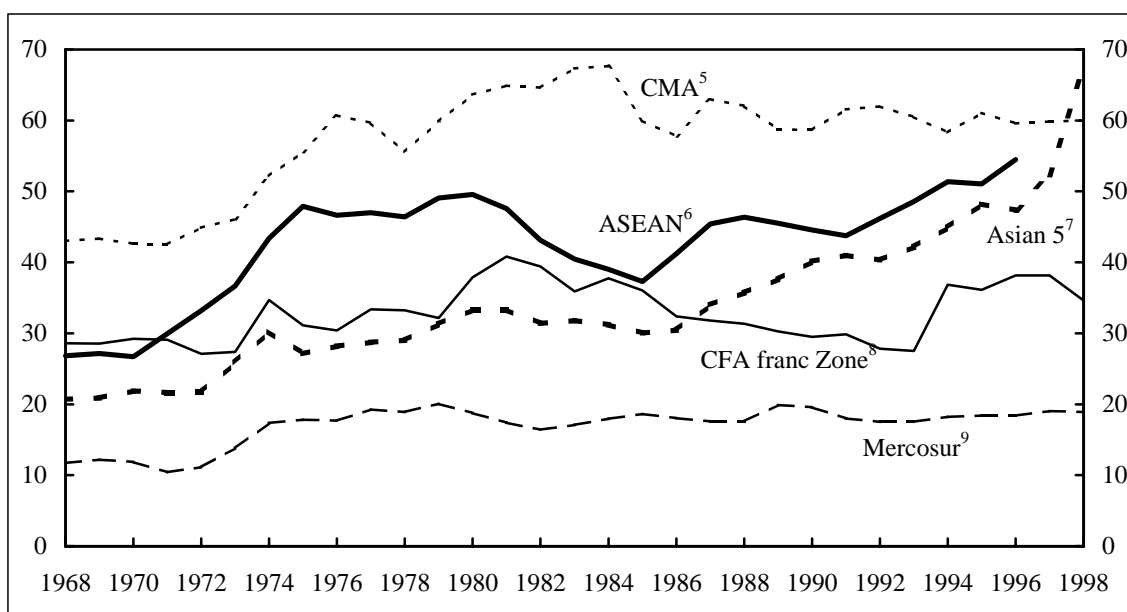
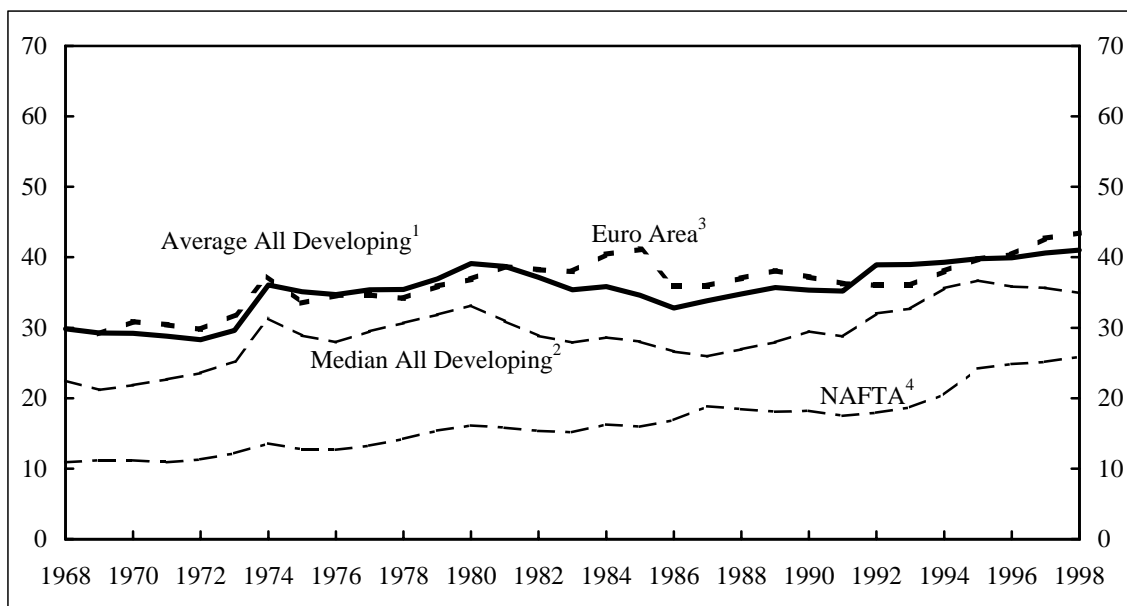
Source: International Monetary Fund, World Economic Outlook Database and Developing Countries Bonds, Equities and Loans Database.

Figure 3. Developing Countries: Change in Bank Loans, 1986-1998  
(in billions of U.S. dollars)



Source: Bank for International Settlements.

Figure 4. Advanced and Developing Countries: Measures of Openness of Economies, 1968-1998



Source: International Monetary Fund, World Economic Outlook.

<sup>1</sup> The unweighted average across countries of exports and imports (divided by two) in percent of GDP.

<sup>2</sup> The median value of country's exports and imports (divided by two) in percent of GDP.

<sup>3</sup> Euro Area: Austria, Belgium-Luxembourg, Finland, France, Germany, Ireland, Italy, Netherlands, Portugal and Spain.

<sup>4</sup> NAFTA: Canada, Mexico and the United States.

<sup>5</sup> CMA: Botswana, Lesotho, Namibia, South Africa and Swaziland.

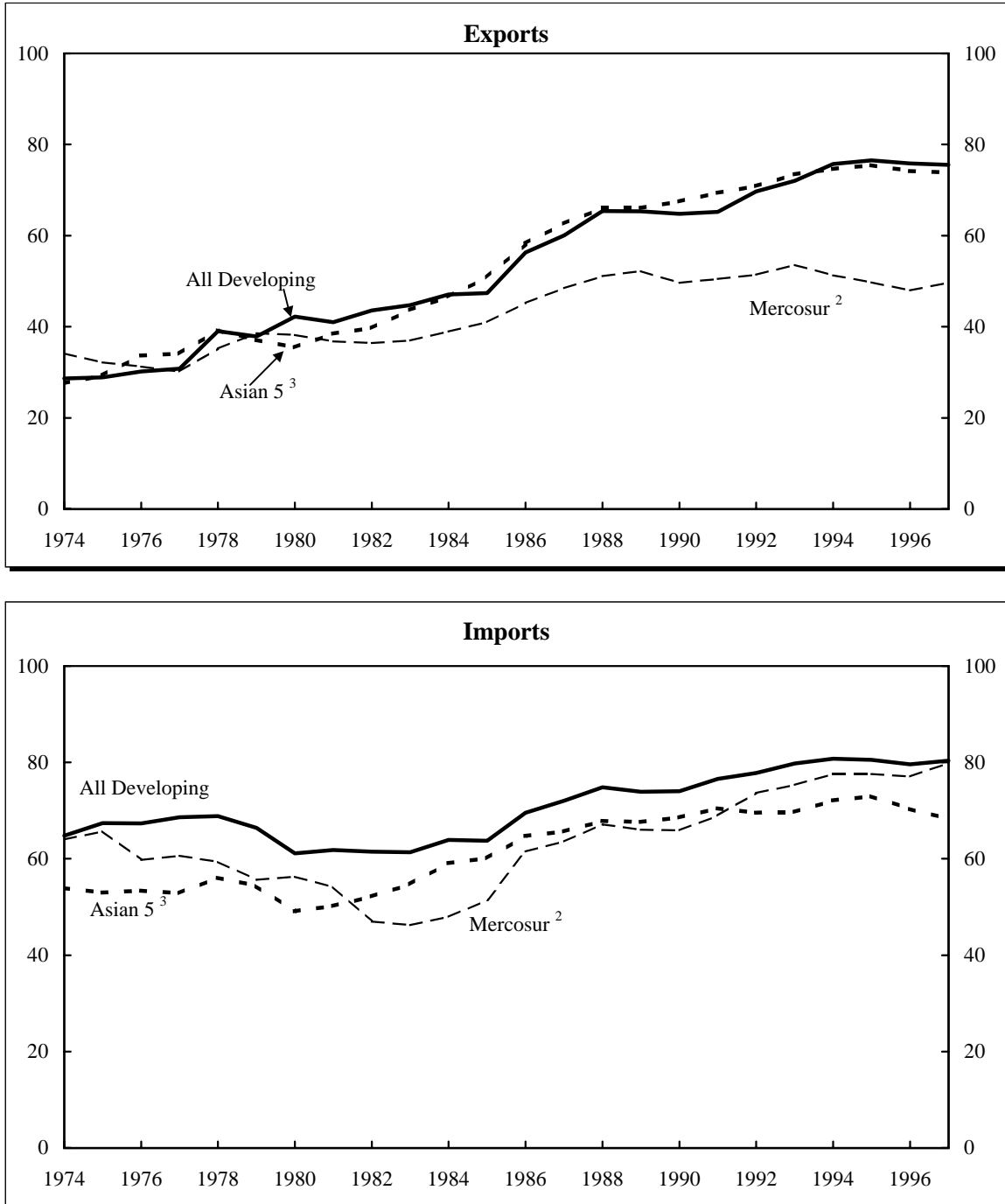
<sup>6</sup> ASEAN: Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Viet Nam. (Brunei data not available).

<sup>7</sup> Asian 5: Indonesia, Korea, Malaysia, Philippines and Thailand.

<sup>8</sup> CFA franc Zone: Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Republic of Congo, Cote d'Ivoire, Equatorial Guinea, Gabon, Guinea-Bissau, Mali, Niger, Senegal and Togo. The sharp increase in the openness measure in 1994 reflects the CFA franc's 50 percent devaluation.

<sup>9</sup> Mercosur: Argentina, Brazil, Paraguay and Uruguay, as well as associate members Bolivia and Chile.

Figure 5. Developing Countries: Share of the Manufacturing Sector in Total Trade<sup>1</sup>, 1974-1997



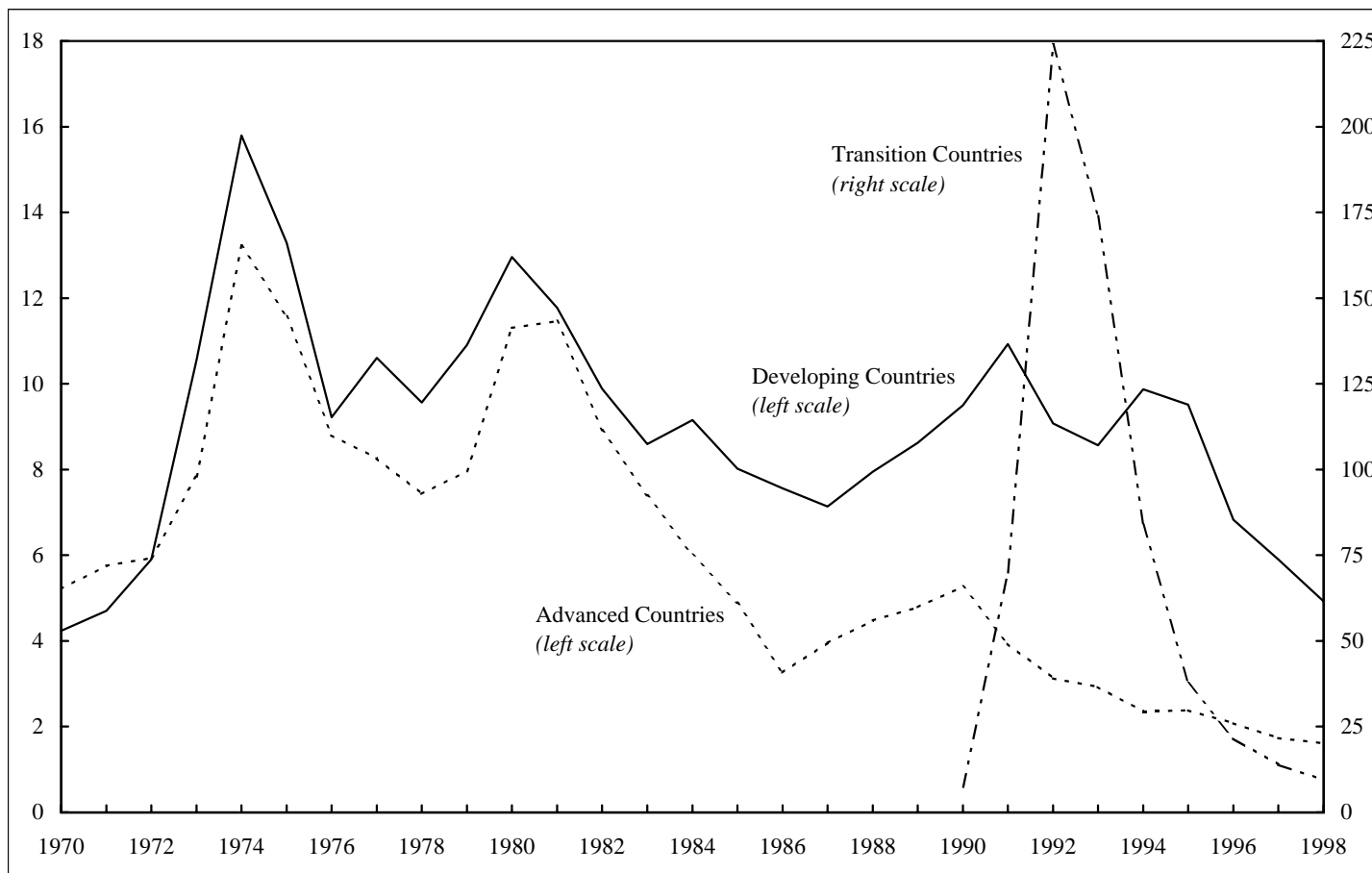
Source: United Nations, Trade Analysis and Reporting System.

<sup>1</sup> The sum of the following SITC categories: (5) chemicals, (6) basic manufactures, (7) machines and transport equipment, (8) miscellaneous manufactured goods, and (9) goods not classified by kind, in percent of total trade.

<sup>2</sup> Mercosur: Argentina, Brazil, Paraguay and Uruguay, as well as associate members Bolivia and Chile.

<sup>3</sup> Asian 5: Indonesia, Korea, Malaysia, Philippines and Thailand.

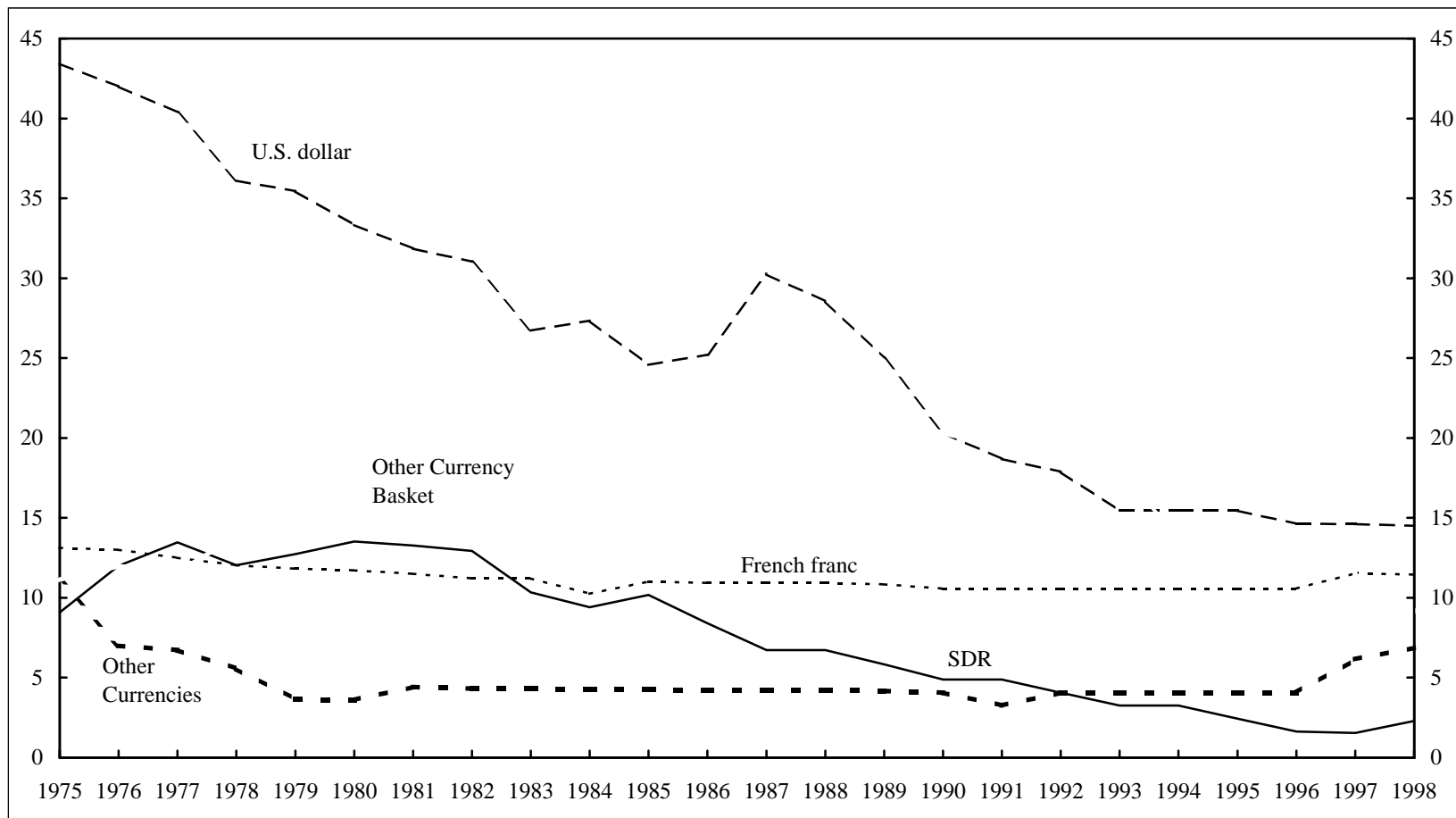
Figure 6. Advanced, Developing<sup>1</sup> and Transition Countries: Median Inflation Rate, 1970-1998



Source: International Monetary Fund, World Economic Outlook.

<sup>1</sup> Excluding transition economies.

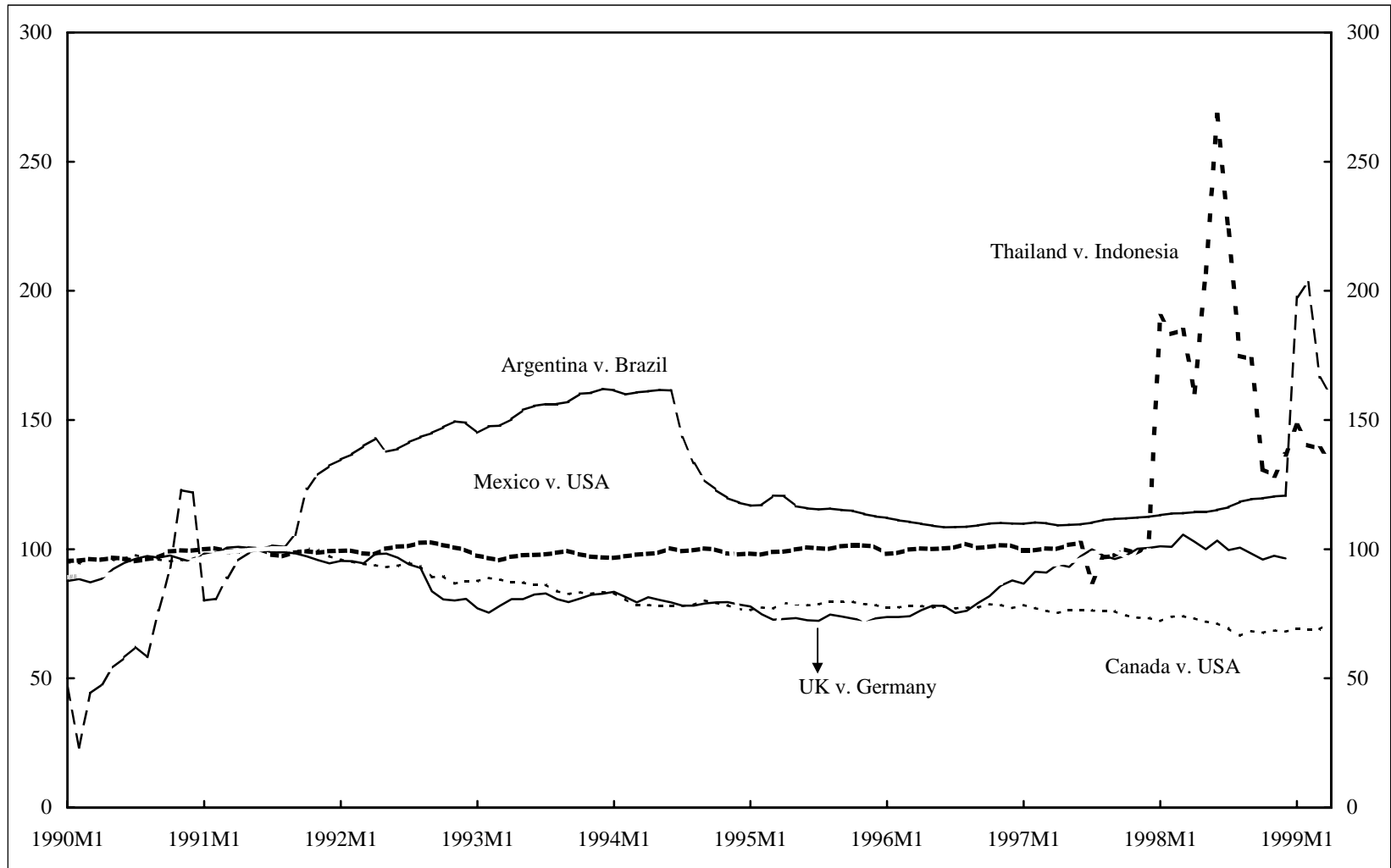
Figure 7. Developing Countries: Evolution of Pegged Exchange Rate Regimes<sup>1</sup>, 1975-1998  
(in percent of total number of developing countries)



Source: Source: IMF's Annual Report on Exchange Arrangements and Exchange Restrictions.

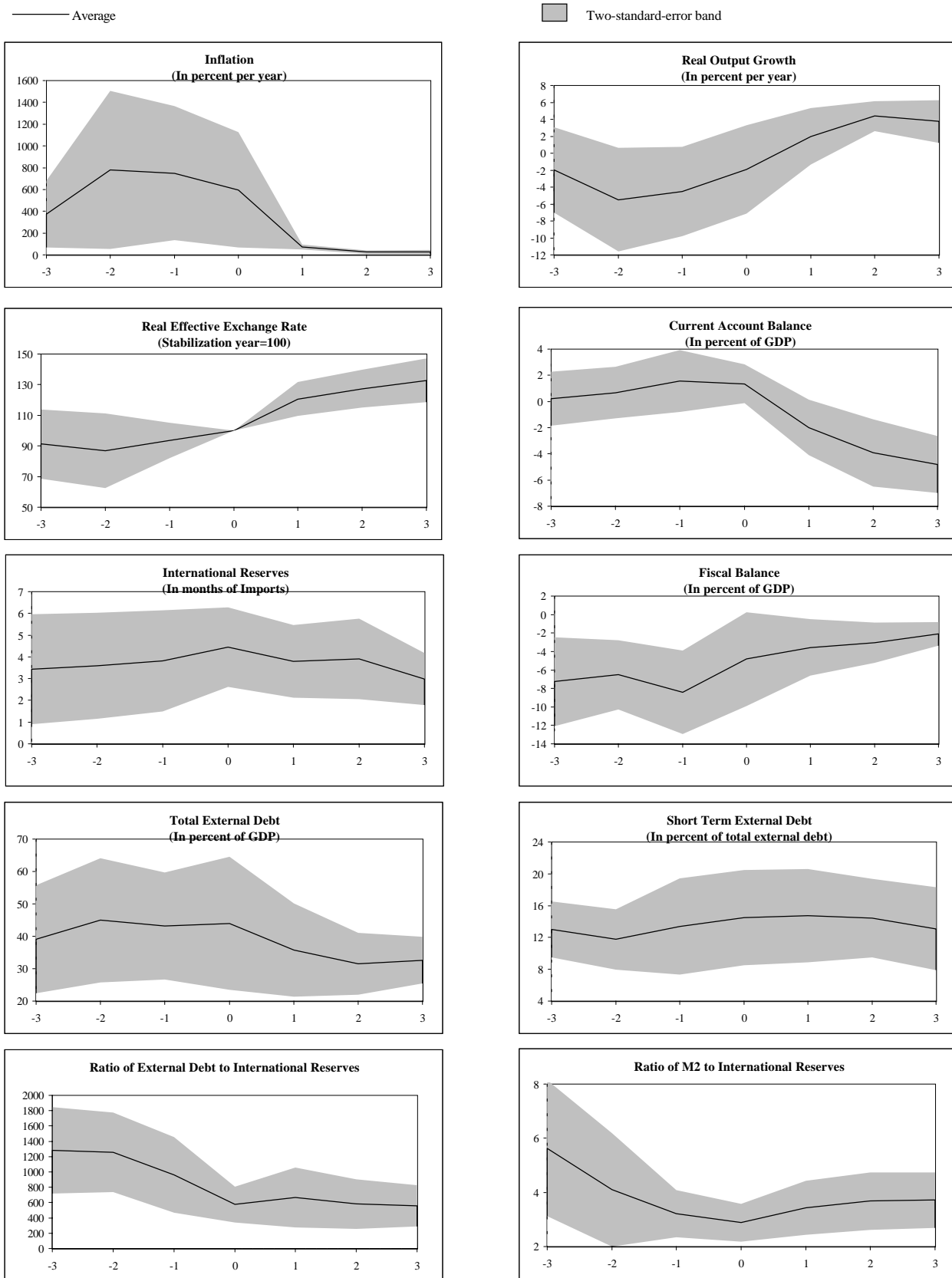
<sup>1</sup> The classification is based on officially reported exchange rate arrangements as of year-end.

Figure 8. Selected Regional Groups: Real Bilateral Exchange Rates, January 1990-April 1999  
( June 1991 = 100 )



Source: International Monetary Fund, International Financial Statistics.

Figure 9: Recent Exchange Rate Based Stabilizations: Selected Economic Indicators 1/  
(Centered on the year of stabilization)



Sources: IMF, World Bank and IMF staff estimates.

1/ Includes data for the following exchange rate based stabilization experiences (year of stabilization in parenthesis): Mexico (1987), Poland (1990), Uruguay (1990), Argentina (1991), Croatia (1993), Lithuania (1994), Brazil (1994) and Russia (1995).