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## Role of National Macroeconomic Policies and Currency Regimes

Weaknesses in national macroeconomic policies and institutions lie at the heart of the currency mismatch problem. Evidence suggests that countries can make significant progress (over periods no longer than a decade) in reducing the extent of the mismatch when they adopt appropriate policies, institutions, and financial-market structures and create the right pattern of incentives to discourage currency mismatches.

In contrast, the authors of the original sin hypothesis (OSH) have not been optimistic about the contribution that better national policies and institutions can make to solving the currency mismatch problem because (1) many emerging economies with good policies and institutions suffer from original sin; (2) it would be too costly for emerging economies to wait for the very slow impact of better policies on original sin; and (3) diversification with fixed costs implies that the optimal international portfolio will contain only a small group of currencies, and hence emerging-economy latecomers will find it harder to be included in the portfolio. In the OSH authors' view, currency mismatch is inherently an "international" problem that requires an international solution.

This chapter focuses on macroeconomic policies: (1) the role of monetary policy and inflation performance in generating currency mismatches and impeding local bond market development; (2) the role of the currency regime in creating incentives to hedge against currency risk; (3) the role of fiscal policies/debt burdens in generating and overcoming currency mismatches; and (4) the role of debt and reserve management policies. The next chapter takes a closer look at microeconomic policies, notably the role of an institutional infrastructure that creates the appropriate incentives.

## Monetary Policy and Inflation

Most analysts regard poor inflation performance and weak credibility for monetary policy as leading suspects in the currency mismatch problem.<sup>1</sup> After all, why should foreign and domestic investors be willing to lend (long-term) in domestic currency if they expect that monetary authorities in emerging economies will sometimes engineer bouts of high inflation to lower their real debt obligations? If that expectation is widespread, then lenders will insist on lending either in foreign currency or in domestic currency at short maturity or on inflation-indexed terms. We agree with the mainstream view: a wide body of evidence and country experience supports the proposition that poor inflation performance contributes significantly to currency mismatching.<sup>2</sup>

A recent study by John Burger and Francis Warnock (2002) strongly indicates that high and variable inflation matters for currency mismatching and bond market development in emerging economies. We give considerable weight to their findings because it is the first study to employ data on the total bond market (in 50 countries), not just data on international bonds. Burger and Warnock (2002) find that countries that have had higher or more variable inflation tend to issue more foreign currency-denominated debt, and this result remains when high-inflation outliers are removed from the sample. Similarly, when the size of the local currency-denominated bond market relative to GDP is the dependent variable, they find that countries with lower or less volatile inflation (and thus likely more stable monetary and fiscal policies) have better-developed bond markets. Burger and Warnock (2002, 19) sum up their empirical results as follows: “[T]he results . . . indicate an important role for past policies in the current state of both the development and currency composition of countries’ bond markets.” Carmen Reinhart, Kenneth Rogoff, and Miguel Savastano (2003a) build a domestic dollarization index for developing countries that combines data on the ratio of foreign-currency deposits to GDP with those on the share of domestic debt denominated in a foreign currency. They obtain results similar to those of Burger and Warnock (2002); in particular, they find that domestic dollarization is higher, the higher the probability that annual inflation will be at or above

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1. See, for example, Jeanne (2001).

2. In contrast, Eichengreen, Hausmann, and Panizza (2002) have been rather skeptical about the monetary credibility explanation for currency mismatching because their cross-country regressions of original sin on inflation find only a weak effect for inflation once high-inflation outliers are dropped from the sample because inflation-indexed debt in domestic currency is relatively rare in international securities and because the monetary-manipulation story does not explain why corporations in emerging economies (who, unlike governments, do not hold the monetary reins) also seem to have trouble borrowing abroad in their own currency.

**Table 6.1 Type of domestic debt at issuance, end-2000**  
(percent of total)

Region	Floating-rate	Fixed-rate	Inflation-indexed	Exchange rate-linked
Latin America	34	16	28	22
Asia	35	63	0	2
Central Europe and others <sup>a</sup>	13	65	20	2
Total	27	48	16	9

a. Includes Israel and Saudi Arabia.

Source: Turner (2002).

40 percent. Reinhart, Rogoff, and Savastano (2003a, 49) conclude: “Considering that dollarization is a form of indexation, it is not surprising that inflation history is the most important variable in explaining domestic dollarization.” Gianni De Nicrolo, Patrick Honohan, and Alan Ize (2003), examining cross-country differences in the dollarization of bank deposits, likewise find an important role for inflation performance, with their estimates implying that a doubling of inflation increases the dollarization share by about five percentage points.

Mohsin Khan, Abdelhak Senhadji, and Bruce Smith (2001) also find a strong link between financial depth and inflation, using a large cross-country sample for the 1960–99 period. They look at several measures of financial-market activity, including bank lending to the private sector, stock market capitalization and trading volume, and measures that aggregate bank lending and stock market activity and bank lending and stock and bond markets. For all these measures, they find that there are significant threshold effects, such that *when inflation rises above the threshold of 3 to 6 percent per year, there is a strong negative effect on financial development.*

High and variable inflation is likewise cited as one of the key factors in the lower access of developing countries (*vis-à-vis* industrial countries) to long-term finance. While the literature shows that information asymmetries, poor collateral law, weak judicial efficiency, and various firm characteristics (e.g., firm size and the maturity of firm assets) contribute to this lower access, we can only echo the judgment of Gerard Caprio and Patrick Honohan (2001, 49) that “there is nothing like inflation for stifling a long-term debt market.”

Once account is taken of domestic bonds, the use of inflation-indexed bonds is not as limited as some (e.g., Eichengreen, Hausmann, and Panizza 2002) have suggested. As shown in table 6.1, inflation-indexed bonds represent about 16 percent of domestic bonds (at issuance) for emerging economies as a group. Also, consistent with the view that inflation matters, in Latin America (where earlier inflation excesses have been most

marked), the shares of inflation-indexed and exchange rate-linked debt are higher, and the share of fixed-rate debt is lower than in other regions (particularly in emerging Asia, where control of inflation has historically been most successful).

There is then little reason to doubt that better inflation performance in emerging economies would greatly aid in building deeper local bond markets and thus reduce the extent of currency mismatches. Moreover, better inflation performance and greater financial depth should be mutually reinforcing: lower inflation would promote financial depth, and greater financial depth would nurture a domestic political constituency to resist manipulated inflation surprises.

Consequently, our action program includes a proposal that emerging economies adopt inflation targeting as their monetary policy framework. We follow others (e.g., Bernanke et al. 1999, Mishkin 2000, and Truman 2003) in describing inflation targeting as a monetary policy framework that constrains discretion on four counts: there is an institutional commitment to low inflation as a primary objective of monetary policy; a numerical target or range for inflation is publicly announced, along with a time schedule for meeting that target; the central bank is given “instrument independence”; and there are transparency and accountability guidelines for monetary policy such that the public is informed about the reasons for monetary policy decisions and about how far monetary policy objectives have been attained. Though the implementation of inflation targeting in emerging economies faces more formidable challenges than in industrial countries, and its history is too recent for definitive conclusions, the track record of inflation targeting in emerging economies has been quite good on the whole. Specifically, studies find that countries adopting inflation targeting have been relatively successful in meeting their announced inflation targets, that the record in meeting inflation targets has been much better than in meeting announced monetary growth targets, that countries adopting inflation targeting still allow monetary policy to respond to falls in output, and that inflation targeting has rarely been associated with a subsequent loss of fiscal prudence.<sup>3</sup> And the better monetary policy credibility becomes in emerging economies, the better the medium-term prospects for reducing currency mismatches.

Pursuit of an inflation targeting framework for monetary policy does not mean that an emerging economy would have to follow a complete hands-off policy with respect to exchange rate movements that it considers excessive. It could still make episodic use of sterilized exchange market intervention, and the exchange rate could also influence the timing of

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3. See IMF (2001); Corbo, Moreno, and Schmidt-Hebbel (2001); Mishkin and Schmidt-Hebbel (2001); and Schaechter, Stone, and Zelmer (2000). Truman (2003) arrives at a more mixed verdict.

interest rate movements decided on domestic grounds. But a publicly announced exchange rate target or band would be ruled out.

## Currency Regime

The currency regime is another factor often put forward as generating currency mismatch. The traditional argument is that fixed exchange rates make market participants complacent about currency risk, with little incentive to hedge.<sup>4</sup> Supporters of the OSH reject this proposition as well as its policy implication that movement to a more flexible currency regime would reduce exposures to currency risk. They argue instead that the higher exchange rate volatility associated with floating rates means that hedging will be more expensive; hence, there will be less of it under floating rates than under fixed rates. In addition, Barry Eichengreen, Ricardo Hausmann, and Ugo Panizza (2002) report that 22 of the 25 developing countries (in their sample) with the most flexible exchange rate regimes had very high levels of original sin. Once again, we reject the original sin argument and stress three arguments in favor of the traditional view that greater (de facto) exchange rate flexibility would reduce currency mismatching.

First, almost all the emerging-market currency crises of the past seven or eight years have involved officially announced exchange rate targets and, usually, little precrisis de facto movement of exchange rates. For example, Indonesia, Korea, Malaysia, and the Philippines kept their exchange rates within narrow bands in the two-year run-up to the Asian financial crisis. As such, there is little to suggest that market participants are made as aware of currency risk by fixed exchange rate regimes as they would have been if regularly reminded by short-term movements in the nominal exchange rate. Nor is there persuasive econometric evidence that currency mismatches tend to be lower under fixed-rate regimes. While Carlos Arteta (2002) found that currency mismatches in emerging-market banking systems have been greater under floating exchange rates than under fixed rates, we do not regard his conclusion as reliable because he was not able to control for the share of bank loans going to producers of nontradables (which can lead to indirect exposure to currency risk), or for off-balance sheet exposure of banks, or for regulations that limit the net open position

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4. Accounting rules can also compound this problem. Estimates of annual debt service charges on dollar debt may include the dollar interest payments due but not the capital losses due to currency depreciation. Hence a borrower with dollar debt appears to “pay” less debt service than an equally indebted borrower with local-currency debt. In many cases, borrowers—governments as much as corporations—are not required to report the impact of currency movements on the local-currency value of foreign-currency debt. Such misreporting of underlying exposures undermines market discipline.

of banks.<sup>5</sup> A recent IMF (2003) study on financial stability in dollarized economies concluded that the main source of currency risk for banks in highly dollarized economies was the exposed position of their borrowers; the same study also reported, for example, that the share of total dollar loans granted to borrowers in the nontradables sector reached, in mid-2002, over two-thirds in Bolivia, 50 percent in Costa Rica, 60 percent in Peru, and 80 percent in Paraguay. We likewise do not attach much weight to Eichengreen, Hausmann, and Panizza's (2002) finding that the vast majority of emerging economies with floating-rate regimes had high levels of original sin because, as argued earlier, original sin is not a good measure of currency mismatch. In the end, we agree with Max Corden (2002) who, after reviewing case studies of currency crises in Asia, Latin America, and Europe, concludes that the unhedged foreign currency-borrowing problem tends to be much worse under fixed but adjustable currency regimes than under floating rates.

Second, in cases where emerging economies have moved from fixed to floating exchange rate regimes, behavior toward currency risk seems to change for the better. A leading case in point is Mexico, which was forced off its peg in late 1994 and has since run a managed float. Using a large sample of firms listed on the Mexican stock exchange, Lorenza Martinez and Alejandro Werner (2001) report that while firm size was the main determinant of dollar debt during the fixed-rate period, exports became the key explanatory variable during the floating-rate period, as the composition of foreign-currency debt shifted toward borrowers better able to service that debt. They conclude that "Under a predetermined exchange rate regime, firms will not fully internalise their exchange rate risk, and they will be more likely to engage in balance-sheet mismatches than under a floating rate regime." Looking at 400 nonfinancial firms in five Latin American countries, Hoyt Bleakley and Kevin Cowan (2002) find similarly that, *ceteris paribus*, the share of foreign-currency debt is higher for firms producing tradables than for those producing nontradables, suggesting that there is a natural incentive to hedge so long as government intervention does not distort that incentive (either in the exchange market itself or in the implementation of the official safety net). Using the same database (as in Bleakley and Cowan 2002), Cowan (2003) reports in a recent paper that the share of dollar debt is higher in periods when the exchange rate is less volatile. Going in the same direction, growth in derivatives markets—be it in industrial countries or in emerg-

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5. Banks face indirect currency exposure from the currency exposure of clients with large currency mismatches. A large depreciation can lead to widespread insolvencies of corporate clients with large currency mismatches, leading to large loan delinquencies to banks. Thus, even if the currency composition of bank deposits is equal to the currency composition of bank loans (i.e., no direct currency mismatch), there can be substantial *indirect* currency risk. We prefer to define currency risk in terms of sensitivity of net worth to changes in the exchange rate because it captures indirect as well as direct exposure to exchange rate changes.

ing economies—usually takes off when actual or prospective volatility in exchange rates or interest rates increases so much that market participants recognize that it is in their own interest to buy insurance against that volatility. With the exception of Hong Kong, all the emerging economies in our top tier of hedging facilities (Singapore, South Africa, Mexico, Korea, and Poland) now have floating—not fixed—exchange rate regimes.

Third, the “harder” the exchange rate peg, the more difficult it is likely to be for the authorities to introduce prudential measures against currency mismatching. For example, if the government pledges under its currency board arrangement that one peso is to be equal to one dollar for all time, then it may well find it awkward to argue simultaneously that its banks should be required to hold capital against a net open position in foreign exchange in case the peso depreciates against the dollar. An IMF (2003) report notes that two currency board countries (Argentina before its crisis and Bulgaria) formally excluded from their calculations of banks’ open positions the positions in the currency to which the exchange rate was pegged.

To sum up, while we do not regard floating exchange rates as a sufficient precondition for controlling currency mismatching in emerging economies, it is surely pretty close to being a necessary condition; without it, efforts to limit currency mismatching will have to climb uphill. This is why our action program includes a currency regime of managed floating for those larger emerging economies that have significant involvement with private capital markets.

## Fiscal Policies

The weaker a government’s fiscal accounts, the greater will be its incentive to devalue or inflate in order to lower the real value of its obligations. We share the view that fiscal prudence and cautious levels of debt accumulation will aid efforts to reduce currency mismatching.<sup>6</sup> Indeed, experience with emerging-market debt problems suggests that neither national authorities nor international financial institutions have been conservative enough in gauging what constitutes a “sustainable” public debt ratio.<sup>7</sup>

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6. The OSH rejects this view, finding little role for fiscal fundamentals in explaining cross-country differences in original sin. More specifically, Eichengreen, Hausmann, and Panizza (2002) report that neither the public debt to GDP ratio, nor the average fiscal deficit, nor the ratio of public debt to tax revenue, nor the principal components of these fiscal variables is associated with higher levels of original sin; in fact, if there is any relationship between the two, their empirical results suggest that countries with more original sin have less public indebtedness. They conclude: “Hence, we find no traction for fiscal interpretations of the causes of original sin” (2000, 21).

7. See Goldstein (2003) and Reinhart, Rogoff, and Savastano (2003b) for explanations of why the traditional framework for assessing public debt sustainability in emerging economies typically yields too optimistic an answer.

Reinhart, Rogoff, and Savastano (2003b) have recently undertaken a comprehensive empirical analysis of external and domestic borrowing, credit ratings, domestic dollarization, inflation, and debt restructuring in developing countries. Their results suggest a role for fiscal fundamentals, which is consistent with our view. They argue that the main reason behind the recurrent debt cycles in developing countries is not that they borrow too little but rather that they often borrow too much. They maintain that many developing countries suffer from “debt intolerance,” which they define as a syndrome where weak institutional structures and a problematic political system make external borrowing a tempting device for developing-country governments to avoid hard decisions about spending and taxes. They measure debt intolerance as the ratio of the stock of external debt (scaled by GNP or exports) to an index of sovereign risk and find that there are large differences both between industrial and developing countries and between developing countries themselves in their measured debt intolerance. They show that debt repayment histories, debt levels, and the history of macroeconomic stability can explain cross-country differences in debt intolerance. While debt levels do not explain credit ratings for industrial countries, higher external debt ratios translate into lower credit ratings for developing countries.<sup>8</sup> They also find that higher debt levels and patchier credit histories are associated with higher levels of domestic dollarization in developing countries. They conclude (2003b, 4): “Debt intolerance can, of course, express itself in ways other than our core measure, including the maturity structure of a country’s debt . . . as well as the currency composition of debt and degree of dollarization. . . . Indeed, both a short maturity structure and the degree of dollarization are factors that exacerbate a country’s risk of a credit event. . . . Perhaps less well understood is that these risks are not due to ‘original sin’ but are in fact outcomes of a country’s intolerance to repay its external and domestic debts.”

In a historical study of how the United States, Canada, Australia, New Zealand, and South Africa overcame original sin, Michael Bordo, Christopher Meissner, and Angela Redish (2002) find that fiscal policies were anything but irrelevant. Their conclusion merits note: “[W]e consider the factors that may explain the evolution of the U.S. and the Dominions to a state free of original sin. The factors we emphasize for the

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8. In their most recent paper, Eichengreen, Hausmann, and Panizza (2003d) dispute the empirical findings of Reinhart, Rogoff, and Savastano (2003b) on the link between credit ratings and debt burdens. They also argue that—contrary to the arguments made by Reinhart, Rogoff, and Savastano (2003b)—they never asserted that original sin was the only cause of debt intolerance. Much of the controversy here parallels that on original sin and currency mismatching, with the authors of the OSH claiming that the critics have misinterpreted their findings. Suffice it to say that we find the case made by Reinhart, Rogoff, and Savastano (2003b) more credible than the one made by Eichengreen, Hausmann, and Panizza (2003e).

common movements across the five countries include: sound fiscal institutions, credibility of monetary regimes, financial development, and big shocks such as the World Wars” (p. 4–5).

In summary, as the Asian financial crisis demonstrated, it is possible to get into serious currency mismatches even after following a path of fiscal rectitude. But this does not mean that sustained progress in controlling currency mismatches can be accomplished in an environment of irresponsible fiscal policies. The OSH dismisses the role of fiscal fundamentals because it looks at only one element (original sin) of currency mismatch. Once a broader view of currency mismatch is taken, including the degree of dollarization in the domestic financial system, sound fiscal policy becomes all the more important.

## **Debt and Reserve Management Policies**

Prudent debt and reserve management policies are essential elements of a strategy to reduce currency mismatches. This section examines these two elements.

### **Debt Management**

A government’s decisions about the currency denomination of its own debt have a major impact on the degree of aggregate currency mismatch in an economy—especially in emerging markets where the government is often the largest borrower on capital markets. How should governments decide between issuing debt in domestic currency and issuing debt in foreign currency?

One approach is the balance-sheet perspective: the currency denomination of government liabilities depends on the currency denomination of government assets. New Zealand has attempted such an approach: government debt management is related to an overall government balance sheet, encompassing not just financial assets and debts but also physical assets (e.g., schools, roads, etc.) and future liabilities such as pensions (Anderson 1999). The logic of this approach is that borrowing aimed only at acquiring foreign-currency assets (e.g., official foreign exchange reserves and the exploitation of natural resources) should be denominated in foreign currency. Borrowing to finance local-currency assets (i.e., whose value is insensitive to exchange rate movements) should be in local currency. Since most public-sector investments are in the latter category, this argument would suggest that most government borrowing should be denominated in local currency. A related consideration is that the fact governments collect taxes in local currency (and often exempt exports from taxation) should further tilt the policy choice toward borrowing in local currency.

Another approach is to compare the macroeconomic consequences of different borrowing strategies. The main macroeconomic difference between domestic and foreign borrowing in the short term is that government borrowing locally pushes up domestic interest rates and so crowds out private-sector borrowing (perhaps forcing the private sector to borrow abroad). In the short term, foreign borrowing tends to avoid this crowding-out effect.<sup>9</sup> Over time, however, repayments rise, exerting a deflationary drag on the economy. Such a pattern of short-term benefits but long-term costs has tempted many governments to rely too heavily on foreign borrowing, and this has often made governments and their electorates too complacent about the size of fiscal deficits. Ensuring that the unpleasant consequences of heavy government borrowing are felt immediately (i.e., through higher domestic interest rates) may be more conducive to sober policymaking than resorting to devices such as foreign borrowing that postpone the pain.

A final point to remember is that, in a crisis, widening credit spreads and currency devaluation both tend to overshoot at the same time. In such circumstances, “cheap” foreign-currency debt can quickly become very expensive to service and refinance.

These considerations suggest that governments in many emerging-market countries should have, as a medium-term target, the objective of reducing reliance on foreign-currency debt. And, indeed, many did so in the late 1990s. Some comparative data shown in table 6.2 show that many governments in emerging markets do indeed rely mainly on domestic debt markets. A particularly notable example is that of India, which manages to finance a very large deficit entirely on domestic markets. In several other countries, however, there is still too much reliance on foreign-currency debt or on exchange rate-linked debt. Nevertheless, the *medium-term* objective of reducing foreign-currency debt does not necessarily determine *short-term* financing decisions, particularly when the exchange rate is very volatile. Very large exchange rate depreciation (often perceived as overshooting by the authorities) can create serious dilemmas for policymakers. Brazil’s experience during 2001 when financial-market conditions were very difficult illustrates some of the issues involved. The Brazilian currency depreciated sharply during much of 2001 (about 40 percent from end-2000 to September 2001) and had the mechanical effect of increasing the share of outstanding foreign-currency debt in total debt. At the same time, the high yields on domestic paper made borrowing in domestic currency very expensive, and it seemed all the more expensive to those who believed the exchange rate had fallen too far and was likely to bounce back. A further consideration was that exchange rate volatility—and the prospect of further weaknesses—increased the private-sector demand for exchange rate

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9. See Sokoler (2002) for an exposition of this argument.

**Table 6.2 Outstanding government debt by type (original maturity), end-2001 (percent)**

Country	Fixed-rate long-term <sup>a</sup>	Short-term <sup>b</sup>	Debt indexed to		
			Inflation	Exchange rate	Foreign-currency debt
Argentina	n.a.	n.a.	n.a.	n.a.	97.0
Brazil	3.9	42.0	7.9	20.4	25.5
Colombia	17.2	0.1	25.5	4.3	50.0
Mexico	28.2	40.5	2.2	0.0	29.0
Peru	2.0	2.0	11.0	n.a.	85.0
China	100.0	n.a.	n.a.	n.a.	n.a.
India	93.9	1.3	0.1	n.a.	4.7
Indonesia	12.1	17.2	15.8	2.7	52.2
Korea	74.7	0.4	n.a.	n.a.	24.9
Malaysia	80.0	3.0	n.a.	n.a.	16.7
Philippines	34.0	18.0	n.a.	n.a.	48.0
Singapore	24.1	66.0	n.a.	n.a.	n.a.
Thailand	57.5	7.1	n.a.	n.a.	35.5
Czech Republic	37.0	46.2	1.2	n.a.	n.a.
Hungary	36.4	33.3	1.6	n.a.	29.7
Poland	34.3	21.5	n.a.	n.a.	34.8
Russia	11.1	0.4	0.5	n.a.	88.0
Israel	22.2	4.3	47.0	3.0	23.5
South Africa	75.3	6.5	3.2	n.a.	15.0
Turkey	0.6	29.9	11.7	12.9	44.9

n.a. = not available

- a. With a maturity longer than one year; maturity of one year or less classified as short-term.  
b. Including debt indexed to short-term interest rates.

Source: Mohanty and Scatigna (2003).

hedges. In the event, the government decided to increase its issuance of dollar-linked notes, in effect allowing local companies to hedge. In this case, policymakers reacted to an exchange rate they believed to be significantly “wrong.” If their judgment is vindicated, they can economize on financing costs.<sup>10</sup> But the inherent risks in such strategies, if the government’s expectations prove wrong (e.g., the exchange rate falls further), argue for only sparing and limited use of foreign-currency borrowing.

10. The Brazilian real did indeed appreciate in the months that followed, appreciating by 17 percent against the dollar between October 2001 and March 2002. In retrospect, then, real-denominated borrowing during mid-2001 proved to be much more expensive than dollar-denominated borrowing. A similar story could be told for 2003—again the authorities were subsequently able to reduce reliance on foreign-currency borrowing (as of the time of writing in March 2004).

## Increased Foreign Exchange Reserves?

Surveys of reserve managers suggest that one lesson drawn from the Asian crisis is that emerging-market countries need—in this new world of much greater capital mobility—to hold much larger reserves than previously thought. High levels of reserves can in effect reduce the risk of large or disruptive shifts in the exchange rate. The danger of course is that this can encourage borrowers to take on too much foreign-currency debt (see, e.g., Caballero and Krishnamurthy 2002). The main drift of this book, therefore, is that the first task of policymakers should be to ensure that the private sector manage and limit its own foreign-currency risk exposures. It was because such exposures were allowed to become excessive—partly because of implicit expectations of public-sector guarantees—that the Asian crisis was so severe.

Assuming that private-sector risk exposures are properly managed (and that government policies do not significantly distort such choices), governments will still have to decide how large their reserves should be. This depends on several factors. One key factor is the volatility of the real or financial economy—which is typically higher in emerging economies. Countries that operate a fixed-rate regime, or that are particularly vulnerable to exchange rate swings, may need even more liquidity. Countries with large current account deficits, undiversified exports, or that are vulnerable to contagion from weak neighbors may also need more conservative liquidity management policies. Some argue there is no objective way of calibrating the desired level of reserves: it may simply be necessary for developing countries to maintain reserves at a level that the market (and ratings agencies) perceives to be adequate in the circumstances. It is certainly clear that the level of reserves is a key element determining sovereign credit ratings.<sup>11</sup>

A simple rule of thumb (sometimes called the Guidotti Rule) is that usable foreign exchange reserves (including any available through contingent credit lines) should be sufficient to meet all repayments and interest on foreign debt falling due over the subsequent year.<sup>12</sup> This rule has the great advantage of simplicity but has two shortcomings. One is that it

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11. A simple econometric test on the determinants of credit ratings reported in annex A of Hawkins and Turner (2000) found that the absolute value of the coefficient on foreign exchange reserves exceeded that of the coefficient on debt (suggesting that borrowing to build up reserves improved a country's credit rating), but that the difference is not statistically significant.

12. Pablo Guidotti proposed this rule in 1999. There are several versions of this rule, but the basic ideas are the same. An earlier measure used by Reddy (1997) combined two rules of thumb—he expressed India's reserves in terms of "months of payments for imports and debt service taken together" but also noted the need to supplement this statistic with other indicators.

does not take account of the current account deficit, but this fault can easily be remedied. The other is that it does not distinguish between different sorts of financial claims according to likely responses in a crisis. It could be argued that reserves should be related to some volatility-weighted aggregate of liabilities in order to quantify more precisely the exposure to sudden capital outflows. Liabilities that easily reverse might be thought to “require” higher reserves than more stable inflows—for example, foreign direct investment (FDI) and trade credit may be more stable than portfolio and bank flows. The complication with this approach, however, is that an investor who is “locked in” holding one asset (e.g., an FDI-type asset such as a factory) can easily take offsetting positions in other assets.

The benefits of building up larger foreign exchange reserves need to be balanced against the costs. It is important to analyze carefully the macroeconomic consequences of reserve accumulation. The opportunity cost of holding reserves is the alternative use of reserve assets. One possibility is that resources could have been invested in real domestic assets: in this light, the cost of reserves may be seen as the return on the domestic investment forgone. High rates of reserve accumulation in Asia since the Asian crisis can thus be viewed as the counterpart of a much-reduced rate of domestic investment. A second macroeconomic consideration is that a very large buildup of foreign exchange reserves is often associated with poor policies.

A different notion of the cost of reserves is the cost of policy mistakes that higher reserves either represent or make possible. High levels of reserves have often been the by-product of policies aimed at resisting currency appreciation—and this has sometimes impeded necessary adjustment or led to inflation. And it is not hard to point to cases where, at least in retrospect, larger reserves allowed flawed policies to be sustained longer and ultimately made them more costly.

Finally, there may be a certain “beggar-thy-neighbor” element lurking in the background. Foreign investors, lacking any firm basis to assess the adequacy of a country’s reserves, may simply look at the level of reserves relative to that in comparable countries. If this is the case, it might become a significant problem for international economic policy: countries may be driven to “compete” with each other, and reserves might well rise to wasteful levels. This argues against any simple conclusion that “emerging markets need more foreign exchange reserves.”

Nevertheless, it does seem clear that (1) countries with uncertain access to capital markets need higher levels of reserves than countries with a high credit standing, and (2) the “need” for reserves does need to take some account of the country’s short-term foreign exchange liabilities even if simple, one-size-fits-all rules are not appropriate.

