- Determination of the wage rate is, in most European countries, assigned to the social partners; consequently, they should be responsible for employment and unemployment.
- Taxation and spending tax revenue is assigned to the government; consequently, the government should be responsible for the allocation of resources and for economic growth.
- The right to define the institutional setting of a market economy—that is, to make the laws—is assigned to parliament; consequently, parliament should be responsible for creating the right institutions with the appropriate incentives and constraints—for instance, for the labor market.

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4 Moderating Fluctuations in Capital Flows to Emerging Market Economies

Michael Mussa, Alexander K. Swoboda, Jeromin Zettelmeyer, and Olivier Jeanne

The emerging market crises of the 1990s—in particular, the shock of the Asian crisis and its global repercussions—have generated a perception of deep inadequacies in the international financial system, and an intense debate on global financial reform, particularly regarding capital flows to emerging markets.[1] This chapter highlights the challenges and constraints of different proposals about how to mitigate and cope with volatility in international capital flows. The goal is *not* to discuss comprehensively the many reform proposals on the international financial architecture that have emerged since the onset of the Asian crisis. Instead, particular attention is paid to the role of international *public* intervention in forestalling and mitigating future crises. Other reform topics, such as involvement of the private sector, are treated in other chapters.

An informed discussion of proposals on how to deal with the instability of international capital flows requires an understanding of the environment in which the financial system operates and of the problems it must solve. Our discussion begins with a short review of the development of capital flows since the end of the Bretton Woods era, briefly documenting the boom-bust cycle of capital flows and trends in their composition. While there are many similarities between the debt crisis of the 1980s and the crises of the 1990s, there are also important differences. Unlike the earlier crisis, the emerging market crises of the 1990s were not preceded by major disruptions in the world economy that also affected the major industrial economies. The more recent crises affected a much larger share of world output and involved official financial support packages on a much larger scale than the 1980s debt crisis.

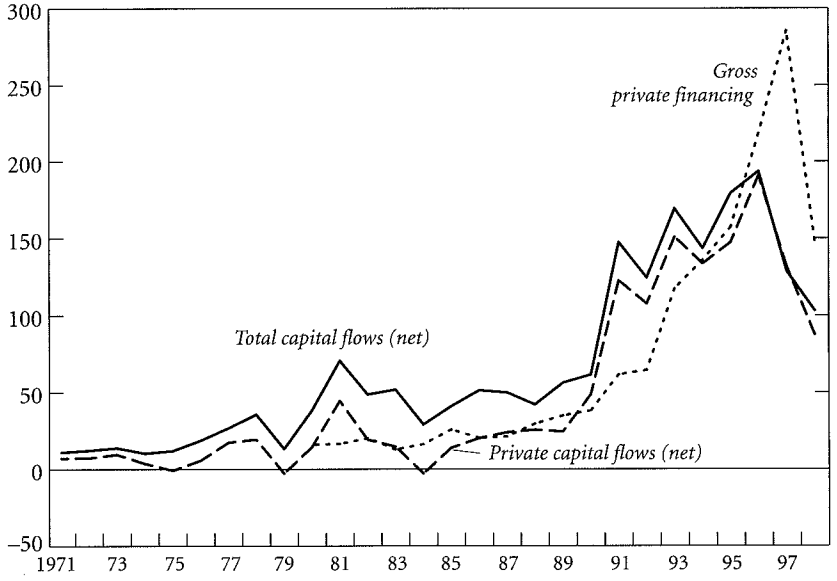
[1]For two excellent surveys, see Eichengreen (1999) and Minton-Beddoes (1999).

Against this background, the causes of capital flow boom-bust cycles and of systemic instability in the 1990s are discussed. While national policy failures—especially in banking and financial supervision, and lack of transparency—along with adverse shocks paved the way for the 1990s financial crises, systemic fragilities also played an important role. We identify some of these, and relate them to the types of international capital flows and their maturity and currency composition. The magnitude and abruptness of capital flow reversals would, of course, be smaller were they not preceded by a sustained buildup of capital inflows. Some observers pointed to moral hazard as a major cause of excessive capital inflows to emerging markets. We discuss various forms that moral hazard may have taken, and argue that the availability of emergency assistance from international financial institutions cannot, on the whole, have played a major role in the lead-up to the Asian crisis.

This chapter turns next to ways of improving the management of international capital flows. When addressing systemic risks, policy must face some basic trade-offs. Most proposals, whether they are capital controls, measures to "bail in" the private sector, or attempts to change the composition of capital flows, all involve trade-offs between efficiency, stability, and distributive considerations. While domestic policy reform, supervision, and standards all have important roles to play, and while these and other measures to strengthen crisis prevention and to make the system less vulnerable are necessary and should be implemented, crises associated with sharp capital account reversals will not be eliminated. Consequently, countries will still find themselves in situations where they cannot meet their external debt obligations, leading to three possible outcomes: national default involving the government, most of the financial system, or the nonfinancial private sector; imposition of capital controls; or resorting to international financial assistance, sometimes on a massive scale.

Much of the focus of the later sections of this chapter is on the role of internationally supported mechanisms for providing emergency financing to countries in difficulty. One strand of the argument is that assistance provided by the international community has costs, but that these costs are typically significantly smaller than the volume of assistance, to the extent that interest-bearing loans extended during crises are, in fact, later repaid. And these costs should be set against the systemic benefits generated by the assistance. It remains true that the provision of international financial support for countries in difficulty should guard against the generation of excessive moral hazard—on the side of both borrowers and lenders. The existence of moral hazard, however, does not, in and of itself, invalidate the desirability of international financial assistance. Some degree of moral hazard is an inevitable by-product

Figure 1. Developing Countries: Total and Private Capital Flows
(Billions of U.S. dollars)



Sources: IMF, World Economic Outlook Database, and Bonds, Equities, and Loans Database.

of any insurance scheme. The issue is to find the right balance between the benefits provided by the insurance and its costs, including the costs associated with the likely generation of some degree of moral hazard.

Capital Flows in the Post–Bretton Woods Era

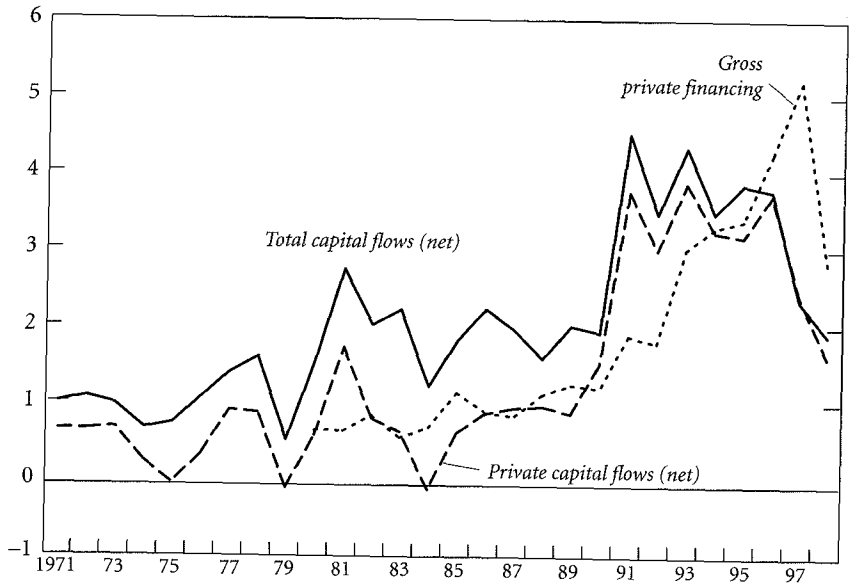
We now highlight three trends in international capital flows that are of particular relevance for the discussion that follows. Additional detail, in particular on the volatility of capital flows and the incidence of crises over time, is provided in the chapter appendix.[2]

Boom-Bust Cycles and Secular Trends

Aggregate private capital flows to emerging markets since the mid-1970s are characterized by two main regularities. First, a general upward trend (see

[2]For a survey of developments in capital flows to emerging markets, see Mussa and Richards (1999).

Figure 2. Developing Countries: Total and Private Capital Flows
(In percent of GDP)

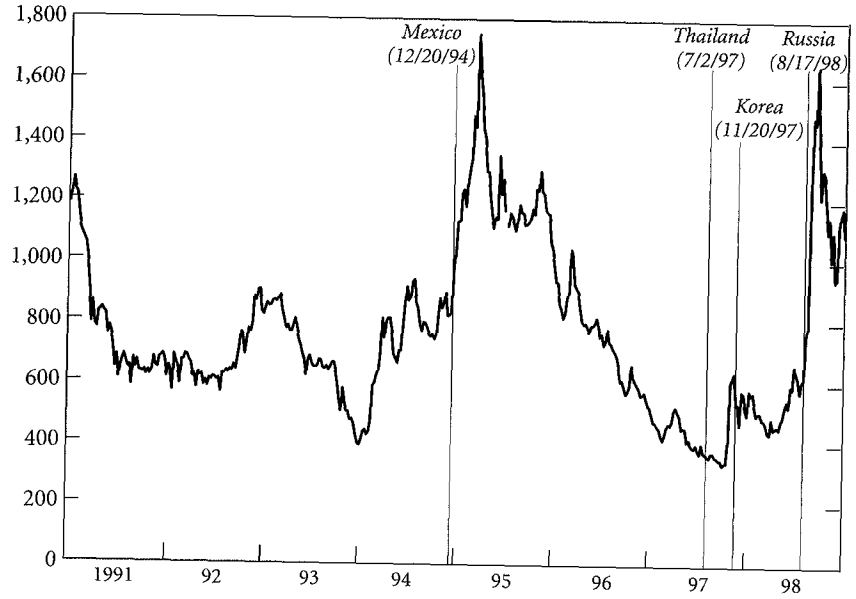


Sources: IMF, World Economic Outlook Database, and Bonds, Equities, and Loans Database.

Figures 1 and 2), not just in dollar terms, but also in terms of emerging markets' GDP, regardless of whether one focuses on net private capital flows registered in the balance of payments or on gross private financing in international capital markets.[3] This is the manifestation of increasing capital market integration and capital account openness on the part of an important group of emerging market economies, accounting for most of the GDP of developing countries. Second, net private capital flows exhibit substantial medium-run swings. Two major boom-bust cycles can be identified. The first builds up in the 1970s and early 1980s and unwinds after the onset of the debt crisis in 1982–83. The second cycle begins in the late 1980s, with net capital flows rising until 1996, and begins to unwind in 1997. Interestingly, gross new flows of private capital to emerging markets do not peak until the summer of 1997, then fall sharply with the start of the Asian crisis, and

[3]The latter excludes foreign direct investment and only includes primary issues of international bonds, equity, and bank loans. For more details on the differences between the two concepts, see the appendix.

Figure 3. Emerging Market Bond Spreads in the 1990s[1]
(In basis points)



Source: Blooming Financial Services, L.P.
[1]JP Morgan Emerging Market Bond Index (Brady Narrow) sovereign spread over the theoretical U.S. zero-coupon curve.

then drop sharply again after the Russian default and devaluation in August 1998.

These major movements in aggregate capital flows mask somewhat higher frequency cycles in emerging market asset prices, one example of which is shown in Figure 3—emerging market bond spreads, based on a basket of external-currency-denominated debt instruments for 13 large emerging markets. Two main cycles are observable in the long ebb and flow movements of capital in the 1990s: a decline in spreads in the early 1990s, which ends with a sharp reversal after the Mexican crisis; and a similar decline that starts in late 1995 and continues through 1997, with an initial reversal at the time of the Korea crisis and a much larger reversal at the time of the Russian crisis. It is notable that the spreads continued to decline well into the Asian crises, and that the peaks in spreads in 1995 and 1997 lagged the onsets of the Mexican and Asian crises by several months. This would suggest that the sharp rises in spreads did not occur only in reaction to the initial crises themselves, but were a reaction to (or a manifestation of) spillovers to other countries in the aftermath of the initial attacks.

Trends in the Composition of Capital Flows

Since the 1970s, the share of the private sector as a *source* of capital flows to emerging markets has been high. The bust period after the debt crisis in the 1980s witnessed a temporary increase in the role of official financing, but it declined again in the 1990s (Figure 4). Where there has been remarkable change, however, is in the *recipients* of capital flows. The importance of the private sector as both an issuer of bond debt and as a recipient of foreign bank loans has risen dramatically since the mid-1980s (Table 1, top).

An equally dramatic change has occurred in the *composition of assets.* In the 1990s, flows of foreign direct investment (FDI) provided more than half of total net flows to emerging markets, and these flows appear to have been sustained quite well in the recent crisis. In addition to the rise in FDI as a share of net capital inflows, balance of payments data show a sharp increase in portfolio investment relative to bank loans, particularly since the late 1980s. This is corroborated by gross financing data, which show bond issues rising from just over 10 percent of total financing in the early 1980s to almost 50 percent in the mid-1990s, with bank loans exhibiting a corresponding decline (Table 1, bottom). By the mid-1990s, bonds had replaced bank loans as the main source of external private financing in most regions of the globe (see also Appendix, Table A3). Notwithstanding the general decline in the importance of bank loans in the average level of capital flows to emerging markets, however, data from the BIS (Figure 5) show that these flows were particularly vulnerable to reversal in the Asian crisis.

While the growing role of private recipients and of FDI and bonds as the main vehicles of private financing constitute clear trends, the trend toward shorter maturities is less immediately apparent (see the chapter appendix).

Figure 4. Developing Countries: Private and Official Capital Flows
(In percent of GDP)

Source: IMF, World Economic Outlook Database.

Table 1. Composition of Private Capital Flows for Developing Countries[1]
(In percent)

	1974–78	1979–83	1984–88	1989–93	1994–98
By sector of debtor					
Distribution of bank loans by issuer[2]					
Banks	...	...	26.5	30.8	26.0
Public sector	...	...	42.7	35.2	23.8
Nonbank private sector	...	...	28.8	32.6	40.9
Distribution of bond stocks by issuer[2]					
Sovereign	...	...	33.8	32.3	27.3
Other public sector	...	...	42.7	41.0	26.7
Private	...	...	23.6	26.7	46.1
By type of investment					
Distribution of net private capital flows					
Net foreign direct investment[3]	37.1	47.9	68.0	33.6	72.9
Net portfolio investment[3]	2.5	16.3	18.7	46.6	36.2
Portfolio debt securities liabilities	3.8	13.0	2.1	30.4	24.5
Bank loans and net other private investment[3,4]	60.4	35.8	13.3	19.8	−9.2
Debt flows[5]	64.2	48.8	15.4	50.2	15.3
Distribution of total gross private financing[6]					
Fixed income issues	...	13.1	28.4	38.6	47.7
Equity issues	...	0.1	1.1	8.4	8.5
Loan commitments	...	86.8	70.5	53.0	43.8

Sources: IMF, *International Financial Statistics*, World Economic Outlook Database, Bonds, Equities, and Loans Database; and the Bank for International Settlements.

[1]The definition of developing countries excludes countries in transition.

[2]Data on bank loans and bond stocks start in 1985; hence the first average is calculated from 1985–88.

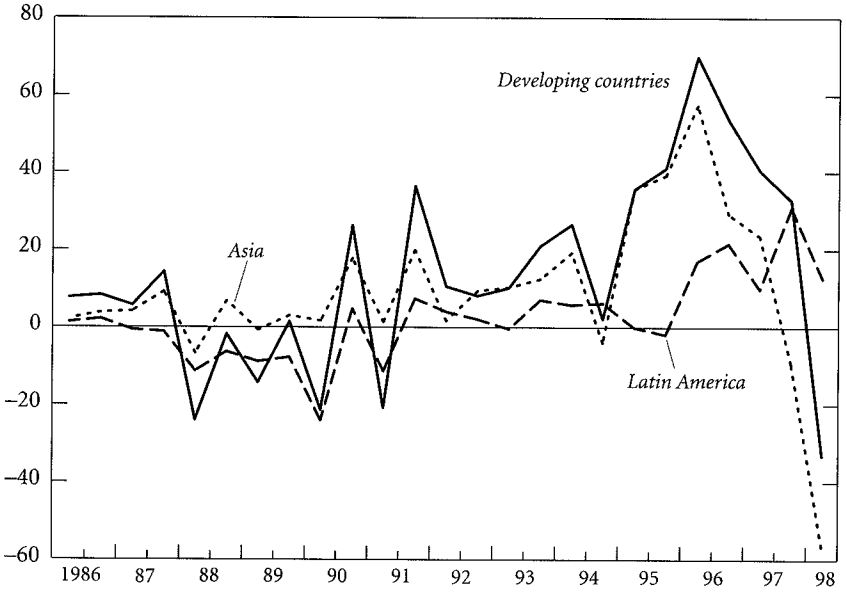
[3]Expressed in percent of net private capital flows.

[4]Net other investment (private) is the difference between net other investment (balance of payments definition) and net external borrowing from official creditors.

[5]The sum of "Portfolio debt securities liabilities" and "Bank loans and net other private investment."

[6]Data on gross private financing start in 1980; hence, the first average is calculated from 1980–83.

Figure 5. Developing Countries: Change in Bank Loans
(Billions of U.S. dollars)



Source: Bank for International Settlements.

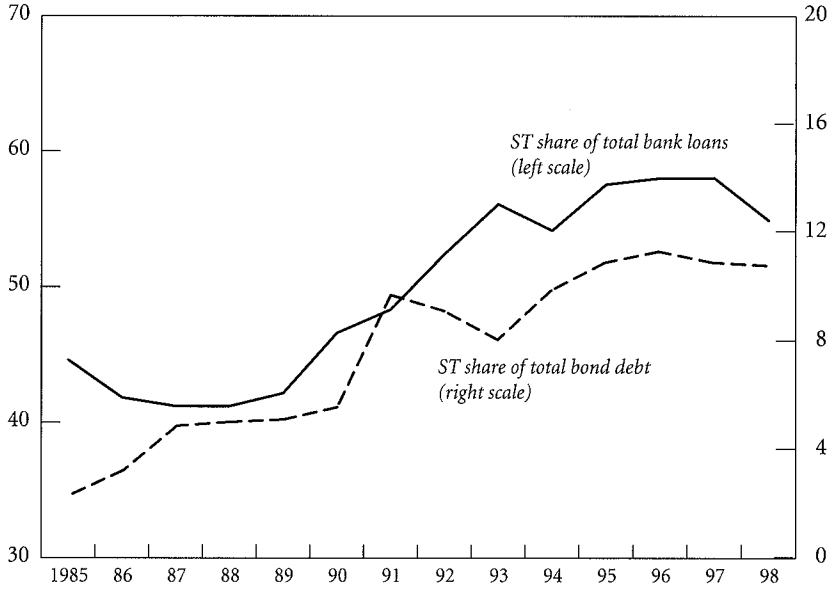
However, there is a clear shortening of (remaining) maturities for bank and bond issues during the boom phase of the 1990s, with some unwinding beginning in 1997 (Figure 6), as one would expect given the reduction in rollover rates that characterized the Asian crisis.

Capital Flow Reversals and Financial Crises

Currency crises and sharp reversals in capital flows are not new phenomena, but it is difficult to find a trend, in the incidence of currency crises—defined as a sharp devaluation or a sudden loss in reserves—that have occurred since the end of the Bretton Woods system. The evidence that capital flow reversals were larger and more frequent in the 1990s is stronger, but even here, the result is sensitive to the type of data we use to measure capital flows (see the chapter appendix for details). On the whole, it is surprisingly hard to argue that the 1990s were a period of unique capital volatility, largely because of the precedent set by the debt crisis of the 1980s and its associated capital flow reversals.

Indeed, in at least one vital respect the financial crises affecting emerging market economies in the 1990s were similar to the debt crisis of the 1980s. For the countries most severely affected, the crises involved widespread actual or

Figure 6. Developing Countries: Short-Term Debt as Share of Total Debt[1]
(In percent)



Sources: IMF, Bonds, Equities, and Loans Database and Bank for International Settlements.
[1]Remaining maturity concept.

potential defaults, which imposed massive externalities, in terms of cost and availability of financing, on other national liabilities—and indeed, on other countries. In the 1980s, this problem arose primarily from sovereign default by the governments of some emerging market countries, mainly in Latin America, on credits owed to syndicates of industrial country commercial banks. In the 1990s, reflecting important changes in the character of financial flows to emerging markets, potential or actual systemic defaults took more diverse forms.

- For Mexico in the *tequila crisis* and Russia in 1998, the issue concerned marketable obligations of the sovereign (the tesobonos for Mexico and the GKOs for Russia), as well as obligations of important parts of the banking system.
- For Indonesia, Korea, and Thailand, the threat of widespread default on private debts issued by financial institutions and by corporate entities (rather than direct obligations of the sovereign) were the primary concern.
- For Argentina during the tequila crisis, systemic default was arguably somewhat less of a concern, although there were substantial pressures on the

banking system and more general concerns about the financial consequences for banks and others in the event of a break in the convertibility plan.

- For Brazil, concerns about the ability of the government to roll over its (mainly domestic) debt and about the capacity of Brazilian entities more generally to meet external payments obligations were important issues at the height of the recent crisis, although the sustainability of the exchange rate regime was also a key problem.

In both the 1980s and the 1990s, other emerging market economies that also experienced pressures for capital flow reversals, but where this problem did not reach the level of potential systemic (or "national") default, generally tended to escape the worst effects of the crises.

In other important respects, the crises of the 1990s were somewhat different from the crises of the 1980s. First, unlike the debt crisis, the emerging market crises were not preceded by major disruptions in the world economy nor did the crises substantially affect the major industrial economies. U.S. monetary policy was tightened in 1994 prior to the Mexican crisis; but this was nothing like the tightening that occurred in 1980–81. Growth was generally sluggish in Europe and Japan for most of the decade, and Japan fell into a steep recession beginning in 1997, but this was very different from the global recession that affected all the industrial countries in the early 1980s. There were substantial fluctuations in the yen/dollar exchange rate between 1995 and 1998 but the turbulence in global financial markets pales in comparison with the wide swings in exchange rates and in real and nominal interest rates experienced in the industrial countries in the late 1970s and early 1980s. Thus, while there were important external economic developments that influenced the recent crises in emerging markets, the crises primarily affected emerging market countries and were not part of a much larger global economic turbulence. This fact has focused attention both on the fundamental weaknesses in the emerging market countries most affected by the recent crises and on possible malfunction in the international financial system in dealing with difficulties originating from emerging markets.

Second, the recent emerging market crises affected a *much larger share of world output* than earlier crises, both because relatively large countries were affected and because the number of countries that were hit was relatively high. In contrast to the debt crisis of the 1980s, which affected primarily Latin American economies, the recent crises involved Asia, Latin America, and Russia as well as some other transition economies. Moreover, initial output losses in most cases have been as large or larger than the initial output losses suffered by the countries worst hit in the debt crisis of the 1980s (see Table 2).

Table 2. Cumulative Output Loss[1] for Crises in the 1980s and 1990s
(In percent)

	After One Year [t to t+1]	After Three Years [t to t+3]	After Five Years [t to t+5]
1980s			
Mexico	–15.4	–40.2	–80.8
Argentina	–8.5	–46.5	–73.9
1990s			
Mexico	–15.3	–18.8	–21.6
Indonesia	–15.8	–61.8	–108.9
Korea	–6.4	–25.0	–40.1
Malaysia	–4.3	–32.5	–66.8
Philippines	–2.1	–12.6	–23.2
Thailand	–19.6	–55.9	–89.8

Sources: IMF, World Economic Outlook Database; and IMF staff estimates.

[1]Calculated as the sum of the output gap for two, four, and six years after the crisis, starting with the crisis year. Output gap is the percentage difference between actual and potential output (which is based on a potential output growth estimate); potential output growth for Mexico in the 1990s was taken as the average output growth from 1990 to 1994 while potential output growth for the rest of the cases was taken as 4 percent.

Third, while the direct adverse effects of recent emerging market financial crises have involved a larger share of world output, the *global* systemic threat from these crises appears to have been less than the threat posed by the debt crisis of the 1980s. In particular, large exposures of commercial banks in industrial countries to potential losses in the 1980s do not appear to have a nearly equivalent counterpart in the 1990s crises, when potential losses to industrial country banks were generally a much smaller fraction of bank equity. Consequently, the emerging market crises of the 1990s posed much less of a systemic threat to the global financial system than did the earlier debt crisis[4]—with the exception of the 1998 Russian default, which, combined with the Long-Term Capital Management (LTCM) crisis, provoked a very substantive widening of risk spreads in developed financial markets as well. This development reflects the declining importance of bank credit flows in total capital flows as well as in credit flows to emerging market economies in the 1990s, as compared with in the late 1970s and early 1980s. Interestingly, the decline in importance of bank credit flows and the potential vulnerability of banks to large-scale losses undoubtedly made it more difficult and less relevant to attempt the strategy used to deal with the debt crisis in the 1980s.

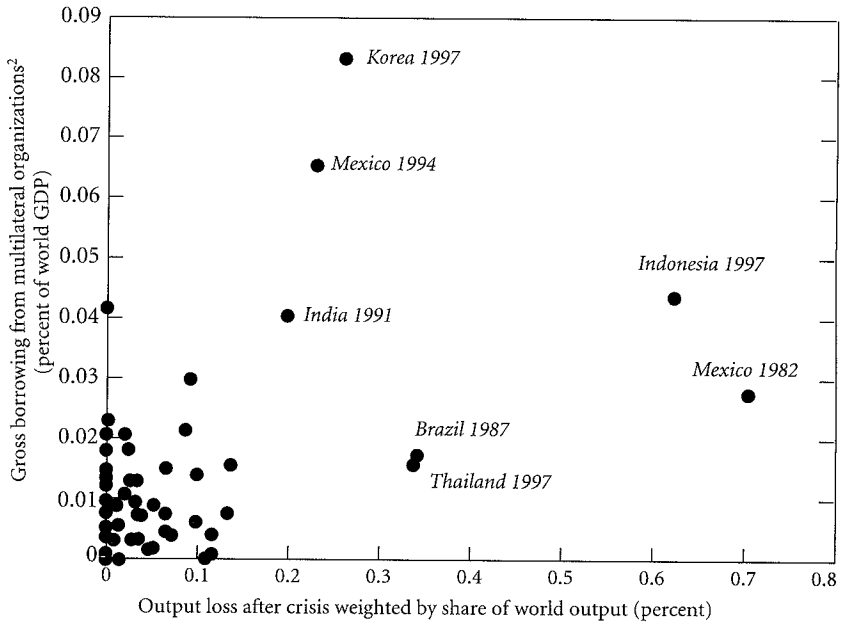
[4]The substantial difficulties of the industrial countries and general financial market turbulence in the early 1980s also contributed importantly to global systemic risks at that time.

Such a strategy featured agreements by bank syndicates on restructuring their claims on the governments of emerging market economies as the principal means for avoiding disorderly national defaults.

Fourth, the 1990s crises elicited responses from the international community that, in certain cases, involved unusually large quantities of official financial support. In contrast, in the debt crisis, official international financial support (measured relative to GDP of the affected countries) was relatively limited, and much greater reliance was placed on organizing the restructuring of private credits as the means for avoiding explicit defaults. Figure 7 plots the initial output cost and magnitude of multilateral financing for 66 crisis episodes in 17 large developing countries in 1975–98. The main insight from the figure is that the four large recent crises of 1994–97 (Mexico, Thailand, Korea, and Indonesia) constitute outliers in terms of both output cost and financing. There are only three other comparable outliers during 1975–97. (Note that the figure understates the difference in overall international official financing between the 1990s and earlier crisis episodes as it does not take into account bilateral assistance.)

Fifth, despite high initial output losses, it appears that the longer-run costs of recent emerging-market financial crises (relative to the size of the affected economies) will not be exceptionally large compared with the standard set in the 1980s debt crises, which lasted longer and led to exceptionally large cumulative losses (see Table 2 and Table A10 in the appendix). For Mexico and Argentina during the tequila crisis, it is known that access to private international capital flows was rapidly restored after the crisis passed and that, after sharp recessions in 1995, recoveries were quite vigorous, especially in comparison with the prolonged period of stagnation following the debt crisis. For the Asian crises countries (except Indonesia), access to private capital flows generally has been reestablished. Korea has started a vigorous recovery, with Thailand, Malaysia, and the Philippines lagging somewhat behind. It appears that the total cumulative output loss for Korea and Malaysia was about the same order of magnitude as that of Mexico in the 1995 tequila crisis (around one-quarter of annual GDP in the precrisis year). Output loss for Thailand and, especially, Indonesia, where the crisis was more protracted and had set in somewhat earlier, total cumulative losses were substantially larger (Table 2), although still smaller than those of the debt crisis. Thus, the benefit of the relatively large international support packages provided in the recent crises clearly did not avoid substantial costs for the countries receiving such support. Rather, the benefit would appear to lie in helping to avoid a prolonged disruption of normal international (and domestic) financial relations for these countries, thereby facilitating earlier and more vigorous recoveries from the (virtually) unavoidable initial slumps. Leaving aside

Figure 7. Gross Borrowing from Multilateral Organizations and Weighted Output Loss After Crisis, 17 Large Developing Countries[1]



Sources: IMF, World Economic Outlook Database, *International Financial Statistics*; World Bank, Global Development Finance Database; and staff estimates.

Note: The 1998 numbers for Korea are from the IMF Staff Report for the Fifth Review Under the Stand-By Arrangement as of March 8, 1999, and cover loan disbursements from the International Bank for Reconstruction and Development, the International Finance Corporation, and the IMF.

[1]The sample comprises Argentina, Brazil, Chile, Colombia, Mexico, Peru, Venezuela, India, Indonesia, Korea, Malaysia, Pakistan, Philippines, Thailand, Egypt, South Africa, and Turkey.

[2]Including the IMF.

Indonesia and Russia, situations of potential national default appear to have been dealt with (if not completely resolved) more expeditiously in the emerging market crises of the 1990s than was achieved for countries that were seriously caught up in the debt crisis of the 1980s.

In summary, five related features are characteristic of the development of international capital flows since the mid-1970s:

(1) a secular trend toward the integration of developing countries in international capital markets;

(2) a trend toward more diverse and atomistic agents at both ends of capital flows—bondholders rather than banks in the creditor countries, private agents rather than governments in the debtor countries;

(3) long booms ending in abrupt reversals, which exhibit larger repercussions across emerging markets in the 1990s as compared with earlier decades;

(4) a continuing phenomenon of financial crises periodically spreading across a number of emerging market economies, with very high costs in terms of lost economic output and all of the attendant damage that such losses imply; and

(5) little indication that, even with the relatively large official support packages provided in some recent crises, it has been possible to avoid substantial short-run costs when crises do occur. There is some suggestion, however, that by helping to avoid a prolonged disruption of normal international financial relations, recovery may be abetted and longer-run costs may be reduced.

Excepting substantial improvements in other aspects of the architecture of the international financial system, these trends do not plausibly suggest that the problems surrounding unstable capital flows to emerging markets, and management of financial crises such instability engenders, will become less pressing in the future than they have been in the past. Instead, the secular trend in capital flows to emerging markets, and the fact that much of these flows are denominated in foreign currencies, may imply increasing vulnerability on the part of these countries to sharp capital flow reversals. Moreover, the trend toward more diverse and atomistic providers and recipients of capital is likely to create coordination problems which make both the prevention and the resolution of crises more difficult.

Explaining the Instability of Capital Flows

The instability of international capital flows in the 1990s has revived old debates about whether the blame for crises should be put on national policymakers, adverse shocks, or some failure in the working of the international financial system. On the one hand, there is no shortage of domestic policy failures and adverse shocks to which the capital account instability of the 1990s can be attributed. On the other hand, there is also clear evidence of a systemic component to the instability of international capital flows in the 1990s. International linkages created contagion across emerging economies that were distant and dissimilar, and this contagion did not spare, in some cases, countries with sound fundamentals. To many it appears obvious that the international financial system has exhibited a tendency to amplify and propagate the effects of policy failures and shocks, rather than to mitigate or absorb

them. Even for those who do not entirely share this view, the large-scale losses that countries have suffered and the widespread effects of recent crises across emerging market countries have raised questions about whether the international system can be improved in order to reduce the likelihood and severity of such crises in the future.

Domestic Policy Failures and Adverse Shocks

The road to the international financial crises of the 1990s was paved by fundamental weaknesses in the form of domestic policy failures (including regulatory failures and implicit guarantees) and compounded by adverse external shocks. One lesson that had to be relearned in the 1990s was that the range of fundamental weaknesses that must be considered when assessing country risks is very wide. Risk factors are not limited to the traditional macroeconomic imbalances, such as overvalued currencies, current account, or fiscal deficits; they also include microeconomic financial fragilities, and their implications for default risk in the corporate and banking sectors.[5]

In some cases, such as Mexico in 1994 or Russia in 1998, macroeconomic imbalances were a major driving force behind the crisis, along with adverse internal and external shocks. In Asia, macroeconomic problems, though less clearly due to unsustainable policies and less acute, were not completely absent either. During the 1990s, several Asian currencies, most notably the Thai baht, experienced some appreciation in their real exchange rates. This may help to explain why by summer 1997, sizable current account deficits had emerged in Malaysia and Thailand and, to a lesser extent, in Indonesia and the Philippines. Both a real exchange rate appreciation and widening current account deficits resulted despite generally high rates of domestic savings and were, at least in part, a reflection of pressures from capital inflows seeking higher returns than generally seemed available in the industrial countries. Furthermore, the sharp appreciation in the U.S. dollar relative to the yen and the European currencies in the two years leading up the crisis led to a worsening of cost-competitiveness in the Asian countries whose currencies were effectively pegged to the dollar. These exchange rate developments were compounded by sector-specific shocks such as a fall in the demand for semiconductors in 1996 and adverse terms of trade fluctuations which caused a significant slowdown of export growth in Southeast Asian countries between 1996 and 1997.

[5]This feature, while more prevalent in the 1990s, is not new. Chile in 1979–82 gave an example of a crisis where financial fragility played an important role, alongside macroeconomic imbalances (see Milesi-Ferretti and Razin, 1996).

Microeconomic financial fragilities were also prevalent in many of the crisis-hit countries. This point applies not just to the Asian crisis. Analyses of the 1994–95 Mexican crisis, while focusing on macroeconomic imbalances as the proximate source of financial difficulties, point to the weakness of the banking system as one important reason why the government was unable to defend the peso when it came under attack. Financial fragility is emphasized more forcefully in fundamentals-based explanations of the Asian crisis because it is more difficult, in this case, to account for the magnitude of the crisis mainly by pointing to macroeconomic imbalances. Asian economies gave a number of signs of insolvency in the corporate and banking sectors prior to the crisis. For example, the rate of nonperforming loans before the crisis was above 15 percent in Thailand, Indonesia, Korea, and Malaysia. In Korea, 8 of the largest 30 conglomerates were, in reality or by law, bankrupt by mid-1997 (Corsetti, Pesenti, and Roubini, 1998).

The reasons why an unusually large fraction of capital inflows was directed to insolvent projects prior to the Asian crises have been widely discussed elsewhere. They generally stress the moral hazard generated by the combination of implicit bailout guarantees given by governments to domestic projects, financial liberalization that allowed, in some countries, the entry of a large number of new competitors into the banking sector, and poor banking supervision.[6] Capital inflows also contributed to bidding up asset prices, which in turn enhanced the borrowing capacity of domestic agents by increasing the apparent value of their collateral but also their vulnerability to an abrupt fall in asset prices. These problems were aggravated by the operation of exchange rate bands and governments' stated commitment to maintaining them, which meant that there was little perceived exchange rate risk to deter capital inflows in the form of domestic borrowing in international currencies.

Systemic Fragilities

It is difficult, however, to argue that domestic policy failures and adverse shocks completely explain both the massive buildup of capital flows to emerging market economies on increasingly attractive terms until summer 1997 and the persistence and extent of the subsequent widespread financial crises. The fundamental deficiencies that are now widely diagnosed as contributing to recent crises were not entirely unrecognized before the crises erupted. Granted that predicting the timing of crises is difficult even when vulnerabilities are recognized, the fact of a rising tide of finance on increasingly attractive terms up until

[6]See IMF (1997b, 1998a, and 1998b); Lane and others (1999); McKinnon and Pill (1997); and Krugman (1998).

the crisis hit is difficult to reconcile with the image of global financial markets entirely guided by fully rational and well-informed investors. At a minimum, it is suggestive of the relevance of bubbles, manias, panics, and other anomalies.[7]

Market participants themselves generally report that shifts in "market sentiment" play an important role in driving developments in the capital markets, especially under circumstances of an evolving crisis. While events signaling possible changes in the fundamentals clearly play some role in triggering changes in market sentiment, this is not all that is going on. The internal dynamics of the operation of global capital markets are also important in the evolution of crises.[8]

The view that there is a significant systemic component to the instability of international capital flows is also strongly supported by the contagion of financial crises across countries. Such contagion appeared in the tequila crisis following the Mexican peso devaluation in December 1994, which spread effects across several Latin American countries. It appeared more broadly in October 1997 following the initial attack on the Hong Kong dollar peg. And it engulfed virtually all emerging market economies in the turbulence during August–October 1998 following Russia's devaluation and default and the general fragility of international financial markets apparent in the LTCM crisis. The different explanations that have been proposed for contagion all suggest that this phenomenon is, to some extent, an intrinsic feature of a globalized economy (see Box 1). First, trade and international financial linkages, by which crises can spread from one country to another via a kind of "domino effect," have been magnified by the increasing international integration of goods and financial markets. Second, international investors, faced with the task of analyzing credit risk in larger countries, tend to classify emerging economies in wide regional groups and do not necessarily pay attention, in times of cri-

[7]Berg and Pattillo (1999) find that fundamentals-based models would not, in general, have been very useful in predicting the Asian crises on the basis of data available at the beginning of 1997, except possibly in the case of Thailand. Market participants, moreover, do not appear to have been any better than econometricians at predicting crises, as shown by the optimistic views that generally prevailed concerning Asian emerging markets well into 1997 (despite information about banking problems in several countries). The difficulty in predicting financial crises can be interpreted as (weak) evidence that, in addition to observable fundamentals, other factors must have been at work in triggering crises.

[8]The IMF's *International Capital Markets* reports of April 1993 and September 1998 go into considerable detail to describe the internal dynamics of capital market developments in connection with the ERM crisis of 1992 and the Asian crisis of 1997–98, respectively. The specific role of hedge funds in the early phases of the Asian crisis is taken up in Eichengreen and Mathieson (1998). Capital market dynamics in the wake of the Russian and LTCM crises are taken up in the *World Economic Outlook and International Capital Markets Interim Assessment* (IMF, 1998c). It is clear from these descriptions that a considerable variety of (sometimes complex and surprising) mechanisms have operated to spread contagion through international financial markets during recent crises.

Box 1. Contagion

There are two international links by which crises can spill over from one country to another and generate contagion through a "domino effect." The first channel of transmission is through trade. One country's devaluation generates incentives for other countries with important bilateral or third-country trade links to devalue their currencies as well. There is evidence, for example, that the devaluation of the Thai baht in the summer of 1997 put pressure on neighboring countries to devalue. The second channel of transmission is through the international financial markets. Countries are linked by common creditors. For example, when a bank is confronted with a marked rise in nonperforming loans in one country, it is likely to reduce the overall risk of its assets by pulling out of projects elsewhere—possibly in other emerging markets. This problem is more acute when the common investors take highly leveraged positions and engage in cross-market hedging. It has been argued that the transmission of the "Russian virus" to Brazil resulted from large investors having to liquidate their positions by holding "fire sales" in Brazilian markets in order to meet the margin calls on their losses incurred in Russia, thus triggering an abrupt fall in the price of Brazilian assets (Calvo, 1998).[1]

There is also evidence that international investors tend to engage in herding behavior at the global level. That is, they tend to take the same positions at the same time with respect to regional groups of countries or wide asset classes in an apparently unpredictable and erratic way. While it is tempting to view herding as irrational behavior, and a sign of market inefficiency, it can also be interpreted as a rational response by investors to uncertainties on the true state of the economy. Regional herding, for example, might be explained by the fact that countries in the same region seem to share some similarity, such as a common unobservable fundamental (in Asia, the state of the banking sector), or the same model of economic development or regulation. A problem in one country may then act as a "wake-up call," leading international investors to revise their beliefs on other countries that share the same features (Goldstein, 1998). For example, the extent to which Thailand and other Southeast Asian countries were perceived to share the same model of close bank-firms relationships and the same weakness in banking supervision, a bank failure in Thailand was bad news not only for Thailand (and its creditors) but for the region as a whole. Moreover, the fact that international investors tend to classify emerging economies in large regional groups and do not gather detailed information about the specifics of each country may be an inherent feature of globalization. As Calvo and Mendoza (1998) show, the fixed costs of gathering and processing country-specific information may lead precisely to this outcome when the number of countries open to international capital becomes large.

Herding is not always a regional phenomenon, however. In some instances, international investors have withdrawn *en masse* and with short notice from emerging markets as a whole. Such behavior seems difficult to rationalize in terms of learning on a hypothetical characteristic that would be common to all emerging economies. It may become more understandable, on the other hand, in a self-fulfilling liquidity crisis perspective. If several countries are simultaneously vulnerable to shifts in market feelings, speculation will naturally involve more than one country at a time. Liquidity crises, in other words, have a natural tendency to become systemic. A wave of self-fulfilling liquidity crises may be regional, but they may also involve economies that are distant and unrelated, provided that these economies are vulnerable to a panic at the same time (Masson, 1998). In fact, the contagion between very distant parts of the world that we have observed in the 1990s, and that culminated with the transmission of the "Russian virus" to Brazil in the summer of 1998, has been interpreted by some economists as a clear sign of self-fulfilling speculation (Krugman, 1999).

[1]It is difficult to assess the relative importance of these channels of contagion on the basis of the empirical evidence, in part because the countries that are linked in trade are also linked in finance, making the two channels difficult to distinguish. Glick (1998) find that contagion is mostly regional, and interpret it as a sign that the trade channel is significant. Many economists, however, think that trade flows are not large enough to make them the main channel of contagion (Masson, 1998). Kaminsky and Reinhart's (2000) results suggest, moreover, that financial linkages are more likely culprits than trade links. Looking at a sample of crises in Asian and Latin American countries during 1970–98, they find that grouping countries in accordance with their exposure to common bank creditors has a higher predictive power than grouping them by region or trade links.

sis, to the specifics of each country. Finally, contagion may also be the result of increased systemic liquidity risk, as investors have a tendency to simultaneously "rush for the exits" in different countries. Thus, looking at the number of emerging market countries in different regions and with differing internal conditions that became involved in the sequence of crises, starting with Thailand in midsummer 1997, it is impossible not to see that systemic forces played an important role both in the buildup of conditions that led to these crises and in their subsequent dramatic unwinding.

Systemic Fragility and the Form of Capital Flows

There appear to be important differences among different forms of international capital flows in generating potential systemic fragilities. As noted above, in recent

crises, the flow of foreign direct investment appears to have been reasonably well sustained, even for several countries encountering quite severe difficulties. Direct investors are generally investing for the long run, and they usually recognize that an effort to exit suddenly in a crisis, if it is possible at all, can be done only by sacrificing much of the value of their investment. While direct investors may hedge their positions and attempt to use these hedges when a crisis looms, there is little evidence that this was a predominant phenomenon in recent crises. Thus, the conventional wisdom that FDI involves relatively little potential for contributing to an external financing crisis seems to be confirmed by recent experience.

Foreign portfolio equity investment is presumably more "footloose" than FDI. Holders of easily marketable investments can sell and get out of a country if they sense a potential crisis; and anecdotal evidence suggests that there was a good deal of this happening in some recent crises. When a substantial number of investors try to sell and get out, however, the price of equities falls, often substantially and very quickly. Hence, holders of portfolio equity investments usually cannot get out for free. Losses suffered because of a decline in market prices—and possibly compounded by simultaneous currency depreciations—may persuade some investors to stay in rather than to leave. Large drops in equity values, which affect domestic as well as foreign equity holders, tend to have adverse effects on the economy and, in some cases, on the financial system. These effects generally appear to be significantly less severe than those associated with national default (on credit obligations by a country's sovereign, by much of its banking system, or by a large segment of nonfinancial businesses). For example, in Hong Kong the decline in equity values by about 50 percent between September 1997 and August 1998 probably contributed to the Hong Kong recession but there was no serious threat of national default. Similarly, Malaysia suffered from a sharp drop in equity values, but relatively less exposure to foreign credit and a generally stronger banking system helped to shield Malaysia from some of the adverse effects of the crisis that were felt more acutely in Thailand.

Credit flows are potentially the most dangerous form of international capital flows because of the risk of disrupting the entire financial system in the event of a national default. When the sovereign defaults on its credit obligations, the effect is usually to disrupt most forms of capital flows to the entire economy. Widespread default by a country's banks on their external credit obligations tends to have a similar effect. In fact, because default by the sovereign often seriously impairs the value of bank assets, and because the government is generally expected to step in to avert widespread default by a country's banks, there is often a two-way link between banking system default and sovereign default. Beyond the banking sector, governments are generally perceived as providing much less of an implicit or explicit guarantee of private sector credits, but widespread defaults by nonbanks typically impair the solvency of much of the banking system, and this brings in the government as the guarantor of the banking and payments system. As in the case of Indonesia, when default is widespread across nonfinancial businesses, the disruption to a country's domestic and international financial relations and the adverse effects on trade and economic activity are profound. Any or all of these situations may be deemed episodes of "national default."

With respect to credit flows, an important factor influencing the potential for systemic fragility relates to the maturity and currency structure of international liabilities. The vulnerability of several emerging economies to potential financial crises was increased by a sharp progression in the level of their short-term liabilities from the 1980s to the 1990s, partly due to an increase in the overall debt level but also to a shortening of its maturity. These countries, thus, had to roll over much larger amounts of debt than the level of resources they could mobilize on short notice.

This liquidity mismatch was aggravated by a currency mismatch, whereby liabilities denominated in foreign currencies were not backed by an equivalent amount of assets in the same currencies. The value of these debts in terms of domestic currencies, as a result, increased sharply when the latter were devalued (Krugman, 1999). These liquidity and currency mismatches made countries vulnerable to self-fulfilling runs, in which each investor rushes for the exit because he believes that most investors are doing the same.[9] To the extent that debt is denominated in foreign currency, these runs will not be mitigated by exchange rate depreciation even with a flexible exchange rate, implying that the burden of the run falls squarely on the debtor. Runs of this type result from collective market behavior, and may look to the outside observer as the consequence of erratic shifts in market sentiment that are difficult to explain by news about the underlying economic situation. The vulnerability of countries to this type of financial panic can be aggravated by adverse shocks or domestic policy failures, especially in banking and financial supervision and the management of capital account liberalization.[10] But it is also a feature of a world where capital

[9]As noted already in the crises of the 1980s, this problem exists not only for corporate debt but also for sovereign debt. In the latter case, the asset that backs the liabilities is the right to levy future taxes, which is also very illiquid (see Cole and Kehoe, 2000; and Sachs, Tornell, and Velasco, 1997, on the Mexican crisis).

[10]The most oft-quoted example of badly managed capital account liberalization is Korea, which maintained stringent controls on FDI inflows and limited opportunities for foreigners to purchase bonds and equities issued by domestic corporations, while leaving Korean banks free to collect dollar-denominated deposits by international banks and investors.

flows to emerging markets are short term, foreign-currency denominated, and involve more and more diverse and atomistic lenders and borrowers.

Interplay of Policy and Systemic Fragility

The form that capital flows to emerging market economies take (and the maturity and currency structure of credit flows) is not something that is wholly beyond the influence of the countries that receive these flows. Indeed, one of the key problems in recent crises has been the tendency to shift in the direction of the most potentially dangerous forms of international capital flows in the period leading up to a crisis. When Mexico experienced large foreign exchange reserve losses during 1994, part of the response was to shift the financing of the governments' debt from peso-denominated cetes to dollar-linked tesobonos. Along similar lines, Thailand used large volumes of reserves and undertook large forward commitments in its efforts to resist adjusting the Thai baht exchange rate. Korea impaired the liquidity of a significant part of its foreign exchange reserves during 1997 by lending their reserves to Korean financial institutions that were having difficulty refinancing their external credits. Brazil intervened heavily, issued dollar-linked domestic debt, and took on commitments in the foreign exchange futures market as part of its efforts to defend the exchange rate peg of the real during late 1997 and 1998. Such policy actions often do succeed, at least for a while, in staving off a potential crisis—which explains why they are undertaken. But, when a crisis comes, they tend to make its management much more difficult.

More generally, there is concern that, beyond problems with the management of the government's own assets and liabilities, government policies tend to encourage capital flows in forms that pose particular dangers of systemic fragility. One concern is with explicit and implicit commitments to peg the exchange rate, without adequate understanding of the policies that may be required to support such commitments. When the exchange rate is pegged and domestic interest rates are above foreign currency interest rates (in the pegged currency), private debtors have an incentive to borrow abroad or to borrow domestically in foreign-currency-denominated instruments. Banks often have an incentive to facilitate this process and thereby increase their exposure to either credit or foreign exchange risk. If the exchange rate comes under pressure, the government faces the unpleasant choice of raising domestic interest rates, which may weaken the economy and exacerbate incentives for foreign currency borrowing, or of adjusting the exchange rate, which creates large capital losses for those who have borrowed in foreign currency. Because of this as well as other problems, it is now increasingly recognized that only countries with strong underlying

policies consistent with a durable exchange rate peg should implement this form of exchange rate regime.

Another concern is the explicit or implicit guarantees that governments often give on the liabilities of financial institutions, especially banks. Without adequate and vigorously enforced prudential regulation and supervision of financial institutions, the existence of such guarantees generates substantial moral hazard. Specifically, it fosters imprudent lending—often financed by external interbank borrowing—and can lead to situations where even deeply insolvent institutions continue to operate or expand at the expense of more prudent competitors. When a crisis comes, the result is often large-scale losses that threaten overall financial stability and ultimately become the burden of taxpayers. Recent crises are replete with experiences of this phenomenon. Guarding against this problem, through international surveillance of the implementation of established principles for sound banking, is one of the key items on the agenda for strengthening the architecture of the international monetary system.

Moral Hazard Associated with International Support

A more specific and fundamentally different concern about moral hazard has been increasingly emphasized after the international support package for Mexico in 1995. This is the concern about the moral hazard that may have been generated *at the international level* by expectations of intervention by the international community in the event of a crisis. In Mexico in 1995, large-scale international support from the IMF and the U.S. Treasury helped to avoid both sovereign default on the tesobonos and a systemic default on short-term international bank credits. Avoiding defaults clearly had very important benefits for Mexico in enabling a rapid return to international capital markets access by late 1995, which, in turn, contributed significantly to the rapid recovery of the Mexican economy—a stark contrast with Mexico's experience in the debt crisis of the 1980s. Avoiding these defaults also clearly benefited the holders of those specific Mexican credits who would probably have suffered losses in the absence of large-scale international support.

In a narrow sense, the benefit to Mexico's creditors came at Mexico's expense—as the creditors were ultimately paid with Mexican resources and not with the resources borrowed from the international community. In a broader sense, however, the benefit to these creditors did not come at Mexico's expense—because Mexico surely would have been much worse off in the event of default. Nor did this benefit to creditors (to any significant extent) come at the expense of the suppliers of emergency international support to the Mexican government, who were paid interest and received good security for their loans, much of which

have been repaid.[11] Nevertheless, the example set by enabling these creditors to escape from the Mexican crisis with little or no loss (when otherwise they would have taken substantial losses) raised the concern that, in the future, similarly situated creditors would be encouraged to take imprudent risks, expecting that if problems developed for an important emerging market country, large-scale international support would again help protect creditors.[12]

The fact that promising international financial assistance raises the level of capital inflows to emerging economies (and/or allows them to borrow more cheaply) does not necessarily imply the presence of moral hazard. To the extent that international support reduces the total economic losses sustained in a crisis (taking into account any costs or risks of providing the assistance), or the likelihood of a liquidity crisis, true economic risk associated with international capital flows is correspondingly reduced. True risk reduction presumably encourages greater individual risk-taking than would occur without expectations of international support. If the additional risks undertaken are adequately compensated by expected benefits, this outcome is desirable and economically efficient.[13]

International financial assistance may, in principle, encourage risk-taking beyond the economically efficient level, but the channels through which the moral hazard effect travels are more subtle than usually acknowledged. In particular, the effect cannot be understood as a simple transposition of the distor-

[11]Interest on loans from the U.S. Treasury to the Mexican government bore a significant premium over comparable U.S. Treasury rates, and the U.S. government made significant profits on these loans, which have been fully repaid. For IMF credits, it is arguable whether the rates charged fully and adequately compensated the ultimate suppliers of credit for their own costs and the possible risks of IMF lending to Mexico. By any reasonable accounting, however, the subsidy element in IMF lending to Mexico was quite small, and it would have been even smaller or nil if the rate charged had been set in accordance with the Supplemental Reserve Facility that was introduced in December 1997, specifically for the purposes of short-run emergency financing.

[12]It has also sometimes been argued that expectations of international support create moral hazard by encouraging borrowing countries to undertake imprudent borrowing. However, the large costs suffered by countries, such as Mexico, when they become involved in a financial crisis—even when they receive international support—suggests that such imprudence is generally not the consequence of rational economic calculation (with the exception of cases where accountability of officials and/or the political risk from steering a country into crisis is very small). Accordingly, concerns about moral hazard arising from expectations of international support have focused more on potential distortion of incentives on the creditor's side rather than on the debtor's side.

[13]For example, people may choose to live in more expensive houses because (fairly priced) fire insurance allows the risks of losses from fire to be diversified and borne (for a fee) by those willing to accept such risks. Although risks of losses from fires are larger because people choose more expensive houses, economic efficiency is actually improved relative to a situation where fire insurance is not available. In contrast, if fire insurance induces home owners to undertake actions (like smoking or overloading electrical circuits) that increase fire risks and that (unlike house value) cannot be monitored and fairly priced in insurance policies, then there is a moral hazard distortion.

tions at the national level to the international level. Moral hazard is created by domestic policies—notably through implicit or explicit government guarantees of private debt and inadequate regulation of financial institutions—from the expectation that the costs of excessively risky behavior by borrowers and lenders will ultimately be borne by a third party—namely the average domestic taxpayer. In contrast, the subsidy element in international support packages tends to be quite small, so that *direct* generation of moral hazard caused by expectations that the international community will absorb losses that should be borne by others cannot be a substantial problem. This said, international financial assistance might contribute to moral hazard *indirectly* by magnifying the shifting of losses inside the country in ways that encourage imprudent risk-taking. For example, the anticipation of international financial assistance might enable domestic agents to borrow more from international investors than they would otherwise, raising the ultimate cost of a bailout for the domestic taxpayer.

Because international financial support may contribute to moral hazard by magnifying domestic policy failures, it is important that the international community promote sound financial supervision and policies in emerging countries, an issue we discuss below. In the foreseeable future, however, it is likely that the international community will continue to confront crises in countries where the structure of financial safety nets and supervision is less than perfect. In deciding how to deal with such crises, the experience of how such situations are handled—and, in particular, the efforts that national governments exert, and the support they receive from the international community—will influence the behavior of suppliers of short-term credit to governments and banking systems. The best course of action, though, is not for the international community to adopt a uniform policy of no support in every situation where some indirect contribution to moral hazard may be a concern (see below for further discussion). Often, as with Mexico in 1995, the consequences of denying international support would be to risk imposing very large additional and immediate losses on innocent victims in a financial crisis when trying to impose comparatively moderate losses on the individuals who have acted inappropriately—not an attractive trade-off.

A quantitative measure of the importance of any direct or indirect moral hazard caused by expectations of emergency international support in the events after the Mexican crisis is difficult to obtain.[14] Most of the private capital flows to the

[14]Possible moral hazard arising from expectations of international support must be sharply distinguished from moral hazard arising from expectations of interventions by national governments using their own resources. As noted earlier in the text, there is little doubt that moral hazard arising from expectations of national government interventions—related to a wide variety of explicit and implicit guarantees—was an important factor in the buildup to recent crises.

crisis-hit emerging market countries were not in forms that were protected (loans to sovereigns or interbank claims). In fact, owners of direct foreign investments, portfolio equity investments, and credits to the nonfinancial sector in crisis-ridden economies took substantial losses when crises occurred—in countries that did and did not receive substantial international financial support.

In the Asian crisis countries, sovereign external indebtedness was generally quite small, leaving the international interbank credits as the primary potential focus of moral hazard concerns. Even here, the degree to which moral hazard artificially encourages flows beyond prudent limits depends on two perceived probabilities: (1) the perceived probability that a country will get into deep financial difficulty that threatens default on interbank credit lines in the absence of official support; and (2) the perceived probability that national resources will be inadequate to handle such a problem and that large-scale international support will be needed and available to fill in the gap.

In Asia, before the onset of the crisis, there was little indication that either of these perceived probabilities was very high.[15] Before 1997, when private capital was flowing in large amounts to Asian emerging market economies, there was little apparent worry among the suppliers of capital of possible severe difficulties on the scale that actually later materialized. With enviable records for strong and sustained economic growth and low inflation, sound government budgets, high savings and investment rates, generally well-educated workforces, and stable political arrangements, fundamentals in these economies were generally seen as being very strong.[16] With the exception of the Philippines, countries that became involved in the crisis had not been accustomed to, and probably were not expected to, rely on international financial support. (Expectations concerning support from national governments for banks or firms that got into difficulty are another matter altogether.) Once the crises got rolling, of course, attention began to focus on prospects for international support, but this was after private capital (including interbank credits) had already flowed into Asia. Indeed, it is one of the desired functions of international support and of the expectations that hopefully arise from an announcement of negotiations for such support

[15]Moral hazard applies to the situation that prevails before a crisis starts. It refers to the artificial incentive for capital to flow into a country because of the expectation that if trouble later develops, international support will help shield creditors from losses that they should rightfully bear.

[16]For Thailand, there were pressures on the exchange rate peg starting in late 1996, and there were concerns about some Korean chaebols and banks by early 1997. The Thai stock market fell considerably over the course of 1996 and the Korean stock market experienced a smaller decline. For the other Asian emerging market countries there was little sign of trouble until well into 1997. Problems of the type and magnitude that might give rise to requests for official international support were not "on the radar screens."

that it helps to keep private capital already in a country from flooding out. This desired effect is not moral hazard.

Russia is the one clear case where moral hazard arising from expectations of international support plausibly did significantly influence private capital flows prior to the crisis. Russia had long relied on international support, and there was the widespread perception that because of Russia's economic and political importance, unusual efforts would be mounted in the official sector to ward off a crisis that threatened Russia's stabilization and reform efforts. Widening yield spreads on Russian government debt during the spring and early summer of 1998 indicated that creditors were aware both of some significant risk of devaluation (reflected particularly in spreads for ruble-denominated debt) and of some broader risk of default (reflected in spreads on Russian Eurobonds). Market commentary about the so-called "moral hazard play" suggests that many of those who undertook Russian sovereign risk did so in the belief that international support would be forthcoming to avert a Russian collapse—or at least would be sufficient to allow most creditors to escape before the collapse occurred. In the midst of the event, a substantial new package of support from the IMF was arranged in July 1998, together with an agreed significant strengthening of Russia's stabilization and reform policies. When the policy efforts proved inadequate and unconvincing, however, a collapse did occur in mid-August, and holders of Russian sovereign obligations sustained very large losses, especially domestic and foreign holders of ruble-denominated GKOs.

This dramatic event has had large costs for the Russian economy and for Russia's stabilization and reform efforts. Nevertheless, some very important lessons have been learned from it. International support for a country facing a financial crisis is neither unlimited nor unconditional. Even in very important cases, private creditors, including creditors of the sovereign, cannot automatically assume that they will be able to escape from a difficult situation without loss. Thus, while the example set by Mexico in 1995 arguably raised concerns about indirect moral hazard arising from expectations of rescues of private creditors as the consequence of large-scale emergency support from the official sector, the example of Russia must, in at least equal measure, have diminished those expectations and, hence, concerns.

In the final analysis, the international community has three important ways in which it can limit concerns about indirect moral hazard. First, through the conditionality associated with its support, the international community can and does insist that countries receiving such support should reform their national policies to lessen the amount of moral hazard they tend to generate. This is a key reason why reform of financial sector policies has been an important component of conditionality in a number of recent IMF programs. Second, the

international community can and is mounting a much broader effort, outside of the specific context of financial support packages, to promote national reforms, in conjunction with many aspects of improving the international financial architecture, to decrease moral hazard. Third, the international community can maintain that its support is not unlimited or universally available for averting national default as clearly demonstrated in the handling of the debt crisis and in more recent episodes. Those who would engage in excessive risk-taking should know that the expectations on which it is based could be very wrong.

Stabilizing and Coping with International Capital Flows

The analysis of the previous section offers a useful vantage point for discussing proposals to strengthen the international financial and monetary system and to moderate and better cope with fluctuations in international capital flows. Broadly, two areas can be distinguished. The first focuses on improving domestic policies and increasing transparency. This would both reduce the fundamental weaknesses that make countries vulnerable to financial crises, and make it less likely that existing weaknesses go unnoticed over extended periods of time, thereby diminishing the extent of damage from future crises. While the desirability of these initiatives is widely acknowledged, it is doubtful that they will be sufficient to forestall every recurrence of the types of problems recently experienced in the international financial system.

The second concerns measures to address systemic risks and contain crises more directly. Initiatives in this area include improved international institutions, improved rules for debt workouts, or the regulation or reduction of certain types of international capital flows. An assessment of these measures, we shall argue, must start with an acknowledgment that they involve difficult trade-offs.

In what follows, we will only briefly discuss the first type of measures (which has been considered extensively in various discussions on the "architecture" of the international financial system). We then concentrate on the key trade-offs that must be faced in any realistic effort to improve the performance of the international monetary and financial system. The existence of these trade-offs is what makes reform of the system necessarily an exercise in the second-best rather than a search for the ideal. With this understanding, we move on to the concluding discussion of the future role of the *official* sector, especially of *official financial assistance*, in containing and resolving crises.

Domestic Policy Reform, Supervision, and Standards

Among the potential causes of financial imbalances and vulnerabilities that can lead to crises, two are largely undisputed. First, there is asymmetry of information—in the sense that potential lenders cannot fully observe the solvency of borrowers. This is a well-known characteristic of any financial system, but may exist in aggravated forms both in developing countries, which lack the information-gathering institutions of more advanced economies, and in lending or investment relationships that transcend borders. Second, domestic policies may be inadequate or even counterproductive, in the sense that they create moral hazard problems of their own (for example, through implicit guarantees).

There is wide consensus that it is necessary to address these two causes of vulnerabilities. In particular, there is agreement that emerging markets need to strengthen data dissemination—including, and especially, as regards foreign investors—and financial market regulation. It is also widely recognized that the burden of strengthening transparency and financial supervision does not solely rest on emerging market governments. Excessive inflows and overlending, such as are typically observed in the run-up to crises, clearly take "two to tango." The eagerness of the lending or investing institutions to participate could, in part, be related to institutional and regulatory shortcomings in the *lender* country.[17] In any case, there is clear scope for improving the risk management behavior of lending institutions and ensuring that the exposure of highly leveraged institutions, including but not limited to hedge funds, is correctly understood by their creditors.

These issues are generally matters of domestic policy, raising the question of what the international community can do, apart from technical assistance, in encouraging domestic transparency and regulatory reform. In general, the answer is "by setting standards."[18] This includes international standards on accounting and auditing, capital adequacy of banks, principles of bank regulation, principles of securities regulation, bankruptcy laws, and reporting of data by national governments.[19]

[17]Levy Yeyati (1998) explores the potential moral hazard problem posed by the existence of deposit guarantees in lender countries.

[18]See Group of Ten (1996); Group of Seven (1998) and Group of Twenty-Two (1998a, 1998b).

[19]Examples of initiatives already taken in this area include the Basel Capital Accord (BIS, 1988), the *Core Principles for Effective Banking Supervision* (BIS, 1997), the *Objectives and Principles of Securities Regulation* (IOSCO, 1998), and the IMF's Special Data Dissemination Standard (http://dsbb.imf.org). The task of developing and implementing standards is one in which international institutions, national regulators, and private associations—such as the International Accounting Standards Committee (IASC) or the International Organization of Securities Commissions—can usefully cooperate. The Financial Stability Forum, established under the auspices of the G-7 (at the suggestion of Bundesbank President Hans Tietmeyer), is supposed to foster communication and coordination among various institutions and groups working in these areas.

If the very difficult problems of implementation could be successfully resolved, these initiatives could go a long way toward limiting the kinds of financial sector vulnerabilities that often precede crises. However, successful and complete implementation across the broad range of emerging market economies (and many advanced economies as well) appears likely to be a prolonged and demanding task. Moreover, it is far from clear that even broad-scale implementation would be sufficient—in the absence of additional measures that address systemic vulnerabilities—to reduce the risk of financial crises to an entirely satisfactory level.

Two arguments can be made. First, measures that improve prudential regulation or that better inform investors about a country's solvency do not remove the possibility of contagion and liquidity crises. For example, better information will not address the essential cause of a financial run, when the most relevant information for an individual investor is not what the fundamentals are but what other investors are doing—whether or not they are rushing to the exits. Second, even if sufficiently improved fundamentals would reduce the chance of violent capital flow reversals to an acceptable level, it is not clear that the initiatives proposed would actually succeed in reducing domestic market failures and policy errors sufficiently. And in the presence of contagion, countries that have not fully put their economic houses in order will continue to exert an externality on countries that have.

In a world economic and financial system that will inevitably remain somewhat second best, systemic measures may thus be required as a second line of defense. Crises are unlikely to disappear completely; as a result, there is a need to think about systemic improvements not just for crisis prevention, but also to mitigate and contain future crises.

Improving the System: Some Key Trade-Offs

Most participants in the architecture debate would agree that reform of the international financial system should have three key objectives:

- foster efficiency and growth—allowing an international allocation of capital to where it can generate the highest (risk-adjusted) returns;
- crisis prevention—reducing the risk of international financial crises ex ante; and
- crisis mitigation—mitigating the impact and equitably sharing the burden of international crises ex post.

Because of problems of asymmetric information, however, and other distortions that generally prevent any financial system from operating with absolute efficiency, simultaneous pursuit of these objectives gives rise to fundamental

tensions.[20] In practice, under any feasible reforms of the global financial system, measures that bring us closer to one of the three stated objectives will have costs in terms of at least one of the other two. In turn, this suggests that there is no universally applicable, first-best approach for dealing with these problems.

To begin with, note that a number of emerging market countries that retained relatively tight controls on capital flows appear, in general, to have been less affected by recent crises than many emerging market countries that pursued more open policies; this is to be expected. However, while policies that tend to maintain a relatively closed capital account presumably provide significant protection against international financial crises, they substantially impair a country's ability to take advantage of the efficiency gains from broader participation in the global financial system. There is clearly a trade-off here. The terms of the trade-off are made worse by imprudent measures in capital market opening and may be improved by a more gradual approach. However, the bottom line is that greater openness to international capital flows in most emerging market economies does involve some unavoidable risks. As countries have considered this trade-off, in an environment of rapidly improving technology, declining costs, and improving information flows in the global financial system, more and more countries have moved toward more liberal capital market regimes. If this trend is to be sustained in a manner that is beneficial for all participants in the global system, it is important to do more to contain the risks and damages of financial crises.

Important trade-offs also affect most proposals to limit risks of financial crises by influencing the buildup of conditions that may lead to such crises. As discussed above, credit flows, particularly short-term credit flows denominated in foreign currency pose particular risks of financial crises and of possible national defaults—especially compared with flows of FDI or of portfolio equity investment. Accordingly, measures to shift the composition of international capital flows—such as Chilean-type controls on short-term credit inflows—or prudential rules that discourage short-term lending by banks to emerging market countries appear relevant to decreasing crisis risk. The use of Chilean-type controls, which are analytically similar to a tax on short-term credit inflows, however, confront the underlying tension between the provision of public goods and the distortionary costs of taxation. Taxing short-term inflows, through lengthening the maturity structure of international finance, could provide a public good in the form of a lower risk of liquidity crises and of possible national defaults. Such taxes, however, lead to efforts at avoidance

[20]For a general exposition of problems of asymmetric information and its effects on the global financial system, see Eichengreen, Mussa, and others (1998).

that affect the level and distribution of capital flows and other financial activities in ways that do not necessarily serve the public welfare. As with any tax where there are significant opportunities for avoidance, there are limits on when attempts should be made to use the instrument, and these are likely to vary with time and circumstances. Used judiciously, this instrument may be helpful to some countries in discouraging a form of capital inflow that poses particular risks, but it is not necessarily relevant or useful for every emerging market country.

More generally, efforts to divert capital flows into forms that are thought to pose less danger of systemic risks generally run counter to the incentives of economic agents to pursue their own self-interests. Both sovereigns and private sector borrowers often find it cheaper to borrow short term or in foreign currencies (and subject to foreign laws) than to borrow longer term or in domestic currency; and creditors on the other side of such transactions share coordinated preferences, making the transaction mutually beneficial.[21] Arguably, distortions in the joint incentives of borrowers and lenders lead to too much short-term, foreign currency credit, resulting in excessive risks of financial crises and potential for national defaults. In particular, it might be argued that there are serious principal/agent problems between the officials and managers who make decisions to increase short-term credit exposures in the hope of averting a crisis and those who will bear much of the cost if the result is to produce a more damaging crisis somewhat later. Concerns about such problems rightly give high priority to reforms that would tend to establish better discipline over the use of short-term credit (especially foreign currency credit) by governments, financial institutions, and businesses. This includes greater transparency and establishment of standards for sound management of public debts, strengthened regulation and supervision of financial institutions, and consideration of prudential measures to encourage sound debt management by private business.

It is difficult to draw a sharp dividing line, however, and say what constitutes too much short-term debt or how far it is prudent to shorten maturities to take on foreign currency debt so as to avert a crisis. Prohibiting all short-term or foreign currency borrowing surely goes too far. After all, compared with the most advanced industrial countries, emerging market countries typically have underdeveloped financial systems without broad and deep domestic markets for longer-term government or private debt. This is particularly true for countries with recent histories of financial instability. And, when

[21]See Jeanne (1999) for an explicit theoretical treatment of this issue and a demonstration of why short-term credit can, in some circumstances, reflect a desirable equilibrium outcome.

emerging market countries wish to access credit in global capital markets, they typically cannot do so in domestic currency. Moreover, when a country experiences difficulty in maintaining external financing flows, shortening maturities and increasing foreign-currency-denominated borrowings can be quite useful in forestalling a financial crisis that is not necessarily inevitable. Sometimes this strategy works. But sometimes the strategy fails, and the subsequent crisis and costs are enlarged.

Knowing how far to go in this trade-off is a difficult judgment to make. For the international community, public questioning of such judgments made by national authorities poses a dilemma in that, however legitimate the questioning may be, it could provoke a crisis that might otherwise be avoided. Not questioning, however, risks that national authorities may inordinately delay policy adjustments that are painful but necessary, with the result of a deeper and more costly crisis down the road.

Trade-offs also affect various proposals for ex ante reductions of crisis risks through proposals for private sector "bail-ins" in the event of financial crises. Here the idea is that private creditors would be required, under certain conditions, to retain or expand their exposures to a country experiencing an actual or potential financial crisis. Some are concerned that the institution of such mechanisms would raise the ex ante cost of borrowing for many emerging market countries. This would not be bad, necessarily, provided that the effect was consistent with greater economic efficiency. Of greater concern is what happened when this type of mechanism was applied to commercial bank credits in the 1980s debt crisis. It helped to avoid disorderly defaults, but the result was also to cut off access to voluntary private capital flows to the affected countries for an extended period and to help drive sovereign financing out of banks into the international bond market where such forced restructurings are perceived to be difficult to arrange. Perhaps a better structured mechanism, applying to a wider range of creditors, could be made to function better. However, with a wide array of creditors typically holding a variety of different claims against diversified groups of debtors (versus syndicates of banks holding claims against the sovereign in the debt crisis of the 1980s), the prospects for making such a mechanism work now do not appear very propitious. Moreover, the application of such mechanisms could generate an adverse trade-off between mitigating the risks of crises (by discouraging excessive borrowing) and containing crises when they do occur. Specifically, application of the mechanism on a regular basis may increase the incentive for creditors to flee from a country at the first signs of trouble.[22]

[22]This is forcefully argued by Fischer (1999), p. 19, and Eichengreen (1999), p. 71.

Note that this logic does not apply just to extreme proposals such as "mandatory haircuts," but to any scheme that increases the expectation that private investors will have to bear a larger share of losses in the event of a crisis.

Finally, on trade-offs, there is the already discussed problem of the moral hazard potentially arising from international support packages versus the concern about the excessive damage that can be done to both innocent and not-so-innocent parties when a crisis is left to run its own course. In principle, international support packages that involve little subsidy element and that are well designed and implemented should generate comparatively little moral hazard problems. However, even when international support resources are readily available and a country is experiencing severe difficulty, too much support may be provided when it is not appropriate. In the end, for the global financial system to function reasonably efficiently, there will be circumstances when countries should be allowed to default, even if it imposes substantial costs on the country and many of its residents, on the country's creditors, and on other parties.

National Defaults and the Role of International Financial Assistance

Traditionally, national default has not been considered a policy option but, rather, the residual outcome when everything else has failed.[23] There are good reasons, however, to see national default as an explicit, albeit unpleasant, option that can be taken in some exceptional circumstances to resolve financial crises. International credit will continue to be affordable for emerging economies only to the extent that defaults remain painful and, consequently, rare events. This is true even if the term "default" is defined widely to include ex post, private sector bail-in mechanisms[24]—such as bond contracts that facilitate debt restructuring and creditor councils that would lower the costs of negotiations between bondholders and debtors.[25] Private sector bail-in measures of this type can limit the disruptive consequences of defaults by facilitating a more orderly process that leads to *ex post* efficient outcomes. *Ex ante* debt restructuring, however, remains a very undesirable outcome from the perspective of investors. As a result, investors would want to be compensated for taking this risk by requiring higher returns on bonds that carry a higher chance of being restructured. In this situation, debtors who want to minimize the cost of finance would either shun bond contracts that are easy to renegotiate—as has indeed been the case so far—or look for other ways of committing to creditors that restructuring will not occur.

Moreover, it is probably an illusion to believe that there is an "orderly" way for resolving many situations of national default. In Korea in early 1998, it was possible to organize a voluntary rescheduling of the obligations of Korean financial institutions to major international banks. But this was a special situation that was facilitated by a government guarantee for the restructured loans and the presence of large-scale international financial assistance, and where a relatively limited and uniform group of creditors was persuaded that they would absorb little or no loss as a result of the agreed restructuring. In contrast, restructuring of bank claims in the debt crisis of the 1980s, which ultimately involved significant concessions by creditors, was a more protracted process and led to prolonged disruptions of market access for the countries involved. And, in these cases, the process was facilitated by the existence of a relatively well-organized group of creditors and by a fairly uniform set of claims against sovereign borrowers. As an example of what may be expected when a wide array of creditors holds a variety of claims against a diverse group of debtors, efforts to organize a resolution of the national default by many Indonesian corporate borrowers have, so far, proved very difficult. Arguably, bond contracts that specify qualified majorities for approval of restructurings and other similar reforms might make the resolution of future national defaults somewhat easier. But in situations where creditors are asked to accept substantial losses or where there are many creditors with differing claims against many debtors, resolution of national defaults is unlikely to be quick or easy. The probable high cost of resolving such situations, for all involved, provides a strong incentive to avoid the circumstances that may lead to national defaults. It is not desirable to blunt this incentive by creating the false expectation that national defaults will never occur.

An alternative way of dealing with some situations of potential national default is through the imposition of controls on capital outflows. The relevant circumstances are those where domestic debtors can meet their obligations in domestic currency (perhaps with the aid of an expansion of domestic money and credit), but they cannot obtain enough foreign exchange at a sufficiently attractive exchange rate to meet their obligations denominated in foreign currency. The imposition of controls on foreign currency payments on the prin-

[23]Economists are not so squeamish. Following the debt crisis of the 1980s, the theoretical literature discussed, at length, the implications and consequences of the "option" to default. See Bulow and Rogoff (1989).

[24]The contract modifications proposed may lead to the avoidance of default in a legal sense, by allowing renegotiation of the bond terms before its old terms have been breached. However, as long as the new terms are less favorable than the old terms, the reputational effects of this type of restructuring are similar to those of a partial default, because investors would have preferred to stick to the old terms if given the option. This would seem to justify the use of the term "default" to describe debt restructuring aided by private sector bail-in measures.

[25]A comprehensive discussion both of proposals and experiences in this area is provided in IMF (1999a). Eichengreen (1999) also provides a very useful exposition of many of the relevant issues.

cipal of outstanding loans (and other capital outflows) might, in such circumstances, protect the exchange rate against massive depreciation that would force many debtors with substantial foreign currency liabilities into insolvency.[26] Conceivably, even foreign creditors might see some advantage in this solution, provided that interest generally continued to be paid and there was the reasonable expectation that principal repayments would not be long interrupted. The alternative of a messy national default, with likely large-scale losses to creditors, would not be attractive.

However, the use of controls on capital outflows to contain national default risks has some important limitations and drawbacks. In general, controls are not useful in forestalling a potential default by the sovereign because the imposition of controls by the sovereign on payments to meet its own obligations is logically the same thing as default; if the sovereign cannot raise sufficient foreign currency to meet its foreign currency obligations, it defaults, and it cannot use the excuse of controls to hide this fact.[27] For private debts, capital controls can do little to resolve a potential national default if there is widespread insolvency of domestic banks or firms in terms of capacity to meet obligations in domestic currency—unless the government is prepared to inject massive amounts of domestic liquidity. Also, if private debts to foreigners are legally subject to the jurisdiction of foreign laws, there may be considerable doubt as to whether capital controls afford legal protection against actions by creditors.

More generally, the imposition of controls to forestall a situation of potential default (in contrast with the maintenance of controls already in place) may be regarded by creditors as much the same thing as an outright default, leading to the same problems of prolonged disruption of access to international credit markets. If the underlying problems giving rise to the threat of national default are deep and persistent, then the imposition of controls on capital outflows may provide only temporary respite from pressures on the exchange rate. If domestic debtors, on a wide scale, generally fail to meet even interest obligations on their foreign debts, national default becomes a practical fact. Furthermore, there is general concern that controls, which typically have only

[26]Krugman (1999) has suggested consideration of controls on capital outflows in situations less extreme than potential national default, as a means to allow a country in difficulty to pursue an expansionary monetary policy while protecting the economy from the effects of withdrawal of foreign-owned capital. The considerations in this case are much the same as in the more extreme case of potential national default.

[27]In the case of Russia, default on the GKOs in August 1998 involved domestic currency obligations of the sovereign issued in the domestic market (with some held by foreigners). Controls on capital outflows could have done nothing directly to help avoid this default.

limited effectiveness in restraining outflows in the short run, will tend to impair access to international credit flows in the longer term.

In an environment of increasing capital market integration, when the opportunities and incentive to evade controls are very high in a crisis, controls on outflows must be drastic to be effective and, for that reason, necessarily entail large costs in terms of reputation and new inflows.[28] Their effective use would require, moreover, a comprehensive apparatus of restrictions ready to be activated in the event of a large capital flow reversal. It is hard to imagine that countries that consistently pursue a long-run objective of integration would wish to pay the large reputational costs associated with the maintenance of such an apparatus on a permanent basis. In short, while it is foolish to reject completely the idea that imposition of outflow controls may be helpful in some instances, particularly for countries that still maintain the apparatus for such controls, it would be even more foolish to see outflow controls as a magic bullet that can be used with assured effectiveness and little cost to mitigate the effects of external payments pressures by emerging market countries that seek to establish and maintain broad access to international capital markets.

This leaves emergency financing as a final option to deal with situations of potential financial crises that threaten national default. However, does emergency financing necessarily have to be equated with official financing? As discussed above, even without new bond contracts or other reforms, a variety of means exist and have been used in particular situations for ex post bailing-in of private sector creditors that are more orderly than the most disruptive forms of national default. There are also ex ante mechanisms, in the form of contingent credit lines from international banks, for private sector provision of emergency liquidity that can take some of the burden off the official sector. The usefulness and reliability of such arrangements, however, remain open to question.[29] A private provider of this type of liquidity insurance has the incentive to hedge the risk implicit in contingent credit lines in ways that could effectively undo the insurance function of these credit lines (for example, by

[28]Notably, when Malaysia imposed controls of capital outflows in September 1998, downward pressures on the ringgit had already largely abated. Indeed, the trend of developments in Asia, subsequent to the imposition of controls by Malaysia, was for fairly persistent upward pressure on the exchange rates of all of the Asian crisis countries.

[29]As an alternative to contingent credit lines, a country could borrow foreign currencies on a long-term basis (with staggered maturities) and hold the proceeds as additional liquid reserves that could be used in the event of a crisis. There is a cost to this alternative, as interest paid on long-term borrowings will generally exceed interest received on liquid reserves, and this cost may exceed the fees paid for contingent credit lines of the same amount. However, holding additional reserves (financed by longer-term borrowing) does not raise the same questions and concerns as privately supplied contingent credit lines.

cutting back other exposures to a country as the perceived likelihood of a draw on the contingent line increases).[30] Official providers of liquidity support, including contingent liquidity support, for countries facing potential external financing difficulties have fundamentally different objectives, namely to help contain external financing crises; and they would see the hedging of their exposures as fundamentally contradictory to these objectives. As a logical matter, provision of emergency financial assistance to deal with the problem that private creditors wish to exit en masse from a country is not a task for the private sector, but lies strongly in the range of comparative advantage of the official sector.

In the area of official support, recent experience has persuaded key policymakers that, in addition to traditional IMF organized programs that provide conditional support to countries already experiencing financial pressures, it was desirable to create a new facility to provide contingent support for countries with sound fundamentals that might get into difficulty because of contagion from a financial crisis affecting other countries. The result is a Contingent Credit Line (CCL) in the IMF that allows for the precommitment of substantial assistance, on a contingent basis, for countries that are judged to have sound fundamentals. The objective of the CCL is to deal with potential contagion and liquidity crises preemptively, and thus reduce not only the incidence and extent of crises but also the demand that will be put on ex post public crisis lending. The hope is that the existence of the CCL may help to encourage more countries to correct fundamental problems before they face possible financing difficulties, thereby mitigating the risk of crises. It remains to be seen, however, how the CCL will work in practice. On a sobering note, it might be observed that the large disbursement programs undertaken by the IMF in recent crises would, in general, have been poor candidates for the CCL. Substantial adjustments in countries' policies to correct fundamental economic problems (including structural weaknesses in financial sectors), under IMF conditionality, were essential to these programs; and phasing of disbursements was generally appropriate to enforce this conditionality.

[30]If a private provider of contingent credit could credibly commit not to hedge its exposure (which is not really feasible for a large financial institution with diverse positions in a country and a capacity to trade actively in many instruments beyond the knowledge of its client), this problem might be solved. However, exposures might still be hedged indirectly, for example by taking account of correlations of risks across assets. Specifically, exposures to other countries might be cut back as a substitute if it is believed that risks for these countries are correlated with those of the client country, as they appear to be, at least within regions for emerging market countries. This suggests that wide-scale use of privately supplied contingent credit lines by emerging market countries could become yet another mechanism for financial contagion.

The CCL may well be of some important use for countries concerned with possible contagion should a crisis flare up again. However, beyond countries that are eligible for the CCL (based on having sound fundamentals), there will surely be individual countries that get into external payments difficulties, sometimes of such severity that they are threatened by national default. Also, if the historical pattern of boom and bust cycles in international capital flows to emerging markets persists—and there is no sound reason to believe it will not—then a time will likely occur again when a good number of emerging market countries face severe external financing difficulties. While the variety of reforms to the international monetary system that are now under way should help to lessen these problems, other trends in the global financial environment—moving toward greater capital account liberalization for a wider range of countries and toward more diverse and atomistic players on both sides of the market—may make crises more likely and more difficult to manage. Accordingly, there will continue to be a need for official assistance—in appropriate circumstances with as little subsidy as possible, and subject to relevant conditions—to help countries manage their external payments difficulties and, especially, to help contain the severe economic damage typically associated with situations of national default. Thus, the critical questions of emergency financing will not be the "ifs" of official financial assistance, but the "hows" and "whens"—questions of timing, volume, charge rates, and conditionality.

Lessons from Recent Experience

The experience with recent financial crises suggests some considerations that will need to be taken in resolving these issues.

First, in the periods of buildup and of stress, financial crises affecting emerging market countries tend to reflect both domestic economic weaknesses or maladjustments and systemic deficiencies. An effective approach to lessen the likelihood and to ameliorate the effects of future potential crises needs to operate on both the buildup and stress periods and needs to focus on correcting both types of deficiencies.

Second, financial crises can have very large costs, particularly for the countries most severely affected, but also through contagion and other transmission mechanisms for a wide range of less-affected countries. The costs tend to be particularly great for countries that experience national default. In contrast, the costs to the international community for the type of financial support it provides to countries in difficulty are comparatively mod-

est. Interest-bearing loans with high expectations of repayment, rather than grants, are the predominant form of international support. Nevertheless, the resources of the international community are limited—notwithstanding the large support packages in some individual cases—relative to the scale of a widespread capital flows reversal that could potentially occur, especially following a buildup of the magnitude of the one that preceded the onset of the Asian crisis.

Third, there is no exact formula for the international community to provide support to countries facing financial crises. In 1995, a very large international support package was instrumental in helping Mexico avoid national default, thereby substantially reducing the economic costs of the crisis. A different form of solution was adopted in the 1980s debt crisis. In this case, it was easier to secure a coordinated rollover and restructuring of commercial bank claims because available official resources were too small to replace potential private outflows, and because it was thought that creditors should not be allowed to avoid participation in helping to resolve the crisis. In the case of Korea, in 1997–98, a mixed approach was adopted. When it was discovered that promised policy reforms and substantial injections of official support were insufficient to motivate rollovers of most maturing international interbank claims, official efforts were made to secure agreement for concerted rollovers and lengthening of maturities under a government guarantee. In Indonesia, where many foreign claims were against diverse corporate borrowers and solvency problems were acute, a concerted rollover and restructuring proved much more difficult, and national default ensued as the only available option.

Fourth, the often expressed concern about how moral hazard is generated when some crises are resolved—shifting losses away from those who ought to bear costs—relates primarily to how national economic policies are structured and implemented. Widespread implicit and explicit guarantees of financial institutions, liabilities, and inadequate regulation of such institutions have been a particularly important source of this type of moral hazard in recent crises. In addition, there is some legitimate concern that an indirect moral hazard effect of international financial support could lead to national policies that directly generate moral hazard. Largely, this concern is mitigated both by the conditionality in international support packages, which presses for national policy reforms, and by broader international efforts to promote improved national policies. Moreover, although unfortunate in other respects, the examples that both demonstrate the limited and conditional character of international financial support and reveal the costly consequences of national default teach painful but valuable lessons that help contain moral hazard.

Appendix. Trends in the Composition and Volatility of Capital Flows

This appendix seeks to identify broad trends in international capital flows to emerging markets since the early and mid-1970s. It looks at three main themes: (1) major compositional changes, (2) trends in the volatility of capital flows and capital flow reversals, and (3) trends in the prevalence and severity of currency crises, and in the effectiveness of official financial assistance in mitigating the impact of currency crises on the real economy. While this encompasses a large set of stylized facts with relevance for the "architecture" debate, it leaves aside several potentially important empirical issues that have been studied independently in recent IMF Research Department studies, including developments in capital flows in long-term historical perspective (i.e., beyond the 25-year period discussed here), the qualitative and structural differences between the crises of the 1980s and those of the 1990s, and the presence of "contagion" in the financial crises of the latter.[31] To the extent that the discussion in subsequent sections draws on these issues, these studies will be referred to directly.

Throughout this section, we utilize two alternative concepts of capital flows. First, private capital flows as measured by the sum of net foreign direct investment, net portfolio investment, and net "other" investment from the financial account of the balance of payments, minus net official borrowing. This is referred to as "net private capital flows." Second, we use the sum of emerging market bond issues, equity issues, and loan commitments to private creditors that are issued through international capital markets. The latter is referred to as "gross private financing."[32]

[31]Respectively, IMF (1997a), pp. 234–51; IMF (1998a), Chapter 3; and IMF (1999b), Chapter 3.

[32]The differences between these two concepts are as follows. First, gross private financing includes only *primary* issues in *international* markets. As such, it ignores both capital inflows through secondary bond and equity markets (for example, purchases of Russian GKOs by foreign residents) and foreign purchases of local equity or bond issues, both of which would be recorded in net private capital flows as net portfolio investment. Second, net private capital flows are obviously a net concept while gross financing is not; in particular, the latter misses debt repayment and changes in assets held by the emerging economy abroad. Third, net private capital flows include foreign direct investment while gross private financing does not (except for the case in which more than 10 percent of new equity issue is purchased by a single investor). Finally, the sources are different: net private capital flows are constructed from the balance of payments and are thus based on debtor country information, while gross private financing is based on information obtained from banks and other financial market institutions.

Trends in Levels and Composition

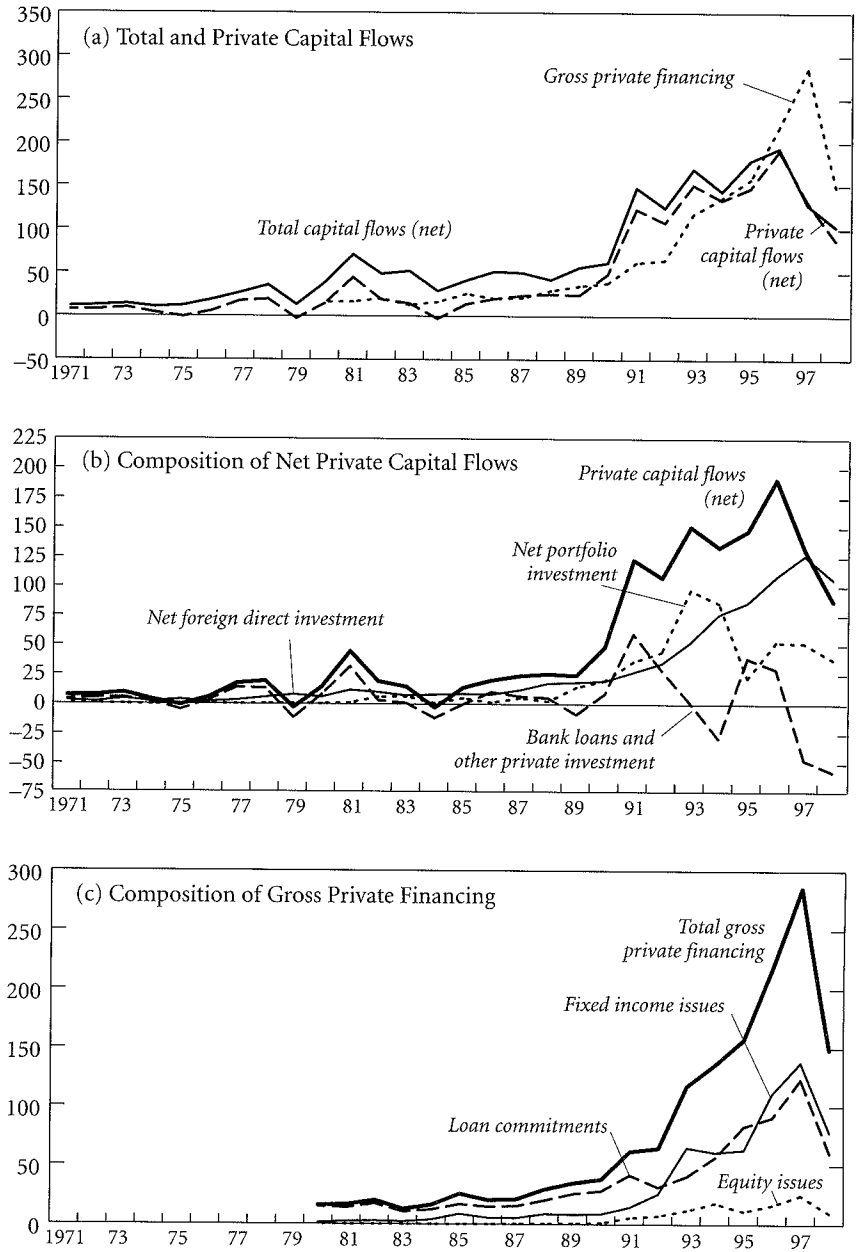
Figure A1 shows the development of net total and private capital flows to developing countries beginning in 1971 and of gross private financing beginning in 1980. Two main boom-bust cycles are discernible from the net flow data.[33] The first builds up in the 1970s and especially after the second oil crisis of 1979, and unwinds by 1984. This is the cycle associated with the debt crisis of 1982–83. The second cycle begins in the late 1980s and rises until about 1996, and begins unwinding in 1997. The broad movements of gross financing are generally correlated with these trends except that (1) the cycle associated with the debt crisis of the early 1980s is not discernible in gross financing data (perhaps because we have no information on the increase of gross financing in the 1970s), (2) the "bust" phase of the cycle of the 1990s appears to begin in 1998 rather than 1997. Quarterly data reveal, however, that gross financing peaked in the third quarter of 1997, that is, the reversal actually occurred in the second half of 1997.

Figure A1(a) and Table A1 also show that the contribution of private to total financing was much higher (in percentage terms) in the 1990s than in the 1970s and 1980s. Note that the gap between private and total financing (i.e., the contribution of net official borrowing to total financing) widens considerably following the bust of the early 1980s, only to narrow sharply as the next boom sets in around 1990. This suggests a countercyclical behavior of official financing (both in percentage terms and in absolute levels), as one might expect. Note also, though, that the beginning bust in 1997 does not appear to be associated with an increase in net official financing; only in 1998 does the gap begin to widen again. Simple correlations confirm that official financing was countercyclical to private flows, at least in Asia and Latin America and after 1981. There seem to be considerable discrepancies across regions and periods though (see Table A2).

The composition of net private flows and gross private financing is illustrated in Figures A1(b) and A1(c) as well as Tables A1 and A3, respectively. Four main facts stand out. First, foreign direct investment shows a stable secular trend that is roughly in line with that of net private capital flows as a whole. It is much less volatile than the other two components of net private flows. As a result, however, it constitutes a very high proportion of net private financing during bust phases but a much lower one during boom phases (Table A1, top). Second, the share of portfolio investment (bonds and equity) was insignificant prior to the mid-

[33]Expressing capital flow as a percentage of developing country GDP (not shown) reduces the overall trend but leaves the basic boom-bust patterns unchanged.

Figure A1. Developing Countries: Volume and Composition of Capital Flows
(Billions of U.S. dollars)



Sources: IMF, World Economic Outlook Database, and Bonds, Equities, and Loans Database.

Table A1. Composition of Net Capital Flows: Developing and Transition Countries
(In percent)

	1974–78	1979–83	1984–88	1989–93	1994–98
Developing countries[1]					
Net private capital flows[2]	43.8	40.4	37.7	81.2	92.4
Distribution of net private capital flows					
Net foreign direct investment[3]	37.1	47.9	68.0	33.6	72.9
Net portfolio investment[3]	2.5	16.3	18.7	46.6	36.2
Bank loans and net other private investment[3,4]	60.4	35.8	13.3	19.8	–9.2
Latin America					
Net private capital flows[2,5]	86.2	76.2	1.9	92.4	. . .
Distribution of net private capital flows					
Net foreign direct investment[3,5]	18.3	25.2	. . .	33.1	59.4
Net portfolio investment[3,5]	0.9	9.2	. . .	80.7	53.3
Bank loans and net other private investment[3,4,5]	80.9	65.6	. . .	–13.8	–12.6
Asia					
Net private capital flows[2]	44.9	54.4	61.5	76.4	86.2
Distribution of net private capital flows					
Net foreign direct investment[3,5]	38.2	25.9	31.2	54.0	. . .
Net portfolio investment[3]	0.9	1.2	12.7	10.9	12.5
Bank loans and net other private investment[3,4]	60.8	73.0	56.1	35.1	–12.9
Other[6]					
Net private capital flows[2,5]	. . .	. . .	27.2	76.5	84.2
Distribution of net private capital flows					
Net foreign direct investment[3]	6.0	–6.0	55.9	12.5	47.0
Net portfolio investment[3]	–0.8	–6.1	69.1	48.2	41.6
Bank loans and net other private investment[3,4,5]	94.8	. . .	–25.0	39.3	11.4
Former communist and transition countries					
Net private capital flows[2,5]	20.0	. . .	. . .	9.0	99.6
Distribution of net private capital flows					
Net foreign direct investment[3,5]	. . .	8.6	5.8	. . .	59.6
Net portfolio investment[3,5]	0.0	0.0	0.0	. . .	80.8
Bank loans and net other private investment[3,4,5]	. . .	91.4	94.2	. . .	–40.4

Sources: IMF, *International Financial Statistics* and World Economic Outlook Database.

[1]The definition of developing countries excludes countries in transition.

[2]Expressed in percent of total net flows; defined as the sum of net foreign direct investment, net portfolio investment, and net other investment (private).

[3]Expressed in percent of net private capital flows.

[4]Net other investment (private) is the difference between net other investment (balance of payments definition) and net external borrowing from official creditors.

[5]Ellipsis points indicate that either net private capital flows are larger than total net capital flows or the corresponding component of net private capital flows is larger than net private capital flows.

[6]Other is a residual category after subtracting Asia and Latin America from Developing Countries.

Table A2. Correlation Between Private Capital Flows and Official Borrowing: Developing and Transition Countries

	Total	1971–81	1982–90	1991–98
Between net private flows[1] and net official borrowing				
Developing countries[2]	–0.17	0.58	–0.73	–0.23
Latin America	–0.61	0.84	–0.64	–0.65
Asia	0.23	0.32	–0.17	–0.59
Other[3]	–0.12	–0.73	–0.22	0.46
Former communist and transition countries	–0.45	0.14	–0.71	–0.60
Between change in net private flows[1] and change in net official borrowing				
Developing countries[2]	–0.10	0.12	–0.47	–0.05
Latin America	–0.62	0.33	–0.71	–0.74
Asia	–0.04	–0.49	–0.27	0.02
Other[3]	0.18	–0.27	–0.06	0.55
Former communist and transition countries	–0.40	–0.11	–0.84	–0.30

Source: IMF, World Economic Outlook Database and staff estimates.

[1]Net private capital flows is defined as the sum of net foreign direct investment, net portfolio investment, and net other investment minus net official borrowing.

[2]The definition of developing countries excludes countries in transition.

[3]Other is a residual category after subtracting Asia and Latin America from Developing Countries.

1970s, and has been rising since then. Two phases can be distinguished: the 1980s when the share of portfolio investment rose and subsequently remained stable in the 15–20 percent range, and the 1990s when the share continued to rise sharply in most regions, bringing the average share up to over 35 percent, and up to 50 percent during the boom phase prior to the crises of the mid-1990s. The notable exception here is Asia, where portfolio investment remained around 10–15 percent. Third, the initial rise of portfolio investment during the 1980s was almost entirely driven by bond issues, while the 1990s witnessed a rapid increase in the relative importance of equity investments, which rose from zero to up to about 15 percent of gross private financing. Fourth, the share of bank loans in private flows suffers a secular decline, particularly after the debt crisis, which roughly mirrors the rise of portfolio investment. This decline is less pronounced in Asia than in the other regions (Table A3).

The maturity of debt is usually reported as stock rather than flow data, which makes sense if one is interested in the vulnerability of countries to capital flow reversals. Figure A2 and Table A4 show data from three sources: the World Bank's Global Development Finance database (formerly known as World Debt Tables), which reports the *original maturity* of debt stocks based on debtor country data and some maturity information from creditors, BIS data on the

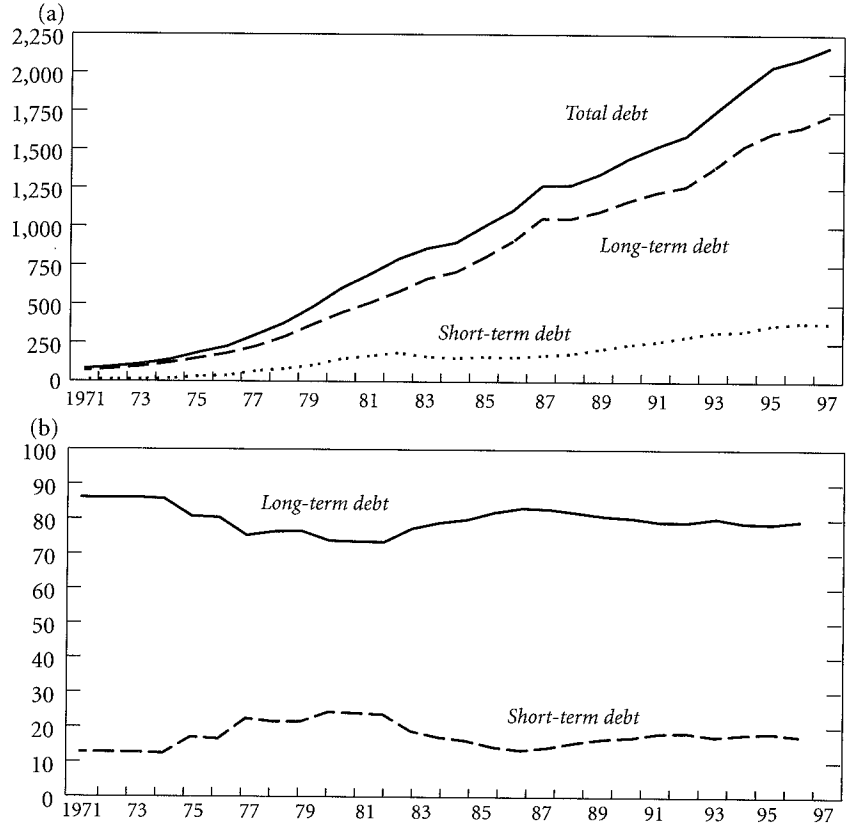
Table A3. Composition of Gross Private Financing: Developing and Transition Countries
(In percent)

	1980–83	1984–88	1989–93	1994–98
Developing countries[1]				
Distribution of total gross private financing				
Fixed income issues	13.1	28.4	38.6	47.7
Equity issues	0.1	1.1	8.4	8.5
Loan commitments	86.8	70.5	53.0	43.8
Latin America				
Distribution of total gross private financing				
Fixed income issues	14.8	25.0	61.5	64.6
Equity issues	0.0	0.2	16.2	5.2
Loan commitments	85.2	74.7	22.2	30.3
Asia				
Distribution of total gross private financing				
Fixed income issues	12.3	31.5	30.6	41.1
Equity issues	0.0	1.5	7.5	10.7
Loan commitments	87.7	67.1	61.8	48.1
Other[2]				
Distribution of total gross private financing				
Fixed income issues	10.6	24.5	29.4	39.5
Equity issues	0.8	1.0	2.5	8.2
Loan commitments	88.6	74.5	68.2	52.3
Former communist and transition countries				
Distribution of total gross private financing				
Fixed income issues	2.6	19.1	38.1	48.6
Equity issues	0.0	0.0	0.5	7.0
Loan commitments	97.4	80.9	61.4	44.4

Source: IMF, Bonds, Equities, and Loans Database.
[1]The definition of developing countries excludes countries in transition.
[2]Other is a residual category after subtracting Asia and Latin America from Developing Countries.

remaining maturity of bank loans on the basis of information by creditor banks, and similar information on bond maturity data. The main message from Figure A2 is that there seems to be no trend in the maturity composition of overall debt when viewed over the entire period, Figure A2(b) indicates, however, a *cycle* in debt maturity that roughly coincides with the boom-bust cycle of the late 1970s and early 1980s, with debt maturities shortening during the boom phase and lengthening after the bust. Figure A2(b) and Table A4 also indicate a moderate shortening in the initial maturity of overall debt during the cycle of the 1990s, at least until 1996. Table A4 also shows a much more pronounced shortening of *remaining* maturities—the more relevant concept as an indicator of a country's vulnerability to capital flow reversals—since the late 1980s (see data on bank loans and bonds). Aggregate bank loan data show a substantial increase in the

Figure A2. Developing Countries: Maturity Structure of Debt
(Billions of U.S. dollars)



Source: World Bank, Global Development Finance Database.

share of short-term debt between 1988 and 1996, with some subsequent unwinding. There are considerable regional differences underlying this aggregate, however, with Asia showing a pronounced cycle that peaks in 1995, Latin America a more or less continuous upward trend, and the maturity profile of the remaining developing world staying more or less flat. In contrast, bond maturity data show a rising trend in the proportion of short-term debt for *all* regions between 1985 and 1998. The period under consideration may be too short, though, to distinguish whether this is indeed part of a secular trend or of a long cycle that has yet to unwind.

Finally, we turn to the sectoral composition of capital recipients, again using stock data on both bank loans and bonds (Table A5). In the aggregate

Table A4. Short-Term (ST) Debt as a Share of Total Debt: Developing and Transition Countries
(In percent)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Developing countries[1]														
ST share of overall debt[2,3]	16.2	14.3	13.4	14.3	15.7	16.7	17.1	18.3	18.4	17.4	18.0	18.4	17.6	...
ST share of total bank loans[3,4]	44.6	41.8	41.2	41.2	42.2	46.6	48.3	52.4	56.1	54.1	57.5	58.0	58.0	54.9
ST share of total bond debt[3,5,6]	2.3	3.2	4.8	5.0	5.1	5.5	9.7	9.1	8.0	9.9	10.9	11.3	10.9	10.8
Latin America														
ST share of overall debt[2,3]	11.2	8.5	9.6	10.8	13.1	16.3	17.6	18.6	20.0	20.0	18.9	17.5	17.8	...
ST share of total bank loans[3,4]	39.5	34.9	33.2	32.4	31.2	36.2	39.6	44.4	49.8	50.7	52.1	53.4	53.6	55.0
ST share of total bond debt[3,5,6]	6.6	11.0	18.9	12.8	9.2	9.4	11.8	9.3	9.6	12.2	15.4	15.8	13.5	8.8
Asia														
ST share of overall debt[2,3]	17.6	14.0	12.3	13.0	12.5	13.8	14.8	16.1	16.2	16.2	19.2	20.7	19.0	...
ST share of total bank loans[3,4]	45.1	43.3	44.9	46.8	49.4	53.3	56.7	60.7	62.5	57.5	63.5	62.4	61.5	53.5
ST share of total bond debt[3,5,6]	0.3	0.3	0.1	2.2	2.0	3.3	8.3	9.7	6.8	7.3	6.9	6.4	8.3	13.4
Other[7]														
ST share of overall debt[2,3]	21.5	20.5	17.2	16.6	17.5	18.7	18.9	21.7	23.5	19.7	19.9	20.9	16.2	...
ST share of total bank loans[3,4]	55.8	55.6	54.1	53.3	55.4	55.9	51.4	53.6	56.2	54.0	54.0	53.9	56.6	57.7
ST share of total bond debt[3,5,6]	2.3	4.2	7.3	6.1	10.4	8.6	11.0	7.2	6.5	9.8	9.2	12.3	9.9	10.3
Former communist and transition countries														
ST share of overall debt[2,3]	17.5	18.5	18.4	22.5	25.9	19.5	16.5	14.4	8.7	8.7	9.4	10.3	...	...
ST share of total bank loans[3,4]	39.4	36.8	33.3	37.7	38.7	32.5	24.2	29.6	35.6	36.3	38.4	43.9	47.6	44.4
ST share of total bond debt[3,5,6]	0.0	2.5	0.0	0.0	0.2	0.9	1.1	2.0	3.2	7.9	13.6	7.3	8.3	10.4

Sources: World Bank, Global Development Finance Database (GDF); IMF, Bonds, Equities, and Loans Database (BEL); and Bank for International Settlements (BIS).

[1]The definition of developing countries excludes countries in transition except in the case of GDF data, which includes countries in transition.

[2]From the Global Development Finance Database.

[3]Short-term bond debt from the GDF database is defined as debt that has an *original maturity* of one year or less, while short-term bank loans from the BIS and short-term bond debt from BEL are both defined as debt that has a *remaining maturity.*

[4]From the Bank for International Settlements.

[5]From the Bonds, Equities, and Loans Database.

[6]Excluding convertible bonds.

[7]Other is a residual category after subtracting Asia and Latin America from Developing Countries.

data, the main notable trend for both bond and bank debt is a substantial increase in the proportion of debt owed by the private sector. For the case of bank-based debt, both Latin America and Asia show a strong upward trend, beginning in 1989 for Latin America and over the whole sample period for Asia. For bond-based debt, the upward trend in private debt is driven by Asia, where privately owed debt rises from just under 10 percent to almost 60 percent of total bond-based debt between 1985 and 1997. In contrast, Latin America sets out at a much higher level (30 percent in 1985) and peaks in 1994 at about 55 percent, followed by a rapid decline to 36 percent in 1998.

Volatility of Capital and Capital Flow Reversals

We next turn to the issue of whether capital flows have become more volatile in the 1990s relative to earlier decades. We work from two perspectives. First, it is straightforward to check whether there is a trend in the *variance* of capital flows to a given set of countries, expressed in percent of GDP of those countries, along subperiods of time. To be able to compute such variances for sufficiently short subperiods, one needs to work with quarterly data. Second, one may want to ignore small, high-frequency movements that could be driving changes in variances but do not affect the stability of a country, and instead focus on the incidence and average volume of capital flow *reversals,* defined as declines in capital flows in excess of a given threshold. In this context, it is sufficient to use annual data, which is available for a longer time period and a larger set of developing economies.

Table A6 computes the variance of gross private financing and net private capital flows for a set of time periods since 1980 and a sample of nine large emerging economies: three from Latin America (Argentina, Brazil, and Mexico), four from Asia (Korea, Pakistan, Philippines, and Thailand) and two others (Israel and South Africa). The upper panel shows the variance of gross private financing and confirms the view that the volatility of flows to emerging markets was higher in the second half of the 1990s relative to previous periods. This is true for all countries in the sample as well as aggregate flows across regions and across the entire sample. For Latin America, the variance of gross financing almost triples in the 1993–97 period relative to the average of earlier periods; for Asia, it almost quadruples. This pattern is *not* confirmed, however, when variances are computed using net private capital flows (see lower panel of Table A6). In this case, the variance in the 1993–97 period is the highest of the four periods in only four of the nine countries (namely, all Asian countries). For the aggregate data, the variance shows no trend, regardless of whether Argentina, which constitutes an outlier for the 1988–93 subperiod, is excluded or not.

Table A5(a). Sectoral Composition of Bank Loans by Issuer: Developing and Transition Countries
(In percent)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Developing countries[1]														
Banks	26.8	26.4	26.1	26.6	27.2	28.9	30.2	32.7	35.1	31.8	25.6	23.1	23.8	25.9
Public sector	41.2	42.2	43.4	44.0	42.2	37.6	35.4	32.1	28.8	29.1	29.3	22.4	19.1	18.9
Nonbank private sector	29.3	29.9	28.6	27.4	28.5	31.5	33.2	34.2	35.6	38.6	35.4	37.2	41.9	51.2
Unallocated	2.6	1.5	1.8	2.0	2.1	1.9	1.2	1.0	0.5	0.4	0.3	0.2	0.1	0.2
Latin America														
Banks	22.0	21.3	20.8	21.3	21.7	21.7	21.9	24.9	26.3	25.4	24.8	24.4	25.1	24.1
Public sector	50.1	51.7	54.1	55.9	55.9	52.0	48.4	43.0	38.3	33.8	34.4	28.4	23.2	20.2
Nonbank private sector	26.4	26.0	24.0	21.6	21.2	25.0	28.6	30.9	34.8	40.2	40.5	47.1	51.5	55.5
Unallocated	1.5	1.0	1.1	1.2	1.2	1.2	1.1	1.2	0.6	0.5	0.3	0.2	0.2	0.2
Asia														
Banks	30.6	27.6	27.9	28.9	29.8	33.2	36.2	38.5	40.9	33.8	19.5	16.0	17.5	21.9
Public sector	39.5	38.9	38.7	37.1	33.4	29.8	26.4	22.9	20.2	26.0	27.2	18.6	16.0	18.4
Nonbank private sector	27.6	32.3	31.9	32.3	35.1	35.7	36.4	37.9	38.6	39.9	32.0	30.9	35.8	50.5
Unallocated	2.3	1.2	1.5	1.7	1.7	1.4	0.9	0.8	0.3	0.2	0.2	0.1	0.1	0.2
Other[2]														
Banks	34.6	36.5	35.3	35.1	34.8	35.5	35.5	37.1	40.3	39.0	40.1	41.2	39.6	38.1
Public sector	22.5	24.4	25.5	27.0	25.3	23.4	26.5	27.6	27.1	26.7	25.1	21.9	19.6	17.6
Nonbank private sector	37.4	36.2	35.2	34.1	35.7	37.4	36.3	34.1	32.0	33.8	34.3	36.5	40.8	44.2
Unallocated	5.5	2.9	3.5	3.8	4.2	3.7	1.8	1.2	0.6	0.6	0.5	0.4	0.1	0.1
Former communist and transition countries														
Banks	50.6	60.8	58.9	48.9	61.4	62.9	65.1	69.3	72.1	73.1	73.7	68.6	53.4	50.1
Public sector	29.9	32.5	32.7	27.2	30.1	22.8	22.2	19.2	17.2	15.3	14.2	12.7	13.9	13.6
Nonbank private sector	2.1	1.9	1.4	0.4	4.5	11.2	10.6	10.0	10.1	11.5	11.9	18.6	32.6	36.2
Unallocated	17.4	4.9	4.9	4.0	4.1	3.0	2.1	1.6	0.6	0.1	0.2	0.1	0.1	0.1

Source: Bank for International Settlements.
[1]The definition of developing countries excludes countries in transition.
[2]Other is a residual category after subtracting Asia and Latin America from Developing Countries.

Table A5(b). Sectoral Composition of Bond Stocks by Issuer: Developing and Transition Countries
(In percent)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Developing countries[1]														
Sovereign	35.3	32.5	30.8	36.6	38.4	36.2	33.2	29.3	24.5	22.0	23.2	27.7	30.1	33.2
Other public sector	40.7	44.2	43.9	41.8	41.9	43.7	42.9	40.4	36.1	31.8	28.9	25.7	24.4	22.6
Private	24.0	23.3	25.3	21.6	19.7	20.1	23.9	30.3	39.4	46.2	47.9	46.6	45.5	44.2
Latin America														
Sovereign	21.6	21.5	24.5	52.1	57.6	42.6	34.5	23.6	17.5	17.3	24.3	37.5	46.9	49.8
Other public sector	47.5	44.4	40.7	25.9	25.3	36.5	35.9	32.3	29.4	28.1	23.8	19.0	16.2	14.3
Private	30.9	34.1	34.8	22.0	17.1	20.9	29.6	44.1	53.1	54.6	51.9	43.5	36.8	35.9
Asia														
Sovereign	51.5	42.6	37.8	36.4	36.1	33.7	29.9	25.4	17.1	12.1	9.6	9.0	8.4	11.0
Other public sector	38.9	46.8	47.7	48.9	49.6	51.1	51.3	52.8	49.9	40.6	37.7	35.0	33.4	31.1
Private	9.6	10.6	14.5	14.7	14.3	15.2	18.8	21.8	33.0	47.2	52.7	55.9	58.2	57.9
Other[2]														
Sovereign	12.8	11.9	13.1	22.5	28.9	37.1	42.7	53.7	68.4	74.2	76.7	75.5	62.6	55.8
Other public sector	37.8	36.0	33.9	34.7	33.7	28.8	25.2	23.0	17.1	11.6	9.3	9.4	15.9	21.0
Private	49.4	52.1	53.0	42.8	37.4	34.1	32.2	23.3	14.5	14.2	14.0	15.1	21.5	23.1
Former communist and transition countries														
Sovereign	79.1	77.9	86.4	79.3	62.8	59.7	63.2	69.2	78.6	79.1	83.8	86.9	78.9	75.7
Other public sector	0.0	0.0	0.0	12.9	32.9	37.3	34.8	29.2	21.1	20.4	15.7	10.0	10.3	9.9
Private	20.9	22.1	13.6	7.8	4.3	3.0	2.0	1.6	0.3	0.5	0.5	3.2	10.8	14.4

Source: IMF, Bonds, Equities, and Loans Database.
[1]The definition of developing countries excludes countries in transition.
[2]Other is a residual category after subtracting Asia and Latin America from Developing Countries.

Table A6. Volatility of Capital Flows to Selected Developing Countries[1]
(In percent of GDP, based on quarterly flow data)

	Gross Private Financing			
	1980:Q1–1983:Q3	1983:Q4–1988:Q2	1988:Q3–1993:Q1	1993:Q2–1997:Q4
Argentina	0.35	0.04	0.02	0.37
Brazil	0.04	0.19	0.18	0.33
Mexico	0.19	0.03	0.12	0.54
Korea	0.19	0.25	0.04	0.39
Pakistan	0.03	0.04	0.05	0.77
Philippines	0.15	0.02	0.04	1.02
Thailand	0.11	0.23	0.05	0.57
Israel	0.09	0.05	0.29	0.37
South Africa	0.01	0.11	0.02	1.03
Total[2]	0.02	0.03	0.03	0.10
Total excluding Argentina	0.02	0.04	0.04	0.09
Latin America	0.04	0.03	0.06	0.14
Asia	0.04	0.07	0.02	0.19

	Net Private Capital Flows			
	1980:Q1–1983:Q3	1983:Q4–1988:Q2	1988:Q3–1993:Q1	1993:Q2–1997:Q4
Argentina	2.24	2.35	47.94	0.64
Brazil	1.02	0.32	3.66	1.19
Mexico	3.94	1.90	0.96	2.85
Korea	1.21	1.14	0.54	5.08
Pakistan	0.14	0.10	0.34	0.53
Philippines	1.51	1.12	0.84	3.70
Thailand	0.90	0.71	0.44	11.33
Israel	5.29	6.50	2.42	2.58
South Africa	1.25	0.94	0.16	0.77
Total[2]	0.53	0.14	0.47	0.33
Total excluding Argentina	0.63	0.19	0.44	0.44
Latin America	1.28	0.24	1.34	0.57
Asia	0.56	0.44	0.28	3.62

Source: IMF, *International Financial Statistics.*
[1]Volatility is calculated as the variance of quarterly capital flows within each subperiod.
[2]Variances based on the sum of capital flows across the sample of countries.

The question is whether these findings hold up when one focuses on the incidence of large capital flow reversals rather than volatility of capital per se. For given thresholds of defining what one means by "reversals," Table A7 shows both the incidence of such reversals and their average volume along analogous subperiods as those of Table A6, based on a sample of 17 economies that jointly account for over 75 percent of flows to developing countries in the periods 1980–98 and 1990–98. The thresholds were chosen in the following

way. First, we tried defining a "reversal" as a reduction in net capital inflows by 3 percent of GDP, following a convention used in the literature on current account reversals[34] (upper right panel of Table A7). After finding that this threshold is fairly low, in the sense that it identifies a rather large number of reversals, we tried doubling this threshold to 6 percent (lower right panel of Table A7). Finally, we picked two thresholds for gross private financing in a way that would generate about the same number of reversals across the subperiods common to both datasets as the 3 and 6 percent thresholds, respectively, for net private capital flows (left panels of Table A7).

Focusing first on the two left panels, note that the results based on gross financing data confirm those of Table A6. Both the incidence and the average volume (for a given threshold) of financing reversals were sharply higher in the period 1994–98 than in the earlier subperiods. This is true regardless of whether the 1 or 2 percent threshold is chosen. A much less definite picture emerges from the right panels of Table A7, however, which are based on the balance of payments concept of net private capital flows. For the lower threshold, there appears to be no clear trend in the incidence of reversals over time; in particular, the incidence of reversals in the subperiod containing the debt crisis is about as large (13) as the incidence of reversals in the 1994–98 subperiod (14). We do find, though, that the average size of reversals greater than 3 percent is larger in the 1990s, driven by much larger reversals in the Asian countries in this period. For the higher threshold, on the other hand, we now find a higher incidence of reversals in the 1994–98 subperiod compared to earlier subperiods, but no real trend in the volume. In other words, measured in terms of net private capital flow reversals as a percent of GDP, the countries that were hit hardest during the debt crisis were hit just as hard—or even harder—than the countries worst hit in the Asian crisis.

Figure A3 gives another presentation of how the incidence of reversals (as defined in Table A7) develops in time, by plotting the total incidence and regional distribution of reversals for each year of our sample period. It confirms that gross financing data show a sharp rising trend, while the evidence from net capital flow data is, at best, mixed. As the lower right panel of the figure shows, even for the 6 percent threshold there is not much of a trend in the incidence of reversals once reversals are no longer aggregated into the subperiods used in Table A7.

In a final step, we check that the results from Table A7 and Figure A3 are not sensitive to the way in which reversals were defined. For each of our two concepts of capital flows, Table A8 plots the distribution of negative changes in flows according to the size of the change, for each of the subperiods of Table

[34]See Milesi-Ferretti and Razin (1996).

Table A7. Reversals of Capital Flows to Selected Developing Countries[1]
(Thresholds are in percent of GDP, based on annual data)

	Gross Private Financing				Net Private Capital Flows					Memo Item[2]
	1981–83	1984–88	1989–93	1994–98	1974–78	1979–83	1984–88	1989–93	1994–98	1981–83
	Threshold: 1 percent				*Threshold: 3 percent*					
Total number	8	8	5	18	6	13	10	6	14	9
Asia[3]	3	5	0	9	1	3	5	1	7	2
Latin America[4]	5	2	4	7	4	7	4	3	5	6
Other[5]	0	1	1	2	1	3	1	2	2	1
Average size	–1.7	–2.2	–2.5	–4.2	–4.3	–7.4	–6.2	–9.5	–11.1	–9.1
Asia[3]	–1.1	–2.4	0.0	–5.3	–3.5	–6.7	–6.5	–5.0	–15.9	–8.5
Latin America[4]	–2.0	–2.1	–2.8	–3.1	–4.2	–8.6	–5.5	–7.5	–6.5	–9.3
Other[5]	0.0	–1.3	–1.5	–3.4	–5.3	–5.3	–7.3	–14.8	–5.8	–8.5
	Threshold: 2 percent				*Threshold: 6 percent*					
Total number	2	3	3	11	0	3	4	3	9	3
Asia[3]	0	2	0	7	0	1	2	0	6	1
Latin America[4]	2	1	3	3	0	2	1	2	2	2
Other[5]	0	0	0	1	0	0	1	1	1	0
Average size	–3.1	–3.4	–3.3	–5.5	0.0	–16.9	–8.3	–14.0	–14.7	–16.9
Asia[3]	0.0	–3.6	0.0	–5.7	0.0	–13.0	–9.7	0.0	–17.9	–13.0
Latin America[4]	–3.1	–2.9	–3.3	–5.2	0.0	–18.8	–6.5	–8.3	–8.8	–18.8
Other[5]	0.0	0.0	0.0	–4.8	0.0	0.0	–7.3	–25.5	–6.9	0.0

Sources: IMF, World Economic Outlook Database, and Bonds, Equities, and Loans Database.

[1]A reversal is defined as a change in the level of capital flows (in percent of GDP) exceeding the threshold value. Changes above the threshold value in adjacent years were counted as one reversal.

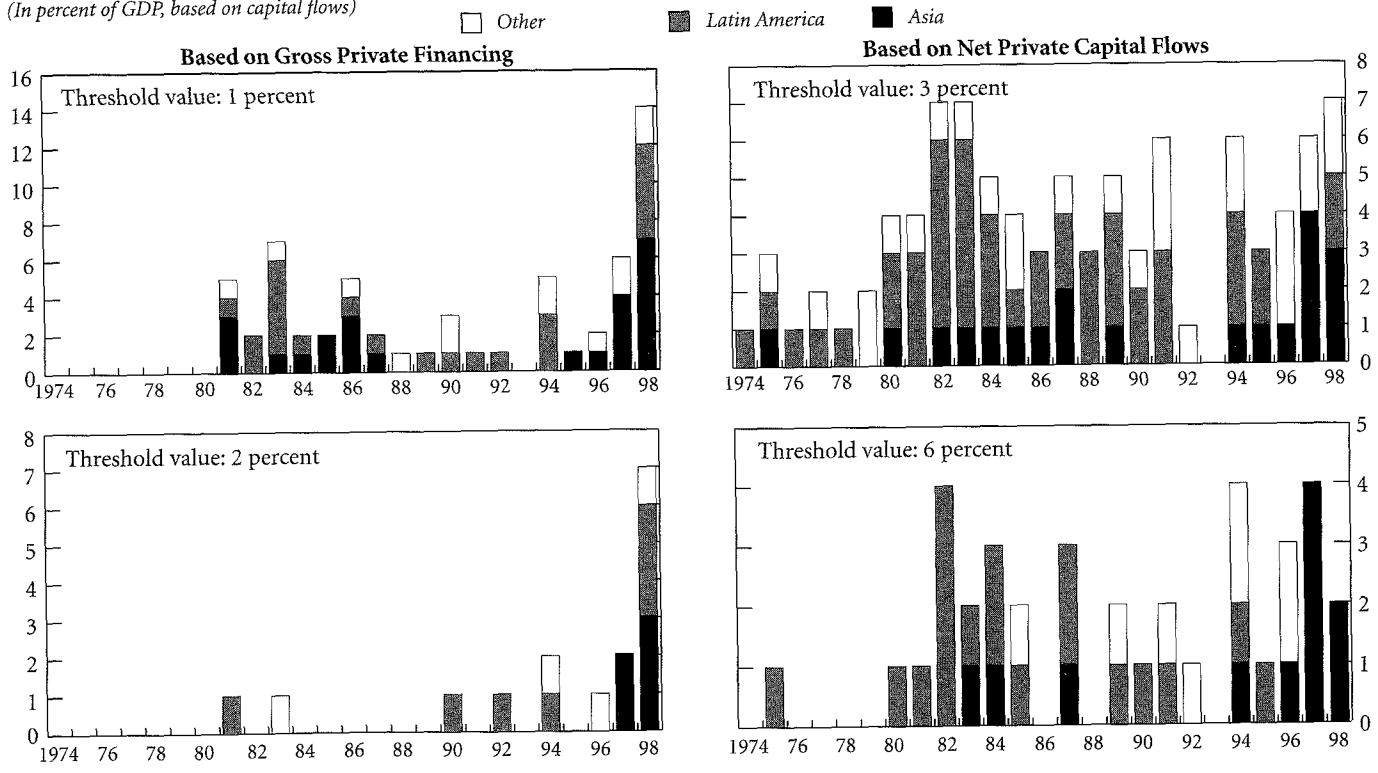
[2]Memorandum item for net private capital flows.

[3]India, Indonesia, Malaysia, Pakistan, Philippines, Thailand, and Korea.

[4]Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela.

[5]Egypt, South Africa, and Turkey.

Figure A3. Instances of Reversals: Regional Composition
(In percent of GDP, based on capital flows)



Sources: IMF, Bonds, Equities, and Loans Database and staff estimates.

A7. In the upper panel, the distribution of reversals for the 1994–98 subperiod dominates the distribution for all earlier subperiods, in the sense that for all categories of negative changes except the first (0–0.5 percent), the incidence of reversals in this subperiod is larger than in any other. The same cannot be said for the lower panel, which is based on net capital flow data. Indeed, comparing the 1980s and the 1990s in the lower panel (see data for 1981–89 and 1990–98) does not give a sense that reversals were generally more frequent in the 1990s. However, if the comparison is between the boom-bust cycle of the 1970s and early 1980s and that of the 1990s (see data for 1975–84 and 1989–98), the case could be made that at least reversals in the upper half of the distribution—namely, exceeding 4.5 percent of GDP—were more frequent in the 1990s cycle than in the earlier boom-bust cycle.

In summary, the behavior of gross private financing flows to emerging markets strongly supports the idea that capital movements have become more volatile, and large reversals more frequent, in the 1990s. In contrast, net capital flows do *not* seem to have been significantly more volatile in the 1990s relative to earlier periods, although we do find some suggestion that larger reversals were more frequent during the 1990s boom-bust cycle relative to that of the 1970s and early 1980s. For the most part, these conflicting findings are likely to be driven by the fact that FDI is included in the definition of the latter but not the former. As we have seen, FDI flows both rise sharply in the 1990s and tend to be much less volatile than loans and portfolio investment. Thus, focusing on the behavior of gross financing probably gives an exaggerated impression of the volatility of capital flows in the 1990s as it misses FDI, a stabilizing component of total private capital flows that was much more prominent in the 1990s than in earlier periods.

Table A8. Distribution of Reversals of Capital Flows to Developing Countries
(In percent of GDP, based on annual flows)

	0–0.5	0.5–1.0	1.0–1.5	1.5–2.0	2.0–2.5	2.5–3.0	3.0–3.5	>3.5
Based on gross private financing								
1981–83	31	13	9	5	4	2	1	1
1984–88	31	11	8	4	3	2	0	0
1989–93	24	11	2	4	0	3	0	2
1994–98	25	26	11	17	5	9	5	7
1981–89	68	28	17	10	7	5	1	1
1990–98	43	33	13	20	5	11	5	9
	0–1.5	1.5–3.0	3.0–4.5	4.5–6.0	6.0–7.5	7.5–9.0	9.0–10.5	>10.5
Based on net private capital flows								
1974–78	45	18	6	2	1	0	1	0
1979–83	51	24	17	7	3	5	1	4
1984–88	56	19	15	5	6	2	1	1
1989–93	46	17	7	8	2	4	0	2
1994–98	44	21	17	9	8	6	2	5
1981–89	97	40	29	14	8	9	2	6
1990–98	79	34	22	14	10	8	2	6
1975–84	100	44	26	10	7	5	3	4
1989–98	90	38	24	17	10	10	2	7
Memorandum item								
1981–83	30	17	12	6	2	5	1	4

Sources: IMF, World Economic Outlook Database, and Bonds, Equities, and Loans Database.

Currency Crises and the Trade-Off Between Adjustment and Financing

International financial crises are clearly not a new phenomenon, going at least as far back as the 1870s.[35] There is a widespread impression, however, that large crises have become more frequent, and exceptionally virulent, in the 1990s. In the remainder of this section, we ask whether this is true over the time period since the collapse of the Bretton Woods system. In particular, we examine whether there are noticeable trends in the incidence of currency crises, in the severity of the balance of payment adjustment following a currency crisis, and in the role of official financing (if any) in mitigating the impact of the crisis.

Currency crises are identified in two ways. Building on recent work for the *World Economic Outlook*,[36] we define a *pressure index* as a weighted average of the excess of monthly percentage depreciation and monthly percentage reserve changes over their respective country-specific means, excluding periods of inflation in excess of 100 percent.[37] A crisis is identified if the pressure index exceeds the sum of its mean plus a given factor of its standard deviation (both defined over the entire sample) and no other crisis occurred in the preceding 18 months. Second, we use a criterion inspired by Frankel and Rose (1996), defining a crisis as a monthly depreciation that *both* exceeds a certain absolute threshold (identical for all countries) *and* exceeds average monthly depreciation in that country over the last 12 months by an-

[35]See IMF (1997a).

[36]IMF (1998b), Chapter 4. Related criteria are used by Eichengreen, Rose, and Wyplosz (1995), and Kaminsky and Reinhardt (1999).

[37]The weights were chosen to equalize the variance of the two components of the index over the entire sample. More precisely, the index is defined as follows:

$$pressure_i \equiv \frac{\Delta x_i - \mu_{\Delta x_i}}{\sigma_{\Delta x}} - \frac{\Delta r_i - \mu_{\Delta r_i}}{\sigma_{\Delta r}}$$

where x stands for the natural logarithm of the nominal exchange rate (in local currency per US$), r for the natural logarithm of international reserves, and i for a country index. Thus, a higher "pressure index" indicates either a higher depreciation or a higher reserve loss or both.

other threshold.[38] The latter is introduced to help deal with high-inflation periods. The advantage of the pressure index is that it captures speculative attacks that ultimately did not lead to a (large) depreciation but involved large reserve losses. On the other hand, the Frankel-Rose-type criterion does not require the elimination of high-inflation periods from the sample.

Table A9 and Figure A4 show the number of crises identified by these two criteria since the mid-1970s, for three progressively higher thresholds in each case. For the case of the pressure index, the standard deviation (SD) factor of 1.5 was used in the May 1998 WEO while the more demanding factor of 3.0 (which would roughly identify the top 0.5 percentile of pressure index realizations if the latter were normally distributed), has been used elsewhere in the literature on currency crises.[39] The 2.0 factor is shown as an intermediate possibility.[40] The thresholds for the Frenkel-Rose-type criterion were chosen in a way that generates roughly the same total number of crises as those generated by the pressure index at the three levels of the SD factor.

The main result of Table A9 and Figure A4 is that the incidence of currency crises shows no trend over the 1975–98 period. The incidence in the five-year period 1994–98 is not particularly high when compared with earlier periods, usually ranking third or even fourth among the five subperiods. This finding is robust across both identifying criteria and thresholds, regardless of whether one looks at the sample of 17 large emerging market economies, which we focused on in the previous section, or a larger sample of 34 developing countries used in the 1998 *World Economic Outlook* chapter on currency crises.

Next, we ask whether the average extent of postcrisis adjustment, that is, the extent to which the crisis affected the real economy—as measured by either the current account or output—is larger in the 1990s than in previous periods. Judging from Table A10 and Figure A5, the answer is not clear-cut. Based on the top panel of the table, the average current account turnaround after crises that were identified by the pressure index criterion (with SD factor 1.5) was much higher in the 1994–98 period than in preceding subperiods.[41]

[38]As in the case of the pressure index, an 18-month window applies. Note that this is not the exact criterion actually applied by Frankel and Rose. They work with annual data and use thresholds of 25 percent for annual depreciation and 10 percent for the excess of annual depreciation relative to the trend of the last three years. A three-year window applies in their case.

[39]See Kaminsky and Reinhardt (1999); and Berg and Pattillo (1999).

[40]This would roughly correspond to the top 2.5 percentile of the index if it were normally distributed.

[41]The next panel (SD factor 3.0) also shows a high turnaround for the 1989–93 period, but this is mainly due to the effect of a large outlier (Venezuela 1989).

Table A9. Distribution of Currency Crises Over Time

	Full Sample of 34 Countries[1]					Subsample of 17 Large Countries[2]				
	1975–78	1979–83	1984–88	1989–93	1994–98	1975–78	1979–83	1984–88	1989–93	1994–98
Crises identified using pressure index (WEO criterion)[3]										
SD Factor: 1.5										
Total	22	30	35	28	20	10	14	15	12	15
Latin America	7	11	14	9	5	4	4	7	3	4
Asia	6	7	4	5	7	2	5	3	5	7
Other	9	12	16	12	8	4	5	5	4	4
SD Factor: 2										
Total	15	24	26	21	19	7	11	12	8	14
Latin America	5	9	14	6	4	2	4	7	2	3
Asia	4	5	4	4	7	2	3	3	4	7
Other	6	10	7	9	8	3	4	2	2	4
SD Factor: 3										
Total	9	17	15	12	13	5	10	7	5	9
Latin America	3	7	10	3	3	2	3	5	1	3
Asia	3	3	2	2	4	1	3	1	2	4
Other	3	7	3	6	5	2	4	1	2	2
Crises identified using Frankel-Rose-type criterion[4]										
Thresholds: 7.5 percent; 5 over trend										
Total	24	24	30	32	25	11	14	18	18	15
Latin America	9	11	15	13	6	7	7	10	9	4
Asia	5	4	4	6	8	2	4	3	5	7
Other	9	9	10	12	10	2	3	5	4	4
Thresholds: 10 percent; 6.5 over trend										
Total	16	19	28	23	19	9	11	17	12	12
Latin America	8	10	16	11	6	6	6	11	7	5
Asia	3	3	4	2	5	1	3	3	2	5
Other	5	6	7	9	7	2	2	3	3	2
Thresholds: 20 percent; 15 over trend										
Total	11	13	16	16	9	7	8	10	8	7
Latin America	6	8	12	9	3	5	4	8	6	3
Asia	3	2	2	0	3	1	2	1	0	3
Other	2	3	2	6	2	1	2	1	2	1

Source: IMF, World Economic Outlook (WEO) Database and staff estimates.

[1]Argentina, Bangladesh, Brazil, Chile, China, Colombia, Costa Rica, Ecuador, Egypt, Hong Kong SAR, India, Indonesia, Israel, Jamaica, Kenya, Korea, Malaysia, Mexico, Morocco, Nigeria, Pakistan, Paraguay, Peru, Philippines, Singapore, South Africa, Sri Lanka, Taiwan Province of China, Thailand, Tunisia, Turkey, Uruguay, Venezuela, and Zimbabwe.

[2]Argentina, Brazil, Chile, Colombia, Egypt, India, Indonesia, Korea, Malaysia, Mexico, Pakistan, Peru, Philippines, South Africa, Thailand, Turkey, and Venezuela.

[3]Crisis if pressure index exceeds mean + standard deviation times SD factor (see text for definition of pressure index).

[4]Crisis if monthly depreciation exceeds first threshold *and* average depreciation over last 12 months by more than second threshold.

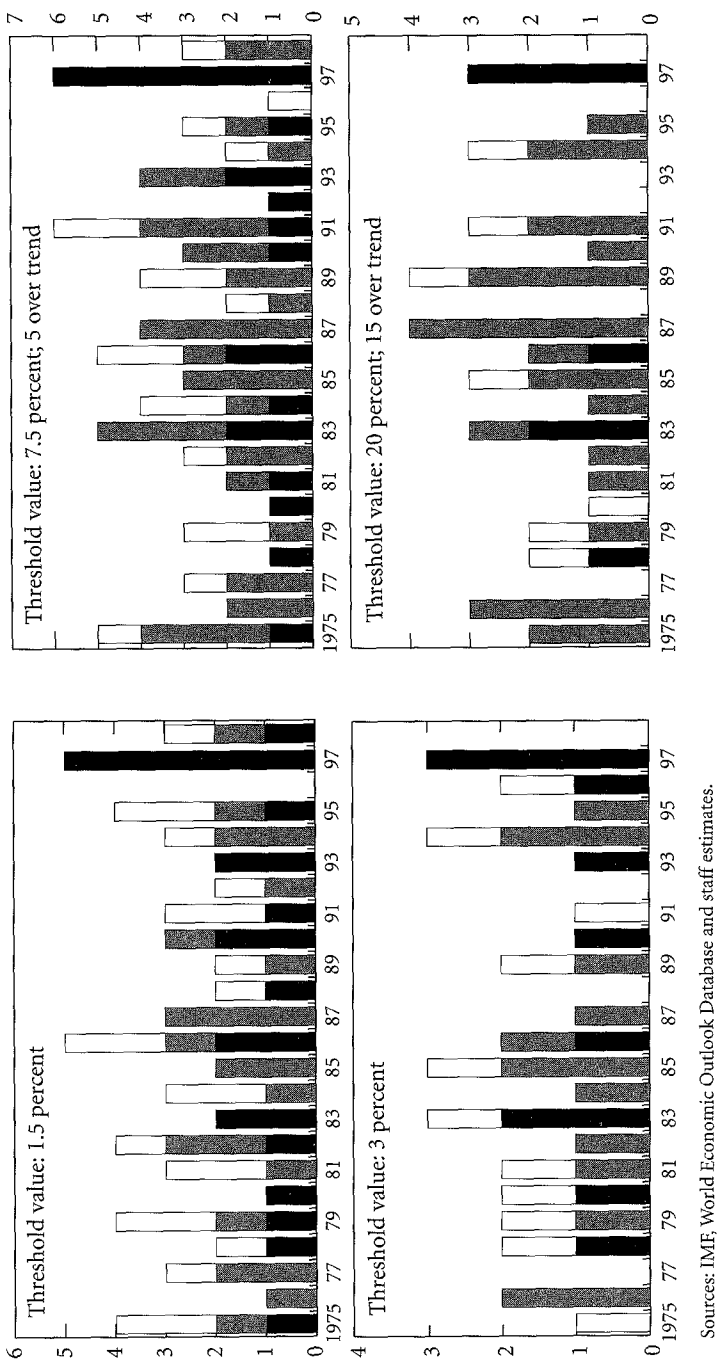


Figure A4. Distribution of Currency Crises Over Time
(In percent of GDP based on capital flows)

Table A10. Adjustment After Crisis: Sample of Large Countries
(In percent of GDP, based on annual data)

	1975–78	1979–83	1984–88	1989–93	1994–98
Average current account adjustment			*SD Factor: 1.5*		
Crisis Year + 1 (rel. to crisis year)	2.4	2.2	0.5	2.0	5.3
Crisis Year + 1 (rel. to 3-year precrisis average)	0.2	0.6	0.3	2.5	6.9
			SD Factor: 3.0		
Crisis Year + 1 (rel. to crisis year)	1.9	2.4	–0.1	4.7	4.9
Crisis Year + 1 (rel. to 3-year precrisis average)	0.1	0.1	–0.4	7.4	6.7
Average output loss[1]			*SD Factor: 1.5*		
First two crisis years	–3.1	–9.1	–2.1	–4.4	–7.9
Entire crisis period	–3.1	–10.5	–4.5	–5.9	–7.9
			SD Factor: 3.0		
First two crisis years	–5.3	–8.3	–3.0	–7.1	–10.8
Entire crisis period	–13.7	–10.3	–8.2	–8.4	–11.1
Average output loss weighted by share of world output[2]			*SD Factor: 1.5*		
First two crisis years	–3.1	–10.1	–3.4	–4.5	–11.7
Entire crisis period	–3.1	–11.1	–4.5	–5.4	–11.7
			SD Factor: 3.0		
First two crisis years	–5.5	–11.9	–2.3	–5.2	–18.2
Entire crisis period	–9.4	–13.3	–4.1	–6.2	–18.4

Source: IMF, World Economic Outlook Database and staff estimates.

[1]Calculated as the sum of the differences between the average output growth in the three years preceding the crisis and either output growth in the first two crisis years or over the entire crisis period. The end of the crisis period is defined as the year at which output growth returns to the precrisis trend, except for (1) the 1997 crises and (2) Brazil 1987, in which output growth did not (yet) return to trend. In these cases, the "entire crisis period" is set equal to the first two crisis years.

[2]As above, except that output loss is weighted by the country's PPP share of world output.

According to the simple average output loss criterion, however, the average crisis of the late 1990s was no worse than the average crisis of the early 1980s. This echoes some of our results on the magnitude of capital flow reversals in the previous section. However, this still leaves the possibility that *world output* suffered more during the 1990s crises than in the early 1980s crises, because those countries that were hard hit might have constituted a larger share of the world economy than those that were hit hard in the previous decade. The bottom panels of the table, showing the average output loss weighted by the size of the economy in crisis, suggests that this was indeed the case,

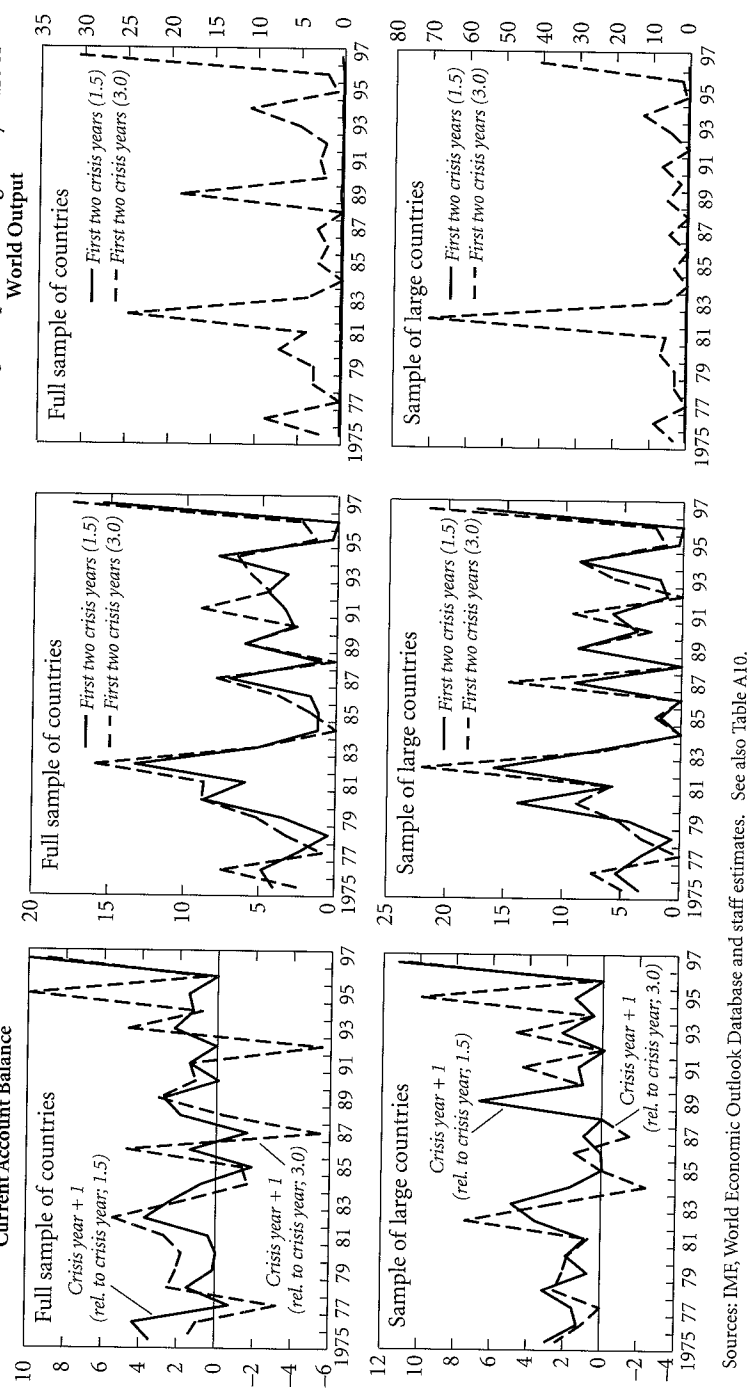


Figure A5. Adjustment After the Crisis
(In percent of GDP)

Sources: IMF, World Economic Outlook Database and staff estimates. See also Table A10.

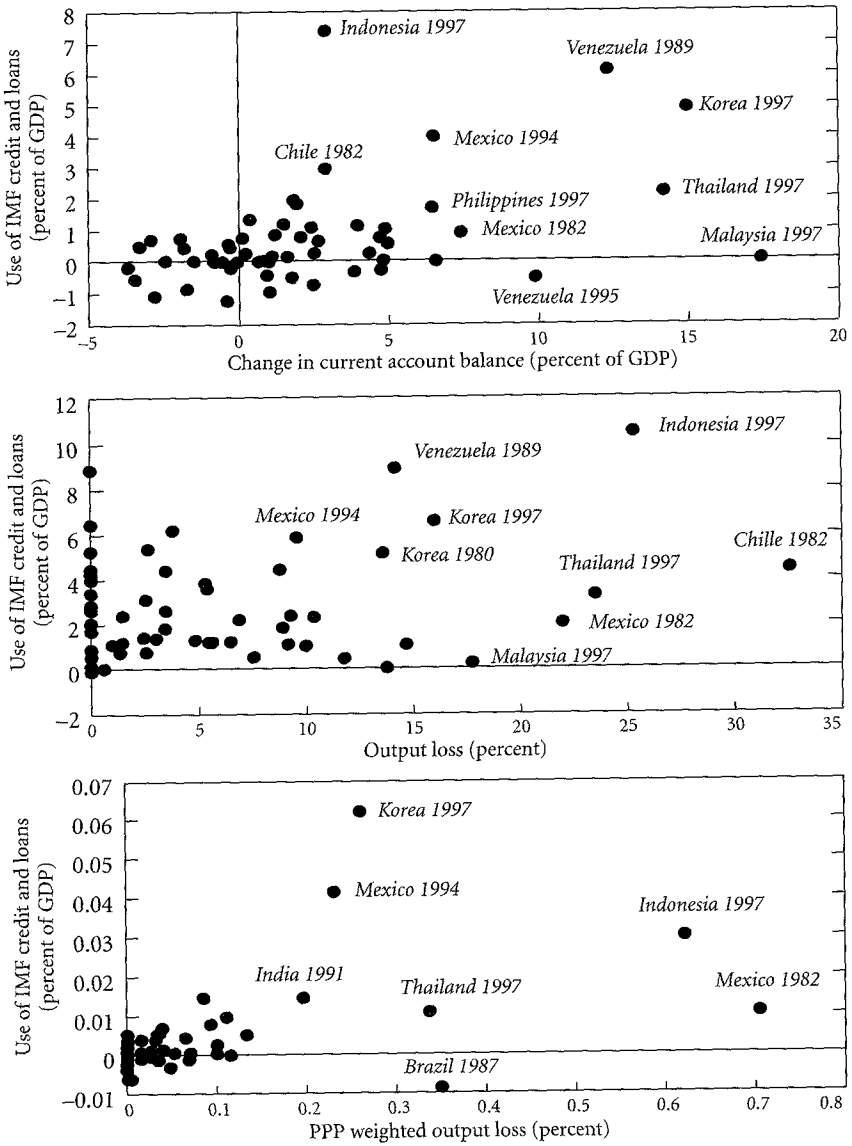
although its extent is sensitive to the cutoff defining crises. If the threshold is set high, meaning that relatively small depreciations or reserve losses—which often implied zero or small output losses, particularly in the 1990s—are disregarded, then the crises of the late 1990s come across as much more damaging than those of the early 1980s.

Finally, we consider the trade-off between official financing and adjustment, where the former is measured either by net IMF purchases or net lending from all multilateral institutions, and the latter by the three measures of Table A10 (also Figures A6 and A7), using the set of crises identified based on the sample of 17 large developing countries and the standard deviation factor of 1.5 (see Table A9).[42] The main message from the figures is that the large crises of the 1994–98 period—Thailand, Indonesia, and Korea in 1997, and (to a lesser extent) Mexico in 1994—are located up and to the left of the main concentration of points, implying that the trade-off between adjustment and financing was worse for these crises than for most other crisis episodes. The same cannot be said for the 1994–98 crises more generally, in the sense that the remaining crises in this period are all well dispersed within the cloud of points that characterizes the earlier crises. Moreover, there are notable differences across the three adjustment measures (as one might expect on the basis of Table A10). The worsened trade-off between adjustment and financing is most clear in the upper plot of figures, in which adjustment is measured through the current account. In this case, the points for the four large Asian crises and Mexico 1994 are alone with only one other point (Venezuela 1989) in occupying the northeastern half of the plot. If adjustment is measured by unweighted output loss, the case for a worsening of the trade-off is less compelling. In particular, the Mexican rescue appears rather successful when measured in this space—while the extent of official financing was much larger than in 1982, the output loss was also much smaller.

In summary, while the 1990s were not unusual in terms of capital volatility and crisis occurrence, the capital flow reversals in the 1990s were different—and, indeed, "worse"—in several respects. Capital reversals and crises of the 1990s involved private sector debtors to a much greater extent than earlier periods. They were more universal, thus raising the issue of contagion (in par-

[42]It might be reasonably argued that official financing should be defined as the *sum* of official financial assistance and reserve use, which are equivalent insofar as both are substitutes for faster current account adjustment and/or more currency depreciation. Measuring the "reserve use" associated with a given crisis poses substantial practical difficulties, since the reserve loss typically begins in a gradual fashion in the course of foreign exchange market intervention before the crisis erupts.

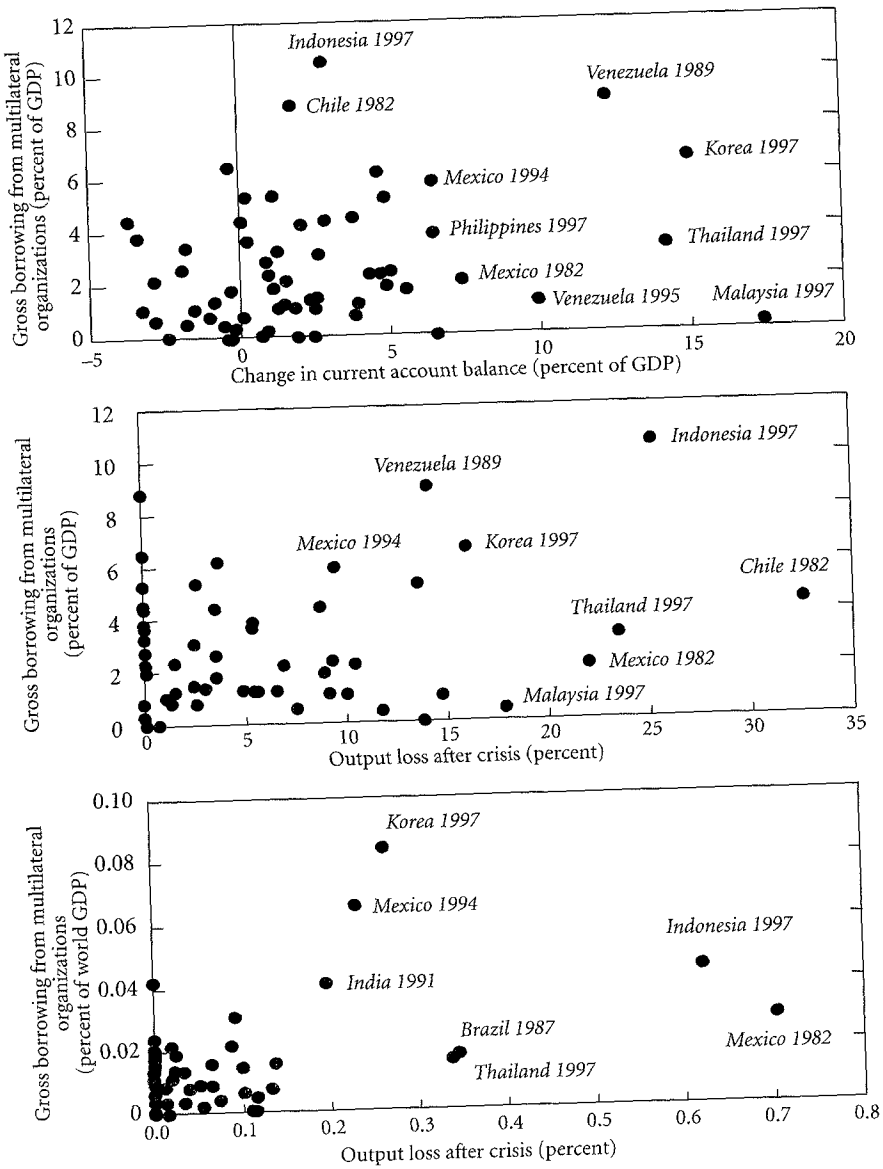
Figure A6. Use of IMF Credit and Loans Versus Measures of Average Adjustment After Crisis for Sample of Large Countries
(Crisis year + 1; Factor 1.5)



Sources: IMF, World Economic Outlook Database; *International Financial Statiatics;* and staff estimates.

Note: The 1998 numbers for the Asian countries are from the WEO, except those for Korea, which are from the IMF Staff Report for the Fifth Review Under the Stand-By Arrangement as of March 8, 1999.

Figure A7. Gross Borrowing from Multilateral Organizations[1] and Measures of Average Adjustment After Crisis: Sample of Large Countries
(SD Factor 1.5)



Sources: IMF, World Economic Outlook Database; *International Financial Statistics;* and staff estimates.

Note: The 1998 numbers for Korea are from the Staff Report for the Fifth Review Under the Stand-By Arrangement, as of March 8, 1999, and cover loan disbursements from the IBRD, IFC, and IMF.

[1]Including the IMF.

ticular after the Asian crisis). They had a larger joint impact on world GDP than any other cluster of emerging market crisis over a period of similar length. They led to larger current account adjustments than earlier crises, and triggered exceptionally large volumes of official financing. The latter suggests that the trade-off between financing and adjustment may have deteriorated, at least as far as the major Asian crisis cases were concerned.

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Comments

Lessons from the Czech Experience

Oldrich Dedek

The Czech Republic's recent history of economic transition is sure to attract attention from any researcher interested in the topic of boom-bust patterns of capital flows. The mid-1990s was a period of massive capital inflows into the country. Net capital inflow as a share of GDP reached 8.5 percent in 1994 and peaked at a record level of 16.6 percent one year later. During this same period official external reserves increased from almost zero at the beginning of 1993 (after the breakup of Czechoslovakia) to $14 billion at the end of 1995. The share of net foreign assets as a component of the change in the money supply almost doubled from 45 percent in 1993 to 80 percent in the last quarter of 1995. In the first quarter of 1997 the Czech economy was exposed to a new wave of capital inflow in the form of Eurobond issues valued at an astonishing $1.7 billion. The exchange rate reacted with a sharp appreciation, just as the current account deficit was widening sharply.

In May 1997, the Czech currency came under attack from severe exchange rate speculation. As a result, the monetary authorities gave up supporting the koruna's currency band and let the exchange rate float. The central bank interest rate climbed in just two weeks from 12.5 percent to 86 percent. The volume of foreign exchange reserves spent in direct interventions was approximately 20 percent of the preattack value. Commercial banks were also hit by a massive liquidity squeeze.

The government launched two austerity packages that imposed budget cuts of as much as 2.7 percent of GDP and a wage freeze in the public sector. Economic instability was quickly followed by political instability. The economy was effectively pushed into recession, with a 4.1 percent decline in output in the last quarter of 1998.

Causes of Monetary Instability

The Czech National Bank maintains a fairly straightforward argument for the currency turbulence in the country—the primary cause was that macroeconomic imbalances were underestimated. The positive macroeconomic results