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## Causes and Consequences of the Recent Crises

It is impossible to explain the evolution of the architecture exercise without first examining the emerging-market crises of the 1990s, especially the Mexican and Asian crises, with particular attention to the explanations given for them and the responses of the international community. Others have already reviewed those crises in detail;<sup>1</sup> this chapter focuses on the features that set them apart from earlier currency crises and on the unusual nature of the official response.

As both crises began when large capital inflows came to a sudden stop and gave way to large capital outflows, this chapter starts by asking why emerging-market countries started to experience large capital inflows in the early 1990s. It then examines the policy problems posed by those inflows—the macroeconomic problems that used to be the main focus of concern, and the microeconomic problems that help explain the vulnerability of the Asian countries and the virulence of the Asian crisis.

The chapter then turns to the Mexican crisis to ask how it began, what might have been done to contain it, and why it was transformed from a currency crisis into a sovereign debt crisis. Although the Mexican crisis had some unusual features and the official response to the crisis was controversial, there was comparatively little debate about the causes of the crisis and no perceived need for a new set of currency-crisis models to explain the onset of the crisis.<sup>2</sup>

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1. On Mexico, see IMF (1995), Edwards (1997), and Boughton (2000); on Asia, see IMF (1997b, 1998b, 1998c, 1998d), Bosworth (1998), and Eichengreen (1999a, appendix C).

2. See, however, Cole and Kehoe (1996), who model the *tesobono* crisis.

**Table 2.1 Private capital flows to developing countries, 1977-95**  
(billions of dollars)

Type and region	1977-82 <sup>a</sup>	1983-89 <sup>a</sup>	1990	1991	1992	1993	1994	1995
<b>All developing countries</b>								
By type								
Direct investment	11.2	13.3	18.6	28.4	31.6	48.9	61.3	71.7
Portfolio investment	-10.5	6.5	18.3	36.9	47.2	89.6	50.4	37.0
Other <sup>b</sup>	29.8	-11.0	8.5	88.5	51.5	34.6	40.6	72.9
<b>By region</b>								
Asia	15.8	16.7	25.6	47.9	30.8	69.9	81.9	105.9
Western Hemisphere	26.3	-16.6	17.3	24.0	54.7	64.2	48.5	48.9
Other developing countries	-11.6	8.7	2.5	82.0	44.8	38.9	22.0	26.7
<i>Total net capital inflow</i>	<i>30.5</i>	<i>8.8</i>	<i>45.4</i>	<i>153.8</i>	<i>130.2</i>	<i>173.1</i>	<i>152.4</i>	<i>181.5</i>

a. Annual average.

b. Includes bank loans.

Note: Because of rounding, details may not add to totals given.

Source: International Monetary Fund.

The Asian crisis generated much more disagreement. Some blamed it on policies and private-sector practices that were once widely praised as important contributors to the “Asian miracle” but had outlived their usefulness. On this view, the Asian crisis was foreordained. Had it not started in Thailand, it would have been triggered elsewhere in Asia. And once it began, it was bound to spread, because it drew attention to fundamental flaws in the economic and financial systems of several Asian countries. Others saw the Asian crisis as an avoidable accident resulting from policy mistakes in Thailand, and they blamed its subsequent spread on investor panic and the complex workings of financial markets. On this view, Indonesia, Korea, and other Asian countries were the innocent victims of the Thai crisis and could have coped pragmatically with their homegrown problems had that crisis not occurred. These two explanations of the Asian crisis led to a debate about the right remedies and inspired a new set of currency crisis models.

## The Capital Inflow Problem

Private capital flows to developing countries grew dramatically in the first half of the 1990s (see table 2.1). Their growth reflected the “push” of events in the major industrial countries and the “pull” of events in the developing countries. In the words of a World Bank report,

In industrial countries two key developments have increased the responsiveness of private capital to cross-border investment opportunities. First, competition and rising costs in domestic markets, along with falling transport and communications costs, have encouraged firms to look for opportunities to increase efficiency by

producing abroad. This is leading to the progressive globalization of production and to the growth of “efficiency-seeking” FDI [foreign direct investment] flows. Second, financial markets have been transformed over a span of two decades from relatively insulated and regulated national markets toward a more globally integrated market. This has been brought about by a mutually reinforcing process of advances in communications, information, and financial instruments, and by progressive internal and external deregulation of financial markets.

In developing countries, the environment is also changing rapidly. Since the mid-1980s, several countries have embarked on structural reform programs and increased openness of their markets, through progressive lowering of barriers to trade and foreign investment, the liberalization of domestic financial markets and removal of restrictions on capital movements, and the implementation of privatization programs. There have also been major improvements in fiscal performance and the sustainability of external debt.

Although the perceived risks of investing in emerging markets remain relatively high, the more stable macroeconomic environment, growth in earnings capacity (both output and exports), and a reduction in the stock of debt in many countries (following the implementation of the Brady Plan) are leading to a decline in such risks and an increase in the expected rates of return in the major recipient countries. (World Bank 1997, 13-14)

The Bank’s report acknowledged that individual countries had suffered reversals, but these, it implied, were due in the main to the countries’ own policy errors. Therefore, it was optimistic about the outlook for globalization and financial integration:

The sustained increase in private capital flows in the face of recent shocks suggests that markets have entered a more mature phase. . . . Governments have demonstrated an awareness and ability to respond promptly and aggressively to changes in market conditions. And markets have become more able to discriminate among countries on the basis of their underlying fundamentals. This does not mean that there will not be year-to-year fluctuations in private flows in response to changes in international financial conditions. But private flows to developing countries in the aggregate are less likely to suffer from a widespread or prolonged decline of the kind seen after the debt crisis. (World Bank 1997, 25)

The Fund’s assessment of the outlook was somewhat more guarded. It described the revival of capital flows as a “surge” and gave as one of the main causes the “push” of cyclical developments in the industrial countries during the early 1990s—the economic slowdown in the United States and the resulting fall in interest rates (IMF 1995).<sup>3</sup>

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3. The Fund’s more cautious account appeared just after the Mexican crisis and may have been influenced by it; the Bank’s account appeared two years later, after that shock had worn off but before the Asian crisis. Nevertheless, the Fund’s caution was not new. Early in the 1990s, IMF staff had drawn attention to the volatility of capital flows and to the cost of coping with abrupt reversals; see, e.g., G. Calvo, Leiderman, and Reinhart (1993). There is still disagreement, moreover, about the influence of push and pull factors on capital flows to developing countries. Fernandez-Arias and Montiel (1996) conclude that the push of low foreign interest rates was more powerful than the pull of domestic conditions and policies, but Bacchetta and van Wincoop (1998) reach the opposite conclusion. Nevertheless, most studies show that changes in US interest rates strongly affect those capital flows; see S. Calvo and Reinhart (1996) and Eichengreen and Rose (1998).

What can a capital inflow do for you—and to you? This question is narrower than the one posed by Maurice Obstfeld (1998); he surveys the whole set of benefits conferred by international capital mobility, including benefits that do not require any *net* capital inflow, such as the risk-reducing effects of portfolio diversification.

### **Whether to Bank or Spend an Inflow**

Consider a country that starts to attract foreign capital. The relative contributions of pull and push factors do not matter here, although they may have a bearing on the sustainability of the capital inflow—a point to which we will return. To make use of the extra purchasing power supplied by the inflow, the country should import more or export less and let its trade balance deteriorate. It should also try to ensure that the capital inflow is used for investment, not consumption, so as to raise real output; otherwise, it may not be able to make the requisite income payments to its foreign creditors.

In some cases, a capital inflow will lead directly to an increase in imports; that will happen, for example, when an inflow is used to build a new factory and the equipment needed for the factory has to be imported. But the resulting increase in imports may not be as large as the capital inflow itself, and the government of the capital-importing country must then decide what to do with the rest of the foreign currency counterpart of the capital inflow—whether to “bank” or “spend” it.

When a capital inflow is deemed to be temporary, it is prudent to bank a large part of the inflow in order to guard against its cessation. A government can do that by intervening on the foreign exchange market to prevent its currency from appreciating under the influence of the inflow and, in the process, accumulate foreign exchange reserves. But it must also “sterilize” the monetary impact of its intervention. Otherwise, bank lending will rise and stimulate spending, and the increase in spending will have much the same effect as an appreciation of the country’s currency. It will raise imports, reduce exports, and thus spend the proceeds of the capital inflow.<sup>4</sup>

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4. When a government or central bank intervenes to keep its currency from appreciating, it buys foreign currency with newly created domestic currency, raising the liquidity of the banking system. To offset this monetary effect, a central bank can sell domestic securities, reduce its own lending to the banking system, or impound the increase in liquidity by requiring banks to hold larger cash balances at the central bank. These techniques have different side effects. Sales of domestic securities are costly to the central bank and government; interest rates on domestic securities sold to the public are usually higher than interest rates on reserve assets. Kletzer and Spiegel (1998) find that this quasi-fiscal cost may have deterred some central banks from full-fledged sterilization. A mandatory increase in the banks’ cash balances does not have this effect, but it reduces the banks’ earnings; see Reinhart and Reinhart (1999). For these and other reasons, countries that seek to keep capital inflows from raising domestic spending are often advised to tighten their fiscal policies instead of

A number of emerging-market countries sought to bank capital inflows in the 1990s. They were concerned to guard against a cessation of the inflows but had additional objectives. Because those countries depended heavily on export-led development, the countries sought to preserve the price competitiveness of their export industries—to hold down the prices of their currencies and the domestic currency prices of their exports. In several cases, moreover, intervention to keep the exchange rate stable was seen as a way of conferring credibility on the central bank's commitment to combat inflation.

When a capital inflow is expected to endure, a strong case can be made for spending the inflow by letting the trade balance deteriorate. Two strategies will accomplish that end: letting the domestic currency appreciate, or intervening to prevent it from appreciating but letting domestic prices rise by allowing the monetary effects of intervention to fuel an increase of lending and spending. Both strategies involve an appreciation of the price-adjusted or *real* exchange rate, but an appreciation of the *nominal* rate may be the better strategy. It is easier to reverse if the capital inflow ends unexpectedly. Furthermore, a onetime increase in domestic prices can ignite an inflationary spiral.

## The Crucial Question of Sustainability

It is, of course, impossible for a government to know whether to bank or spend a capital inflow without knowing how long it will last—something no one can know with certainty. Therefore, a prudent government will do some of both; and that was the strategy adopted by many developing countries in the 1980s and early 1990s (see Bosworth and Collins 1999). It is nevertheless essential to form some sort of judgment about the sustainability of a capital inflow in order to assess the long-term viability of a country's policies, its real exchange rate, or its current account deficit. This obvious point is often ignored, however, even by many economists. They still tend to equate appreciation with overvaluation, to treat a current account deficit as a symptom of unsound domestic policies, and thus to regard a capital inflow as a dubious substitute for the elimination of a current account deficit.

These views may have been sensible in the 1970s and 1980s, when capital flows were driven by trade flows. Developing countries sought capital inflows to cover their trade deficits—and most of the inflows went directly to the countries' governments. But in the 1990s, trade flows were driven by capital flows. Emerging-market countries ran current account

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relying mainly on sterilized intervention; see, e.g., Schadler et al. (1993) and Montiel (1996). Sterilization is sometimes said to raise domestic interest rates, but that is not strictly true. More accurately, it will prevent interest rates from falling, as they would as the result of nonsterilized intervention; see Kenen (1981, 1993) and Frankel (1997).

deficits because they were attracting capital inflows—and most of the inflows went directly to the private sector.<sup>5</sup> In these new circumstances, it was no longer possible to assess the viability of a country's situation without first assessing the long-term outlook for the capital account.

All too often capital inflows end abruptly, for unanticipated reasons. That is what happened to Mexico in 1994. But something can perhaps be learned about the medium-term outlook by assessing the relevant pull and push factors and by examining the composition of the capital inflow itself. During the Asian crisis, for example, flows of foreign direct investment were remarkably stable, whereas interbank flows were very volatile. Pondering the long-run implications of an ongoing capital inflow may also yield clues. Will a country be able to service its external debt, given the rate at which the capital inflow is adding to that debt compared to the rate at which it is raising the country's capital stock and its future output?<sup>6</sup> Has the real appreciation of the country's currency depressed the level or the growth rate of domestic output? If so, confidence in the continuity of the country's policies may be undermined, making it less attractive to foreign investors.<sup>7</sup>

To assess sustainability one must also ask how capital inflows are used. It is not enough to favor investment over consumption. The quality of the investment matters too, as it affects not only future output but also the domestic financial system. When banks and other domestic lenders are flooded with loanable funds, thanks to a capital inflow, they are apt to behave imprudently, and that temptation may be irresistible when lenders are protected by governmental guarantees—explicit or implicit—and are not closely supervised. Under those circumstances, a large capital inflow is likely to reduce the quality of loans and the productivity of the

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5. Bosworth (1998) makes the same point. Nevertheless, the old view crops up repeatedly; see, e.g., Feldstein (1998), who says that Thailand had to attract foreign capital to cover its current account deficit. It has been equally hard to banish the so-called Lawson Doctrine, which holds that a capital inflow should not cause concern when it offsets a private-sector deficit (an excess of private investment over private saving) but should cause grave concern when it offsets a public-sector deficit. Although the Asian countries did not have large public-sector deficits, we know now that they should have been concerned about the size of the capital inflows they were experiencing in the mid-1990s.

6. For theoretical and empirical work on the dimensions of sustainability, see Milesi-Ferretti and Razin (1996, 2000); for applications, see Edwards (1999b) on Mexico, and Corsetti, Pesenti, and Roubini (1998b) on the Asian countries.

7. Dornbusch, Goldfajn, and Valdés (1995) focus on this question in their analysis of the Mexican crisis; in their view, the slow growth of the Mexican economy in the mid-1990s was due largely to the real appreciation of the peso, and slow growth would lead eventually to a reduction of capital inflows. Yet they are unduly dismissive of the point made here. Without running a large current account deficit and, to that end, letting the peso appreciate in real terms, Mexico could not have spent a very large part of the capital inflow it attracted in the early 1990s.

projects they finance. This moral hazard problem will be compounded when lenders believe that their debtors are likewise protected by governmental guarantees—that they are too big to fail or too well-connected politically. It will also be compounded when capital inflows reflect the relaxation of restrictions on the activities of banks and other lenders unaccompanied by an intensification of prudential supervision. Facing new opportunities on both sides of their balance sheets, new ways of obtaining loanable funds, and new ways of using them, lenders may abuse those opportunities if they are not properly supervised. Taken together, these institutional shortcomings can cause a banking crisis that can lead, in turn, to a currency crisis that aggravates the banking crisis.<sup>8</sup>

## The Mexican Crisis of 1994-95

Banking crises often come before currency crises, but that was not true in the Mexican case. Although Mexican banks were in trouble before the onset of the crisis, the currency crisis came first. It began to build up in the spring of 1994, with the assassination of Luis Donaldo Colosio, the presidential candidate of the PRI.<sup>9</sup> Net portfolio investment in Mexico fell from \$8 billion in the first quarter of 1994 to \$1.5 billion in the second quarter, and it did not recover thereafter (see table 2.2). In the fourth quarter, moreover, there was a large capital outflow that led to a sharp drop in reserves, and the Mexican authorities sought to engineer a modest devaluation of the peso. But the devaluation did not restore confidence; on the contrary, it led to more capital outflows. Mexico's reserves fell by \$4 billion in the two days following the devaluation, and its remaining

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8. Kaminsky and Reinhart (1999) examine the links between financial liberalization and banking crises and the connections between banking and currency crises; they find that the majority of banking crises covered by their study led to currency crises. See also Demirgüç-Kunt and Detragiache (1998) and Goldstein (1998). Adapting a model developed by Kiyotaki and Moore (1997), Edison, Luangaram, and Miller (2000) show how volatile capital flows and exchange rate changes amplify procyclical swings in credit flows and asset values and how this phenomenon helps explain the severity of the Asian crisis.

9. There were other political shocks in 1994: rebels in Chiapas seized six towns in January; the secretary general of the PRI was assassinated in September; and fighting erupted again in Chiapas on 19 December, one day before the devaluation of the peso. But Agénor (1995) found that the Colosio assassination was the only political shock that generated expectations of a devaluation; he also found that changes in economic fundamentals did not significantly affect those expectations. Yet Mexico's reserves started to fall steeply in October, well before the devaluation, and there is reason to believe that residents began to fear a devaluation before foreigners did; see IMF (1995) and Frankel and Schmukler (1996). And in the Mexican and Asian crises alike, the abrupt depreciations right after the crises began were due largely to foreign currency purchases by residents, including domestic banks that were trying to cover their foreign currency debts, not to currency speculation by hedge funds and other foreign investors; see Garber (1996), Garber and Lall (1998), and Eichengreen et al. (1998b).

**Table 2.2 The balance of payments of Mexico, 1993-96** (quarterly data, millions of dollars)

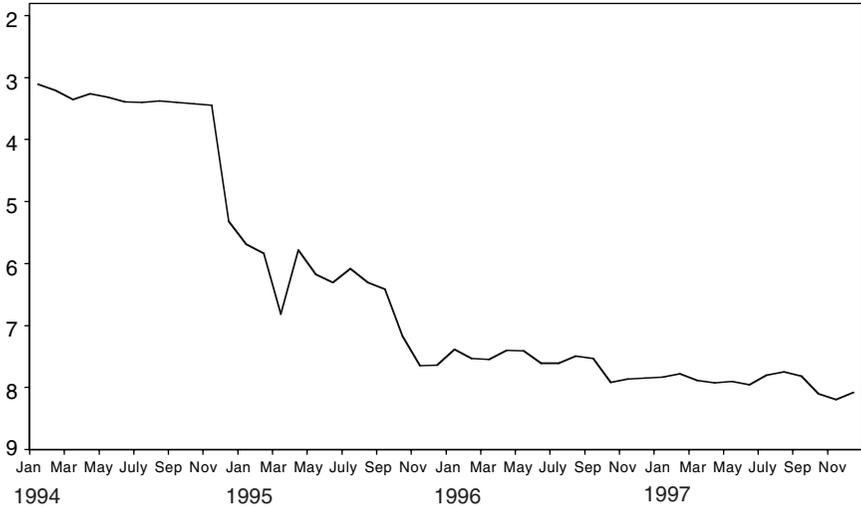
Item	1993	1994:1	1994:2	1994:3	1994:4	1995:1	1995:2	1995:3	1995:4	1996:1	1996:2	1996:3	1996:4
Exports of goods FOB	12,972	13,776	15,068	15,064	16,974	18,787	19,631	20,087	21,036	21,870	23,607	24,247	26,275
Imports of goods FOB	16,342	18,073	19,618	19,859	21,796	18,190	17,033	17,873	19,358	19,936	21,410	22,835	25,288
Trade balance	-3,370	-4,297	-4,550	-4,794	-4,822	597	2,599	2,215	1,678	1,934	2,197	1,413	987
Balance on goods, services, and income	-6,760	-7,593	-8,503	-8,957	-8,391	-2,228	-726	-1,525	-1,057	-1,106	-935	-2,019	-2,799
Current account balance	-5,850	-6,782	-7,476	-7,908	-7,496	-1,355	356	-450	-128	-105	296	-829	-1,691
Direct investment (net)	1,097	3,152	3,283	2,814	1,723	1,983	2,914	2,255	2,375	2,028	1,780	2,004	3,374
Portfolio investment (net)	7,089	7,983	1,540	3,257	-5,364	-7,517	-3,998	-414	1,552	1,303	2,913	9,007	738
Other investment (net)	254	664	-1,743	-1,635	113	-3,185	-1,447	-4,165	-840	-3,826	-3,322	-8,687	-1,179
Monetary authorities	—	—	—	—	—	—	—	—	-788	-1,459	—	—	—
Government	-284	-1,471	-343	-262	-310	-863	-117	-2,477	47	145	-329	-8,308	-330
Banks	485	350	321	-953	2,196	-3,633	-1,741	-2,216	784	-1,900	-1,369	-1,313	804
Other sectors	53	1,785	-1,721	-420	-1,774	1,311	412	528	-883	-612	-1,624	934	-1,653
Financial balance	8,440	11,799	3,080	4,436	-3,528	-8,719	-2,531	-2,324	3,088	-496	1,371	2,324	2,933
Net errors and omissions	-782	-4,534	-3,909	3,903	1,217	-1,924	690	543	-3,557	629	-1,479	-70	978
Overall balance	1,808	484	-8,305	430	-9,808	-11,998	-1,484	-2,232	-597	29	188	1,426	2,221
Increase (-) in reserve assets	-1,514	-107	8,654	-140	9,991	-691	-3,229	-4,666	-1,062	224	75	-175	-1,930
Use (+) of IMF credit	-294	-377	-348	-290	-183	7,452	-287	3,416	1,369	-253	-263	-1,250	-291
Exceptional financing	—	—	—	—	—	5,237	5,000	3,482	291	—	—	—	—
FOB = free on board													

Note: Because of rounding, details may not add to totals given.

Source: International Monetary Fund.

**Figure 2.1 Mexican exchange rate, 1994-97**

pesos per dollar,  
inverted scale



Source: International Monetary Fund.

reserves were too small to defend the new exchange rate. Therefore, the peso was set free to float, and it began to depreciate rapidly (see figure 2.1).

### The Transformation of the Crisis

The currency crisis turned quickly into a debt crisis. The short-term dollar-indexed *tesobonos* were designed to protect investors against exchange rate risk, but the methods by which they were issued and redeemed provided only imperfect protection (see Garber and Lall 1998). This was not a serious problem before the devaluation, when the day-to-day changes in the peso-dollar rate were quite small; it loomed very large, however, as soon as the peso was floated. At the first *tesobono* auction after the float began, investors bid for only \$28 million of the \$600 million on offer, and outcomes thereafter were not much better. Yet \$9.8 billion of *tesobonos* were due to mature in the first three months of 1995, and another \$6.4 billion in the following three months. Hence, the Mexican government faced a huge problem. If it could not roll over the *tesobonos*, the budgetary cost of redeeming them would be enormous; the cost of redeeming the \$9.8 billion due to mature right away would have exceeded 50 billion pesos—an amount close to a quarter of the government's revenues in 1994.<sup>10</sup> And that was just part of the trouble. The maturing *tesobonos*

10. This calculation uses the exchange rate prevailing at the end of 1994, and the peso continued to depreciate thereafter; it also ignores the \$6.4 billion of *tesobonos* maturing in the second quarter of 1995.

were held mainly by foreigners, who would have wanted to convert the proceeds into dollars, and Mexico did not have enough dollars. Its official reserves had fallen to \$6.3 billion at the end of 1994. The result was a self-fulfilling debt crisis. As no holder of *tesobonos* could be sure that the rest would roll over their holdings, no one wanted to hold them.<sup>11</sup>

The rest of the story was told in chapter 1. After failing to obtain congressional support for US financial assistance to Mexico, the US Treasury joined with the IMF in assembling \$50 billion of official financing.<sup>12</sup> Soon thereafter, the Mexican government announced a number of policy changes, including a tightening of fiscal policy and measures to combat inflation by limiting wage increases.

The official financing for Mexico was unique in more than its unprecedented amount. Although other crisis-stricken countries obtained large-scale official financing in subsequent years, the amounts involved were not intended—nor were they sufficient—to pay off those countries' short-term foreign debts. The size of the Mexican package, by contrast, was meant to extinguish the whole stock of *tesobonos*, to help Mexico cope with large dollar withdrawals from its banking system, and to help it rebuild its reserves.

Mexico's banking system was fragile before the currency crisis. In fact, its fragility is often cited to explain why the Bank of Mexico failed to raise interest rates in 1994, when US short-term rates were rising. But the currency crisis made matters worse. Mexican banks had large foreign currency debts, as well as large foreign currency claims on domestic firms that could not meet their obligations after the peso began to depreciate. Furthermore, Mexican interest rates soared during the currency crisis, doing great damage to debtors, as most bank loans in Mexico have variable interest rates. In the Mexican case, then, the currency crisis was due in part to financial fragility; but it produced a full-fledged banking crisis that led to a sharp contraction of domestic lending and a very large fall in output in 1995.<sup>13</sup> Real gross domestic product fell by 15 percent from

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11. In the model proposed by Cole and Kehoe (1996), cited above, there are two equilibria—one in which all investors roll over their *tesobonos* and one in which they try to redeem them. The shift from the first to the second is triggered by a "sunspot" variable. The real-world counterpart of that adverse shock was, of course, the December devaluation, which led to the unsuccessful *tesobono* auctions. See also Sachs, Tornell, and Velasco (1996b).

12. This total included \$7.8 billion already committed by the IMF. It also included \$10 billion from the Bank for International Settlements (BIS) and \$3 billion from commercial banks, but those parts of the package were never utilized.

13. See Mishkin (1996, 1999) for ways in which the interest rate and balance sheet effects of a currency crisis disrupt domestic credit flows, causing a financial crisis and depressing economic activity. The same sorts of disruption occurred during the Asian crisis. In fact, the balance sheet problems of the Asian banks are given a very prominent role in most accounts of the Asian crisis—a much larger role than the comparable troubles of the Mexican banks, which were overshadowed by the urgency and size of the *tesobono* problem. In the Asian case, however, the banks' difficulties played a major role in triggering the crisis.

the fourth quarter of 1994 to the third quarter of 1995, although it recovered rapidly thereafter.

## An Explanation of the Crisis

Capital flows to Mexico began to grow rapidly in the early 1990s. In fact, net capital flows to Mexico accounted for roughly a fifth of total net flows to developing countries in 1990-93 (IMF 1995). Mexico had been the first country to issue Brady bonds, which reduced, consolidated, and partially collateralized Mexico's debt to foreign banks—the overhang from the debt crisis of the 1980s. Mexico had also embarked on ambitious reforms—deregulation, privatization, and trade liberalization—and would soon subscribe to the North American Free Trade Agreement (NAFTA). Furthermore, it had dismantled most of its capital controls in order to qualify for membership in the Organization for Economic Cooperation and Development (OECD). Finally, Mexico had adopted a comprehensive strategy for reducing inflation, based on a commitment to exchange rate stability and on the annual *pacto*—an agreement involving the government, business, and the trade unions, which aimed at coordinating wage, price, and exchange rate developments. By most measures, moreover, Mexico was following a prudent fiscal policy.<sup>14</sup> There was thus much talk of a “Mexican miracle,” although Mexico's performance was less impressive than its reform program promised.<sup>15</sup>

Because of its commitment to exchange rate stability, the Bank of Mexico did not let capital inflows drive up the price of the peso in the foreign exchange market; it engaged in sterilized intervention and built up its reserves. But as the capital inflow continued, a growing share was offset by Mexico's trade deficit, which rose from less than \$1 billion in 1990 to \$18.5 billion in 1994. Furthermore, the peso was appreciating in real terms—a familiar characteristic of an exchange rate-based stabilization. Although the inflation rate was falling steadily, the inertial nature of inflation, reinforced by backward-looking wage indexation, prevented it from falling fast enough to preclude a large cumulative increase in the Mexican price level and a significant appreciation of the real exchange rate.

For Rudiger Dornbusch, Ilan Goldfajn, and Rodrigo Valdés (1995), who describe this process, the real appreciation of the peso, taken together with the growing trade deficit, proved that the peso was hugely overvalued by

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14. Leiderman and Thorne (1996) argue, however, that lending by the Mexican development banks should be treated as quasi-fiscal spending and that the increase of that lending in and after 1993 had weakened the country's fiscal stance.

15. On the “invention” of the Mexican miracle, see Edwards (1997, 1-4), who describes the large gap between promise and performance and the more dramatic gap between “modern Mexico, on the verge of entering the first world” and “quasi-feudal Mexico, with its sorrow and frustration.”

the mid-1990s; this, they say, was the main cause of the peso crisis. Although the real appreciation was indeed a by-product of the exchange-rate-based stabilization, not of the capital inflow itself, one cannot definitively conclude that the peso was overvalued. Recall the point made earlier: normative judgments about the real exchange rate and the current account balance cannot be made in isolation. One must also ask whether a country should bank a large part of a capital inflow, because the inflow is unlikely to continue, or spend a large part of the inflow (as Mexico did) by letting its real exchange rate appreciate and causing its current account to deteriorate.

One can perhaps argue that the Mexican authorities should have been less optimistic about the sustainability of the capital inflow (see Edwards 1997). Had they taken a more cautious view, however, they would have been forced to devalue the peso in, say, 1993, in order to reduce the current account deficit and bank a bigger portion of the capital inflow. They could not have allowed the peso to float; it would have appreciated in nominal terms instead of depreciating, thereby causing an even larger real appreciation.<sup>16</sup> They might have tried to limit the capital inflow by reimposing the capital controls that they had just dismantled, but that would have jeopardized Mexico's membership in the OECD. They should perhaps have tried less hard to propagate faith in the Mexican miracle. But politicians—least of all fervent reformers like those on the Mexican team—are never willing to sell their own policies short.

It may be more useful to ask what could have been done in 1994, when rising interest rates in the United States and political uncertainties in Mexico itself combined to call into question the sustainability of the capital inflow. The Bank of Mexico should have let Mexican interest rates rise, not with the aim of sustaining the inflow but rather to check the growth of domestic demand and thus slow the growth of imports. At the very least, the central bank should have refrained from sterilizing fully the liquidity-reducing effects of its dollar sales in the foreign exchange market during the spring of 1994, when it intervened to support the peso.<sup>17</sup> It was unwise, moreover, to issue additional *tesobonos* when foreigners started to run down their holdings of peso-denominated government debt. And Mexico should have devalued the peso in October, when it weakened

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16. The same point is made by Fischer (1996), and I am inclined to agree with his general judgment that Mexico might have come through unscathed had it not suffered a run of bad luck—the set of political shocks that began with the Colosio assassination and continued until the day before the devaluation.

17. This point also is made by G. Calvo and Mendoza (1996), who carry the argument further. Having found that rising US interest rates reduce the demand for money in Mexico, they conclude that additions to the domestic assets of the Bank of Mexico did not merely offset contemporaneous reserve losses but led to further reserve losses.

again, as Mexico still had sufficient reserves to defend a new, lower exchange rate.<sup>18</sup>

It would have been hard to take these steps, however, during the run-up to a national election; and it was not much easier right after the election, when the outgoing government was still in charge and was loath to countenance an implicit repudiation of its previous policies.<sup>19</sup>

## **The Tequila Effect**

The Mexican crisis was contagious. Stock prices fell sharply in Argentina and Brazil after the Mexican devaluation; spreads on Brady bonds rose abruptly, especially those of Argentina, Brazil, and the Philippines. The Argentine peso and Thai baht came under attack, along with the Brazilian real, Philippine peso, and Hong Kong dollar. Argentina was the principal victim of the “tequila effect,” losing more than a third of its currency reserves in the three months following the Mexican devaluation. There were large flows of funds out of Argentine assets and out of Argentine banks, and one bank was shut down. And though the so-called tequila effect wore off rather rapidly in most of the affected countries, Argentina suffered a full-fledged banking crisis and had to seek assistance from the IMF and World Bank.

Previous empirical research on contagion had emphasized trade links among the affected countries.<sup>20</sup> But these cannot possibly account for the strength of the tequila effect on Argentina; it does not trade much with Mexico, and the two countries are not close competitors in third countries’ markets. And the same can be said of Mexico’s trade links with the other victims of the Mexican crisis.<sup>21</sup> It would thus appear that the tequila effect

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18. On the case for an earlier devaluation and the debate about it in academic and official circles, see DeLong and Eichengreen (2001).

19. There is indeed a clear link between the uncertainties surrounding elections and the incidence of financial crises. Mei (1999) examines nine crisis in 1994-97 and finds that eight of them occurred just before or after an election, and the election effect is significant even after controlling for the influence of economic vulnerability. It is also easy to find sources of political uncertainty in most of the countries hit by the Asian crisis: in Thailand, the fall of the government and the rapid turnover of finance ministers; in Indonesia, the illness of President Suharto; in Korea, the statements of the incoming President, Kim Dae-jung, before and after his election. No IMF program, even one flawlessly designed and fully financed, could have produced a rapid revival of confidence amidst those uncertainties.

20. See, e.g., Eichengreen, Rose, and Wyplosz (1996) and Eichengreen and Rose (1999).

21. Glick and Rose (1999) find that trade links do indeed help account for the tequila effect, but their results may reflect their ways of measuring contagion. When they measure contagion by the size of the depreciation in the victim’s currency, they find that trade links play a major role; when they measure it by the amount of exchange market pressure, they find that those links play a minor role. Their analysis of the case of Argentina, with weak trade links to Mexico, is consistent with those findings. When they use their first definition of contagion, they find that Argentina was unaffected (because its currency did not depreci-

traveled mainly through asset-market channels. Investors retreated from many emerging-market countries, but mainly from countries with vulnerabilities resembling those of Mexico—pegged exchange rates, weak banks, and low reserves.<sup>22</sup>

## The Asian Crisis of 1997-98

Many attempts have been made to blame the Asian crisis on some fatal defect in the public policies and private-sector practices of the Asian countries. Most have focused on the use and abuse of government guarantees, explicit or implicit, to domestic banks and their corporate customers. Michael Dooley (1999, 2000b) argues that a crisis had to occur as soon as the governments' contingent liabilities implied by those guarantees came to exceed the governments' assets. At that point, the guarantees ceased to be credible, and capital inflows gave way to capital outflows.<sup>23</sup> Craig Burnside, Martin Eichenbaum, and Sergio Rebelo (1998) add one step. When guarantees get very large, the government cannot honor them without running a budget deficit; and when the prospective deficit gets very big, the government must switch from debt financing to money financing. There will then be inflation and currency depreciation. But the anticipation of those events will trigger a currency crisis before they have run their course.<sup>24</sup>

Ronald McKinnon and Huw Pill (1998, 1999) and Paul Krugman (1998b) also emphasize the role of guarantees but tell a different story. Instead

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ate); when they use their second definition, they find that Argentina suffered severely (because it experienced severe exchange market pressure). But Glick and Rose deserve much credit for being among the first to stress the regional nature of contagion.

22. See Sachs, Tornell, and Velasco (1996a). Frankel and Schmukler (1998) also stress the adverse shift in investors' views, but they find that views about a particular country reflect the country's fundamentals. They also find that the Mexican crisis directly affected investors' views about other Latin American countries but only indirectly affected their views about Asian countries, via its impact on Latin America. Tornell (1999) makes a related point: as lending booms occurred in Latin America before they occurred in Asia, the Mexican crisis hit Latin American countries harder than Asian countries, whereas the Thai crisis hit Asian countries harder than Latin American countries.

23. See also Dooley and Walsh (1999) and Chinn, Dooley, and Shrestha (1999). Irwin and Vines (1999) enrich the story by adding a point ascribed below to McKinnon and Pill and to Krugman. The excessive investment induced by guarantees has two crisis-inducing effects: it raises the government's contingent liabilities and also raises the probability that the government will have to honor them.

24. For similar stories, see Corsetti, Pesenti, and Roubini (1998a) and Calomiris (1998a). Buch and Heinrich (1999) tell a different forward-looking story: the expectation of a devaluation or depreciation reduces the expected net worth of domestic banks having large foreign currency debts, making it harder for those banks to roll over their debts and raising the risk of a banking crisis along with a currency crisis.

of assuming with Dooley and others that foreign investors can keep close track of a government's contingent liabilities and will therefore flee a country as soon as those liabilities exceed the government's assets, they stress the effects of guarantees on capital formation and the realized rate of return. As firms will be encouraged to undertake projects likely to yield low rates of return (what Krugman describes as "Panglossian investment"), the guarantees will have to be honored eventually. When the government cannot honor them fully, confidence and capital formation will collapse and capital inflows will be reversed.

These stories help us understand aspects of the Asian crisis. They can explain why the productivity of new investment fell in several Asian countries during the years before the crisis (see Corsetti, Pesenti, and Roubini 1998b). They can also explain why the Asian crisis led to a sharp contraction of capital formation and a large fall in output. Finally, they help explain why the IMF and others responded to the crisis by calling on Asian governments to end what the various models describe generically as implicit guarantees—to eliminate government-directed lending that was by its nature guaranteed, to sever incestuous links between borrowers and lenders, and to introduce and enforce bankruptcy regimes so as to keep insolvent firms from walking away from their debts. Pedro Alba et al. (1999) provide a long list of the objectionable policies and practices.

It is very hard to believe, however, that the Thai crisis erupted simply because foreign investors realized suddenly that the Thai government's contingent liabilities were too big to be honored—or that the attempt to honor them would lead to budget deficits, inflation, and currency depreciation. In fact, it is hard to believe that foreign investors were able to measure and thus add up the government's liabilities. Some liabilities, such as subsidies, had well-defined cash values, but it would have been impossible to attach cash values to other important forms of preferential treatment. What would be the ultimate cost of regulatory forbearance or, for that matter, the cost of future guarantees for some or all of the liabilities of some or all of the Thai banks? No one could know precisely when the Thai government's contingent liabilities had outrun its assets.

The Asian crisis must therefore be explained as the joint result of premature capital account liberalization, inadequate policy responses to the ensuing capital inflow and buildup of foreign currency debt, faulty exchange rate policies, and—last but not least—faith in the immortality of the Asian miracle that led to excessive investment in a handful of cyclically sensitive export industries and in commercial construction. And the subsequent spread of the crisis, first from Thailand to its neighbors, then northward to Korea, can best be explained by panic and herd behavior, when foreign investors began to see that countries quite different in many respects had bad things in common.

Without prejudging the issue raised at the start of this chapter—whether the Asian crisis was inevitable and would have started elsewhere had it

not started in Thailand—let us look first at events in Thailand, then track the spread of the crisis to other Asian countries. What were the proximate causes of the Thai crisis? Why was it so contagious? Why did it do so much damage to the real economies of the crisis-stricken countries?

## How the Crisis Started

Thailand began to experience a capital inflow in the early 1990s and, like Mexico, started out by banking a large portion of the inflow. It held the baht-dollar exchange rate virtually constant after 1990 and built up its foreign exchange reserves, which rose from \$9.5 billion at the end of 1989 to \$28.9 billion at the end of 1994. But the capital inflow rose hugely in 1995; and though there was another big increase in reserves, there was also a large increase in the current account deficit, which rose to 8 percent of GDP. Beginning in 1994, moreover, there was a significant change in the composition of the capital inflow. The net foreign currency debt of Thai banks grew by only \$3.3 billion in 1993 but rose by \$13.3 billion in 1994 and by another \$10.5 billion in 1995. This surge followed the opening of the Bangkok International Banking Facility (BIBF), which was ostensibly meant to attract offshore banking to Thailand but served mainly as a vehicle for channeling foreign currency credit to domestic borrowers.<sup>25</sup>

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25. On the role of the BIBF, see Alba et al. (1999). Thai banks were not allowed to incur unhedged foreign currency debts, but they could treat foreign currency claims on Thai residents as offsets to their foreign currency debts; see Brealey (1999). Thai branches of Japanese banks played a large role in this process. A similar process was at work in Korea, where the foreign branches of Korean banks served as conduits for foreign currency loans to Korean firms; see Dooley and Shin (2000). Bernard and Bisignano (1999) note that these forms of intermediation altered fundamentally the character of interbank lending. Previously it had served as a marginal funding source for large banks in the industrial countries, but in the 1990s it became a principal funding source for Thai and Korean banks. Those banks had low credit ratings, even before the Asian crisis (Bosworth 1998), but the suppliers of interbank credit behaved as though there had been no change in the riskiness of interbank lending. Giannini (1999) suggests that the surge of interbank lending was due partly to the statement in the “widely read” Rey Report (Group of 10 1996) that interbank credits should be excluded from any future restructuring of private-sector debt. But the growth of interbank lending began before the Rey Report appeared—which was, in fact, *not* widely read. Bordo and Schwartz (1998) are among those who take the opposite tack, asserting that foreign investors ignored the main message of the Rey Report, which warned that large-scale official financing would not be forthcoming routinely; others have argued that the fall in spreads on emerging-market debt after the Mexican crisis reflected the effect of moral hazard. Zhang (1999) argues, however, that the fall in spreads reflected a general shift in capital-market conditions, as there was also a fall in spreads on corporate debt in the industrial countries. After controlling for that shift and for economic fundamentals in emerging-market countries, Zhang finds that there was a residual *increase* in spreads on emerging-market debt and no significant impact of the Mexican crisis itself. For other reasons to doubt that the Mexican rescue led to the subsequent Asian crisis, see Mussa (1999) and Mussa et al. (2000). But see Dell’Ariccia, Godde, and Zettelmeyer (2000), who raise serious questions about previous work on this issue.

There was, as a result, an acceleration of credit creation, despite attempts by the Bank of Thailand to sterilize the monetary impact of the capital inflow.<sup>26</sup>

Although capital inflows peaked in 1995, they stayed at high levels in 1996, despite a deterioration in economic and financial conditions. Thai equity prices fell sharply in 1996, followed by property prices, and the fall in property prices was—or should have been—a warning of trouble ahead. Large amounts of lending by Thai banks and finance companies had been secured by real estate. There was, in fact, pressure on the baht in mid-1996, after one Thai bank collapsed. And there was trouble looming on the real side, too. After rising rapidly for several years, the dollar value of Thai exports fell in 1996, because of the recession in Japan, the appreciation of the baht (caused by the appreciation of the dollar vis-à-vis the yen), the global glut in markets for computer chips, and new Chinese competition in some of Thailand's export markets.<sup>27</sup> The reduction in Thai exports reflected falling export prices as well as falling volume, and it cast doubt on the outlook for export-led growth.

The situation in Thailand did not go unnoticed. The managing director of the IMF expressed his concern to the Thai authorities, and IMF officials traveled to Bangkok to convey the same message (see Eichengreen 1999b). In Thailand itself, moreover, there was growing concern about the banks and finance companies. In February 1997, the largest finance company, Finance One, sought a merger with a bank to stave off collapse. In March, the government suspended stock-market trading in the shares of financial institutions but failed to take stronger measures. Even after the baht collapsed in July, it did not move decisively to close insolvent institutions (see, e.g., Haggard 2000).

Pressures on the baht built up in May 1997, and the central bank responded by intervening heavily on the spot and forward markets. It also introduced capital controls to segment domestic and offshore markets. Foreigners, including hedge funds, took on short positions; but much of the pressure on the baht reflected foreign currency purchases by Thai residents, who were seeking to cover their foreign currency debts (which they continued to do after the baht was set free to float, prolonging

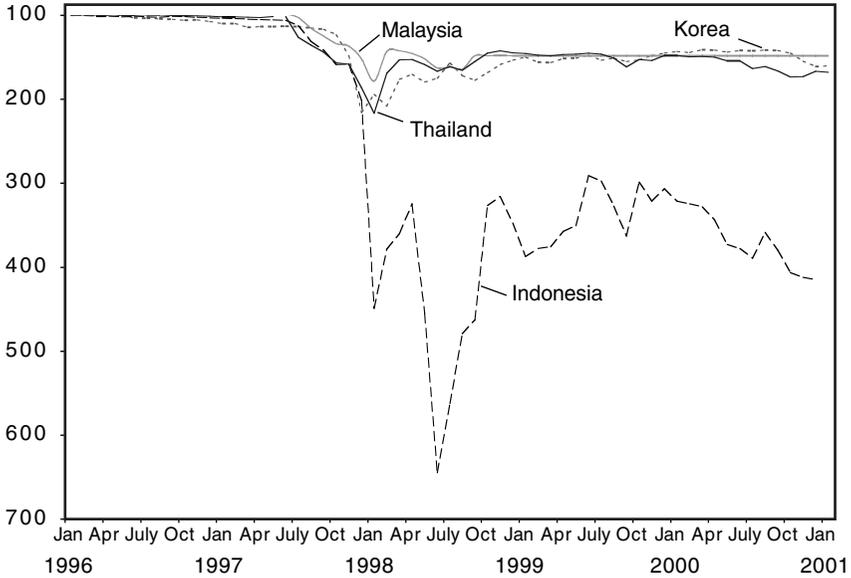
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26. It should be noted, moreover, that sterilization could not keep foreign currency inflows passing through the BIBF from causing domestic credit creation. A foreign currency loan to a Thai resident made by a bank in the BIBF could not raise the reserves of the Bank of Thailand until that Thai resident sold the foreign currency proceeds for domestic currency. Hence, a full round of credit creation had to occur before the central bank had any reason to sterilize the monetary impact of the foreign currency inflow.

27. Diwan and Hoekman (1999) emphasize the impact of Chinese competition and the weakness of the yen but argue that the latter affected Korea and Taiwan more severely than the Southeast Asian countries. Baig and Goldfajn (1999) argue that the weakening of the yen came too early to bear responsibility for the deterioration in the export performance of Thailand and its neighbors.

**Figure 2.2 Asian exchange rates, 1996-2000**

national currency units per US dollar (1996:1=100),  
inverted scale



Source: International Monetary Fund.

the depreciation of the currency).<sup>28</sup> By the beginning of July, Thailand's reserves were all but exhausted; those that remained were barely sufficient to match the forward contracts made by the Bank of Thailand.<sup>29</sup> Therefore, the baht was cut loose from the dollar on 2 July and allowed to float. It depreciated promptly by more than 10 percent and, like the Mexican peso before it, continued to depreciate for several months thereafter (see figure 2.2). Having announced a policy package that failed to halt the depreciation, Thailand turned to the IMF. After arduous negotiations, the Fund approved a three-year standby arrangement amounting to \$4 billion; funding was also provided by the World Bank, Asian Development Bank, and a group of governments led by Japan.<sup>30</sup>

The large amount of official financing—it totaled \$17.2 billion—came as a surprise to those who had read the Rey Report (Group of 10 1996)

28. Ito (1999) asserts that hedge funds led the attack on the baht, but Eichengreen et al. (1998b) find that they played a small role—and an even smaller role in subsequent attacks on other Asian currencies. For more on the role of hedge funds in these and other episodes, see De Brouwer (2001), who attaches more importance to them.

29. The central bank's forward commitments were not made public at the time, but well-informed market participants must have been aware of the bank's high-risk strategy; they bet against it heavily.

30. The Thai policy package approved by the Fund is summarized in Lane et al. (1999), together with those for Indonesia and Korea.

and taken it seriously. Why did the official community decide to provide large-scale financing after having warned investors not to count on it again? Four reasons have been given. First, there was fear of contagion. If foreign banks and other foreign creditors had been forced to roll over their claims on Thailand, they might have begun to withdraw from other Asian countries. Second, the Rey Report had dealt mainly with sovereign debt, not private-sector debt, and it would have been hard to compel private-sector debtors to halt their debt payments; the Rey Report itself had warned that capital controls might be needed to enforce a suspension of private-sector payments. Furthermore, the Rey Report had explicitly advised against interfering with interbank debt, which was the largest and most volatile component of Thailand's short-term foreign debt.<sup>31</sup> Third, there were worries about the fragility of the Japanese banks, which were large lenders to Thailand. Fourth, it would have taken time to devise and implement a suspension of debt payments—and time was running out for Thailand, because its currency was depreciating rapidly and it had virtually no reserves.<sup>32</sup>

## How the Crisis Spread

The problems faced by Thailand in 1996 and early 1997 had little effect on other emerging-market countries, even within Asia. Some of its neighbors did not suffer a similar slowdown of exports, few of them had overvalued currencies, and none had a comparable current account deficit.<sup>33</sup> Equity prices were still rising in most other Asian countries, and

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31. In mid-August, Japanese banks promised informally that they would refrain from reducing their claims on their own Thai branches—but those promises were not honored fully, and Thailand obtained no such promises regarding Japanese claims on the Thai banks themselves; see Lane et al. (1999), who note that creditors' decisions in matters of this sort will always depend on their views about the various debtors involved as well as about the debtor country itself. (In the case of Korea, discussed later, the government solved this problem by guaranteeing the banks' debts.) Despite the informal promises just mentioned, interbank claims on Thailand fell by almost \$16 billion in the second half of 1997 and by \$12 billion more in the first half of 1998 (BIS, *International Banking and Financial Market Developments*, November 1998).

32. Some of those close to the negotiations give a fifth reason for the decision to provide large-scale official financing: the Japanese government wanted to demonstrate that it could mobilize support for Thailand, much as the United States had mobilized support for Mexico. (They also note that the Thai authorities said at the time and thereafter that the amount of official financing was too small, given the size of Thailand's short-term external debt—that Thailand had been underfinanced relative to Mexico.)

33. Using purchasing-power-parity calculations, Chinn (1998) found that the Thai baht, Malaysian ringgit, and Philippine peso were overvalued in mid-1997, but by small amounts. Using model-based calculations, he found that the ringgit and baht were overvalued, along with the currencies of Singapore and Taiwan. But none of his calculations showed that the Indonesian rupiah was overvalued, and they all showed that the Korean won was

their currencies were still strong. Equity prices were falling in Korea, however, because corporate bankruptcies were rising and the won was being allowed to depreciate gradually. In fact, Korea was starting to lose reserves (but was concealing its losses).

Some countries' currencies came under pressure as the Thai crisis approached, but the pressures were contained by intervention, higher interest rates, and, in the Malaysian case, restrictions on nonresidents' use of swap transactions. Once the baht started to depreciate, however, other Asian currencies came under severe pressure, starting with the Philippine peso. On 11 July, less than two weeks after the baht was set free to float, the Philippine central bank widened the band within which the peso was allowed to fluctuate; three days later, the Philippines became the first crisis-stricken Asian country to receive financing from the IMF. On that same day, the Malaysian central bank ceased to defend the ringgit, but Malaysia did not seek help from the IMF.

The crisis continued to spread in August. There was a brief but sharp attack on the Hong Kong dollar, which was tied tightly to the US dollar by a currency board regime, and it led to a very sharp spike in short-term interest rates. On 14 August, moreover, the Indonesian central bank allowed the rupiah to float and adopted a tight monetary policy.<sup>34</sup> In light of what happened later, it is worth quoting the following assessment of Indonesia's initial response:

[President] Suharto's initial approach to the crisis appeared both more decisive and coherent than the Chavalit or Kim government's [in Thailand and Korea, respectively] and more cooperative than the bellicose policy pronouncements of [Malaysian] Prime Minister Mahathir. In contrast to Thailand's costly and futile effort to defend the baht, Indonesia's response to regional contagion was to quickly widen the band within which the rupiah traded, and when this proved inadequate, to initiate a float. When the rupiah continued to fall, the central bank adopted an extremely tight monetary stance—well before going to the IMF—in a bid to support the currency. This policy had severe consequences for the already-fragile banking sector.

Suharto's Independence Day speech in mid-August provided a sober assessment of the country's problems, and was followed by the creation of a special crisis management team headed by the widely respected technocrat Widjono Nitisastro. A wide-ranging set of policy measures followed in September. In early October,

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undervalued. Other studies, however, reached different conclusions; see the survey in Edwards (1999b).

34. As Indonesia still had large reserves, the decision to let the rupiah float came as a surprise. In fact, Indonesia's involvement in the crisis was itself surprising. The model of currency and banking crises developed by Kaminsky (1998), drawing on work by Kaminsky, Lizondo, and Reinhart (1998), predicted the involvement of Thailand, Malaysia, and the Philippines, but not Indonesia. Ito (1999) described the decision to float the rupiah as precautionary. Williamson (1998) first called it unnecessary, but later (2000a) wrote that most of those familiar with events in Indonesia believed that the country's crawling-band regime could not withstand the pressure to which it was exposed.

two months after floating the rupiah, the government turned to the IMF. Although the negotiations were not without conflict, Indonesia was able to conclude an agreement much more rapidly than the Thai government. (Haggard 2000, 65)

Indonesia's initial agreement with the IMF provided \$36 billion of official financing—including \$10 billion from the Fund, \$8 billion from the multilateral development banks, and \$18 billion from foreign governments.<sup>35</sup> Indonesia agreed to maintain a tight monetary policy to stabilize the rupiah and limit the inflationary impact of the previous depreciation. It also agreed to tighten its fiscal stance, close insolvent banks, and adopt other measures designed to revive the financial sector and reform the corporate sector.

The rupiah strengthened in response to these commitments and to concerted intervention by Asian central banks, but it began to weaken again as bad news arrived. The closing of insolvent banks was poorly handled and undermined confidence in the banking system, as the government shut down 16 small banks without promising not to close others.<sup>36</sup> Furthermore, the central bank diluted its tight monetary policy by creating a special facility to inject liquidity into the banking system. And Suharto made matters worse by reversing his earlier decision to defer 15 large investment projects and by producing a new budget based on rosy suppositions about Indonesia's economic prospects. Markets expressed their doubts, as did the IMF, and the rupiah plummeted.<sup>37</sup> There was a bout of panic buying as food and fuel prices soared.

A new IMF program was signed by Suharto in mid-January, with the managing director of the IMF looking on. It was extraordinarily comprehensive and was clearly aimed at dismantling the economic empire of Suharto's family and friends. But it was attacked by his critics as well as his cronies, and Suharto started to backpedal again. Implementation lagged, and economic conditions worsened; inflation soared and output fell. The IMF program was suspended in March and revised in May, but the newly modified program was undermined by civil unrest and political turmoil.<sup>38</sup> As the rupiah continued to depreciate, moreover, Indonesian

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35. In this and the subsequent Korean case, however, the bilateral money was meant to provide a second line of defense, whereas the bilateral money for Thailand was used in tandem with disbursements from the IMF; see Lane et al. (1999).

36. See Lane et al. (1999) and Haggard (2000). Caprio and Honohan (1999) believe that this step should have been taken sooner and that more banks should have been closed, so as to draw a clear line between sound and bad banks and to restore confidence in the former. De Gregorio, Eichengreen, Ito, and Wyplosz (1999) take the same view but praise the Indonesian approach, imperfect as it was, as having been better than the vacillating stance of the Thai authorities.

37. But see Radelet and Sachs (1998) for a more favorable assessment of Suharto's budget.

38. For more on these and subsequent events, see Haggard (2000).

corporations faced a gargantuan increase in the domestic currency cost of servicing their foreign debts. Unlike Thai firms, which had borrowed dollars from domestic banks, Indonesian firms had borrowed dollars from other countries' banks, including banks in Hong Kong. They tried at first to cover their forthcoming payments by selling rupiah for dollars, a tactic that inevitably served to hasten the collapse of the currency. And when they could no longer afford to do that, they defaulted on their debts. The resulting corporate debt problem has not been fully resolved, despite attempts to organize a comprehensive settlement.

## **And How the Crisis Went on Spreading**

Meanwhile, the Asian crisis had migrated northward. On 20 October 1997, the Taiwan dollar was allowed to depreciate by about 6 percent. As Taiwan was not gravely affected by the Asian crisis, this event is sometimes ignored (but see Chote et al. 1998; Masson 1999). The reasons for it, moreover, remain rather obscure. The IMF mentions "exchange market pressures" (IMF 1997b), which Giancarlo Corsetti, Paolo Pesenti, and Nouriel Roubini (1998c) attribute to worries about a loss of competitiveness due to the large depreciations of other Asian currencies. Yet Taiwan might have resisted the attack on its currency, as it had huge reserves, and its decision had unfortunate consequences. The depreciation of the Taiwan dollar led immediately to an attack on the Hong Kong dollar. That attack was repelled by the workings of Hong Kong's currency board regime, but the resulting increase in short-term interest rates caused the Hong Kong stock market to fall precipitously, triggering a worldwide fall in stock prices. Furthermore, and more important, the depreciation of the Taiwan dollar drew attention to the vulnerability of Korea, which is closely competitive with Taiwan.

Several large Korean firms had run into serious problems early in 1997, and they were deeply indebted to Korean banks—which were, in turn, deeply indebted to foreign banks. Indeed, it can be argued that Korea was due for a homegrown currency crisis sooner or later. But the timing of the actual crisis can be ascribed to events elsewhere. At the end of October, shortly after the attack on the Hong Kong dollar and the worldwide fall in stock prices, the Korean won came under heavy pressure. Foreign banks ran down their claims on Korean banks and on their foreign branches, forcing those banks to buy dollars with which to repay their debts. The central bank came to their aid by selling them dollars directly and by depositing dollar reserves with their foreign branches. As a result, Korea's reserves, net of those deposits, fell by \$15 billion during November (Hahm and Mishkin 2000).

On 20 November, the Korean authorities widened the band in which the won was allowed to fluctuate, and the won fell quickly to the edge

of the new band. On the next day, Korea sought help from the Fund—which came through two weeks later. The IMF committed \$21 billion (more than ever before), the multilateral development banks put up \$14 billion, and foreign governments pledged an additional \$23 billion as a second line of defense for the won. Korea undertook to tighten its monetary policy, abolish the band for the won, and introduce comprehensive reforms, including financial-sector reforms and further trade liberalization.

Nevertheless, foreign banks continued to run down their claims on Korea, and the first tranche of IMF credit, amounting to \$9 billion, was used up in two weeks.<sup>39</sup> Accordingly, the Korean authorities asked the IMF to speed up the disbursement of the second tranche, and it also sought to draw down the bilateral credits set up by the major industrial countries. But the Fund and industrial countries refused to provide additional money until the major foreign banks had agreed to roll over the rest of their claims—and urged those banks to do that quickly. In a matter of days, the banks agreed and rolled over their interbank claims for three months, through the end of March, in exchange for a commitment by the Korean government to guarantee the ultimate repayment of those claims. A debt-monitoring system was set up at the Bank of Korea to police the agreement, and rollover rates rose “significantly” (Lane et al. 1999). At the end of March, moreover, the Korean government reached an agreement with 134 creditor banks from 32 countries, covering close to \$22 billion of the short-term debt owed by the Korean banks. It was converted into government-guaranteed bonds with maturities ranging from one to three years and interest-rate spreads running from 2¾ percent over LIBOR (the London Interbank Offered Rate) for the one-year bond to 2¼ percent for the three-year bond.

More could be said about the evolution of the crisis, but narrative is not the main aim of this chapter. We turn instead to the other questions posed at the start of this section. Why was the crisis so contagious? Why did it cause so much damage to the Asian economies?

## Contagion, Exchange Rates, and Output Effects

Contagion is not unusual and tends to be regional. Morris Goldstein (1998) points out, however, that the Asian case had a peculiar feature. It

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39. The net claims of foreign banks fell by almost \$12 billion during the fourth quarter of 1997 and by almost \$16 billion during the first quarter of 1998 (BIS, *International Banking and Financial Market Developments*, December 1998). The 1998 rundown occurred despite the rollover agreement reached at the beginning of 1998. A significant part of the rundown represented attempts by Japanese banks to cut back their total loans, as they were incurring loan losses at home and abroad.

began in a fairly small country, Thailand, but infected a number of larger countries, such as Korea and Indonesia. Furthermore, the Asian currencies depreciated hugely—by more, for example, than the lira and the pound when they left the European Monetary System (EMS) in 1992.

## Analyzing Contagion

A simple taxonomy provided by Paul Masson (1999) can help us sort out the reasons. There are, he says, monsoonal effects, spillover effects, and expectational effects.

*Monsoonal effects* are the manifestations of shocks coming from the outside world, mainly from developed countries. Because they can affect several countries simultaneously, producing co-movements in exchange rates, interest rates, equity prices, and other variables, their manifestations resemble contagion.<sup>40</sup> To identify true contagion, however, we must clearly distinguish between the common effects of shocks originating in the outside world and the effects of shocks originating in one of the affected countries.

*Spillover effects* are the manifestations of economic interdependence and represent true contagion. They can take several forms. A contraction of output and income in a crisis-stricken country will reduce its imports from neighboring countries. A depreciation of the country's currency will reinforce the import-reducing effect of the contraction in its income, and it will also have export-raising effects: first, it will stimulate the country's exports to its neighbors, depressing their import-competing industries; second, it will stimulate the country's exports to the outside world at the expense of its neighbors' exports.<sup>41</sup> Interdependence can operate through asset-market channels, too. When foreign or domestic investors suffer losses in one country, they may run down their claims on other countries, even when they have no reason to believe that they will suffer losses on those other claims; they may have to sell them merely to meet margin calls. Furthermore, investors may try to hedge against prospective losses in one vulnerable country by running down more liquid claims on other,

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40. On asset price behavior during the Asian crisis, see Baig and Goldfajn (1999), who find that cross-country correlations of exchange rates and interest rate spreads rose significantly during the crisis. When they then allow for the effects of own-country news and of changes in economic fundamentals, they find strong cross-country effects on exchange rates and equity prices (but not on bond spreads). Forbes and Rigobon (1999) show, however, that changes in cross-country correlations may merely reflect the increased volatility of all asset prices, including the prices of commonly held assets, that often occurs during a crisis; they may not reflect an increase in the underlying interdependence of those asset prices.

41. Diwan and Hoekman (1999) examine the bilateral and third-country trade of the various Asian countries but do not assess the impact of the actual trade-flow changes on the spread of the Asian crisis.

similarly situated countries—a practice known as proxy hedging (see, e.g., BIS 1998; G. Calvo 1998; Goldstein 1998; White 1999).

*Expectational effects* are the manifestations of changes in investors' views. They may involve residents, as well as foreigners, and can take two forms. First, a crisis in one country may lead investors to reassess the economic outlook for seemingly similar countries. Second, a crisis in one country may reduce investors' tolerance for risk and thus cause them to run down their claims on many other countries. Masson describes the first phenomenon as a shift in a unique equilibrium, and the second as a jump between multiple equilibria.<sup>42</sup>

But we also need to distinguish between two quite different ways in which investors may be led to revise their views about a particular country. First, a crisis in one country can serve as a “wake-up call” (Goldstein 1998), causing investors to reassess the existing situation in some other country: it can draw their attention to vulnerabilities they have not noticed before. Second, a crisis in one country can cause investors to predict harmful spillover effects on some other country: they may conclude, for example, that a crisis-stricken country will reduce its imports and thereby reduce some other country's exports. This *anticipation* of spillover effects may have been the strongest cause of contagion during the Asian crisis—more powerful than the actual spillover effects. It may indeed afford the only plausible explanation for the speed with which the crisis spread across the region.

There were some monsoonal effects at the start of the Asian crisis: the Japanese recession, the appreciation of the dollar vis-à-vis the yen, and the fall in demand for Asia's electronic exports. But research on the migration of the crisis has focused mainly on true contagion—the spillover and expectational effects—rather than the common shocks.

Studies of earlier crises, including the EMS crisis of 1992-93, have found that trade-related spillover effects help explain contagion.<sup>43</sup> Two widely cited studies of the Asian crisis also stress trade effects. Reuven Glick and Andrew Rose (1999) show that one country is more likely to import a crisis from another if they have similar trade links with the outside world, and this result holds for the Asian crisis as well as for earlier crises.<sup>44</sup>

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42. Note that herding can reinforce both of these expectational effects. When some investors start to sell off their claims on a particular country because they have grown more wary of its fundamentals or more risk averse, other investors may mimic them. Furthermore, G. Calvo and Mendoza (2000) have shown how globalization can raise the payoff from this behavior. By increasing the number of readily available country-specific assets, globalization reduces an investor's incentive to acquire costly information about a particular country or asset; the investor is more likely to act on the basis of free information alone—including unverified rumors and observed price changes reflecting the decisions of other investors (who may, of course, be doing the same thing).

43. See the studies cited in n. 20, above.

44. But see the comment on their methodology in n. 21, above.

Graciela Kaminsky and Carmen Reinhart (2000) devise country clusters based on the strength of countries' bilateral trade links and the extent to which they compete in third countries' markets. They find that two countries' membership in the same trade cluster raises the probability that one of them will import a crisis from the other.<sup>45</sup> In the same paper, however, Kaminsky and Reinhart formed other sorts of clusters, including clusters based on creditor-bank links, and they found that the creditor-bank clusters did better than the trade clusters in predicting the actual path of contagion during the Asian crisis. For this and other reasons, they conclude that financial-market links played a larger role than trade links in propagating the Asian crisis.<sup>46</sup>

Other studies stress expectational effects. Michael Bordo and Anna Schwartz (1998) and Morris Goldstein (1998) emphasize the wake-up call sent by the Thai crisis; investors were made to recognize the common and worrisome characteristics of several Asian countries—the sizes of their current account deficits and of their foreign currency debts, the flaws in their banking systems, and the pervasive effects of corruption (see also Chote et al. 1998; Eichengreen 1998; Kaminsky 1998). Henri Bernard and Joseph Bisignano (1999, 20) attribute the spread of the crisis to a shift in market sentiment “relatively unrelated to any change in fundamentals or arrival of new information.” Taimur Baig and Ilan Goldfajn (1999) detect in their own empirical results “an element of financial panic” at the start of the crisis. Most of these accounts, however, focus on the attitudes and actions of foreign investors, especially those of the foreign banks that ran down their interbank claims. They pay insufficient attention to the activities of Asian banks and firms, which rushed to cover their foreign currency debts as soon as they saw what was happening in Thailand. We may never know which came first—the exit of the foreign banks or the scramble by Asian debtors to buy foreign currencies with which to repay their debts. But together, the two provide a parsimonious yet attractive explanation for the rapid migration of the Asian crisis and the huge depreciations of the Asian currencies.

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45. When forming the clusters, moreover, Kaminsky and Reinhart study the commodity composition of the countries' exports as well as the countries to which they export.

46. Three other studies also emphasize trade links. Barth and Dinmore (1999) show that there was a large drop in the dollar prices of the Asian countries' exports and suggest that it may have been due to an intensification of competition among the crisis-stricken countries. Their finding, however, may say more about the effects than the causes of contagion. White (1999) concludes that third-market competition played a nontrivial role in propagating the Asian crisis; but like Kaminsky and Reinhart (2000), he appears to attach more weight to expectational effects and to asset-market spillover effects. Finally, Forbes (2001) shows that countries competing with exports from a crisis-stricken country or exporting heavily to it had lower stock-market returns. Insofar as stock-market returns are forward-looking variables, however, this result may reflect the *anticipation* of trade effects rather than their actual impact—the point made in the text above.

## The Role of Exchange Rate Regimes

The exchange rate regimes of the Asian countries and their subsequent collapse played key roles in the crisis. At the end of 1996, the Philippine peso was listed by the IMF as floating independently; the Indonesian rupiah, Korean won, Malaysian ringgit, and Thai baht were listed as having “other managing floating” regimes. In fact, the ringgit and baht had been tied tightly to the US dollar for some years before the crisis; the peso and won had fluctuated modestly vis-à-vis the dollar; and the rupiah had been allowed to depreciate gradually in order to offset domestic inflation.<sup>47</sup>

Five features of the Asian crisis are often blamed on these exchange rate regimes. First, they exposed the Asian countries to large fluctuations in the yen-dollar rate; the appreciation of the dollar in 1995-97 is cited as having been especially harmful to the Asian countries’ exports. Second, Asian banks and firms took the commitment to exchange rate stability as an invitation to engage in unhedged foreign currency borrowing; it was, in effect, an implicit guarantee of the sort so often cited in discussions of the Asian crisis. Third, Asian central banks were firmly committed to exchange rate stability and therefore had to intervene on foreign exchange markets to keep their currencies from appreciating, but they could not prevent the resulting increase in bank liquidity from fueling domestic lending and producing the property boom that weakened the balance sheets of the financial sector. Fourth, the Asian countries made the same mistake that Mexico had made in 1994: Thailand and Korea, in particular, defended their dollar exchange rates tenaciously until they ran out of reserves and could not prevent their currencies from depreciating hugely. Fifth, the depreciations of the Asian currencies were the immediate cause of the financial crisis—the implosion of bank lending and of other credit flows that depressed domestic investment and led to the steep fall in Asian output.

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47. The IMF’s characterization of exchange rate regimes was based at the time on each country’s description of its own regime; the Fund did not start to make judgments of its own until 1999. McKinnon (1998, 2000) treats the five Asian countries as adhering to a dollar standard: their monetary policies stabilized their dollar exchange rates, and their link to the dollar was the nominal anchor for their domestic price levels. Others, such as Frankel and Wei (1994) and Takagi (1999), treat them for analytical purposes as “basket peggers” that put high weights on the dollar and low weights on the yen; see also Ito, Ogawa, and Sasaki (1998). McKinnon argues, however, that big dollar weights made sense, because much of Japan’s trade with Asia is dollar-denominated. In fact, he recommends the restoration of the Asian dollar standard at the purchasing-power parities prevailing before the Asian crisis; otherwise, he warns, Asian countries might engage in predatory devaluations. He readily concedes that an Asian dollar standard cannot be robust unless Japan and the United States undertake to stabilize the yen-dollar rate, but that’s what he would like them to do in any case.

The first assertion is rarely challenged, although questions can be raised about the extent to which the appreciation of the dollar slowed the growth of Asian exports and the extent to which the slower growth of exports contributed to the financial-sector problems that triggered the Thai crisis.<sup>48</sup>

The second assertion is made by Barry Eichengreen (1998), Morris Goldstein (1998), Pedro Alba et al. (1999), and others, and it is rarely challenged. But there are two objections to it. First, the foreign currency debts of Thai banks were covered in large part by their foreign currency claims on domestic firms; the firms were the ones with the unhedged debts. Yet Indonesian and Korean firms also took on large amounts of unhedged foreign currency debt, though the rupiah and won were less tightly tied to the dollar than was the Thai baht.<sup>49</sup> Second, some unhedged debt was yen debt, not dollar debt, and no Asian currency was pegged to the yen.<sup>50</sup>

48. See the papers cited in n. 28, above; see also Barth and Dinmore (1999), who emphasize the role of the Japanese recession rather than the depreciation of the yen vis-à-vis the dollar.

49. From 1992 to 1995, however, the standard deviation of the monthly percentage changes in the baht-dollar rate, at 0.47 percent, exceeded that for the rupiah-dollar rate, at 0.16 percent, and was not much smaller than that for the won-dollar rate, at 0.58 percent (Williamson 2000a). A similar result is obtained by G. Calvo and Reinhart (2000a), who compute the probability that the absolute monthly change in the dollar value of a country's currency will fall within various limits. These are their results for a set of 19 countries with "other managed floating rates" and for the three Asian countries individually:

Country	Period	Probability that change will not exceed	
		1.0 percent	2.5 percent
19-country average	Various	60.0	87.5
Indonesia	11/78-06/97	96.4	99.1
Korea	03/80-10/97	80.1	97.6
Thailand	01/70-06/97	93.6	98.5

The three Asian currencies have higher-than-average probabilities. Here again, however, the rupiah is the most stable in terms of the dollar; the baht is next, and the won comes last.

50. A third objection is raised by McKinnon (2000) and is echoed by Furman and Stiglitz (1998), as well as by Frankel, Schmukler, and Servén (2000). McKinnon points out that the cost of hedging should be low when a country's currency is credibly pegged. Conversely, it should be high and thus a deterrent to hedging when the peg is not credible—what McKinnon describes as a "bad" fix—or when the exchange is flexible and fluctuates widely. Therefore, he says, the failure by Asian firms to hedge foreign currency debt should not be blamed on exchange rate pegging per se; it should be blamed instead on the actual levels at which Asian rates were pegged, which raised the cost of hedging. However, there is a serious flaw in McKinnon's reasoning. If Asian exchange rates were bad fixes and this fact was reflected in the cost of hedging, market participants must have known that they were bad fixes and that the cost of hedging was not unreasonably high (given the risk that such fixes won't survive for long). But McKinnon makes another, more plausible point: Asian banks may have been induced to take on excessive risks, including exchange rate risks, because they believed that they were protected by broad guarantees. Giannini (1999, 36) makes the same point but stresses a different set of broad guarantees: "All arguments emphasizing local guarantees . . . run up against the difficulty of explaining how sophisticated international investors could be made to believe in [local] guarantees when they knew

Although these are valid objections, they do not banish the belief, shared by most observers, that greater exchange rate flexibility might have induced Asian borrowers—firms as well as banks—to hedge more of their foreign currency debts.

The third assertion made above is less controversial. If the Asian countries had let their currencies appreciate before the crisis, in response to the capital inflow, instead of intervening on foreign exchange markets, the capital inflow might not have caused the surge in domestic lending that led to the property boom. Furthermore, the inflow itself might have been smaller. Insofar as the central banks sterilized the effects of their interventions on the currency markets, they prevented domestic interest rates from falling. By seeking to peg their currencies, they thus sustained the interest rate differences that brought on the “carry trade” and the surge of interbank borrowing.

Regarding the fourth effect, the tenacity with which some Asian countries defended their currencies until they ran out of reserves, we should distinguish between the Thai case and all others. Pressures on the baht emerged months before the acute crisis of mid-1997. Accordingly, the Thai authorities might have engineered a modest devaluation and defended the baht thereafter (see Radelet and Sachs 1998). And had they done so, other Asian countries might have been able to defend their currencies. Once the baht had depreciated hugely, however, none of the neighboring countries could expect to engineer a small devaluation or contain a floating rate within a narrow range. The losses incurred by those who had to sell baht, in order pay off their dollar debts, served as a warning to the residents of other countries that they should move quickly to cover their own dollar debts. The result was an extremely inelastic demand for foreign currency that inevitably produced a sharp depreciation of the domestic currency once it was set free to float.<sup>51</sup> In December 1997, after the won was set free to float, Korea’s attempt to limit the depreciation of the won exhausted its reserves in a couple of weeks, and even the arrival of IMF money did not stem the reserve loss.

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that the respective country’s external liabilities were denominated mostly in foreign . . . currency.” To an important extent, he says, imprudent borrowing by Asian banks must be blamed on their foreign counterparties and the guarantees available to them, not the guarantees enjoyed by the Asian banks.

51. See Grenville and Gruen (1999) for a similar interpretation. Corbett and Vines (1999) believe that the Asian countries could have stabilized their currencies had they followed the British example of 1992 and substituted inflation targeting for exchange rate targeting after letting their currencies float. But sterling had ceased to depreciate rapidly before Britain adopted inflation targeting. Similarly, in the case of Brazil the central bank did not start to pursue inflation targeting until the depreciation of the currency had slowed from a crash to a crawl.

**Table 2.3 Change in real GDP of Indonesia, Korea, Malaysia, and Thailand, 1996-99 (percent)**

Country	1996	1997	1998	1999
Indonesia	8.0	4.5	-13.0	0.3
Korea	6.8	5.0	-6.7	10.7
Malaysia	10.0	7.3	-7.4	5.6
Thailand	5.9	-1.7	-10.2	4.2

Source: IMF (2000f).

## Exchange Rates, Balance Sheets, and the Collapse of Investment

The final feature of the Asian crisis, the large fall in output, is commonly attributed to the collapse of domestic lending.<sup>52</sup> The output loss was very large indeed. Table 2.3 shows the percentage changes in real GDP.

Most analyses, moreover, blame the fall in output on the banking-sector problems that were an important cause of the Thai crisis, and a major consequence of other countries' crises.<sup>53</sup> But they disagree about the reasons for those banking-sector problems. Martin Feldstein (1998) and others point to high interest rates—which they blame on the IMF. As interest rates rose, they say, firms could not continue to service their debts. Bad loans built up on the books of the banks, which had to curtail their lending. Although all of this happened in Asia, it has also happened elsewhere without causing comparable damage. The unique feature of the Asian crisis was, once again, the huge depreciation of the Asian currencies, which had a devastating impact on the balance sheets of firms with large foreign currency debts. Firms that failed to cover them quickly, before their countries' currencies began to depreciate, could not afford to cover them later. And that, in turn, was one reason for their governments' reluctance to let go of their pegged exchange rates.

The balance sheet effects of high interest rates were featured initially in work by Ben Bernanke and Mark Gertler on the role of the so-called credit channel in transmitting the effects of monetary policy.<sup>54</sup> The corres-

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52. The collapse of domestic credit flows also prevented Asian firms from exploiting the export opportunities afforded by the depreciations of their countries' currencies; see White (1999). This effect is often invoked to explain why the improvement in the current account balances of the Asian countries during 1998 resulted mainly from import contraction rather than export expansion. Barth and Dinmore (1999) show, however, that Indonesian, Korean, and Thai export volumes rose in 1998 and that the fall in their export receipts was due to a large fall in export prices; see also IMF (1998b).

53. See, e.g., Dekle and Kletzer (2001), who contrast Thailand and Korea, which had very serious banking-sector problems, with Malaysia, Taiwan, and Singapore, which did not. They attach particular importance to the differences between the supervisory regimes in the two groups of countries.

54. See Bernanke and Gertler (1995) and the earlier papers cited there.

ponding effects of currency depreciations have been featured in papers by Guillermo Calvo and Carmen Reinhart (2000c), Paul Krugman (2000), and others.<sup>55</sup> The Calvo-Reinhart and Krugman papers argue that a currency depreciation occurs endogenously when a capital inflow stops or gives way to a capital outflow and a country must therefore shift from current account deficit to current account surplus. In these equilibrium models, moreover, the depreciation is just large enough to make the necessary shift in the current account balance. But it does not operate in the usual way, by switching expenditure from foreign to domestic goods or from traded to nontraded goods—effects that stimulate output and income. Instead, it operates in a dysfunctional way by impairing the creditworthiness of firms with big foreign currency debts, preventing those firms from borrowing, and reducing capital formation—effects that depress output and income. Furthermore, the depreciations of the Asian currencies were far larger than those needed to make the necessary shifts in current account balances. Korea began to accumulate reserves early in 1998, Indonesia and Thailand in 1999. Therefore, the adjustment process was doubly dysfunctional.

## What Happened Thereafter

The architecture exercise began in the wake of the Mexican crisis, but it was heavily influenced by the Asian crisis:

- It led to the creation of two new facilities in the IMF—the Supplemental Reserve Facility (SRF) and the Contingent Credit Line (CCL).
- It encouraged more intense international efforts to strengthen the financial and corporate infrastructure in emerging-market countries.
- It strongly influenced the ongoing quest for the most effective ways to involve the private sector in resolving debt-related crises.
- It touched off a vigorous debate about the scope and character of IMF conditionality—whether the Fund should always insist on “orthodox” austerity, and whether crisis-stricken countries should be made to pursue far-reaching structural reforms in the midst of a crisis.
- It inspired the attempt to promote regional monetary cooperation in Asia—an effort that began inauspiciously, when the United States

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55. See, in particular, Corsetti, Pesenti, and Roubini (1998c), Mishkin (1998), Brealey (1999), and Schneider and Tornell (2000). I also emphasized these effects soon after the Asian crisis began (Kenen 2000b). For empirical work on balance sheet effects in Asia, see Agénor, Aizenman, and Hoffmaister (2000) and other papers cited there. Krugman (1998b) notes that implicit guarantees play no role in his model, though they played a key role in his previous work on the Asian crisis.

quashed a Japanese attempt to create an Asian Monetary Fund, but has since produced a network of credit arrangements linking China, Japan, and Korea with the Southeast Asian countries.

The architecture exercise was also shaped by subsequent events—and they were shaped in turn by the exercise itself. Some of them will be discussed in later chapters, but four deserve to be mentioned here.

### **Malaysia's Capital Outflow Controls**

One event happened in Asia itself. Having declined to seek assistance from the IMF, Malaysia went on to adopt a strategy radically different from those followed by its neighbors. In September 1998, it pegged the ringgit to the US dollar and introduced capital controls in an effort “to insulate the domestic economy from international financial volatility, to curb capital flight and speculation against the ringgit, and eliminate offshore transactions in the domestic currency” (IMF 1998b, 22). Proceeds from sales of domestic securities had to be deposited for one year in a local currency account, lending to foreign banks was forbidden, and transfers between offshore accounts could not be made without permission. The new restrictions disrupted offshore markets, especially in Singapore, by forcing the liquidation of swap positions and the repatriation of offshore ringgit accounts. They also led, not surprisingly, to dire warnings that Malaysia would pay for its sins—that it would be cut off indefinitely from international capital markets.

### **Russia's Unilateral Default**

The second event happened earlier. In July 1998, the IMF had approved an \$11.2 billion drawing by Russia, and \$4.8 billion was made available immediately. The Russian government promised to reduce its budget deficit from 5.6 percent of GDP to 2.8 percent in 1999, relying heavily on measures to increase tax collections. It also undertook to overhaul its banking system and lengthen the maturity of its domestic debt by offering holders of treasury bills (GKOs) an opportunity to exchange them for long-term foreign currency bonds. In light of Russia's previous performance, there were reasons to question the credibility of these commitments, but the program was approved despite reservations within Western governments. Outsiders explained that “Russia is too nuclear to fail.” Insiders seemed to be making a more subtle bet: the money might not buy much real reform but might buy the survival of the reformers themselves.

Unhappily, it did not even buy time. The voluntary debt exchange did little to reduce the stock of short-term government debt, and foreign investors began to wonder whether that debt could be rolled over. They

had taken the IMF's decision in July as proof that Russia would be bailed out and had therefore continued to buy high-yielding GKO's, in what traders themselves described as the "moral hazard play." Many had covered their foreign exchange risks by selling rubles forward to Russian banks, but they began to realize that they faced another risk—Russia might default. And that is what happened in August. When Russia failed to honor the promises made in July, the IMF refused to disburse the next tranche of the \$11.2 billion drawing. Therefore, Russia announced a unilateral restructuring of its ruble-denominated debt, suspended trading in that debt, and imposed a 90-day moratorium on private debt payments, including forward foreign exchange contracts; it also devalued the ruble—which was allowed to float less than two weeks later. And soon thereafter, Russia sought to restructure its foreign currency debt.

The Russian crisis had an extraordinary impact. This is how the Fund described it in a special issue of its *World Economic Outlook*:

The recent turbulence in global financial markets was unusual for a period characterized by relatively strong macroeconomic policies and conditions in many of the advanced economies. The volatility reflected a sudden heightened perception of, and aversion to, risk following Russia's effective default in August and an associated flight to quality. Emerging markets were particularly seriously affected as interest rate spreads on their external debt increased significantly and new private financing virtually ground to a halt. But the repercussions were not limited to these countries, as the global flight to quality led to sharp increases in spreads on financial assets in some of the deepest capital markets in the world, especially in the United States, and to sharp volatility in the dollar-yen exchange rate.

Subsequent actions by the Federal Reserve and other central banks to lower short-term interest rates have helped to alleviate fears of a deepening global credit crunch, as has the international support package for Brazil. However, the process of deleveraging and portfolio rebalancing in response to heightened risk aversion may not have run its course, and the situation remains fragile. . . .

The severe reaction to the Russian default was partly due to the sizes of the losses on Russian exposures and positions, but these were not in aggregate large enough to account fully for the ensuing turbulence. More important was the role of the Russian default as a defining event that challenged widely held views about the default risks associated with *all* emerging market investments, and the willingness of the international community to provide assistance to countries in difficulty. . . .

A second issue concerns the sources of the vulnerabilities that led to the Russian default producing severe liquidity problems in some of the deepest capital markets, and prompting action by a major central bank to facilitate the private rescue of a hedge fund [Long Term Capital Management]. The drying up of liquidity resulted mainly from many investors attempting at the same time to rapidly unwind highly leveraged positions, built either to arbitrage mature market credit spreads or to exploit perceived differences in funding costs between major currencies, most notably the dollar-yen carry trade. (IMF 1998b, 14-15)

In short, the remarkable impact of the Russian crisis reflects effects discussed above: the spillover effects across financial markets resulting from

losses, margin calls, and the unwinding of positions, and the expectational effects resulting from a sudden increase of risk aversion.<sup>56</sup> And the fear cited by the IMF—that the official community might refuse to rescue every sovereign debtor—would soon be confirmed.

## **Brazil's Soft Landing**

The third major event, however, sent a different signal. The Brazilian crisis of 1998-99 appeared to reaffirm the commitment to rescue every sovereign debtor. One wonders, however, whether Brazil would have received a massive amount of official financing if it had run into trouble at a less turbulent time. Even those who are usually critical of large-scale official financial packages concede that the \$41 billion mobilized for Brazil served to postpone the devaluation of the Brazilian real to a more tranquil time (see, e.g., Bordo and James 1999).

Brazil's problems began long before the Russian crisis. In the four years following the introduction of the Real Plan in 1994, the Brazilian inflation rate had fallen from more than 2,700 percent per year to less than 3 percent, and real GDP had grown by some 4 percent per year. But Brazil was a little bit like Russia. The government had a large domestic debt, and much of it was short-term debt. Most was held by residents, not foreigners, but residents and foreigners alike were worried about the rate at which the debt was growing. Public-sector borrowing had reached 6.3 percent of GDP in 1997 and was expected to reach 8 percent in 1998. Furthermore, efforts to hold the debt down had floundered repeatedly in the congress, courts, and provinces.

Brazil had been sideswiped by the Asian crisis but had been able to stem a capital outflow by raising interest rates and unveiling an ambitious fiscal package. That package was not fully implemented, however, and Brazil was thus very vulnerable to the turmoil triggered by the Russian crisis in 1998. There was a \$12 billion capital outflow in August and a \$19 billion outflow in September. Official interest rates were raised to 43 percent, new fiscal measures were announced, and Brazil sought support from the IMF, which mobilized a \$41 billion package and made much of that money available up front.<sup>57</sup> For its part, Brazil undertook once again

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56. For a clear account of the interactions between these effects, see G. Calvo (1998). For a detailed account of the Russian crisis, see IMF (1999d), where the Fund was unusually blunt. It called the rush to buy high-yielding GKO's a "feeding frenzy," and it acknowledged that moral hazard was important in the Russian case. But it went on to say that "many investors bought securities they did not fully understand, and . . . they did so in the face of circumstances that should have raised concerns" (1999d, 41).

57. Of the \$41 billion total, \$18 billion was to come from the IMF itself, some \$8 billion would come from the World Bank and Inter-American Development Bank, and the rest would come from a group of 20 governments via the BIS. About 90 percent of the \$41 billion was to be made available during the first 13 months—an arrangement very different

to tackle its fiscal problems, lengthen the maturity of its public debt, and reduce its reliance on floating-rate debt.

Once again, however, it ran into trouble. In December 1998, congressional opposition blocked the government's plan to reform the social security system. In January 1999, one of the states, Minas Gerais, declared that it would seek to restructure its debt payments to the federal government, and other states followed its lead. Capital outflows resumed, interest rates soared, and Brazil took the familiar two-step path to a floating exchange rate; it began by widening the exchange rate band, then let the real float. It did so, however, before exhausting its reserves or using a very large portion of the \$41 billion mobilized by the IMF. And it did so without reviving inflation—the country's chronic nemesis.

## **A New Set of Sovereign Debt Problems**

Finally, a series of debt problems emerged after the Russian crisis. Fearing that its creditors would refuse to roll over a tranche of treasury bills due to mature very soon, Ukraine sought help from the IMF. But the Fund did not want to furnish financing that would, it feared, be used to buy back those treasury bills. Therefore, it required Ukraine to keep its foreign exchange reserves at an abnormally high level—one that would bar it from using them to repay its debt. Forced to find another way of avoiding default, Ukraine persuaded most of its foreign creditors to swap their holdings of treasury bills for zero coupon eurobonds. (Those who refused had to accept Ukrainian currency for their maturing treasury bills and could not then swap it for another currency.)

Four more debt problems arose in 1999, involving Ecuador, Pakistan, Romania, and, again, Ukraine. Romania scraped together the foreign exchange needed to repay its maturing debt. Pakistan did that once but had then to adopt the Ukrainian strategy—exchanging new debt for old—and Ukraine did the same thing again. But Ecuador defaulted on its foreign currency debt, and its debt problem was far harder to resolve. These four cases will be discussed again when we take up the thorniest issue faced in the course of the architecture exercise—the role of the private sector in solving debt-related problems.

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from those for Indonesia and Korea, which doled out the money more gradually (and did not provide for the scheduled use of the bilateral credits furnished by national governments); see IMF (1998b, 1999h) on which this account draws heavily.

