



## II

# The Asian Crisis: Capital Markets Dynamics and Spillover

Having successfully weathered several bouts of speculative pressures, the Bank of Thailand on July 2, 1997 let the baht float. Its immediate depreciation triggered, in relatively quick succession, the depreciations of several of the regional currencies—the Philippine peso, the Malaysian ringgit, and the Indonesian rupiah. Early characterizations of this first round of currency devaluations were as exchange rate “corrections” that were expected to lead to manageable external adjustment. At that point, no one predicted the large depreciations that would fundamentally call into question the underlying assumptions on which past cross-border borrowing, lending, and investment decisions had been based, and provoke a massive retrenchment of capital flows. Outside the region, the rest of the emerging markets remained relatively insulated from the events in Southeast Asia until late October 1997. Then, what began as a localized disturbance in Hong Kong SAR’s foreign exchange and equity markets was transmitted rapidly and forcefully across the emerging markets, bringing strong pressures to bear, most notably on Brazil and Argentina in Latin America, on Russia, and in Asia on Korea. It resulted in an across-the-board external liquidity squeeze for emerging market borrowers and a deepening of pressures on the already affected countries in Asia.

These events raise a host of questions regarding the dynamics of the crisis and its spillover across the emerging markets. What caused the abrupt and massive swing in flows from Southeast Asia? Which flows—foreign direct investment, portfolio, or bank lending—turned around? Were there factors that exacerbated price pressures to create the eventual enormous depreciations? What were the channels for the rapid transmission of pressures across the emerging markets in October 1997 following the turbulence in Hong Kong SAR? Was it simply broad-based investor panic or did the form and structure of investment linkages play a role? How did the actions of the credit rating agencies affect market dynamics? And, finally, what was the role of different investor groups—the international macro hedge funds that some believe took speculative short positions against the Southeast Asian currencies; the international commercial and investment banks that were large investors of funds in the region; international mutual

funds that had sizable equity investments; multinational corporations with substantial direct investments; domestic banks and corporates that had built up large foreign currency liabilities; and domestic retail investors?

Complete answers to these questions encompass several dimensions—the macroeconomic context, policy responses, and the capital market dynamics and spillover of the crisis. The macroeconomic context and outlook have been addressed in successive rounds of the *World Economic Outlook*<sup>1</sup> while policy issues have been considered elsewhere. This chapter examines the Asian crisis from the perspective of international capital markets and is divided into three broad parts. The first discusses the behavior of the volume, composition, and geographical distribution of capital flows to the emerging markets; the pricing, volatility, and liquidity of emerging debt, equity, loan, and foreign exchange markets; and how these were affected by the Asian crisis. It establishes that the largest swing in capital flows to the affected countries in Asia was in bank lending flows, that capital inflows were generally sustained until the very brink of crisis, and that international banks’ retrenchment from the region took the form primarily of cuts in, and withdrawals of, interbank credit lines, and occurred at a very late stage. There was also considerable unrecorded capital flight from Asia, with anecdotal evidence suggesting it originated with domestic residents, both corporate and household entities.

The second part reviews developments in emerging market banking systems. The boom in capital inflows to Asia in the years leading up to the crisis was intermediated in large part by domestic banks, fueling rapid credit growth. When combined with the regulatory failure to strike a balance between the guarantees necessary for financial stability and bank supervision and regulation required to minimize excessive risk-taking, high loan leverage ratios relative to output rendered financial systems extremely vulnerable to liquidity, market, and credit risks. The depreciations of the region’s currencies and declines in asset values precipitated a reassessment of the

<sup>1</sup>See International Monetary Fund (1997a, 1997b, and 1998).

creditworthiness of local banks, which in turn led to external and domestic liquidity pressures, and a further deterioration in banks' asset quality. Several financial institutions in Thailand, Indonesia, and Korea were closed down, suspended or intervened in, and lending activity came to a standstill with severe consequences for real economic activity. The Asian crisis had a severe impact on some Latin American countries, but banking systems strengthened since the Mexican financial crisis—with revamped regulatory frameworks and an increased foreign presence—were able to weather the contagion effects relatively well.

The third part examines the market dynamics and spillover of the crisis, based in large part on extensive discussions held with a wide variety of market participants. The discussion highlights key characteristics of the boom period of capital inflows to Asia that preceded the crisis, including the activities of international commercial and investment banks, the due diligence carried out by these institutions with regard to local counterparties, investment strategies—in particular the “carry trade,” and the rapid growth of regional fixed-income and foreign exchange markets. This is followed by a review of the developments that gradually revealed the extent and nature of financial sector problems in Thailand, prompting capital outflows and bouts of pressure on the currency. The Bank of Thailand's defense of the baht on the forward foreign exchange market, which provided credit to those wishing to take positions against the currency, provided attractive one-way bets, resulting in a rapid increase in the bank's forward liabilities. Devaluation, the imposition of capital controls, or both, thus became inevitable. Contagion to other regional currencies, and several factors that acted to exacerbate the market response—the unwinding or deleveraging of carry trades by both domestic and foreign entities, the rush by domestic entities to hedge both their on-balance-sheet external debt exposures and their extensive off-balance-sheet swaps and options positions, and the thinness of foreign exchange markets—are discussed.

The transmission of the pressures on the Hong Kong dollar's peg to the U.S. dollar and the turbulence in Hong Kong SAR's equity market in late October 1997 across the emerging markets, in particular to Brazil and Korea, revealed a complex set of cross-border investment linkages. Domestic entities in both countries had taken leveraged positions through offshore intermediaries in emerging market securities. Margin calls on these positions triggered in the wake of Hong Kong SAR and the coincident downgrading of Asian credits by the major rating agencies put pressures on the Brazilian real and the Korean won, and the resulting liquidity squeeze prompted deleveraging by these entities exacerbating price pressures in emerging debt markets.

## Part One: Emerging Markets Financing

### Capital Flows, Reserves, and Foreign Exchange Markets

#### *Capital Flows in the Balance of Payments*

The Asian crisis marked 1997 as the first year in the 1990s of a significant reduction in net private capital flows to the emerging markets (Table 2.1 and Figure 2.1). The volume of such financing had proved remarkably resilient in the past. The Mexican peso crisis, which had previously represented the most serious disruption to emerging markets' international financing in the 1990s, resulted in only a modest reduction of net private capital flows to emerging markets—by less than 3 percent—during 1994, as international investors quickly reallocated portfolios away from Latin America toward Asia and Eastern Europe. Moreover, overall flows rebounded quickly, growing by one-fifth in 1995. In the Asian crisis, there was a shift in the opposite direction, but not by enough to offset the decline of net private capital flows to Asia, the largest recipient of flows during the preceding three years, which shrank by almost \$100 billion in 1997, implying a net decline for all emerging markets of \$67 billion. The decline in total (private and official) flows was a more modest 12 percent, from \$231 billion to \$203 billion, reflecting the bilateral and multilateral official assistance extended to the Asian crisis countries. The sizable net official inflows to Asia offset outflows from Latin America, as Mexico, for the second year in a row, continued to make repayments of the official assistance extended in the aftermath of the Mexican peso crisis.

A key characteristic of the surge in private capital inflows to the emerging markets during the 1990s, and one that has imparted a considerable resilience to total private flows, has been the steady growth of FDI flows, which expanded during 1991–96 at an average annual rate of about 40 percent. Such flows, which have accounted for the largest proportion of flows since 1995, continued to grow robustly during 1997, increasing by 20 percent. Unlike FDI flows, portfolio flows to the emerging markets have been volatile. From a peak of \$104 billion in 1993, for example, they fell to less than one-fourth of this level in 1995 in the aftermath of the Mexican peso crisis, then more than doubled to \$50 billion in 1996. During 1997 portfolio flows shrank by 14 percent to \$43 billion. “Other” flows, which largely consisted of bank lending, were negative—that is, there were net outflows of \$7.3 billion during 1997. This reflected a massive turnaround—from net bank lending inflows of over \$70 billion in 1995 and in 1996.

The precipitous decline of almost \$100 billion in net private capital flows to Asia in 1997 reflected a \$75 billion turnaround in bank lending flows and \$22 billion in portfolio flows, while FDI flows to the re-

**Table 2.1. Private Capital Flows to Emerging Markets***(In billions of U.S. dollars)*

	1990	1991	1992	1993	1994	1995	1996	1997
<b>Emerging markets</b>								
Total net private capital inflows <sup>1</sup>	31.0	126.9	120.9	164.7	160.5	192.0	240.8	173.7
Net foreign direct investment	17.6	31.3	37.2	60.6	84.3	96.0	114.9	138.2
Net portfolio investment	17.1	37.3	59.9	103.5	87.8	23.5	49.7	42.9
Other	-3.7	58.4	23.8	0.7	-11.7	72.5	76.2	-7.3
Net external borrowing from official creditors	22.2	25.7	17.6	18.7	-2.5	34.9	-9.7	29.0
Total net capital inflows	53.2	152.7	138.5	183.4	158.0	226.9	231.1	202.7
<b>Africa</b>								
Total net private capital inflows	-1.9	1.7	-2.0	4.0	10.6	13.8	4.5	8.9
Net foreign direct investment	1.2	2.2	1.8	2.0	3.6	4.2	5.3	7.7
Net portfolio investment	-1.5	-1.6	-0.7	0.9	0.5	1.4	-0.3	2.6
Other	-1.6	1.1	-3.2	1.1	6.5	8.1	-0.6	-1.3
Net external borrowing from official creditors	7.7	6.3	10.8	5.3	8.1	5.2	6.5	8.4
<b>Asia</b>								
Total net private capital inflows	19.1	35.8	21.7	57.6	66.2	95.8	110.4	13.9
Net foreign direct investment	8.9	14.5	16.5	35.9	46.8	49.5	57.0	57.8
Net portfolio investment	-1.4	1.8	9.3	21.6	9.5	10.5	13.4	-8.6
Other	11.6	19.5	-4.1	0.1	9.9	35.8	39.9	-35.4
Net external borrowing from official creditors	5.6	11.0	10.3	8.7	5.9	4.5	8.8	28.6
Affected countries' net private capital inflows <sup>2</sup>	24.9	29.0	30.3	32.6	35.1	62.9	72.9	-11.0
Net foreign direct investment	6.2	7.2	8.6	8.6	7.4	9.5	12.0	9.6
Net portfolio investment	1.3	3.3	6.3	17.9	10.6	14.4	20.3	11.8
Other	17.4	18.5	15.4	6.1	17.1	39.0	40.6	-32.3
Affected countries' net external borrowing from official creditors	0.3	4.4	2.0	0.8	0.7	1.0	4.6	25.6
<b>Middle East and Europe</b>								
Total net private capital inflows	0.2	65.7	38.0	26.6	17.9	16.9	24.2	25.4
Net foreign direct investment	1.0	1.3	1.0	3.9	4.3	3.7	2.6	3.3
Net portfolio investment	2.6	22.3	20.9	15.4	13.2	8.8	9.2	8.2
Other	-3.4	42.2	16.1	7.3	0.5	4.4	12.4	13.9
Net external borrowing from official creditors	-5.9	3.9	-1.4	2.1	-1.5	-5.2	-6.1	-1.5
<b>Western Hemisphere</b>								
Total net private capital inflows	10.1	26.1	56.0	64.3	47.4	35.7	80.5	91.1
Net foreign direct investment	6.7	11.0	13.6	12.8	24.3	25.3	36.9	51.2
Net portfolio investment	17.5	14.7	30.4	61.1	60.6	-0.1	25.2	33.5
Other	-14.0	0.3	12.0	-9.5	-37.5	10.5	18.5	6.5
Net external borrowing from official creditors	7.5	2.8	-2.0	-0.4	-4.0	22.0	-13.4	-7.3
<b>Countries in transition</b>								
Total net private capital inflows	3.5	-2.4	7.2	12.2	18.4	29.8	21.3	34.5
Net foreign direct investment	-0.3	2.4	4.2	6.0	5.4	13.2	13.1	18.2
Net portfolio investment	0.0	0.0	0.1	4.5	4.1	2.9	2.2	7.3
Other	3.7	-4.8	2.9	1.7	8.9	13.6	5.9	9.0
Net external borrowing from official creditors	7.2	1.8	-0.1	3.0	-11.0	8.4	-5.5	0.8
<b>Memorandum items:</b>								
<b>Change in reserve assets</b>								
Emerging markets	66.1	75.1	31.5	84.0	90.9	122.9	100.7	52.2
Africa	4.6	3.7	-2.8	1.6	4.6	1.7	5.1	7.8
Asia	47.4	45.9	6.9	43.0	78.3	47.7	61.4	10.7
Middle East and Europe	-1.2	4.9	1.3	4.9	4.3	12.4	9.5	13.7
Western Hemisphere	14.7	18.0	23.0	20.2	-4.3	24.8	26.2	13.6
Countries in transition	0.7	2.6	3.2	14.4	8.0	36.3	-1.5	6.4

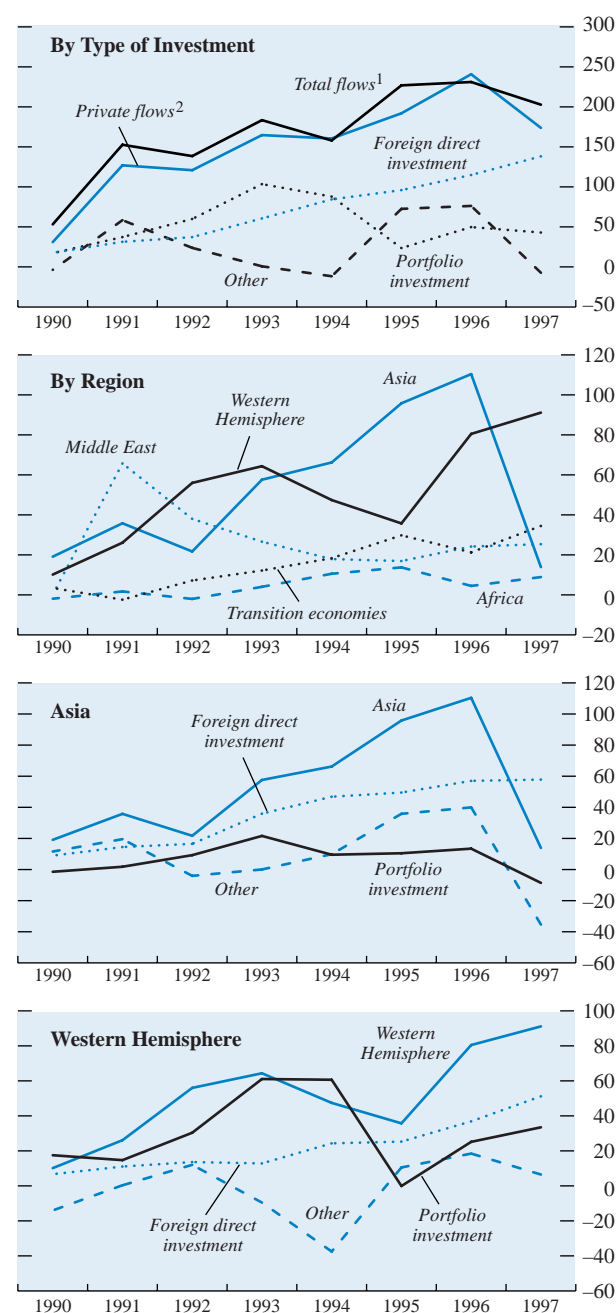
Sources: International Monetary Fund, *International Financial Statistics* and *World Economic Outlook* database.<sup>1</sup>Net foreign direct investment plus net portfolio investment plus net other investment.<sup>2</sup>Indonesia, Korea, Malaysia, the Philippines, and Thailand.

gion remained stable. Most of the decline in total flows to the Asian region reflected declines in flows to the affected Asian countries—Thailand, Malaysia, the Philippines, Indonesia, and Korea—where net inflows of \$73 billion in 1996 were replaced by net outflows

of \$11 billion in 1997. Most of the turnaround to these countries in turn arose from a \$73 billion turnaround in net bank lending flows (Box 2.1), with the sharpest outflows recorded from Thailand and Korea of some \$18 billion each. Portfolio flows to the affected coun-

**Figure 2.1. Net Private Capital Flows to Emerging Markets**

(In billions of U.S. dollars)



Sources: International Monetary Fund, *World Economic Outlook*; and IMF staff estimates.

<sup>1</sup>Private plus official.

<sup>2</sup>Total net private capital flows equal net foreign direct investment plus net portfolio investment plus net other investment.

tries fell but remained positive, while FDI flows remained relatively resilient (Box 2.2). It appears, however, that the extent of portfolio (and total) outflows from the Asian emerging markets during 1997 were understated by official statistics because of the systematic increase in errors and omissions in the balance of payments (see Box 2.3). Increased, and largely unrecorded, capital flight from the affected countries is consistent with plentiful anecdotal evidence of the booming private banking business in the regional financial centers of Hong Kong SAR and Singapore catering to clients from these countries.

Total private capital flows to Latin America reached a new peak of \$91 billion in 1997. This reflected strong growth in both FDI (39 percent) and portfolio investment (33 percent), while bank lending flows—as was the case for Asia—declined by two-thirds. Private capital flows to the transition economies rose robustly (62 percent) to \$35 billion, resulting from strong increases in all categories of inflows. The largest recipient of flows within the region was Russia, where flows increased fourfold to \$10.5 billion, their highest level in the 1990s. Private capital flows to the Middle East and Europe rose modestly to \$25 billion, reflecting increases in bank lending and FDI flows while portfolio flows declined. Private capital flows to Africa, which had fallen sharply in 1996, rebounded in 1997, almost doubling to \$8.9 billion, with South Africa accounting for two-thirds of flows to the region.

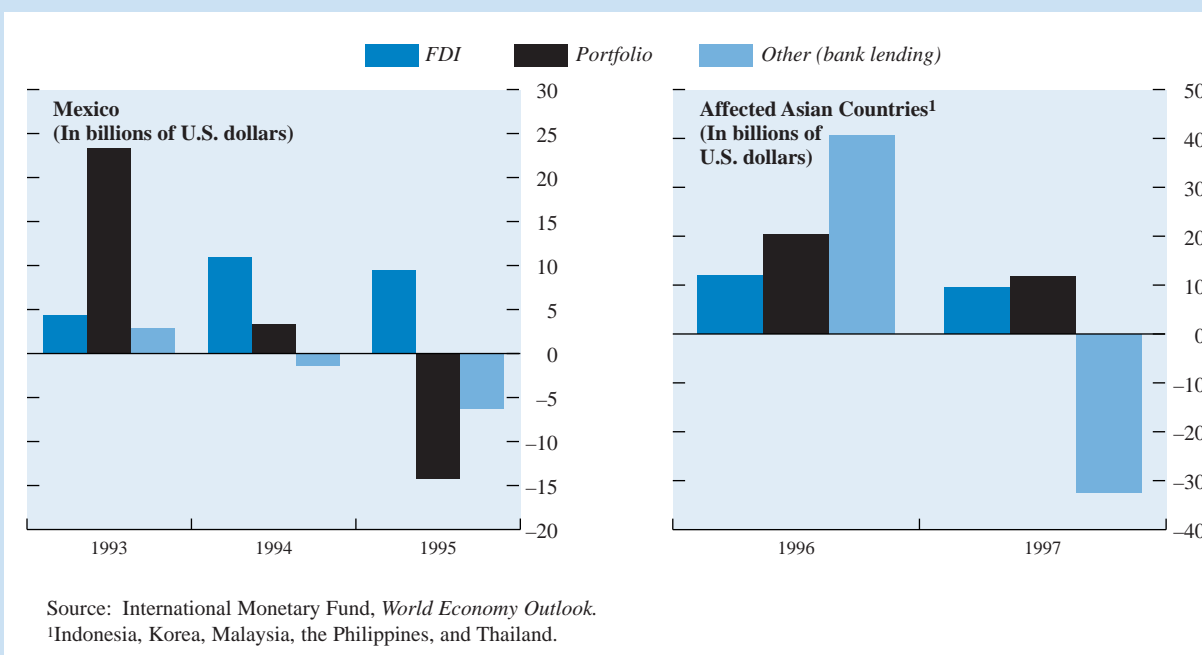
### Reserve Accumulation

Aggregate reserves of emerging market countries continued to grow during 1997 (see Table 2.1). Specifically, of the \$203 billion total net capital flows to the emerging markets, \$52 billion—26 percent—was accumulated as reserves, while the remainder was used to finance current account deficits. This compares with an average rate of about half during the 1990s, when \$571 billion of the \$1.1 trillion in total net flows to emerging markets was accumulated as reserves. For the first time since 1993, Asian central banks were not the largest amassers of reserves, though international reserves of the region as a whole rose by \$10.7 billion, as substantial reserve losses in the affected countries (\$34 billion, representing 27 percent of the existing stock at end-1996) were more than offset by increases in the reserves of China (\$36 billion, the largest ever in a year), Hong Kong SAR (\$12 billion), and India (\$4.5 billion). For the first time since 1992, the increase in Latin American reserves exceeded those in Asia, though only modestly so. Brazil lost \$7.5 billion in reserves during 1997, following a \$8.3 billion loss in October in the spillover from Hong Kong SAR. All of the other major Latin American countries gained reserves, particularly Mexico, where reserves rose by \$9.4 billion. Reserves of the Middle East and Europe

### Box 2.1. Capital Flow Reversals During the Mexican and Asian Crises

Both the Mexican and Asian crises were preceded by strong booms in capital inflows. A key difference during the boom periods, however, was the nature of capital inflows into the respective regions. Inflows into Mexico (and other Latin American emerging markets) were dominated by portfolio flows, while those to Asia were dominated by bank lending flows (see figure below). The reversals of capital flows in each case reflected these initial concentrations. In Mexico there was a sharp reversal in portfolio inflows, from a peak inflow of \$23 billion in 1993 to a net outflow of \$14 billion in 1995, a turnaround of \$37 billion (13 percent of GDP). For the affected Asian countries in the aggregate—Thailand, Malaysia, the Philippines, Indonesia, and Korea—on the other hand, the reversal in 1997 repre-

sented predominantly a retrenchment of bank lending, from net inflows of \$40 billion in 1996 to net outflows of over \$30 billion, a turnaround of \$70 billion (7 percent of GDP). As regards the behaviors of other flows, first, it is notable that net FDI inflows continued during both the Mexican and Asian crises to the affected regions, moderating only slightly in each case (also see Box 2.2 below). Second, while there were net bank lending outflows following the Mexican crisis, these were modest and paled in comparison to the level of portfolio outflows. Third, the data suggest that net portfolio inflows into the affected Asian countries fell, but remained positive for 1997 as a whole. These data, however, likely overstate net portfolio inflows (see Box 2.3 below).



grew by \$14 billion, the transition economies by \$6.4 billion, and Africa by \$7.8 billion, their largest increases in the 1990s.

The increase in 1997 raised emerging market central bank reserve assets to \$871 billion at the end of the year, a more than threefold increase since end-1989, and represents about half of the world's stock of reserve assets. This large buildup in reserves partly reflected intervention to prevent nominal exchange rate appreciation in the face of the substantial capital inflows. It also indicated concerns about the risks of a sudden reversal of capital flows. For example, in December 1994 the Central Bank of Mexico lost \$5 billion in reserves within a few days. During the Asian

crisis, Korea lost \$10 billion in measured reserves and \$25 billion in "usable" reserves, almost exhausting measured official reserves during November and early December 1997. Market participants report that Brazil lost around \$10 billion in a matter of hours at the peak of pressures on the real in late October.

The level of reserves is one of the most closely watched indicators of external pressures and potential vulnerability of a country. During the Asian crisis, market participants expressed concerns about two sources of this uncertainty that limited the usefulness of the official measured and published level of reserves. First, reserve losses often understated the magnitude of central bank interventions in foreign ex-

**Box 2.2. The Resilience of FDI in Emerging Markets: An Update from the Asian Crisis**

The 1997 Capital Markets report observed that the rapid and unflinching growth of FDI to emerging markets during the 1990s, and the steady increase in the share of FDI in total private flows, had led many observers to conclude that in the event of a reversal of sentiment against emerging markets, the consequences would not be as severe. Underlying this belief is the notion that FDI flows, by their nature, tend to be “long term,” in that they are driven by positive longer-term sentiment and, therefore, more likely to be “stable” compared with “short-term” portfolio flows. In addition, to the extent that FDI entails physical investment in plant and equipment, it is difficult to reverse.

The 1997 report also observed last year that the events surrounding the Mexican crisis helped support these views—even as portfolio flows to Latin America fell from a net inflow of \$61 billion during 1994 to approximately zero in 1995, substantial net inflows of FDI continued, actually increasing from \$24 billion to \$25 billion (see Table 2.1). The experience during the Asian crisis provides additional evidence in support of this view. In the face of a massive turnaround of bank lending flows of \$73 billion to the affected Asian countries, and a notable decline in portfolio flows of \$8.5 billion, FDI flows declined by a relatively modest \$2.4 billion during 1997.

There are, however, a number of features of the data on FDI flows that suggest caution in interpreting the growth in importance of FDI. First, the balance of payments differentiation between FDI flows and portfolio flows is arbitrary. Foreign investment in the equity of a company above a critical proportion of outstanding equity is classified as FDI, whereas that below is classified as portfolio equity investment. In reality, small differences in share of ownership are unlikely to represent any

substantially different investment horizons. Second, if the foreign company undertaking the FDI borrows locally to finance the investment, say from a local bank, depending on the form of incorporation of the company locally, the setup of the plant may count as FDI while the bank lending could show up as a capital outflow, reducing the proportion of net bank lending in overall flows and raising the proportion of FDI flows. Finally, there are sometimes tax or regulatory advantages to rerouting domestic investment through offshore vehicles and this has likely overstated the growth of FDI.

With regard to the stability of FDI flows, and the stability such flows impart to overall capital flows, several observations are in order. First, research by Claessens, Dooley and Warner (1995) indicates that historically, for both industrial and developing countries, FDI, and other flows labeled long term according to the traditional balance of payments definition, have generally been as volatile, and no more predictable, than flows labeled short term. Second, there is no reason to believe that a foreign investor wishing to undertake FDI in a country wishes to take an open position on the country’s currency. One way to hedge real assets is to finance them by domestic currency credit so that assets and liabilities in the currency are matched, and the point made above about the (mis)measurement of FDI applies. Finally, in the event a (unhedged) foreign direct investor decides to hedge, there will be an incipient capital outflow. If a counterparty with an exactly offsetting need does not emerge at the same time, such a transaction undertaken through a financial intermediary will, when it offsets its position, result in an actual capital outflow. Hedging by multinational corporations was ascribed a significant role by market participants in generating the pressures on the Brazilian real in late 1997.

change markets as central banks also intervened in forward foreign exchange markets. While some central banks have begun to disclose the extent of such interventions, market participants widely report similar interventions by other central banks. Box 2.4 discusses intervention by central banks in forward and other derivative foreign exchange markets (the reserve implications of such interventions are discussed in Box 2.11). Second, the experience of several of the affected countries revealed that the level of remaining measured official reserves overstated the extent of available reserves as these were sometimes held in forms that became illiquid precisely when they were needed, and usable reserves turned out to be much smaller. The case of Korea is described in Box 2.5.

**Foreign Exchange Markets**

The fall of the Thai baht on July 2, 1997 began a period of turbulence in emerging market currencies un-

paralleled in recent times (Figures 2.2 and 2.3). Five distinct phases can be identified. During the first phase, between July and early October 1997, pressures on emerging market currencies remained by and large restricted to Asia, and within the region to the Thai baht, the Malaysian ringgit, the Philippine peso, and the Indonesian rupiah, with these currencies depreciating by 25–33 percent. Other Asian currencies came under pressure—the Korean won (2.8 percent), the New Taiwan dollar (2.7 percent), and the Singapore dollar (6.8 percent)—but depreciated relatively modestly. The second phase of pressures, starting in late October 1997, was much less discriminating. It began with the Central Bank of Taiwan Province of China’s abandonment of intervention in support of the New Taiwan dollar in mid-October, which led to widespread speculation that the Hong Kong dollar’s peg was vulnerable. Pressures on the already affected Asian currencies then intensified, the Korean won began a steep decline, and in Latin America the

### Box 2.3. Unrecorded Capital Flight from Asia?

At a negative \$64 billion, errors and omissions in the balance of payments for emerging markets were sizable in 1997, and amounted in absolute terms to 37 percent of net private capital flows (see table below). The statistics for the aggregate of emerging markets are, however, dominated by the large and persistently negative errors and omissions for China during the 1990s. Errors and omissions encompass a variety of items, including over- and underinvoicing of trade flows, omissions of payments and receipts for services, and capital flows that go unreported, often because they are seeking to avoid official controls or taxes.

The behavior of errors and omissions for the Asian emerging markets excluding China accords with the broad pattern of capital flows to the region and is, therefore, suggestive of unrecorded capital flows. Errors and omissions for the Asian emerging markets were persistently positive during 1990-95, coinciding with the boom

in capital flows to the region, turning negative in 1996, and were a negative \$24 billion during 1997. Errors and omissions for the countries affected most severely by the Asian crisis turned negative earlier, in 1994, and during 1996-97 accounted for the bulk of errors and omissions to the Asian emerging markets excluding China. The negative \$20 billion in errors and omissions recorded for the affected Asian countries during 1997 indicates capital outflows from these countries well in excess of the recorded total net private capital flows in the balance of payments of \$11 billion (see Table 2.1). Among the affected countries, the distribution of errors and omissions in 1997 was as follows: Korea (-\$8.7 billion); Malaysia (-\$6.6 billion); Indonesia (-\$2.8 billion); Thailand (-\$1.6 billion); and the Philippines (\$0.1 billion). It is also notable (see table below) that in 1997, for the first time during the 1990s, errors and omissions were systematically negative for each and every emerging market region.

#### Errors and Omissions in the Balance of Payments of Emerging Markets

(In billions of U.S. dollars)

	1990	1991	1992	1993	1994	1995	1996	1997
Emerging markets	3.9	-9.2	-7.9	-7.9	-14.9	-14.4	-31.9	-63.6
China	-3.2	-6.8	-8.2	-9.8	-9.8	-17.8	-15.6	-19.1
Emerging markets excluding China	7.1	-2.4	0.3	1.9	-5.1	3.4	-16.3	-44.5
Asia excluding China	3.6	2.1	5.0	4.0	7.3	1.5	-8.0	-23.5
Affected countries	0.3	0.9	2.7	1.8	-4.7	-8.1	-8.5	-19.5
Latin America	2.3	5.3	2.4	1.3	0.5	1.2	-1.2	-7.6
Countries in transition	3.9	-4.7	-2.0	2.0	-2.8	1.1	3.1	-2.6
Middle East and Europe	-1.9	-4.3	-3.8	-4.4	-6.9	1.0	-5.4	-9.3

Source: International Monetary Fund, *World Economic Outlook* database.

Brazilian real and the Argentine peso came under severe speculative pressure. In this period, the Indonesian rupiah initially strengthened in early November on announcement of a stabilization and reform program supported by the IMF and the international community. However, a backing away from monetary tightening and other key elements of the program soon undermined the rupiah, and downward pressures intensified later on reports of the ill health of then President Suharto.

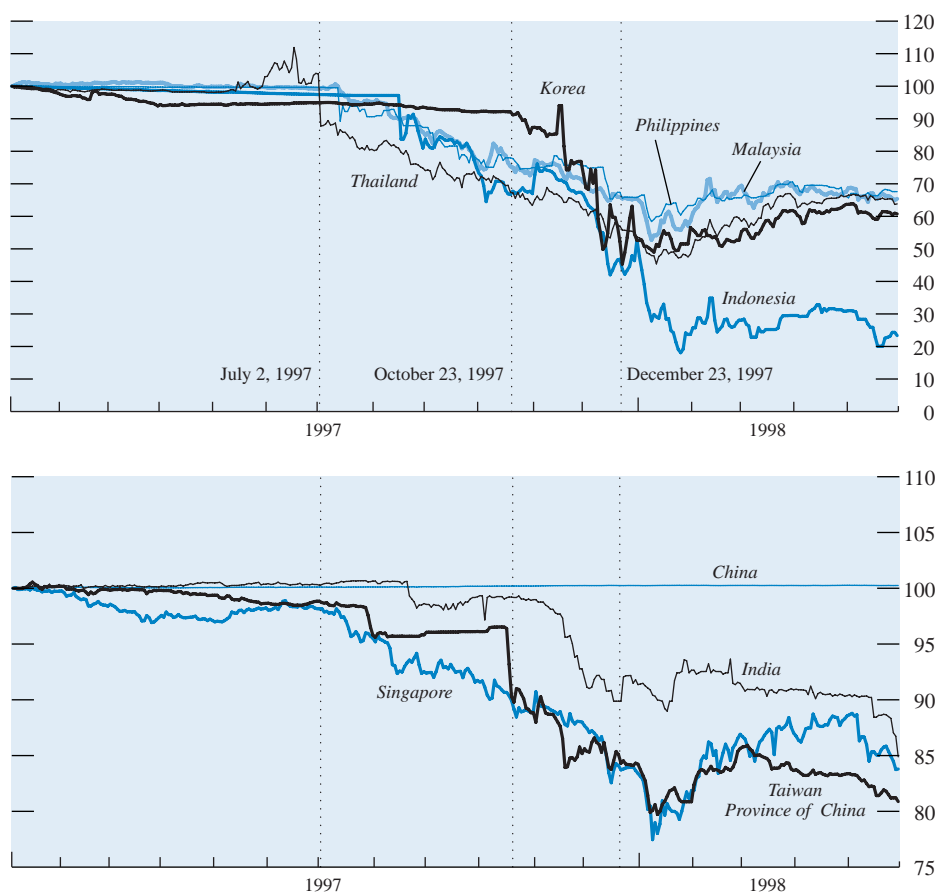
The third phase involved a further intensification of downward pressures on a number of Asian emerging market currencies beginning in early December 1997. A key factor was the revelation (along with agreement on an IMF-supported stabilization and reform program) of the very low level of Korea's usable foreign exchange reserves, relative to short-term claims due before year-end. As information about Korea's reserves and debt situation became known, rollover rates of interbank claims on Korean institutions declined sharply, accelerating downward pressures on the won, and contagion affected other currencies. In-

dependently, the situation in Indonesia continued to deteriorate as Bank Indonesia injected liquidity to keep second tier banks afloat as credit drained from these institutions into cash and into larger institutions that were perceived as more likely to survive. By the time the affected Asian currencies reached their low points in January 1998, the Indonesian rupiah had fallen (relative to its July 1, 1997 level) by 81 percent, the Thai baht by 56 percent, the Malaysian ringgit by 46 percent, and the Philippine peso by 41 percent. During this period the Korean won depreciated (from October 1) to its low in late December 1997 by 55 percent, the New Taiwan dollar by 19 percent, the Indian rupee by 12 percent, and the South African rand by 9 percent.

The fourth phase saw significant recovery in the foreign exchange values of most Asian emerging market currencies, beginning in late December 1997 and early January 1998. Agreement in late December by most of Korea's bank creditors to roll forward their short-term claims, arranged under the auspices of major industrial country central banks, contributed

**Figure 2.2. Exchange Rates of Selected Emerging Markets, January 6, 1997–May 29, 1998**

(January 6, 1997 = 100)



importantly to the change in sentiment, along with an acceleration of financial support from the IMF and other multilaterals and pledges of a “second line of defense” from bilaterals. Evidence of the rapid improvement in Korea’s current account reinforced confidence that the agreement could lead to a more prolonged extension of Korea’s credit terms. Pressures on other Asian currencies generally abated, along with those on the Korean won, with the Thai baht gaining ground additionally on confidence in the new government that took office in December. The Indonesian rupiah, however, followed a more independent course. Notwithstanding announcement of a reinforced program with the IMF in mid-January 1998, the rupiah declined sharply over the course of the month, until the introduction of a government guarantee on all banks’ deposits and third-party liabilities, and the announcement of bank restructuring and corporate debt initiatives provided the basis for a partial rebound at the end of the month. In ensuing weeks, the rupiah recovered on the basis of discussion of possible implementation of a currency board, but then depreciated

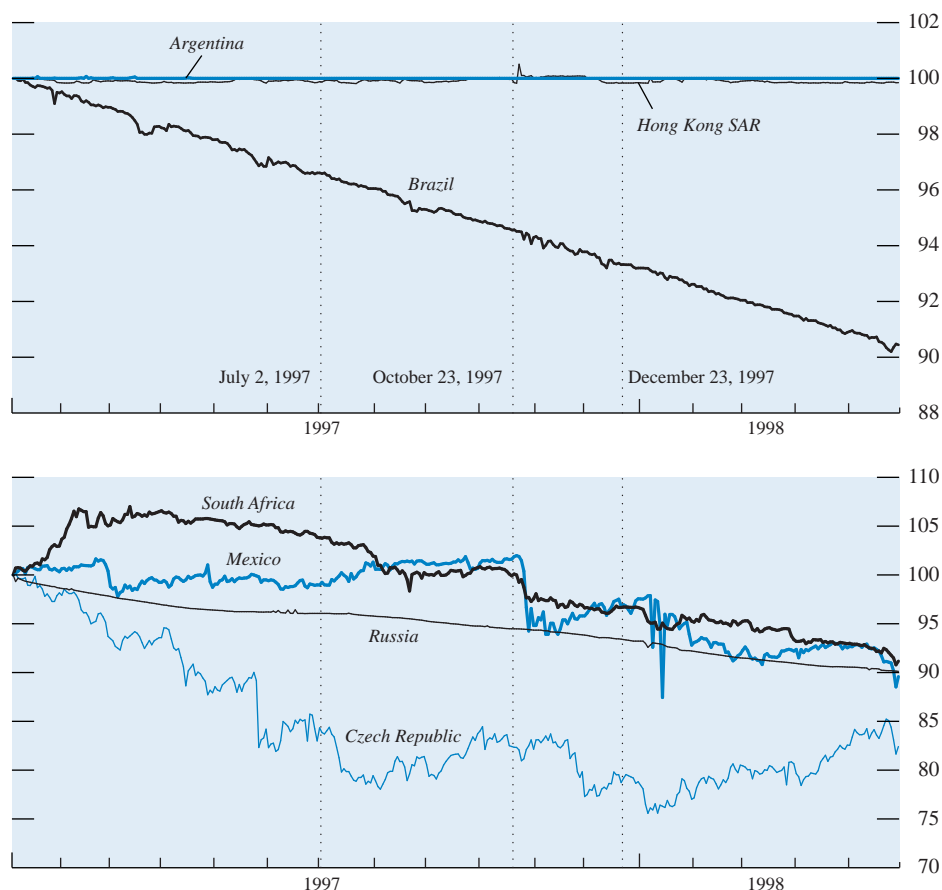
again as viability of this proposal came into grave doubt amidst a very weak banking system (with broad government guarantees on all bank deposits), capital outflows motivated by fears of social unrest, and uncertainties about the survival of the Suharto regime.

With the exception of Indonesia, the fifth phase was one of renewed downward pressure on several Asian emerging market currencies beginning in mid-May. The key instigating factor in this instance was the weakening of the Japanese yen (especially against the U.S. dollar) that followed unexpectedly weak results for real GDP growth in Japan in the first quarter of 1998 and evidence of continuing weakness in the second quarter. By late June, however, most Asian emerging market currencies had stabilized in the face of this new disturbance.

The large gyrations in the affected Asian currencies meant that volatility shot up from essentially nonexistent levels to well above those observed for exchange rates among the major currencies (see Figure 2.3). While there have been reductions since January 1998, volatility remains high. Accompanying the increased



Figure 2.2 (concluded)



Sources: Bloomberg Financial Markets L.P.; and The WEFA Group.

volatility, and in large part reflecting it, the transaction costs of trading these currencies on spot, forward, and other derivative markets skyrocketed (Figure 2.4). Prior to the crisis, bid-ask spreads on these currencies had been similar, perhaps modestly higher, than those for the major currencies. Following the crisis, these spreads widened by factors of between 6 (ringgit) and 13 (rupiah), implying, for example, a hefty 1.7 percent average cost of carrying out a rupiah-dollar transaction on the spot market since the crisis, rising on occasion to as much as 10 percent. The bid-ask spread on these currencies has shown some tendency to decline since January 1998 but has remained at high levels.

Higher volatility and transaction costs were associated with a drying up of liquidity. Average daily volumes fell, standard deal sizes shrank, and the number of market makers in these currencies dwindled. Prior to the crisis, the Thai baht had been perhaps the most liquid of the regional currencies with survey data from Singapore suggesting an average daily trading volume on the interbank market of \$5 billion on the spot market and \$9 billion in the swaps and forward

markets, while volumes for the ringgit and rupiah were similar on the spot market but had smaller swaps and forwards volumes of about \$3.5 billion each.<sup>2</sup> Following the crisis, by April 1998 trading volumes for the rupiah are estimated to have shrunk by 90 percent, for the baht by 80 percent, and the ringgit by 70 percent. Similarly, the standard size of deals shrank, with standard interbank and interbroker amounts declining, for example, for the baht from \$10–20 million to \$3 million for spot transactions and from \$20 million to \$10 million on forward markets. The number of interbank players declined on average by more than half their previous number with, for example, the number trading on the spot market for ringgit down from 25 to 12 and on the forward market from 50 to 20. While the crisis presumably raised the demand for hedging exchange rate risk, the higher transactions costs discouraged hedging and, as evidenced by the reduced turnover on forwards and other

<sup>2</sup>See Singapore Foreign Exchange Market Committee (1996).

#### Box 2.4. Alternative Forms of Central Bank Intervention in Foreign Exchange Markets

In addition to direct intervention on spot foreign exchange markets, central banks, and sometimes federal entities widely perceived to be doing so on their behalf, have often “intervened” in, or taken positions contrary to, prevailing market sentiment in forward and other derivative foreign exchange markets. Such activities have encompassed a diverse set of central banks and instruments. The Bank of England, for example, intervened in the markets for outright forwards for pound sterling at the time of the ERM crisis in 1992, and the South African Reserve Bank conducted such interventions in the forward market for rand over extended periods. Most recently, the Bank of Thailand built up a substantial forward liability—in excess of \$25 billion—to purchase baht and sell dollars, while the Bank of Korea also intervened in the forward market for won. Market participants report that the Banco do Brasil, a federally owned bank, took substantial positions on the currency futures market on Brazil’s futures exchange, the Bolsa de Mercadorias e Futuros, during the period of pressures on the real in late October 1997. The Bank of Korea was also reported to have been “testing the waters” in the offshore nondeliverable forwards (NDF) market for Korean won (that is settled between counterparties in U.S. dollars). There have, on occasion, also been suggestions for the introduction of other types of instruments and active central bank participation in such markets. These have most recently included the use of onshore NDFs settled in local currency. In other cases, such as that of Hong Kong SAR, there have been various proposals for the Monetary Authority to sell currency options to bolster confidence in the Hong Kong dollar.

Disclosure of such activities by most central banks has, at best, been grudging and after the fact. As contingent liabilities of typically uncertain value, the future implications of such interventions for the central bank’s reserves have been open to interpretation by market participants. Most recently, for example, the Bank of Thailand’s forward foreign exchange commitments were interpreted as a one-for-one claim on reserves, which was a considerable exaggeration. The implications for reserves of central bank intervention in forward markets are discussed in Box 2.11.

derivatives markets, the volume of hedging actually declined.

### Bond Markets

#### Secondary Markets

After a temporary though notable widening in the period surrounding the increase in the U.S. federal funds rate in the spring of 1997, yield spreads on emerging market debt, as measured by the benchmark

#### Box 2.5. The Liquidity of Measured Reserves and “Usable” Reserves: The Case of Korea

As the crisis in Korea unfolded, official reserves of the Bank of Korea fell from a reported \$31 billion at end-October 1997 to \$24 billion by early December. “Usable” reserves, however, were reported to be some \$6 billion. This discrepancy between measured and usable reserves arose as a result of foreign currency deposits placed by the Bank of Korea with foreign branches of domestic banks that became illiquid. That is in light of the liquidity pressures faced by these institutions, these deposits could not be withdrawn. The practice of the Bank of Korea placing deposits with foreign branches of domestic banks was begun in the late 1980s with the purpose of encouraging globalization of domestic banks, and their offshore branches used these deposits to fund loans primarily to Korean entities, both off- and onshore. The practice remained relatively small, with some 10 percent of official reserves placed in such deposits, and by end-1996 amounted to \$3.5 billion. However, in January 1997, as the overseas branches of Korean banks suffered liquidity problems in the wake of the Hanbo affair, the Bank of Korea extended liquidity support to them, and by the end of March the amount of such deposits had grown to \$8 billion. Finally, as pressures grew in November, by early December such deposits had risen above \$10 billion.

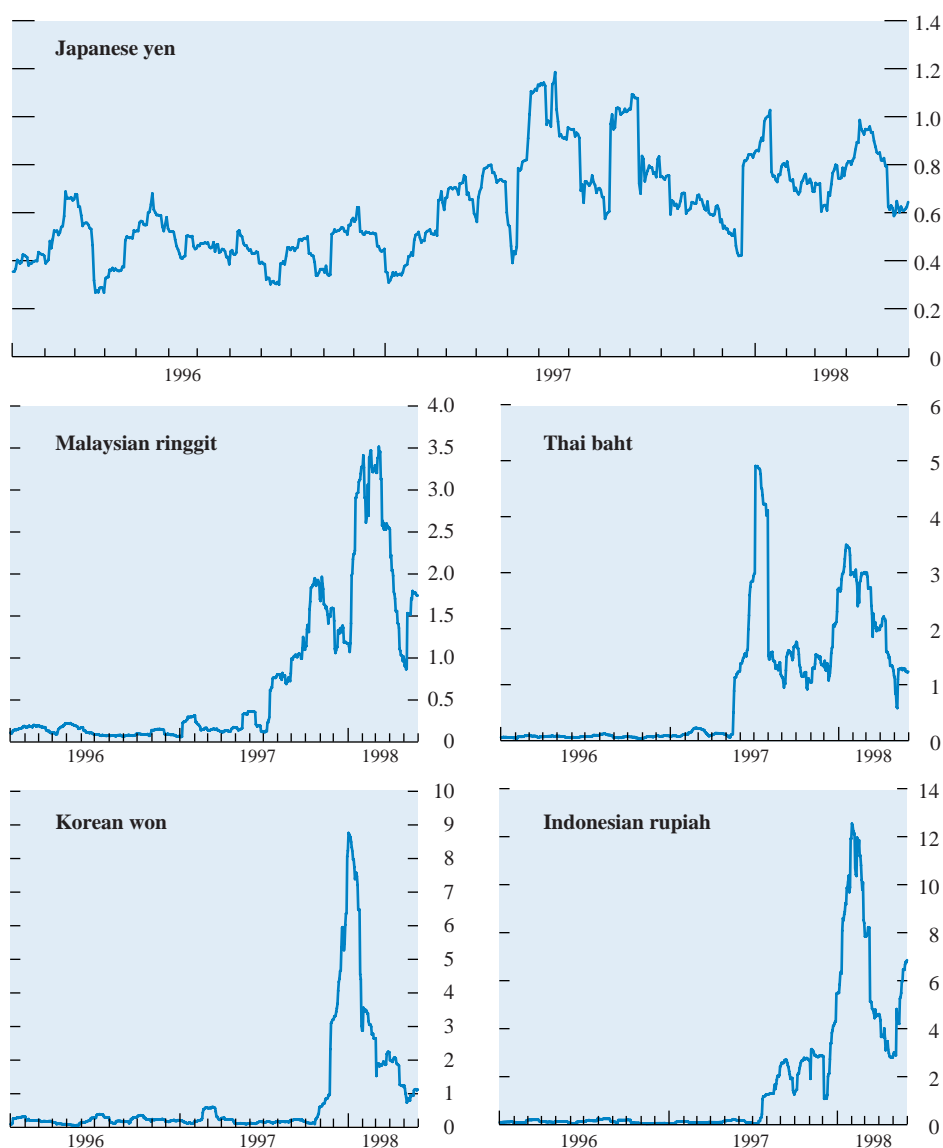
In addition to measured official reserves of \$30 billion prior to the crisis, the Bank of Korea had deposits of \$30 billion with banks onshore. As the central bank sought to draw on these deposits, it discovered that these deposits too could not be accessed as they had either been lent to Korean corporates or invested in—primarily emerging market—assets that the commercial banks were either unable or unwilling to liquidate in prevailing market conditions.

Emerging Markets Bond Index (EMBI), which had been declining steadily since the Mexican crisis, resumed their downward trajectory (Figure 2.5).<sup>3</sup> The floating of the baht in July 1997, and the events in Asia that followed, had only a brief and imperceptible effect on spreads measured by the EMBI, which is dominated by Latin American sovereign credits. These spreads continued to decline, reaching an all-time low in the first week of October of 335 basis points. The financial market turmoil surrounding the events in Hong Kong SAR in late October, and the general deterioration in sentiment against emerging market credits that followed, led to a dramatic widening in EMBI spreads to 640 basis points. Spreads then

<sup>3</sup>Spreads refer to yield differentials relative to comparable government securities in that currency. Spreads on the EMBI are relative to U.S. treasuries.

**Figure 2.3. Selected Asian Currencies: Exchange Rate Volatilities, January 1, 1996–May 29, 1998<sup>1</sup>**

(In percent)



Sources: Reuters; and IMF staff estimates.

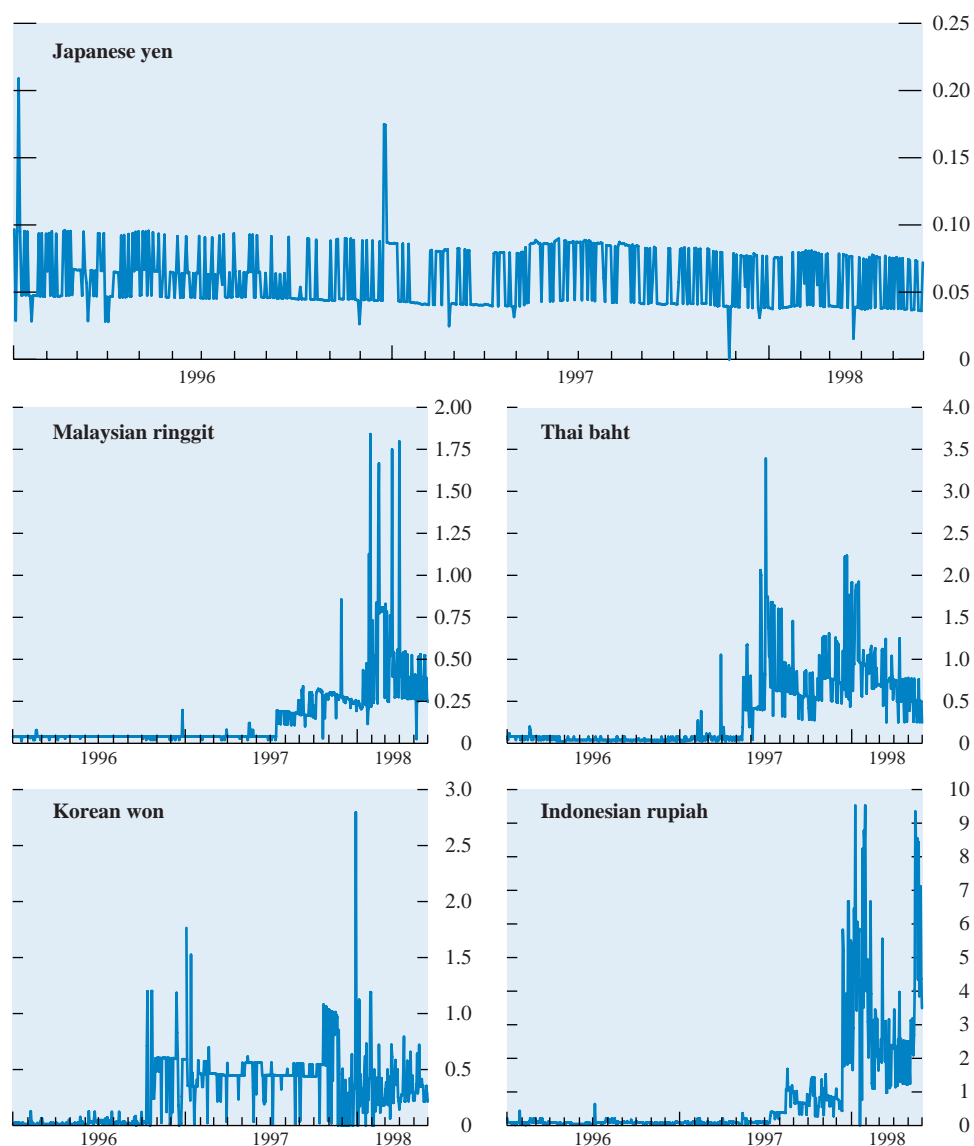
<sup>1</sup>Daily volatilities (20-day rolling window) using daily bid spot prices.

recovered erratically through the end of the year, and continued to do so into 1998, reaching 460 basis points by end-April, before shooting up again to 549 basis points by end-May. At these levels they remained well above their early October 1997 levels.

On the Brady market, spreads for individual countries, both in Latin America—where the largest credits are—and across a diverse set of other credits such as Bulgaria, Nigeria, and Poland, closely followed the pattern observed for the EMBI (Figure 2.6). Among

the Latin American credits, spreads on Brazilian debt were the most severely affected in the late October period. On the Eurobond market, unlike the other emerging market credits just discussed, spreads for the affected Asian credits began to increase earlier in 1997, though they did so gradually and modestly (Figure 2.6). During May 1997, when the Thai baht came under severe speculative pressure, spreads on Thai sovereign debt inched up by a mere 13 basis points to 92 basis points, and a barely noticeable further 3 basis

**Figure 2.4. Selected Asian Currencies: Bid-Ask Spreads, January 1, 1996–May 29, 1998<sup>1</sup>**  
(In percent)



Sources: Reuters; and IMF staff estimates.

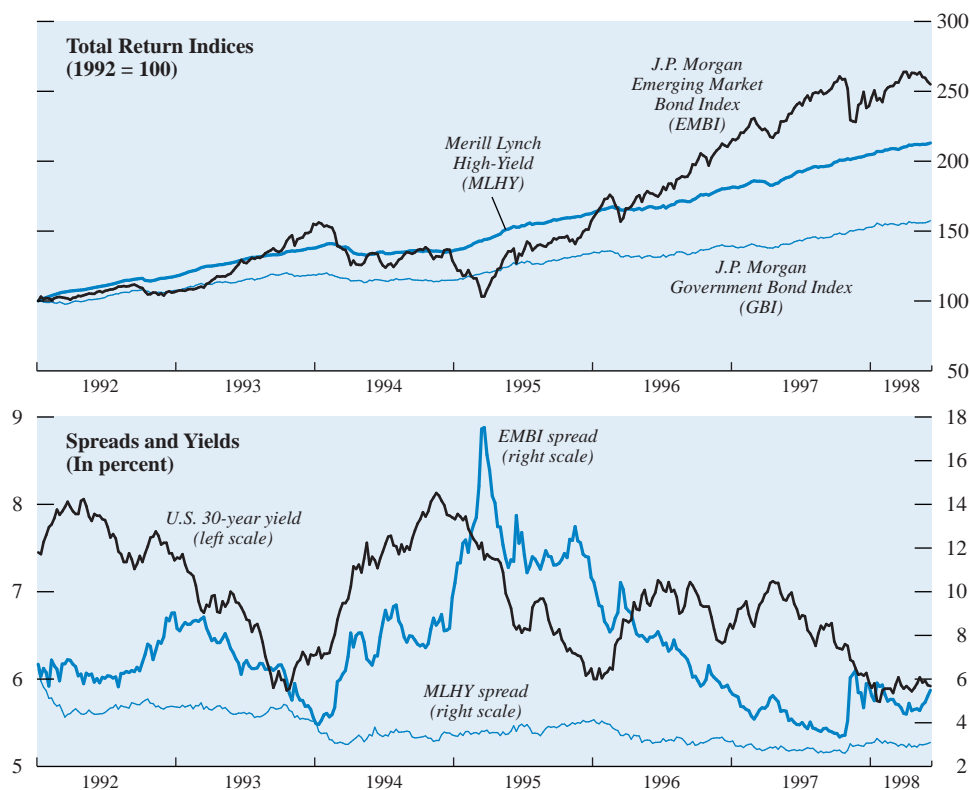
<sup>1</sup>Daily bid-ask spread over midpoint spot rate in percent.

points during June. During this period, spreads on Indonesian and Korean sovereign and quasi-sovereign debt remained essentially unchanged, while for the Philippines they widened by just 6 basis points.<sup>4</sup> Between July and September, spreads for all of the affected Asian credits widened gradually. By end-Sep-

tember, however, the cumulative increase since the beginning of May was only 30 basis points for Indonesia (to 150 basis points) and Korea (to 106 basis points), while for the Philippines it was a more notable 50 basis points (to 226 basis points) and for Thailand 100 basis points (to 174 basis points). The events in late October then provoked a sharp widening of Asian spreads, which was followed by continued deteriorations through the end of the year. The secondary market spread for Korea peaked at 890 basis points in late

<sup>4</sup>The specific bonds these spreads refer to are noted in Figure 2.6. As their durations differ, these movements in spreads should only be taken as indicative.

Figure 2.5. Bond Markets: Selected Returns, Yields, and Spreads



Source: Bloomberg Financial Markets L.P.

December, and those for Indonesia (979 basis points), Thailand (555 basis points), and the Philippines (491 basis points) during January 1998. At end-May 1998, spreads on all of the affected Asian credits remained well above their early October 1997 levels.

Volatility of returns on the EMBI, which had been declining steadily from the peak of 2.8 percent reached in the spring of 1995 following the Mexican peso crisis, continued to fall through October 1997 to reach 1¼ percent (Figure 2.7). The sharp increase in volatility in late October was followed by further increases, but by early January 1998, volatility had leveled off at 2¼ percent, well below the previous peaks following the Mexican peso crisis. It is notable that not only has the volatility of returns on emerging market debt consistently and substantially exceeded those on the mature markets, measured volatility has also fluctuated considerably, making it difficult to estimate or predict volatility with much confidence.

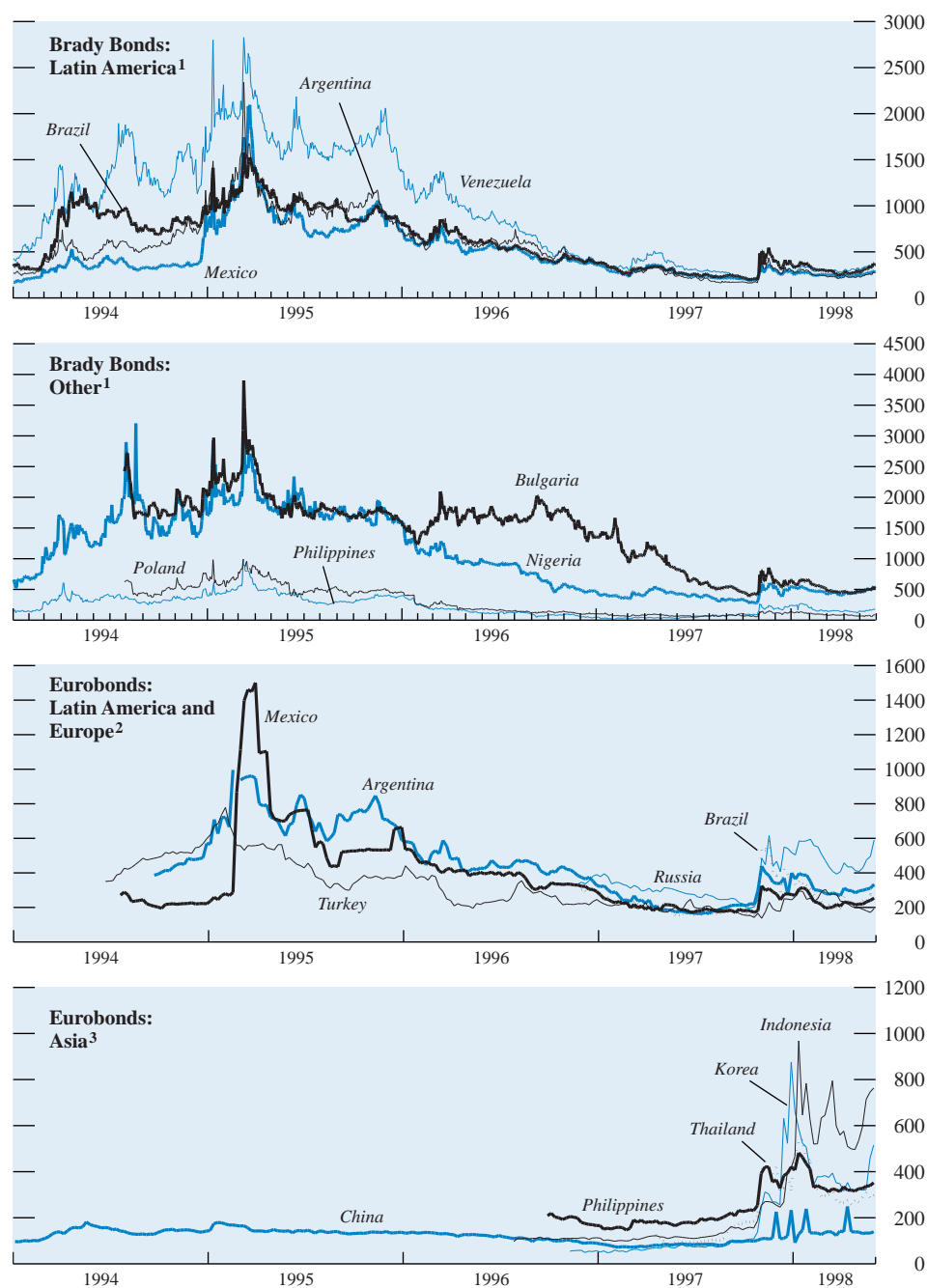
The growing volume of new issuance in the early part of 1997, followed by the sell-off in the fourth quarter, combined to ensure active trading of emerging market debt instruments and derivatives, which grew to reach almost \$6 trillion in 1997 (Table 2.2).

The trend decline in relative importance of Brady bonds in favor of Eurobonds was given an added impetus during 1997 as several countries exchanged some \$7 billion of their Brady bonds for Eurobonds. Local market instruments continued to account for about a quarter of overall activity.<sup>5</sup> The volume of trading increased across instruments from all regions, with the notable exception of Asia. Trading in Asian instruments, which have always accounted for a relatively small proportion of market activity, fell from \$166 billion in 1996 to \$108 billion in 1997. The sharp increase in emerging market spreads and heightened volatility in the fourth quarter of 1997 was associated with a notable increase in trading. In the first quarter of 1998, activity moderated, reflecting declines in the trading of Latin American and Eastern European instruments, the two largest segments of the market. Again, however, Asia bucked the trend, with trading almost doubling.

<sup>5</sup>The coverage of transactions in local instruments is limited to external trading of these instruments, that is, purchases and sales of local instruments arranged with counterparties outside of the jurisdiction of the issuer.

**Figure 2.6. Yield Spreads for Selected Brady Bonds and U.S. Dollar-Denominated Eurobonds**

(In basis points)



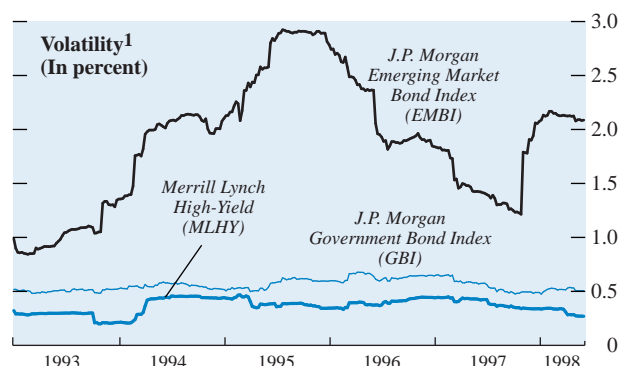
Sources: Bloomberg Financial Markets L.P.; Salomon Smith Barney; and IMF staff estimates.

<sup>1</sup>Yield spreads on Brady bonds are “stripped” yields.

<sup>2</sup>Latin America and Europe: Republic of Argentina bond due 12/03, Republic of Brazil bond due 11/01, United Mexican States bond due 9/02, Ministry of Finance of Russia bond due 11/01, and Republic of Turkey bond due 6/99.

<sup>3</sup>Asia: People’s Republic of China bond due 11/03, Republic of Indonesia bond due 8/06, Korea Development Bank bond due 11/03, Republic of Philippines bond due 10/16, and Kingdom of Thailand bond due 4/07.

**Figure 2.7. Emerging Market Debt: Volatility of Returns**



Sources: Bloomberg Financial Markets L.P.; and IMF staff estimates.

<sup>1</sup>Computed as the standard deviation of weekly changes in (the logarithm of) the total return index over the preceding year.

### Primary Issues

The gradual and modest deterioration in market sentiment against the international debt securities of the affected Asian countries during the first stage of the Asian crisis led to a reallocation of international investor portfolios to other emerging markets but did not fundamentally alter investor appetite for high-yielding emerging market credits. The shift out of Asia into Latin America was most evident in September when Argentina, Panama, and Venezuela brought to market large issues of 30-year uncollateralized

global bonds, totaling some \$7 billion, in exchange for part of their existing Brady bonds. While the portfolio reallocation away from Asia helped create the positive environment for these issues, and the exchanges offered investors added incentives—instruments with pure country risk exposures without the complications of pricing out collateral and repayment risk through call options embedded in Brady bonds—the success of these issues also indicated perceived improvements in the creditworthiness of these countries. Emerging markets' issuance continued at a record-setting pace (\$45 billion) in the third quarter of 1997, reflecting the surge in issuance from Latin America, which offset a relatively modest decline in Asian issuance (from \$16 billion in the previous quarter to \$14 billion) and a pause in Eastern European issuance following record volumes in the previous quarter (Table 2.3 and Figure 2.8).

A number of factors accounted for the relatively modest decline in Asian issuance in the third quarter of 1997. The crisis affected particular countries with varying lags and in different ways. A number of transactions had been arranged earlier. Some issuers, such as quasi-sovereign entities from Korea, benefited from implicit official support. To retain access or to improve the terms of access, some borrowers enhanced issues by linking spreads to future credit ratings and including put options allowing redemption in the event of threshold credit events (Box 2.6). Others collateralized borrowing or were able to raise funds against anticipated foreign currency earnings.

The sharp widening of spreads on secondary markets in the spillover from Hong Kong SAR in late October 1997 and continued increases in volatility forced a number of borrowers to postpone or withdraw

**Table 2.2. Secondary Market Transactions in Debt Instruments of Emerging Markets**

(In billions of U.S. dollars)

	1993	1994	1995	1996	1997	1997				1998
						Q1	Q2	Q3	Q4	Q1
Total turnover	1,978.9	2,766.2	2,738.8	5,296.9	5,915.9	1,620.6	1,416.7	1,322.6	1,556.0	1,229.4
By region										
Africa	78.8	110.0	108.8	222.4	243.6	53.4	63.7	52.0	74.5	64.7
Asia	16.4	23.5	26.3	165.8	107.9	30.7	30.3	23.7	23.2	42.8
Eastern Europe	86.3	172.3	314.1	612.6	859.9	161.5	187.8	218.6	291.9	226.3
Middle East	2.8	2.6	5.3	21.2	62.3	6.6	22.7	12.9	20.1	43.8
Western Hemisphere	1,621.6	2,259.3	2,284.2	4,263.7	4,636.3	1,366.8	1,109.1	1,014.9	1,145.5	849.3
Unspecified	173.0	198.5	0.1	11.2	5.9	1.6	3.1	0.5	0.8	2.5
By instrument										
Loans	273.6	244.4	175.1	248.6	304.5	68.9	59.9	71.8	103.9	58.6
Brady bonds	1,021.3	1,684.0	1,580.1	2,689.9	2,402.5	676.5	610.8	525.3	589.9	435.2
Corporate and non-Brady sovereign bonds	176.6	159.5	211.1	568.2	1,334.8	334.3	256.3	324.3	419.9	285.6
Local market instruments <sup>1</sup>	361.9	524.3	593.2	1,273.8	1,506.0	449.4	393.7	289.4	373.5	379.5
Options and warrants on debt	57.4	142.4	179.2	471.0	364.7	90.8	93.4	111.7	68.8	70.5
Unspecified	88.1	11.6	...	45.3	3.4	0.6	2.8	0.0	0.0	0.0

Source: Emerging Markets Traders Association.

<sup>1</sup>Data for 1993 do not include trading in short-term local market instruments.

**Table 2.3. Emerging Market Bond Issues, Equity Issues, and Loan Commitments**  
(In millions of U.S. dollars)

	1997										1998				
	1991	1992	1993	1994	1995	1996	1997	Q1	Q2	Q3	Q4	Q1	April	May	
<b>Issuance</b>															
<b>Bond issues<sup>1</sup></b>															
Emerging markets	13,946	24,394	62,671	56,540	57,619	101,926	127,942	27,723	42,977	44,835	12,407	25,343	12,146	6,457	
Africa	311	724	170	2,116	1,947	1,648	9,358	0	1,022	6,898	1,438	1,381	0	0	
Asia	4,072	5,908	21,998	29,897	25,307	43,144	45,532	12,748	15,892	14,176	2,716	2,743	5,648	410	
Affected countries	3,160	4,031	11,039	15,908	19,254	31,472	24,753	7,430	8,030	7,860	1,433	300	4,540	300	
Other countries	912	1,877	10,959	13,989	6,053	11,672	20,779	5,318	7,862	6,316	1,283	2,443	1,108	110	
Europe	2,077	4,829	9,658	3,543	6,583	7,408	16,217	2,824	6,538	3,726	3,129	5,437	1,904	1,986	
Middle East	400	0	2,052	2,993	710	2,570	2,671	275	798	273	1,325	1,000	0	0	
Western Hemisphere	7,085	12,933	28,794	17,990	23,071	47,157	54,165	11,876	18,727	19,762	3,800	14,783	4,595	4,061	
<b>Other fixed-income issues<sup>2</sup></b>															
Emerging markets	499	1,348	2,294	4,710	6,064	9,358	10,015	1,938	3,310	3,633	1,134	70	5	357	
Africa	0	0	0	0	58	0	0	0	0	0	0	0	0	0	
Asia	459	1,253	2,166	4,638	5,987	9,358	9,831	1,938	3,135	3,625	1,134	70	5	357	
Affected countries	302	483	1,123	2,252	2,941	4,724	3,710	1,309	1,173	948	280	0	0	0	
Other countries	157	770	1,043	2,386	3,046	4,634	6,121	629	1,962	2,677	854	70	5	357	
Europe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Middle East	0	0	0	0	19	0	158	0	150	8	0	0	0	0	
Western Hemisphere	40	95	128	73	0	0	25	0	25	0	0	0	0	0	
<b>Loan commitments<sup>3</sup></b>															
Emerging markets	41,653	31,464	40,696	56,979	82,972	90,729	123,585	23,294	32,868	29,878	37,545	8,173	5,245	2,281	
Africa	4,274	2,534	1,139	672	6,783	3,183	4,557	1,007	427	717	2,406	170	0	0	
Asia	15,688	15,097	26,984	38,118	46,707	56,200	58,933	14,940	15,614	16,231	12,148	2,444	2,138	413	
Affected countries	8,504	7,050	13,196	16,183	25,396	27,986	25,675	8,059	6,950	5,860	4,805	759	1,669	265	
Other countries	7,184	8,047	13,788	21,936	21,311	28,215	33,258	6,880	8,664	10,371	7,343	1,685	469	148	
Europe	7,253	3,438	4,340	7,004	9,644	12,576	18,487	1,139	6,139	3,777	7,432	1,361	1,399	220	
Middle East	11,090	5,834	1,923	7,670	7,707	6,465	10,755	1,436	1,693	1,510	6,116	25	0	77	
Western Hemisphere	3,348	4,562	6,309	3,516	12,131	12,304	30,853	4,772	8,994	7,644	9,443	4,173	1,708	1,571	
<b>Equity issues</b>															
Emerging markets	5,574	7,247	11,915	18,038	11,193	16,414	24,802	3,213	8,160	6,290	7,139	3,148	1,311	958	
Africa	143	154	215	574	542	781	1,118	0	330	788	0	534	0	0	
Asia	952	2,914	5,156	12,130	8,864	9,789	13,240	2,873	3,526	2,181	4,660	1,730	1,265	326	
Affected countries	485	991	1,478	4,233	5,133	3,061	1,701	589	170	400	542	885	1,104	100	
Other countries	467	1,923	3,678	7,897	3,731	6,728	11,539	2,284	3,356	1,781	4,118	845	161	226	
Europe	81	21	186	641	570	1,289	2,945	166	1,180	400	1,199	713	0	557	
Middle East	506	281	336	89	256	894	2,395	93	1,507	386	409	170	46	0	
Western Hemisphere	3,891	3,876	6,022	4,604	962	3,661	5,102	80	1,617	2,534	871	0	0	74	



<b>Facilities</b>														
Fixed income <sup>4</sup>														
Emerging markets														
Africa	6,462	14,857	33,671	19,312	41,965	32,445	22,163	2,736	11,142	3,457	4,829	2,544	1,000	412
Asia	665	5,864	2,724	4,951	23,270	19,137	15,036	651	8,740	3,217	2,429	44	1,000	0
Affected countries	402	5,443	1,556	2,193	21,407	15,173	10,169	130	5,440	2,600	2,000	0	0	0
Other countries	263	421	1,368	2,757	1,863	3,964	4,866	521	3,300	617	429	44	0	412
Europe	226	103	171	1,003	5,668	680	1,812	85	527	0	1,200	0	0	0
Middle East	0	0	0	326	0	1,250	900	0	600	0	300	0	0	0
Western Hemisphere	5,570	8,890	30,776	11,432	12,627	10,878	4,415	2,000	1,275	240	900	2,500	0	0
Loan <sup>5</sup>														
Emerging markets	28,030	21,446	18,406	22,621	33,966	44,153	71,680	14,360	21,013	17,814	18,492	3,984	2,330	474
Africa	2,677	3,262	1,305	1,031	2,217	2,660	4,536	12	482	2,593	1,450	272	0	0
Asia	8,238	7,939	9,511	11,792	18,092	16,617	26,356	6,942	8,539	5,792	5,083	781	678	115
Affected countries	4,093	4,948	3,220	7,165	6,789	7,981	8,804	3,142	2,043	1,332	2,287	484	0	0
Other countries	4,145	2,991	6,291	4,627	11,303	8,636	17,552	3,799	6,495	4,461	2,796	297	678	115
Europe	3,939	2,593	2,377	3,085	2,970	5,063	11,381	1,364	5,123	2,551	2,343	1,355	429	309
Middle East	4,599	2,654	1,659	319	2,977	1,140	3,204	416	1,147	1,208	432	61	0	0
Western Hemisphere	8,576	4,998	3,554	6,394	7,711	18,674	26,202	5,627	5,723	5,669	9,184	1,515	1,223	50

Sources: BEL; and DCBEL database.

<sup>1</sup>Includes note issues under Euro medium-term note (EMTN) programs.

<sup>2</sup>Includes certificates of deposit.

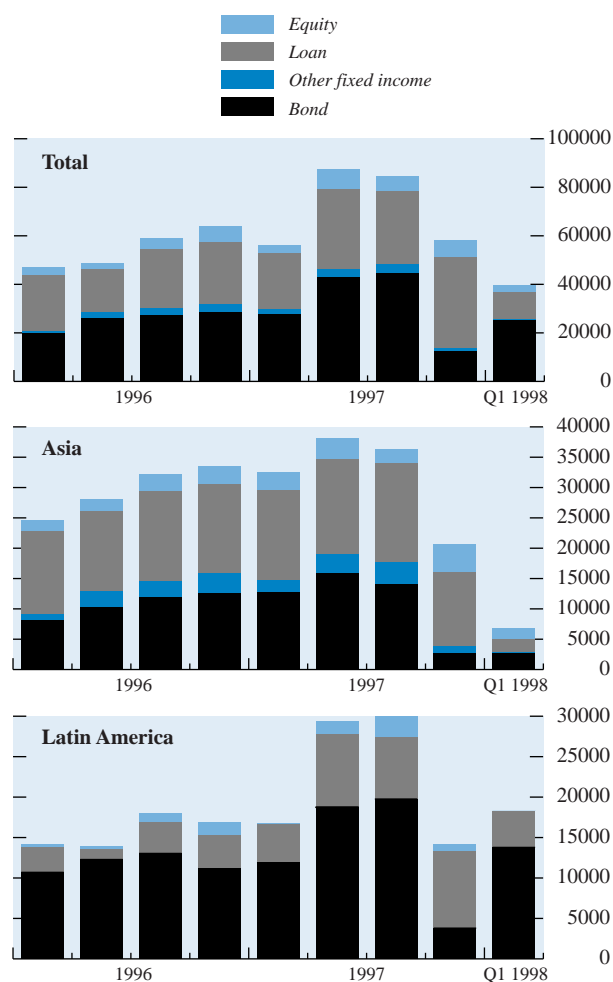
<sup>3</sup>Includes term, construction, mezzanine, and tax-spared loans.

<sup>4</sup>Includes cofinancing and note issuance facilities, certificate of deposit programs, and commercial paper programs.

<sup>5</sup>Includes revolving credits, bridge facilities, export/supplier/acceptance/buyer credits, and overdraft facilities.

**Figure 2.8. Private Market Financing for Emerging Markets<sup>1</sup>**

(In millions of U.S. dollars)



Sources: BEL; and DCBEL database.

<sup>1</sup>Gross primary market financing.

issues, and new issuance came to a virtual standstill in November and December. Compared with an average monthly issuance during 1997 until October of \$12.5 billion, emerging market entities raised a mere \$1.5 billion on international debt markets in the last two months.<sup>6</sup> Notable among the limited issues during the period was that by the Argentine Republic, which used

<sup>6</sup>These figures refer to the face value of bond issues. In fact, actual funds raised during November were much smaller, as one of the three emerging market issues—by an Indonesian corporate—was a \$1.3 billion zero coupon issue, with less than \$0.5 billion of funds actually raised. Total funds raised in November were, therefore, a mere \$0.7 billion.

an innovative structure designed to address volatility in credit spreads by issuing a resettable coupon bond determined by auction (see Box 2.6).

Bond issuance recovered in the first quarter of 1998 to \$24 billion, with a sharp pickup in the share of sovereign borrowing. It is notable that from November 1997 through the end of March 1998, there were only two bond issues from the affected Asian countries—a Thai corporate issue that priced at a spread of over 900 basis points and a privately placed currency-linked won-denominated Korean corporate issue, which limited downside risks to investors from won depreciation but allowed them to share in the upside gains from currency appreciation. The portfolio shift against the affected Asian emerging markets was most apparent in the declining share in total issuance of these countries: from a high of 27 percent in the first quarter of 1997 to 18 percent in the second quarter, 12 percent in the fourth quarter, and a mere 1 percent in the first quarter of 1998. In April, in the first signs that international capital markets were again accessible for the affected Asian countries, the Republic of the Philippines launched a \$500 million 10-year global bond that priced at a spread of 340 basis points over U.S. treasuries. It was followed by the Republic of Korea, which made a spectacular entry into the global bond market, attracting bids of \$12 billion for a final issue of \$4 billion, which priced at spreads of 345 basis points (5-year tranche) and 355 basis points (10-year tranche) over U.S. treasuries.

Reflecting the favorable conditions in emerging debt markets through the third quarter of 1997, average spreads on new issues remained relatively unchanged during the second and third quarters at around 280 basis points, while the new global issues in the Brady exchanges in September caused maturities to jump sharply from 10 years in the second quarter to 15 years in the third (Figure 2.9). The deterioration in terms for new issues in the fourth quarter is not evident in the average calculated spreads, because of the thin volumes and the sharp contraction in maturities. Terms on new issues worsened more noticeably in the first quarter of 1998 as average spreads increased by 66 basis points to 316 basis points, while maturities shrank by a year relative to the fourth quarter of 1997.

The Asian crisis caused a flurry of ratings actions. There was also a host of new ratings, with 14 new countries rated by (at least one of) the major rating agencies: seven in the Western Hemisphere, four in Europe, one in Asia, and one in the Middle East. These new ratings, combined with the spate of downgrades in Asia, caused the average credit quality of emerging markets to deteriorate. The number of emerging markets that had been rated investment grade, having risen steadily from 44 percent in 1993 to 57 percent by end-1996, had deteriorated by end-1997 to about 50 percent, reflecting in particular the loss of

### Box 2.6. Enhancements and Innovations in Bond Structures in Response to the Asian Crisis

The deterioration in investor sentiment reflected in higher spreads and increased uncertainty in volatility of spreads inhibited both issuers and investors on emerging debt markets, prompting a number of enhancements and innovations in bond structures by borrowers in order to retain access.

- Among the affected Asian credits, in June 1997, the Korea Development Bank (KDB), in light of the considerable uncertainty at the time with regards to its future credit standing, issued a \$300 million structured credit-ratings-based floating rate note. The note included a put option that could be exercised by bond holders on coupon dates should KDB's credit rating fall below established threshold levels. To allow the issuer to benefit from future improvements in its credit quality, the structure also included a call option exercisable at the end of year three, or any coupon date thereafter, at par. In a similar vein, in August 1997 the Industrial Finance Corporation of Thailand placed a \$500 million issue that encompassed credit-protection clauses—a two notch downgrade in its credit rating stepped up the coupon by 50 basis points, and every notch downgrade thereafter in a further 25 basis points. Were the rating to fall below investment grade, investors could put the bonds—redeem them—at par. In the event, credit thresholds were breached in each case, and it was reported that both bonds were redeemed.

- In the aftermath of the sharp depreciations of Asian currencies there were several currency-linked issues sold to foreign investors. Denominated in local currencies, these typically limited the downside risk to foreign investors from further currency depreciation, but allowed investors to share in the upside from currency apprecia-

tion. While market participants report several private placements of such notes, public reports are of a \$500 million issue by the Central Bank of the Philippines in August 1997, and a \$250 million issue by a Korean corporate in March 1998.

- There was increased use of bond structures with step-down coupons, that is, coupons decline over the life of the bond. As of end-May 1998 there had been 14 emerging market issues with step-down coupons. Of these, 13 were issued after mid-1997, and 8 of them in 1998.

- As issuers' concerns about locking into expensive long-term funding rates and investors' desire to limit their exposure to volatility caused emerging markets issuance to dry up during November and December 1997, the Republic of Argentina pioneered a novel structure that addressed both these concerns, placing \$500 million of spread adjustable notes (SPANs). Under the structure, the spread is adjusted through a Dutch auction, while incorporating a spread cap and floor. At each reset date, bondholders have the choice of making a noncompetitive bid (rolling over their position), a competitive bid (where they risk losing their holdings if they do not receive an allocation), or no bid at all (they sell their holdings). With a similar objective, in March 1998 Argentina issued floating rate accrual notes (FRANs). The coupon on these adjusts every six months at the (secondary market) spread of its outstanding 2006 global bond less 25 basis points. In addition, when the spread on the outstanding 2027 global bond goes above a certain threshold (set at the beginning of every coupon period) investors in FRANs receive an additional premium. Unlike SPANs, FRANs provide a mechanism whereby both the underlying interest rate and the credit spread float.

investment grade status for Indonesia, Korea, and Thailand. By contrast, the average ratings of countries in the Western Hemisphere improved, with one-third of the countries having investment grade status, compared to only one-fifth at end-1996.

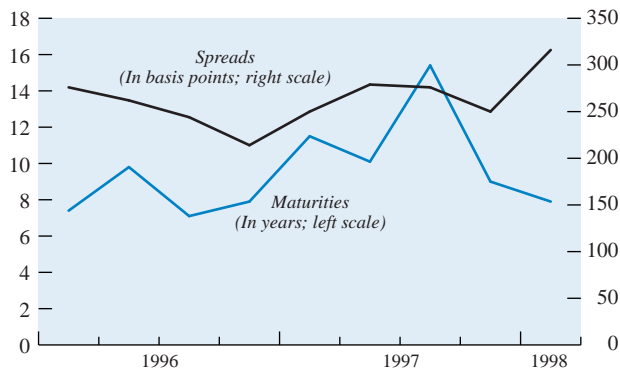
## International Bank Lending

### *Syndicated Loans and Facilities*

Like the international bond market, the international syndicated loan market for emerging market borrowers was resilient to the Asian financial crisis during the first three quarters of 1997. It remained buoyant during the fourth quarter of 1997 (Table 2.3 and Figure 2.8). This remarkable resilience is explained by a number of factors. The effects of the Asian crisis remained localized during the third quarter. Even for the affected Asian countries during the third quarter, a number of deals had been arranged earlier. Overall growth to the Asian region reflected

growth to countries and areas not significantly affected by the crisis such as China, India, Hong Kong SAR, Singapore, and the Taiwan Province of China, which offset a steady decline in syndications of new loans to the affected countries. The change in securities investors' attitudes to emerging market debt in late October in fact encouraged borrowers to turn to the syndicated loan market. A notable example of this switch was the \$3 billion loan facility arranged for Gazprom, a Russian gas company, following the postponement of a convertible bond issue.

The booming syndicated loan market through the first three quarters of 1997 was associated with terms moving in favor of borrowers—tighter spreads, longer tenors, lower fees, and looser structures as evidenced by weaker covenants. While overall activity remained buoyant in the last quarter of 1997, there were increasing signs of stress. There was some widening of spreads, in general stricter collateral requirements, and more frequent inclusion of “material adverse change” clauses in loan documentation. Further, some

**Figure 2.9. Spreads and Maturities for Sovereign Borrowers<sup>1</sup>**

Source: DCBEL database.

<sup>1</sup>Unenhanced U.S. dollar-denominated bonds.

facilities were priced with adjustable spreads linked to credit ratings, such as Mexico's \$2.5 billion revolving credit, arranged in November.

In the first quarter of 1998, as emerging market bond issuance began to recover, volumes of new syndications of both loans and loan facilities for emerging markets collapsed. This contraction occurred across all regions, and was by no means sharpest in Asia. While part of the decline can be explained by the return of some borrowers to bond markets, the remainder suggested an increasing—and widening—retrenchment of international banks from the emerging markets that had not run its course.

### Interbank Claims

In addition to syndicated lending, interbank loans have accounted for an important share of bank lending to emerging markets, particularly the Asian emerging markets. Table 2.4 documents the evolution of interbank claims of BIS-reporting banks on banks in several emerging markets.<sup>7</sup> It is notable that, despite the pressures on the baht in May 1997, interbank claims on Thai banks continued to grow during the second quarter, as they did for each of the other countries—Malaysia, the Philippines, Indonesia, and Korea—that were eventually severely affected by the Asian crisis. In the third quarter, however, which began with the floating of the baht, there was a sharp retrenchment from Thai banks of \$9.9 billion, and from Philippine banks of \$3 billion. There was during the quarter also

a modest reduction in claims on Korean banks of \$0.8 billion, but flows to Indonesian and Malaysian banks were sustained at about \$3 billion each. In the fourth quarter, following the turbulence in Hong Kong SAR, the reduction of international banks' exposures to the region began in earnest and net claims on banks in each and every major emerging market in the Asian region shrank. Among the affected countries the retrenchment was most dramatic for Korea, where \$18 billion in claims, representing about 30 percent of the total outstanding at the beginning of the quarter, were withdrawn. From Thailand, a further \$7.7 billion was withdrawn, bringing the reduction in claims during the last two quarters of 1997 to \$18 billion. As the stock of claims on Indonesian, Malaysian, and Philippine banks prior to the crisis were much more modest than in Thailand and Korea, so was the retrenchment. The contractions of bank claims implied sharp reductions in the outstanding stocks of claims of BIS-reporting banks on Thai and Korean banks. At end-1997, however, with \$60 billion in claims on Thai banks and \$40 billion on Korean banks, these stocks remained both sizable and, excluding the financial centers of Hong Kong SAR and Singapore, the largest among the emerging markets. It is also notable that with the exception of India, all of the major Asian emerging market banking systems were net debtors to BIS-reporting banks at end-1997.

Compared with the large and systematic buildup of claims on Asian banks prior to the crisis, all of the major Latin American emerging market banks, with the exception of Brazilian banks, were net creditors to BIS-reporting banks. In Brazil, banks remained net creditors through the third quarter of 1997, but there was a sharp increase in credit extended to them of \$13 billion during the fourth quarter. Among the European countries, Russian banks were the largest debtors to BIS-reporting banks, with an outstanding amount of \$30 billion, while Polish banks have been net lenders with a net stock of claims of \$11 billion at the end of 1997.

The continued flow of syndicated loans to the affected Asian countries during the last quarter of 1997 combined with the sharp contraction in bank claims indicates that the bulk of withdrawal of international banks' funds from Asia occurred in the form of contractions in interbank credit. As these are typically of shorter maturity, this suggests international banks' primary concern at the time was with local banks' short-term foreign currency liquidity.

### Equity Markets

Returns on emerging equity markets fluctuated sharply during the course of 1997 and diverged markedly across regions (Figure 2.10). Latin American markets remained extremely buoyant during the first half of the year, turning in total dollar returns, as

<sup>7</sup>The BIS-reporting banks include banks in the Group of Ten countries plus Austria, Denmark, Finland, Ireland, Luxembourg, Norway, and Spain, and foreign affiliates of these banks.

**Table 2.4. Changes in Net Assets of BIS-Reporting Banks Vis-à-Vis Banks in Selected Countries and Regions***(In millions of U.S. dollars)*

	1994	1995	1996	1997	1997				Net Outstanding Credit at	
					Q1	Q2	Q3	Q4	End-1996	End-1997
<b>Africa</b>										
South Africa	842	267	1,058	-1,011	409	-1,391	-927	898	6,660	5,568
<b>Asia</b>										
Indonesia	3,443	2,920	162	3,187	1,112	2,699	3,056	-3,680	12,521	15,865
Korea	8,287	14,899	15,722	-19,585	-1,653	399	-838	-17,493	59,470	39,652
Malaysia	8,363	208	975	8,061	4,531	2,282	3,244	-1,996	4,248	12,973
Philippines	-90	681	3,605	-970	260	2,229	-2,941	-518	4,578	3,617
Thailand	17,188	31,705	10,244	-16,377	-240	1,473	-9,944	-7,666	78,051	59,851
China	-4,990	12,120	2,089	11,134	5,016	3,075	4,922	-1,879	-1,673	9,152
India	-292	-1,433	-2,942	-2,813	-194	-133	205	-2,691	-3,887	-6,550
Hong Kong SAR	10,846	40,246	28,518	15,961	-3,764	27,378	-1,669	-5,984	219,335	213,149
Singapore	8,136	18,021	7,747	-17,929	-10,522	4,034	-792	-10,649	116,324	88,881
<b>Europe</b>										
Czech Republic	497	818	-375	-486	-1,034	-739	-282	1,569	492	-17
Hungary	227	-795	-325	278	-52	190	-577	717	3,355	3,238
Poland	-8,022	-3,541	1,944	-3,754	-1,320	734	-1,442	-1,726	-8,016	-11,244
Russia	-3,286	-1,461	1,477	440	-843	-3,804	4,508	579	33,599	30,333
Turkey	-8,230	-750	4,969	-579	2,341	618	-1,407	-2,131	-3,195	-3,443
<b>Middle East</b>										
Egypt	-2,246	1,390	2,749	2,043	-322	-389	1,468	1,286	-17,244	-14,979
Kuwait	870	-441	-298	1,356	-87	-158	843	758	-4,597	-3,077
Saudi Arabia	3,256	-3,520	-1,408	8,837	2,056	2,212	2,868	1,701	-27,770	-18,503
United Arab Emirates	1,430	-4,479	-5,130	-455	-680	-342	1,284	-717	-16,918	-17,245
<b>Western Hemisphere</b>										
Argentina	2,859	-2,244	1,495	-5,042	-1,028	-6,831	5,230	-2,413	2,792	-2,417
Brazil	-20,826	-15,104	2,298	11,692	1,639	763	-3,242	12,532	-7,310	4,559
Chile	-2,144	-181	-500	-3,258	-235	-1,606	-221	-1,196	-3,545	-6,576
Colombia	-21	922	287	756	-180	209	1,078	-351	-1,015	-196
Mexico	9,404	-11,297	-2,358	-4,420	-138	-7,941	3,757	-98	2,799	-1,450

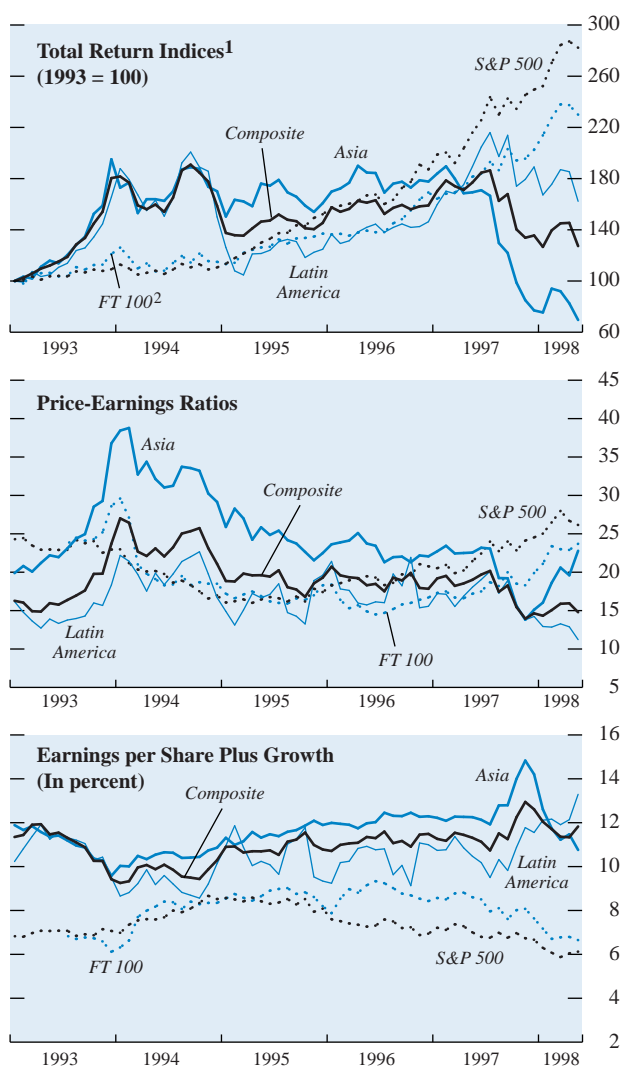
Source: Bank for International Settlements (BIS).

measured by the IFCI investable index, of 40 percent, about double that of the Standard and Poor's (S&P) 500 index. Asian markets, on the other hand, declined modestly by 4 percent. During the second half of 1997, as sharp depreciations in exchange rates combined with declines in local currency equity prices, dollar returns on Asian equity markets went into a free fall, yielding a loss of 56 percent. Latin American markets, on the other hand, after suffering an early sympathetic correction with the Asian markets in July, rebounded, continuing to yield positive returns through the third quarter, albeit more modestly than earlier in the year. Having turned in returns of 46 percent during the first three quarters of the year, however, as a result of the spillover from Hong Kong SAR's equity markets in late October, Latin American markets fell by 12 percent in the fourth quarter. In the first quarter of 1998, returns on Asian markets rebounded strongly, yielding 19 percent, again reflecting both exchange rate appreciations and local currency equity price increases, while Latin American

markets declined modestly. Emerging equity markets generally, and especially in Asia, recorded further declines in the second quarter of 1998, evidence of the deepening economic consequences of the Asian financial crisis and spillovers from weakness in Japan.

As the steep declines in Asian equity prices exceeded declines in earnings and equity prices in the mature markets continued to increase, for the first time since mid-1993 price-earnings ratios for the Asian emerging markets during 1997 fell below those in the mature markets and remained so through May 1998 (see Figure 2.10, second panel). Price-earnings ratios for the Latin American emerging markets, which have remained well below those of the S&P 500 since late 1996, fell further in late 1997, and at end-May 1998 were less than half of those on the S&P 500. Figure 2.10 (third panel) shows that expected returns on equity in the emerging markets, as measured by price earnings ratios adjusted for expected earnings growth, have consistently exceeded those in the mature markets during the period, and despite the sharp

**Figure 2.10. Emerging Equity Markets: Selected Returns, Price-Earnings Ratios, and Expected Returns**



Sources: Bloomberg Financial Markets L.P.; and International Finance Corporation, Emerging Markets Data Base.

<sup>1</sup>All return indices are expressed in U.S. dollars.

<sup>2</sup>Price index.

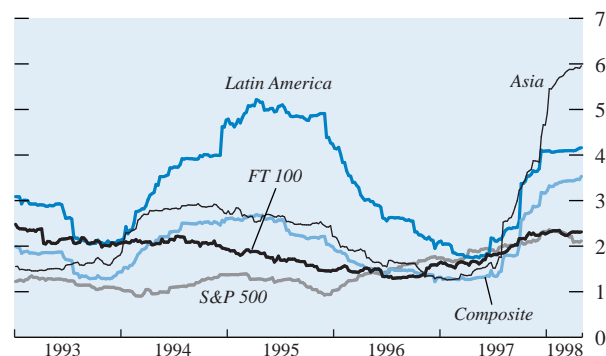
slowdowns in forecasts for earnings (output) growth in Asia, they continue to remain so for both the Asian and Latin American emerging markets.<sup>8</sup>

The volatility of returns on emerging equity markets—in both Asia and Latin America—had declined

<sup>8</sup>Expected earnings growth is proxied by forecast GDP growth, constructed from the prevailing World Economic Outlook forecast as the average for the ensuing five years.

**Figure 2.11. Emerging Equity Markets: Selected Volatilities Comparisons**

(In percent)



Sources: Bloomberg Financial Markets L.P.; and IMF staff estimates.

steadily and dramatically during the course of 1996 and through early 1997 as recovery from the Mexican crisis continued (Figure 2.11). By mid-1997 these volatilities were comparable to, and in fact slightly below, those in the mature equity markets. This situation changed drastically in the second half of 1997, as the volatility of returns on Asian emerging markets rose steeply, to levels in excess of those on Latin American markets at the height of the Mexican peso crisis. While the volatility of returns on Latin American markets rose during the last quarter of 1997, it leveled off in early 1998 at a level below that reached at the height of the Mexican peso crisis. Uncertainty created by the Asian financial crisis was associated with increased trading activity on emerging equity markets. This was most apparent in Asia where, with the exception of China, turnover—calculated as the ratio of the value of shares traded to average market capitalization—rose across the board (Table 2.5). In China, trading continued at a frenetic pace of 231 percent, one of the highest in the world.

Reflecting the buoyant state of the mature equity markets, emerging market entities continued to rely on international placements of equity during the course of 1997, at a pace that was broadly unperturbed by the Asian crisis (see Table 2.3 and Figure 2.8). Issuance by entities in the affected Asian countries of Thailand, Malaysia, the Philippines, Indonesia, and Korea, however, which had already declined in 1996 by 40 percent, fell by a further 44 percent in 1997. International placements of equity from all other regions were buoyant in 1997, but declined during the first quarter of 1998.

Total flows into mutual funds dedicated to emerging markets were substantial in the first half of 1997 (\$6 billion), reflecting strong flows into “nonregion-

**Table 2.5. Annual Stock Market Turnover Ratios in Selected Countries and Regions<sup>1</sup>**  
(In percent)

	1990	1991	1992	1993	1994	1995	1996	1997
<b>Africa</b>								
South Africa	...	...	...	...	13.9	6.7	10.4	18.9
<b>Asia</b>								
China	...	...	...	131.3	235.0	116.6	328.9	230.9
India	66.3	53.6	36.7	20.8	24.2	8.8	17.4	42.8
Indonesia	77.1	39.9	41.3	40.6	29.4	25.3	40.7	71.5
Korea	60.4	82.2	114.0	171.6	173.4	99.3	110.6	189.0
Malaysia	24.6	19.8	28.6	94.2	58.8	36.5	65.5	76.5
Philippines	13.7	18.7	26.0	24.9	29.6	25.7	36.6	36.4
Taiwan Province of China	425.4	322.5	213.4	234.0	321.8	176.6	204.1	460.1
Thailand	92.4	100.8	153.2	84.9	61.3	41.9	36.8	39.2
<b>Europe</b>								
Czech Republic	...	...	...	...	...	46.7	49.9	45.8
Hungary	...	...	7.1	13.7	22.4	17.4	42.1	73.8
Poland	...	13.5	87.4	135.7	180.3	72.9	85.6	77.5
<b>Western Hemisphere</b>								
Argentina	20.6	42.7	84.4	33.0	28.1	12.3	10.6	49.5
Brazil	20.3	37.1	51.6	55.0	67.9	46.9	61.2	85.7
Chile	6.7	9.1	7.1	7.5	9.4	15.7	12.2	10.8
Mexico	44.0	48.1	37.6	37.5	50.0	30.6	43.6	39.8
Venezuela	43.0	32.4	28.6	25.8	20.0	11.8	18.2	31.0

Source: International Finance Corporation, Emerging Markets Data Base.

<sup>1</sup>Ratios for each market are calculated in dollar terms by dividing total value traded by average market capitalization.

specific” funds (\$4 billion) and Latin American funds (\$1 billion), while those to Asia showed a modest decline (Figure 2.12). Following the devaluation of the Thai baht at the beginning of the third quarter, substantial redemptions (\$2.5 billion) from Asian funds began. However, significant inflows (\$1 billion) into nonregion-specific funds continued, while there were insignificant net flows from Latin American funds. Finally, in the fourth quarter, following the events in Hong Kong SAR there were large redemptions across all types of emerging market mutual funds.

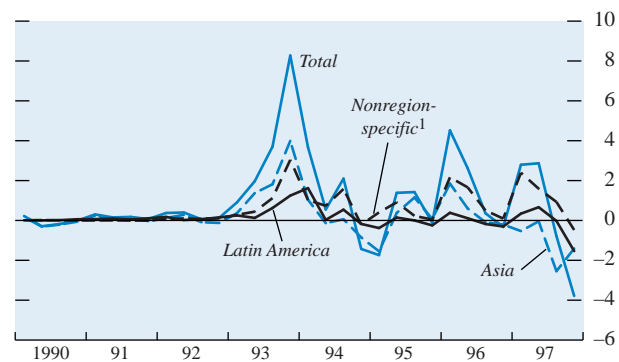
## Part Two: Emerging Market Banking Systems

Developments in emerging market banking systems showed clearly defined regional patterns during 1997–98.<sup>9</sup> The banking systems in many Asian emerging markets were at the core of the region’s financial crises and began a difficult and painful restructuring process. Despite volatile conditions in international financial markets, Latin American banking systems showed resilience to the contagion from Asia and continued a consolidation process fueled by the entry of foreign financial institutions. With the exception perhaps of Russian banks, the impact on Eastern Europe’s banks was limited, and re-

structuring and consolidation efforts continued with a view to eventual EU membership for several countries. Most emerging markets have made efforts to tighten their regulatory frameworks and are moving toward compliance with the Core Principles for Effective Supervision recently promulgated by the Basle Committee on Banking Supervision. Countries have made important improvements in accounting

**Figure 2.12. Emerging Market Mutual Funds: Estimated Net Flows**

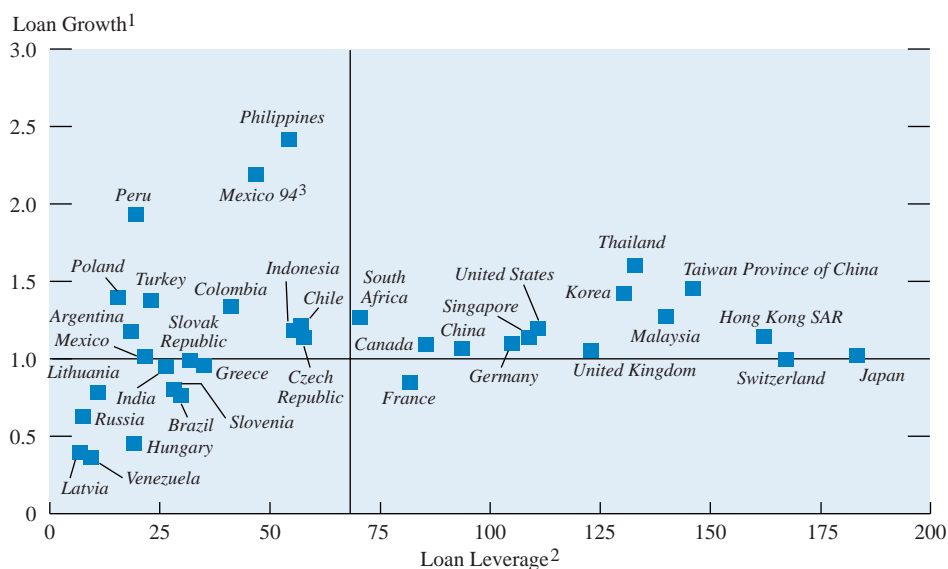
(In billions of U.S. dollars)



Source: Lipper Analytical Services, Inc.

<sup>1</sup>Refers to nonregion-specific funds dedicated to emerging markets.

<sup>9</sup>Annex I details the performance of individual banking systems.

**Figure 2.13. Financial Sector Lending: Growth and Leverage, 1990–96**

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

<sup>1</sup>Loan growth is the ratio of growth in loans to private sector (bank and nonbank) versus nominal GDP growth from year-end 1990 to year-end 1996.

<sup>2</sup>Loan leverage is defined as the ratio of loans to private sector versus nominal GDP as of year-end 1996.

<sup>3</sup>Loan growth from 1990–94 and loan leverage is as of year-end 1994.

Note: Loan growth of the following countries and regions started at different year: Hong Kong SAR, Poland, and Slovenia (1991); Malaysia (1992); and Russia, the Czech Republic, Latvia, Lithuania, and the Slovak Republic (1993).

rules, disclosure of financial information, loan classification and provisioning, and capital adequacy. However, important challenges in implementation remain. A major source of concern in the regulatory community relates to the awareness and measures undertaken to address the year 2000 problem in emerging markets.<sup>10</sup> In the absence of clear and detailed involvement by national bank regulators, including specific publicly disclosed guidelines, the risks of operational problems or even larger disruptions in financial markets are considerable.

The problems facing Asia's distressed banking systems are the legacy of years of bad lending practices and inadequate supervision and regulation that led to high lending growth and risk taking. Although lending growth above that of GDP is a precondition for financial deepening in emerging markets, the sustained growth of bank lending in many Asian countries led to very high leverage ratios that increased financial fragility. Most of the countries in the region, and in particular some of the most severely affected by the

crisis (Korea, Malaysia, and Thailand), displayed lending growth in excess of GDP growth for several years and had higher loan leverage ratios than industrial countries with better developed financial infrastructures (Figure 2.13).<sup>11</sup> Empirical studies have shown that rapid credit growth and leverage are significant determinants of banking crises.<sup>12</sup> Moreover, credit growth in some of these countries was led in part by underregulated nonbank financial intermediaries (Figure 2.14), such as finance companies in Thailand and merchant banks in Korea, that increased competitive pressures on banking systems.

The large capital inflows to the region, driven by partial financial liberalization and implicit guarantees of stable exchange rates, fueled an expansion of

<sup>11</sup>Countries in the early stages of development are expected to be in the northwestern quadrant of Figure 2.13, where loan leverage—defined as the ratio of credit to the private sector relative to GDP—is low but loan growth exceeds GDP growth. As countries advance in their development and loan leverage (or loan penetration) grows, they are expected to converge to the border between the south-east and north-east quadrants.

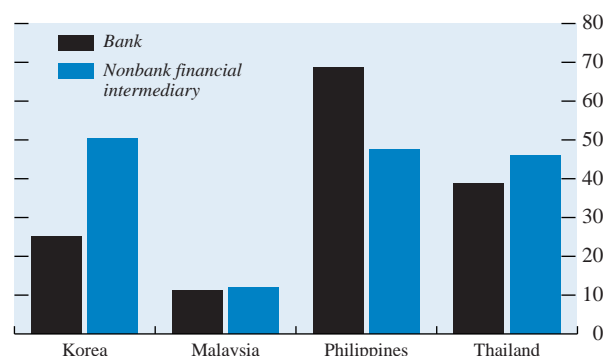
<sup>12</sup>See Demirgüç-Kunt and Detragiache (1998) and Kaminsky and Reinhart (forthcoming).

<sup>10</sup>See Basle Committee on Banking Supervision (1997).



**Figure 2.14. Bank and Nonbank Financial Intermediaries: Average Credit Growth, 1990–96**

(In percent)



Source: International Monetary Fund, *International Financial Statistics*.

banks' balance sheets and led to increasing exposures to liquidity, market, and credit risks. In Korea, regulations limiting international issuance of securities to entities with high ratings, combined with the perceived official support for banks, encouraged the channeling of international borrowing through the financial system for onlending to corporates. In Thailand, the establishment of the Bangkok International Banking Facility in 1993, with the aim of developing a regional financial center, led to a substantial increase in mostly short-term offshore borrowing (and also opened the door to aggressive lending by foreign banks, still restricted in their local activities). These funds were channeled in part to finance real estate and stock purchases, and although banks seem to have had relatively matched foreign currency books, they held sizable maturity mismatches and faced increased credit risks from unhedged corporate borrowers. In Malaysia, restrictions on foreign borrowing left the corporate and banking sectors with relatively low exposures to foreign exchange risks, but highly leveraged corporates and bank exposures to the property and share financing sectors left the banking system in a vulnerable position.

The failure of Asia's regulators to strike a balance between the guarantees needed to reduce financial instability and the regulations and oversight required to minimize excessive risk taking allowed bad lending decisions to proceed with impunity. The perception of implicit guarantees was probably strengthened by the bailouts in the resolution of earlier banking crises in some of these countries (Thailand, 1983–87; Malaysia, 1985–88; and Indonesia, 1994), where substantial support was provided to weak institutions, as well as by government-directed credit to the conglomerates

(*chaebol*) in Korea. Poor accounting, regulatory, and supervisory standards failed to prevent the moral hazard problem generated by these implicit guarantees. Weak loan classification and provisioning rules, combined with lax enforcement of related-party lending restrictions inside large financial (and nonfinancial) groups and regulatory forbearance on securities' exposures and unrealized losses on them, allowed excessive risk taking in Korea and Thailand. In addition, the reluctance to shut down insolvent banks in Indonesia raised doubts about the viability of the authorities' strategy for a gradual consolidation of the country's overstretched banking system. After the devaluation of the Thai baht, the fear that creditor losses in some banks may bring down even good banks led several governments to provide explicit assurances that depositors (and creditors) would suffer no losses on their savings.

Following the depreciation of the Thai baht in July 1997, investors focused increasingly on financial sector vulnerabilities, and liquidity problems (both external and domestic) spiraled as confidence in the region waned. The depreciation of the region's currencies prompted a reassessment of local entities' creditworthiness, and the banks' weak financial fundamentals—as reflected, for instance, in low individual Bank Financial Strength Ratings (BFSR; see Table 2.6)—combined with a lack of transparency and of decisive response from the authorities, fueled the reluctance of foreign creditors to roll over short-term loans to banks across the region.<sup>13</sup> Together with the drying up of liquidity in the international interbank market, the countries in crisis experienced depositor runs from weaker to stronger banks and from the banking system as a whole. A sharp segmentation in the domestic interbank market ensued, as stronger financial institutions became increasingly reluctant to lend to weaker ones, and central banks stepped in to recycle funds back to weaker institutions as well as to provide liquidity support to the financial system at large. In Indonesia, Bank Indonesia tightened liquidity initially but later eased its stance as domestic and foreign liquidity conditions deteriorated sharply. Following agreement on the IMF program at end-October, Bank Indonesia announced the closure of 16 small banks—accounting for about 3½ percent of bank assets—and indicated that no more banks would be liquidated “at this time.” As there was a widespread perception of insolvency at a number of other banks, however, these closures fueled a withdrawal of deposits from the financial system. The subsequent reopening of one of the banks—on the same premises and with the same staff—further hurt the credibility of regulators. The provision of substantial liquidity support—including

<sup>13</sup>For a description of Moody's BFSR, see International Monetary Fund (1996).

**Table 2.6. Average Bank Financial Strength Ratings for Selected Countries and Regions<sup>1</sup>**

	June 1996	December 1996	June 1996	December 1997	May 1998
Emerging markets					
Asia					
China	D	D	D	D	D
Hong Kong SAR	C+	C	C	C	C
India	D	D	D	D	D
Indonesia	D	D	D	D	E
Korea	D	D	D	D	E+
Malaysia	C+	C/C+	C/C+	D+	D
Philippines	D+	D+	D+	D+	D+
Singapore	B	B	B	C+/B	B
Taiwan Province of China	C	C	C	C	C
Thailand	D+	D+	D/D+	D	E+
Europe					
Croatia	...	...	D	D	D
Cyprus	...	C	C	C	C
Czech Republic	D	D	D	D	D
Hungary	D	D	D/D+	D/D+	D/D+
Israel	D+	D+	D+	D+	D+
Poland	D	D	D	D	D
Romania	...	...	E+	E+	E+
Slovak Republic	...	D	D	D	D
Slovenia	...	...	D+	D+	D+
Turkey	D	D	D	D	D
Latin America					
Argentina	D+	D+	D+	D/D+	D/D+
Brazil	D+	D+	D+	D+	D+
Chile	C	C	C	C	C
Colombia	D+/C	D+/C	D+/C	D+/C	D+/C
Mexico	E+	E+	E+	E+	E+
Panama	C	C	C	D+	D+
Peru	...	...	D+	D+	D+
Puerto Rico	D+	D+	D/D+	D+/C	D+/C
Uruguay	...	...	D/D+	D/D+	D/D+
Venezuela	D	D	D	D+	D+
Middle East and Africa					
Bahrain	D/D+	D/D+	D+	D+	D/D+
Egypt	...	...	D+	D	D
Jordan	...	...	D/D+	D/D+	D/D+
Kuwait	D+	D	D/D+	D/D+	D/D+
Oman	D+	D+	D+	D+	D+
Pakistan	...	E/E+	E/E+	E/E+	E/E+
Qatar	D	D	D	D	D
Saudi Arabia	...	D+	D+	D+	D+
South Africa	C	C	D+/C	D+/C	D+/C
United Arab Emirates	D	D	D	D	D
Selected mature markets					
Germany	C+	C+	C+	C+	C+
Japan	D+	D+	D+	D+	D+
United Kingdom	C+	C+	C+	C+	C+
United States	C+	C+	C+	C+	C+

Source: Moody's Investors Service.

<sup>1</sup>The Bank Financial Strength Rating is Moody's opinion of a bank's intrinsic strength—the likelihood that the bank will require financial support from shareholders, the government, or other institutions. The ratings range from A (highest) to E (lowest). It should be noted that the coverage of banking systems is not generally complete, so that the ratings are not necessarily representative of the credit quality of the entire system.

to some large private banks—combined with the reluctance to raise interest rates for fear of further damaging banks' positions led to a loss of monetary control. In retrospect, decisive action to intervene in a number of additional weak banks, combined with a

general guarantee for bank creditors (other than subordinated debt holders) might have forestalled this process. In Thailand, liquidity support channeled by the Financial Institutions Development Fund (FIDF) reached about 15 percent of GDP during 1997, and al-

**Table 2.7. Banks' Liquidity and Solvency Risks—Selected Asian Countries**

	Banks' Foreign Liabilities <sup>1</sup> (In billions of U.S. dollars)		Peak Problem Loans (In percent of total loans)		Recapitalization Costs (In percent of GDP)	
	June 1997	December 1997	S&P	J.P. Morgan	S&P	J.P. Morgan
Indonesia	23.4	24.1	40+	30–35	20+	19
Korea	90.6	78.7	25–30	25–30	20+	30
Malaysia	25.5	22.6	20	15–25	18	20
Philippines	11.4	10.1	n.a.	8–10	n.a.	0
Thailand	85.7	67.6	35–40	25–30	34	30

Sources: Bank for International Settlements (BIS); Standard and Poor's; and J.P. Morgan.

<sup>1</sup>Vis-à-vis BIS-reporting banks.

though it declined during 1998, it contributed to a further depreciation of the baht.

The sharp decline in currencies and asset values, combined with the strong economic downturn, intensified asset quality problems that are gradually showing up on banks' balance sheets, and nonperforming loans increased sharply in the first quarter of 1998. Loan classification rules differ across countries making it difficult to compare asset quality across them. Moreover, under the region's weak loan classification rules, loans were deemed nonperforming when past due for six months so that official estimates of nonperforming loans in December 1997 were under 10 percent of total loans for most crisis countries—with the exception of Thailand, where the deterioration of asset quality started earlier. A better sense of the deterioration in asset quality, however, can be obtained from estimates produced by rating agencies and investment banks that incorporate uniform loan loss classification rules (Table 2.7). Nonperforming loans are projected to rise to around 10 percent of total loans in the Philippines, between 10 percent and 20 percent in Malaysia, 30 percent in Korea and Thailand, and an even higher level in Indonesia. The severe deterioration in asset quality is being driven by increases in corporate bankruptcies and will be exacerbated by falls in real estate values that are expected to follow the declines in (the more liquid) stock prices and currency values (Figure 2.15).<sup>14</sup>

Weakness in domestic financial systems was at the core of the region's vulnerability to crisis, and creating viable and sound financial systems is an essential precondition for a sustained recovery. Consequently, restructuring and recapitalization of financial systems has been an integral component of the IMF-supported programs in Thailand, Indonesia, and Korea. Box 2.7 lists the key measures adopted to this end in the three program countries. Financial sector restructuring embodied in the programs has sought both to deal with existing problems to get the financial system back into

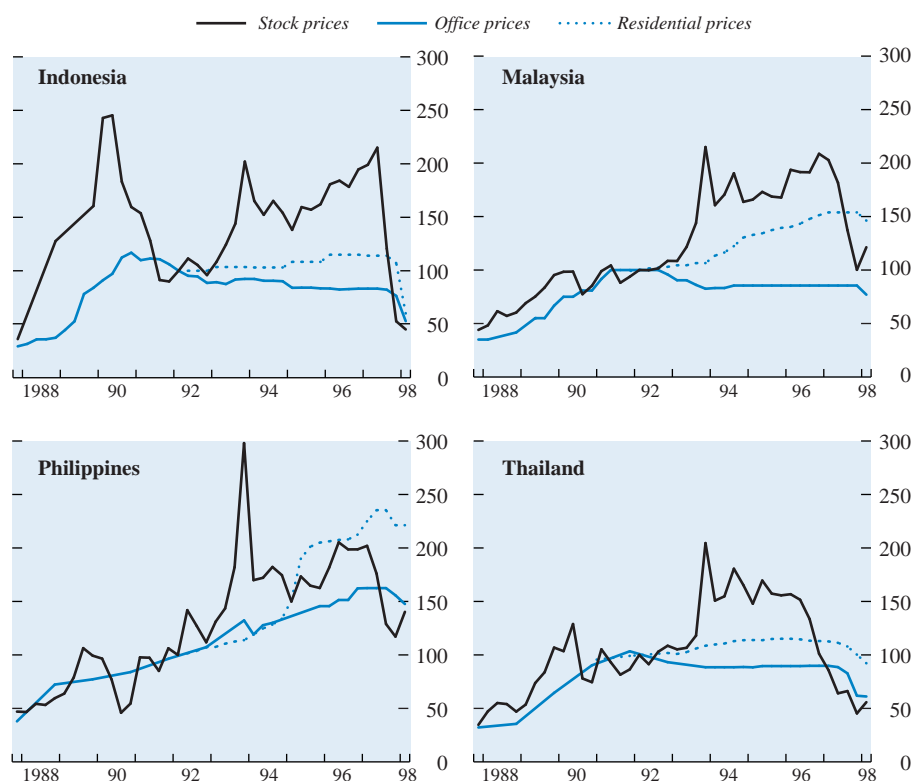
effective operation and structural measures necessary to increase the resilience of these systems, thereby reducing the possibility that problems will recur.

Dealing with existing problems has required the closure of deeply insolvent institutions, the recognition of deteriorations in asset quality, provisioning for these losses, facilitation of the disposal of nonperforming assets, and the recapitalization of those institutions whose capital adequacy had deteriorated below minimum levels. Since the second half of 1997 more than 150 financial institutions have been closed down, suspended, nationalized, or placed under the administration of a government restructuring agency. In general, these are institutions that were clearly insolvent before the crises deepened and where there was no economic purpose in returning them to operation in an appropriately restructured financial system. Many countries in the region set up or expanded the role of asset management corporations to purchase bad loans, and administer and sell them. Recapitalization needs are estimated to range between 18 percent and 34 percent of GDP for the different crisis countries (see Table 2.7).<sup>15</sup> The strategy of recapitalization based on private market fund raising showed some early signs of success in the case of a few large banks, but indications are that a sizable portion will have to be met by public funds. In principle, a straightforward option for raising capital is to foreclose on bad loans, seize the collateral, and sell it for cash. However, foreclosure and bankruptcy laws in the region were inadequate, tending to favor debtors, and consequently some countries have undertaken comprehensive amendments of bankruptcy laws to facilitate the restructuring process. Another option is that of merging with foreign partners, and some countries—notably Korea and Thailand—have increased the scope for foreign ownership. Structural measures to improve the resilience of financial systems included tightening

<sup>14</sup>In Korea, for instance, more than 10,000 companies went bankrupt in the first quarter of 1998 compared with 14,000 for the whole year in 1997 and 11,570 in 1996.

<sup>15</sup>By comparison, the cost of the banking crisis in Mexico is estimated at 14.4 percent of GDP. However, while the level of nonperforming loans peaked at roughly 40 percent of total loans—including loans sold to the Fondo Bancario de Protección al Ahorro (FOBAPROA)—the ratio of credit to GDP was 47 percent, less than half of that of most Asian countries.

**Figure 2.15. Real Estate and Stock Prices in Selected Asian Countries<sup>1</sup>**  
(Indices, March 1992 = 100)



Sources: International Finance Corporation; and Jones Lang Wootton.

<sup>1</sup>Real estate and stock prices in local currencies, except for Indonesia, where prices are in U.S. dollars.

regulatory and supervisory frameworks by shortening the period for classifying loans as nonperforming, increasing general and specific loan loss provisions, the adoption of international accounting standards, improvements in financial disclosure, and the tightening of capital adequacy rules. Several of these measures are being phased in gradually in light of the already substantial deterioration in banks' balance sheets and the need to keep the financial system operational to the greatest extent feasible in the face of the present crisis.

Owing to measures taken following the 1994–95 crisis, Latin American banking systems were able to endure the impact of the Asian crisis relatively unscathed. Brazil was the hardest hit by contagion from Asia. Capital outflows from domestic securities markets and margin calls on highly leveraged domestic institutions, combined with sharp increases in interest rates, led to significant losses on the securities portfolios of some investment banks and medium-sized universal banks. The more conservative and well-capitalized large banks are well prepared to withstand

deteriorations in their loan portfolios caused by high real interest rates, and have continued to demonstrate a strong appetite to absorb medium-sized and small banks in difficulties, providing stability to the system. The Argentine banking system showed a remarkable resilience to the events in Asia and, in sharp contrast to the experience at the time of the Tequila effect, deposits continued to grow during the last quarter of 1997. The increase in interest rates was short lived and smaller than in Brazil, causing some losses on banks' trading books but only a minor deterioration in their loan books. Chile and Venezuela were affected indirectly by the Asian crisis, through the decline in commodity prices in early 1998. Both countries' banking systems have strengthened their balance sheets and so were able to withstand the impact of higher interest rates. In the event, asset quality improved in most Latin American banking systems, with the notable exception of Brazil, but the deterioration in asset quality in that country is unlikely to create systemic risks.

Most Latin American banking systems have been undergoing a gradual consolidation process through

**Box 2.7. Key Financial Sector Policy Responses to the Asian Crisis**

Thailand, Indonesia, and Korea have undertaken several policy measures to deal with financial sector distress and to strengthen financial systems.

- The closure of deeply insolvent financial institutions was a prominent feature of the policy response in all three countries. The Thai authorities suspended 16 finance companies in June 1997 and a further 42 in August 1997. All but two of these companies were closed permanently in December 1997 as they were not deemed to be viable elements of an appropriately restructured financial system. In Indonesia, 16 small banks were closed in early November 1997, and in April 1998, another 7 small banks were closed. In Korea, 14 merchant banks were closed between December 1997 and April 1998.

- Thailand announced guarantees for all depositors and nonsubordinated debtholders of banks and remaining finance companies in August 1997. In January 1998, the Indonesian authorities announced a government guarantee for depositors and creditors (excluding subordinated debt) of banks. Korea announced guarantees on the external liabilities of Korean financial institutions in August 1997.

- The Thai authorities announced in October 1997 the creation of the Financial Sector Restructuring Authority and an Asset Management Corporation to act as the agency to manage and sell bad assets of the financial sec-

tor. In January 1998, Indonesia announced the creation of the Indonesian Bank Restructuring Agency to take over management of weak banks and for disposal of nonperforming assets of the banking system. In Korea, a special fund was set up in August 1997 within the Korea Asset Management Corporation as a unit to buy impaired assets from banks.

- Tighter loan classification and provisioning rules were announced by Thailand in October 1997 as part of the financial sector restructuring package. Capital adequacy standards were also introduced as part of the measures to strengthen the financial system. Strategies for recapitalization in Thailand were aimed at raising new capital privately, except for the four intervened banks. The Indonesian authorities announced a sharp increase in minimum capital requirements for banks, and tightened loan classification and provisioning guidelines for banks in January 1998 though this was later reversed. In Korea, banks not meeting the minimum capital requirements under full provisioning had to submit plans for recapitalization in early 1998. The administration of deposit insurance funds for financial institutions in Korea was consolidated under the Korea Deposit Insurance Corporation. Indonesia and Thailand have planned the creation of a formal deposit insurance scheme as part of strengthening the financial system in due course.

privatization, mergers, and acquisitions. External shocks like the Tequila effect and the Asian crisis have accelerated this process. In less than four years after the 1994–95 crisis, 110 banks have been acquired, merged, or liquidated in five countries (see Table 2.8). Analysts estimate that about 100 more banks would follow that same process over time just in Brazil, and this is being accelerated by the pressures imposed by high interest rates on small and medium-sized banks. Even in Chile, where the banking system has fewer and stronger institutions as a result of the deep crisis in the early 1980s, the two largest banks completed in 1997 two mega-mergers that will intensify the pressures to merge among the medium-sized banks. Finally, in most countries in the region, concentration is

also increasing as a result of organic growth among the largest banks.

An important driving force of the consolidation process in Latin American banking systems has been the entry of foreign institutions that are reshaping the industry and improving its efficiency and stability. Foreign banks are not new in the region, but a recent wave of acquisitions—led by the largest Spanish banks—to take advantage of what is perceived to be an underbanked region is making the foreign presence a much more dominant one. In Argentina and Venezuela, foreign banks control around half of total banking system assets, while in Brazil, Chile, and Mexico foreign control is rapidly approaching 20 percent of total assets (see Figure 2.16). Foreign institutions are bringing with them better risk management systems to the region and are taking advantage of the scope of activities allowed by the universal banking paradigm established in most countries' banking legislation. Indeed, the structure of the financial industry in Latin America is expected to become increasingly similar to that of Europe rather than that of the United States.

Notwithstanding all the recent improvements in prudential regulation and supervision in Latin American banking systems, some important challenges remain. First, although all countries in the region—with the notable exception of Mexico—have an average fi-

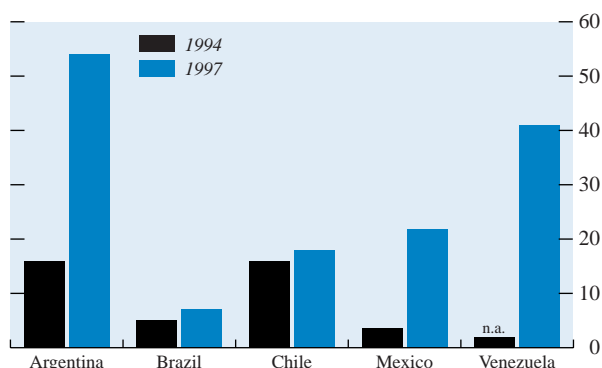
**Table 2.8. Number of Financial Institutions—Selected Latin American Countries**

	1994	1997	Change
Argentina	202	138	-64
Brazil <sup>1</sup>	271	233	-38
Chile	37	32	-5
Mexico	36	53	17
Venezuela	129	109	-20

Sources: IBCA; Standard and Poor's; and Sudeban.

<sup>1</sup>Number of commercial and multiple banks.

**Figure 2.16. Foreign Banks in Latin America:  
Percentage of Total Banking System Assets**  
(In percent)



Sources: Standard and Poor's; Comisión Nacional Bancaria y de Valores; and Sudeban.

Note: Data for Brazil is end-1996; n.a.= not available.

financial strength rating above D (Table 2.6), weak institutions continue to operate in some of the region's banking systems. The opportunities provided by an underbanked environment (as shown by the low loan leverage ratios in Figure 2.13) are leading to rapid credit growth that could mask excessive risk-taking by the weak institutions. Second, a couple of recent bank problems in the region, where banks exhibiting solid balance sheets were found soon after to be insolvent, highlights the need to further improve the transparency and disclosure of information about banks' asset quality and capitalization. Argentina has recently announced a new series of measures designed to improve transparency in the banking system, including quarterly evaluations of all financial institutions by internationally recognized credit rating agencies and the widespread diffusion of their ratings. Third, consolidated supervision, in particular with respect to so-called offshore parallel banks, needs to be substantially improved (see Box 2.8). Also, despite the gains in efficiency and stability derived from the universal banking paradigm, "fire walls" should be strengthened to prevent abuses on the safety net derived from the region's complex ownership structures. Finally, the reduction of moral hazard in the Mexican banking system—where a blanket guarantee on depositors and most debt holders remains after more than three years of restructuring—is a key priority to prevent further abuses of the official safety net. The recent legislation presented to congress constitutes an indispensable complement to the reforms enacted by regulators during the past four years, and their prompt and effective implementation are essential to restoring the health and incentive structure of the banking system.

The current condition of the banking systems in several of the European emerging markets can be traced back to decisions taken by the authorities several years ago in regard to restructuring banks and enterprises, and establishing prudential frameworks and bankruptcy processes. The healthiest banking systems are in Hungary and Poland, where the authorities took steps to encourage bank and enterprise restructuring as part of bank recapitalization. Improvements in asset quality have been enhanced by decisions to allow or encourage substantial foreign participation in the banking sector. In contrast, the recapitalization of the large banks in the Czech Republic in 1992–93 was not accompanied by substantial bank and enterprise restructuring, and a quarter of loans are nonperforming. There are indications, however, that credit and market risk management have improved recently. Foreign investment in the banking sector has been limited, but the authorities have announced their intention to privatize the bigger banks, and a large stake in one of them was sold in March 1998.

In Russia, the banking sector has remained small—bank lending is around 10 percent of GDP—owing to weak demand for money and mistrust of the large number of banks that sprang up in the period of lax licensing. Most banks continue to focus on securities trading and their exposures to market risks are large—as was illustrated by the weak profitability during the volatile conditions of late 1997. Further, with weak prudential supervision, little enterprise restructuring, and the absence of an effective bankruptcy framework, nonperforming loans are estimated at 20–25 percent of total loans. However, bank supervision has been substantially tightened since 1996, and the demand for money has begun to increase as macroeconomic fundamentals have improved, allowing a substantial real increase in bank lending in 1997.

### Part Three: Market Dynamics, Linkages, and Transmission<sup>16</sup>

#### The Boom in Capital Inflows

Some history is useful in understanding the prominent role played by the major international commer-

<sup>16</sup>This section represents the staff's assessment and interpretation of market dynamics, based in large part on extensive discussions with a wide variety of market participants. Discussions were held in several countries at commercial and investment banks with proprietary trading, credit, foreign exchange, and treasury desks; with mutual and hedge fund managers; with credit rating agencies; and with various senior officials at central banks, bank supervisory agencies, ministries of finance, and capital markets regulatory authorities. What is reported here is based on visits to New York, London, Hong Kong SAR, Singapore, and Kuala Lumpur in November 1997; Brazil and Venezuela in February 1998; and Bangkok, Singapore, Jakarta, Kuala Lumpur, Manila, Hong Kong SAR, Shanghai, Beijing, and Seoul in March–April 1998.

cial and investment banks during the recent crises in Asia. The competitive forces driving the globalization of universal banking firms led to an aggressive expansion of these institutions into the region. The search for higher yields in an environment of strong regional growth, combined with the lure of the “carry trade” (see Box 2.9), led to strong growth in bank lending flows, and a spectacular growth of Asian fixed income and foreign exchange markets during the 1990s.

Large cross-currency carry trade inflows into the region, designed to take advantage of high domestic interest rates engineered by central banks to counter inflation while maintaining exchange rate stability, targeted Malaysia as early as 1991–92. Initially, it was the international money center commercial banks that built up large books in the carry trade. By 1993, the focus of activity shifted from Malaysia to Thailand and Indonesia. At this point investment banks expanded rapidly into the region, with some of the major investment houses setting up shop for the first time, while others expanded their existing operations. The most notable example of the aggressive expansion of investment banking activity in the region was Peregrine (see Box 2.10). This is when the carry trade in Asia reportedly “came into its own,” and the treasuries of commercial and investment banks resorted to using such trades as part of their regular funding operations. Fixed income desks were set up and foreign exchange trading desks grew, with the investment banks becoming the leaders of capital market activity, displacing the commercial banks that had led the way in Malaysia.

As noted in Box 2.9, the carry trade took a number of forms, and gradually worked its way down the credit spectrum. These flows were invested in, first, sovereign credit, then the top-tier domestic commercial banks, followed by the lower-tier commercial banks and finance companies, gradually becoming more and more aggressive, moving into the corporate sector and then down the corporate credit spectrum. Issuance of debt paper in Thai baht, Indonesian rupiah, and U.S. dollars, and in particular short-term money market instruments—bills of exchange, short-term promissory notes, bankers acceptances, and commercial paper—proliferated.

After the fact, a key question that has been raised is the extent and quality of due diligence performed by international lenders. The international commercial and investment banks that were often the intermediaries of the foreign capital inflows typically had operations on the ground in these countries, and those that did not regularly visited these countries. In any event there appears to have been regular contact with local entities that were the recipients of the capital inflows and government authorities. In all of these countries—though to varying degrees and in different forms—they received repeated assurances that the financial sector was well supervised, that in the event of prob-

lems at domestic financial institutions official support would be forthcoming, and that there would be no fundamental changes in exchange rate policy—for example, the peg of the baht would be maintained. This is evident from the international investment houses’ own published research reports and accorded with the views of the major rating agencies.<sup>17</sup> A critical point to note is that the due diligence was conditional on the implicit and explicit guarantees offered by the authorities.

The behavior of domestic entities—both banks and corporates—also reflected a firm belief in the official stances on exchange rates. This is, of course, evident from the—by now—well-publicized buildup of substantial unhedged lower-cost external foreign currency debt. It went much deeper than this, though, as indicated by the somewhat less well known but widespread use of cross-currency swaps entered into by domestic entities with foreign commercial and investment banks that effectively lowered the cost of domestic currency borrowing to foreign currency funding rates. Furthermore, domestic entities were active participants in the carry trade, borrowing abroad to invest in local money market instruments, and took open positions through the sale of currency options long the local currencies.

Activity in local money markets—particularly in Indonesia and Thailand—is estimated to have reached a feverish pitch by mid-1996, with a commensurate deterioration in quality. “Bucks of envelopes” and postdated checks were reportedly being used as commercial paper. While the depth and liquidity of these markets increased, they remained in a fledgling state relative to those in the mature markets, lacking a clear legal infrastructure, and secondary market trading was extremely limited. Ultimately, incomplete monitoring of such activities, which appeared to largely bypass collectors of official debt statistics, led to considerable uncertainty with regard to the extent of external liabilities of domestic residents. This was particularly the case in Thailand regarding foreign holding of bills of exchange, and in Indonesia with regard to corporate commercial paper. Market participants generally estimated that these liabilities substantially exceeded those captured by the official debt statistics. By mid-1996 the international commercial and investment banks had built up substantial exposures in the region. Commercial and investment bank treasuries were long regional currencies from the carry trade, while their proprietary trading desks had substantial investments in, and their underwriting desks inventories of, Asian fixed-income instruments. The hedge funds played a very limited role in the fixed-income carry trade in the

<sup>17</sup>For a discussion of how *no* analysts predicted the devaluation of the baht, see Irvine (1997). On the delayed actions of the ratings agencies during the crisis, see Box 2.13 below.

### Box 2.8. Bank Capital Adequacy: Issues for Emerging Markets

Two of the key goals of bank regulation are to protect the payment system and small, unsophisticated depositors.<sup>1</sup> Capital adequacy requirements, which require banks to set aside funds to protect depositors and creditors, are one of the most important tools to achieve that goal. Although changes in the way credit risk is managed are prompting regulators in the mature markets to reconsider how to keep banks sound, capital adequacy ratios remain the key, albeit imperfect, regulatory instrument in emerging markets.

Most emerging markets have adopted the risk-weighted assets ratios recommended by the Basle Capital Accord modifying the guidelines with a view to improving some of their deficiencies and to adapt them to the realities of the emerging markets—such as higher risk environments and less transparent accounting practices. Although assets are risk-adjusted by applying lower weights to low-risk assets such as government bonds, the Basle guidelines do not distinguish between the credit risk of lending to emerging market corporates relative to corporates rated Triple A. Also, the usefulness of risk-asset ratios depends critically on banks making adequate provisions against nonperforming loans,<sup>2</sup> and emerging markets banking crises provide a number of examples of how apparently well-capitalized banks were found to be insolvent as a result of the failure to recognize the poor quality of their loan portfolios.

Regulators in many emerging markets have improved substantially the way they address issues of credit risk, but many countries still need to enhance the regulation and oversight of market risks, as well as consolidated supervision.

#### Credit Risk

The most obvious way to protect emerging markets' banks from the higher credit risks derived from a more volatile and less transparent environment is to require a higher minimum ratio of capital to risk-adjusted assets. A number of emerging markets have done so, with the leading examples being Singapore with a 12 percent ratio and Argentina with an 11.5 percent ratio.

Other regulatory frameworks address credit risk issues applying different asset weights. In addition to the weighting of assets according to the standard categories, for ex-

ample, the Argentine regulatory norms apply an additional risk-weighting factor linked to the interest rate applicable to the loan—to reflect the market-based credit risk premium.<sup>3</sup> Also, the risk-weight for mortgages increases significantly with an index of housing prices, to increase the cost of lending to the real estate sector when the market provides indications of a potential asset bubble. To address similar concerns, the recently approved Chilean banking law attaches a weight of 60 percent to mortgages—rather than the traditional 50 percent proposed in the Basle Accord. This contrasts with the approach of restricting the share of such loans in the bank's portfolio, followed by some Asian countries in the wake of the crises in 1997. Another example is provided by Brazil and Poland, which apply a weight of 50 percent—rather than the standard 20 percent—to the relatively riskier state and municipal securities.

An area where there are wide differences in national interpretation or adaptation of the guidelines is on the definition of capital, in particular that of secondary or Tier 2 capital. The extent to which revaluation, undisclosed and other reserves are computed in the definition of capital introduces large differences on the quantity and quality of capital and is the subject of considerable debate. In addition, while most countries limit subordinated debt to a maximum of 50 percent of Tier 1 capital (or 2 percent of assets), in Argentina banks are required to issue at least 2 percent of deposits as subordinated debt. This requirement is aimed at enhancing the monitoring discipline of junior debt-holders. Banks that are unable to convince debt markets of the adequacy of their capital and the quality of their assets would be unable to rollover their subordinated debt and forced to take corrective actions.<sup>4</sup>

#### Market Risk

The regulation of banks' capital adequacy in emerging markets has focused mostly on credit risks but a case

<sup>1</sup>See Dewatripont and Tirole (1994) for an insightful analysis of the prudential regulation of banks and of the Basle Accord.

<sup>2</sup>See Dziobek, Frécaut, and Nieto (1995) and Folkerts-Landau and Lindgren (1998) for a discussion of this issue.

<sup>3</sup>The risk weight is 1 for loans carrying interest rates up to 18 percent in U.S. dollars and 24 percent in Argentine pesos, and increases gradually to reach 6 for loans with interest rates of over 78 percent in U.S. dollars and over 84 percent in pesos (see Banco Central de la República Argentina, 1997). Also, the bank's rating, between 1 and 5 depending on the quality of the bank's capital, assets, management, earnings and liquidity (CAMEL), is used as an additional coefficient to modify the risk-weight on total assets.

<sup>4</sup>See Calomiris (1997) for an assessment of this proposal and its application in Argentina.

region over much of the period, focusing instead on more traditional long equity investments.<sup>18</sup>

<sup>18</sup>The first activity of hedge funds in regional exchange markets was associated with the devaluation of the ringgit in the last week of December 1992.

Large flows through local financial centers in Singapore and Hong Kong SAR resulted in increasingly liquid (wholesale) foreign exchange markets for regional currencies, particularly the baht, rupiah, and ringgit segments, with the bulk of trading taking place offshore, among banks in Singapore. While there are no time series statistics on turnover in these



could be made that market risks are as important as credit risks for these markets. First, securities prices are more volatile in emerging markets and, as the Asian crisis has shown, losses on banks' trading books can cause severe damage to asset quality and hence to banks' capital bases. Second, in Latin America, the share of securities in banks' portfolios is quite large, reaching similar proportions to the share of loans in some countries.

Argentina has adopted an innovative approach to calculate capital adequacy requirements for market risks, that combines the simplicity of the "standardized approach" proposed in the Amendment to the Capital Accord to Incorporate Market Risks, with time-varying risk weights as in the "internal models approach"—appropriate for the high and changing volatility of emerging market securities.<sup>5</sup> Financial assets are divided into five broad categories (stocks and bonds in pesos and dollars, and positions in currencies other than the dollar) and bonds are in turn divided into short-term (less than 2.5 years) and long-term categories. The capital required for a given asset  $i$  is given by its value-at-risk ( $VaR$ ), which in turn is defined as

$$VaR_i = V_i * k * T^{1/2} * \sigma_i,$$

where  $V_i$  is the net position in the asset,  $k$  is a constant related to the statistical risk tolerance,  $T$  is the holding period, and  $\sigma$  is the asset's daily volatility. The  $VaR$  for a portfolio of assets is given by

$$VaR_p = abs(VaR_L - VaR_S) + \alpha * min(VaR_L; VaR_S),$$

where  $VaR_L$  and  $VaR_S$  represent the total long and short positions in the assets of a given category of assets. The coefficient  $\alpha$  represents the "disallowance" that takes into account the fact that the offset between the long and short positions may not be perfect. The Argentine regulation sets  $\alpha = 1$ , an intermediate position between full ( $\alpha = 0$ ) and zero ( $\alpha = 2$ ) offset.

Many emerging markets where derivatives are extensively traded have some sort of requirements on derivatives trading, but most do not require banks to maintain capital against market risk. In Brazil, for instance, the replacement cost and potential future exposure of derivative contracts provide the basis for the calculation of capital required to cover counterparty credit risk, but no

<sup>5</sup>See Powell and Balzarotti (1997) for a description of the Argentine approach to market risk. Mexico also adopted capital adequacy requirements for market risks in 1997 and adapted the guidelines to the Mexican market and volatility experience.

capital is required for market risk. In Malaysia, banks dealing with derivatives are required to establish a separate independent market risk management unit, but there are no quantitative controls on market risks.

### Consolidation

The level of disclosure in emerging market banks and their subsidiaries' financial statements is generally unsatisfactory and render an evaluation on a consolidated basis difficult and many times inaccurate. The disclosure deficiencies are used many times to avoid regulations and underestimate the assets—and associated risks—against which financial capital should be accumulated to provide a cushion.

In several emerging markets, financial groups have offshore branches and affiliates that represent a significant part of a bank's business, may carry substantially higher risks than the parent company, and can be used to hide bad assets or to expand balance sheets without increasing the necessary capital cushion. In 1997, banks in Brazil, Korea, and Malaysia suffered important trading losses related to offshore operations that fell outside of the regulatory authorities' reach. The central bank of Brazil has initiated attempts to force banks to disclose the extent of their offshore activities, and has recently signed agreements with the authorities in the Cayman Islands and the Bahamas to this effect. However, the requirement to publish or make available consolidated accounts does not apply to entities whose shares are not publicly traded and thus precludes market participants and rating agencies from evaluating the consolidated leverage position of many banks. Also, in Thailand, the Bangkok International Banking Facilities are exempt from the capital adequacy requirements, and they were the main vehicles used for the aggressive lending that precipitated the financial crisis last year.

The supervision of financial conglomerates is also a challenging issue facing regulators in emerging markets, especially in Latin America and Eastern Europe where universal banks are becoming the dominant financial institutions. Regulators are striving to establish effective firewalls among commercial and investment banking activities as well as to identify potential situations where double or multiple gearing can result in an overstatement of the conglomerate's capital.<sup>6</sup>

<sup>6</sup>The Basle Committee on Banking Supervision (1998) has recently released consultation documents—prepared by the Joint Forum on Financial Conglomerates—on this issue.

markets, average daily volumes are estimated to have increased four hundred fold in just four years, rising, for example, in the dollar-ringgit segment from \$25 million in early 1992 to \$9.5 billion during 1995.<sup>19</sup>

<sup>19</sup>Singapore Foreign Exchange Market Committee (1996).

Liquidity and the size of commonly accepted deals are key to the ability of any participant in building up substantial positions against a currency. While the drastic increases in liquidity in regional foreign exchange markets facilitated position taking against the currencies, it is worth emphasizing that liquidity and deal sizes remained well below those in the mature

**Box 2.9. The Asian Carry Trade**

International commercial and investment banks were heavily involved in dollar and yen carry trades in Asia. Dollar carry trades became popular beginning in 1992 and yen trades following the yen's peak against the dollar in April 1995. One technique was to borrow on the interbank market in dollars and yen, to convert the proceeds into local currency, and to on-lend on the local currency short-term interbank market. At the end of the loan period, principal and interest were converted back into dollars or yen. An alternative was for banks and other institutional investors to borrow in the dollar or yen short-term debt market (through, for example, a treasury term repo agreement), to convert the proceeds into local currency, and to hold a time deposit. A final technique was to utilize the money markets. International investors issued money market securities in mature markets and invested the proceeds in local-currency-denominated money market instruments (promissory notes, bankers' acceptances, and other short-term corporate or government paper). And, of course, hybrids of these three techniques were also used.

Data for the Thai baht confirm that all three techniques were profitable for an extended period. Returns computed using the interbank market (subtracting from the interest rate differential the realized change in the exchange rate over the holding period) suggest that in 18 of the 20 quarters up to mid-1997 the carry trade generated a higher spread than investing in the mature markets. The returns on the yen carry trade were profitable in 13 of these 20 quarters, showing greater variability because of volatility in the yen exchange rate. Carry trades using term repos and Thai time deposits tell a similar story.

The effects of speculative pressure in the period leading up to the crisis, as well as the authorities' response, are evident in the limited time series available on the local money market instruments series for Thailand (see table below). Although returns on dollar carry trades were substantial in the second quarter of 1997 because the squeeze applied at the time of the speculative attack raised yields while not allowing the baht-dollar exchange rate to move, returns to both carry trades turned sharply negative with the depreciation of the baht in the third quarter.

**Yields on U.S. Dollar and Japanese Yen Carry Trades in the Thai Baht (Using Money Markets)<sup>1</sup>**

Quarter	Index Returns in Yen <sup>2</sup>	Japanese Yen LIBOR (Three-month)	Profit from Yen Carry Trade	Index Returns in U.S. Dollars <sup>2</sup>	U.S. Dollar LIBOR (Three-month)	Profit from U.S. Dollar Carry Trade
1996:Q3	15.66	0.52	15.09	8.88	5.63	3.13
1996:Q4	23.42	0.49	22.85	6.03	5.56	0.45
1997:Q1	36.24	0.58	35.52	3.97	5.77	-1.73
1997:Q2	-1.33	0.66	-1.98	34.47	5.78	27.54
1997:Q3	-64.90	0.56	-65.15	-71.32	5.77	-73.47

Source: International Monetary Fund, *International Financial Statistics*; Bloomberg Financial Markets L.P.; and Peregrine Securities.

<sup>1</sup>All returns are annualized.

<sup>2</sup>Computed by converting Thai money market index returns into U.S. dollars and yen.

market currencies. For a small emerging market currency, such liquidity constraints act as a natural deterrent to any particular participant quickly taking a large position. Corporate head offices of the international money center banks, which would typically be the counterparty to such a transaction initiated, say, by an international hedge fund, would naturally limit the size of such transactions by the size of the markets because the lack of liquidity could potentially create difficulties in offsetting the transactions and increase market risk until they were offset. Breaking up the desired position into a number of smaller transactions, channeled through several intermediaries, has the disadvantages of taking time and creating price uncertainty in execution, and in a small market increases the likelihood of counterparties learning the size of the aggregate position being taken and thus risks causing adverse price movements against it.

**The Dynamic of the Southeast Asian Currency Crisis*****The Attacks on the Thai Baht***

The first episode of notable pressure on the Thai baht occurred as early as July 1996, following the collapse of the Bangkok Bank of Commerce and the injections of liquidity by the Bank of Thailand to support the financial system. This early episode of pressure is reported to have stemmed largely from international commercial and investment banks unwinding their carry trades, while the hedge funds do not appear to have been active. At this stage, IMF staff and management had already begun to warn the Thai authorities of serious problems in the balance of payments and, correspondingly, the need to allow for greater flexibility of the exchange rate of the baht.

A second episode of serious pressure on the baht occurred in early 1997, following the release in January

### Box 2.10. Peregrine and the Growth of Investment Banking in Asia

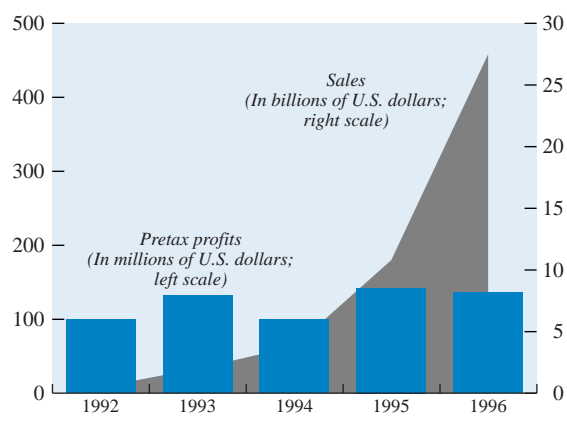
Peregrine Investments had grown dramatically to become Asia's largest investment firm outside Japan before its collapse in January 1998. The growth of Peregrine mirrors closely that of investment banking activities in Asia in the 1990s. Peregrine was a pioneer of the Asian fixed income market and the largest underwriter of Asian equity, in addition to being a major player in the Asian derivatives market. Just as the investment bank Drexel, Burnham, Lambert is credited with pioneering the U.S. junk bond market, Peregrine is credited with opening up the Asian local currency debt market.

Peregrine's style has been variously characterized as "high-flying" and "aggressive." The internal corporate culture that encouraged competition and supervision over management of highly profitable departments was at best limited. Peregrine grew explosively in the 1990s, but this growth increased market share without raising profits (see accompanying figure).

Peregrine was instrumental in opening up the Asian local currency fixed income market to foreign investors, which became one vehicle for the massive carry trade flows to the region in the years leading up to the crisis (see Box 2.9).

Peregrine's activities covered the whole gamut of investment banking activities, including equities underwriting, high-yield debt financing, asset management, and derivatives products. Peregrine intermediated a variety of derivatives instruments such as foreign exchange swaps and yield-enhancing total rate of return swaps on Asian debt and equity. Korean entities and other foreign investors reportedly took large positions on high yield Indonesian instruments through combinations of Indonesian corporate debt issuances underwritten by Peregrine as well as swaps engineered by Peregrine. Peregrine's derivatives exposure to Indonesian corporates was reportedly ten times larger than its exposure through direct debt instruments. It is noteworthy

**Peregrine Investments: Sales and Pretax Profits**



that Peregrine was not registered or regulated as an investment bank, but was in fact structured as a group with some 200 subsidiaries, of which nearly 175 were special purpose vehicles, the majority of which were registered offshore. Only a very small subset (8) were registered in Hong Kong SAR—not as investment banks—but as securities firms regulated by the Securities and Futures Commission.

Peregrine collapsed primarily under the weight of a large inventory of debt issued by an Indonesian taxi and bus company, Steady Safe, which Peregrine helped in issuing dollar-based promissory notes in mid-1997. In the volatile Asian financial climate, Peregrine could not on-sell the notes, and held some \$270 million on its own books, one-third of its capital. With the collapse of the Indonesian rupiah, this large debt inventory went into default and led to the rapid demise of Peregrine.

of poor fiscal and export data for the fourth quarter of 1996, which suggested both an increased monetization of the deficit (reserve money growth was strong) and a deteriorating current account deficit. Concerns about nonperforming assets in the financial sector began to spread at about the same time, and in January market participants learned that several property developers were either unable to or had decided to stop paying interest on loans from finance companies. It was estimated that since 30 percent of the finance companies' assets were in property development, a substantial proportion of all their loans were effectively in default beginning February. On February 5, in perhaps the clearest indication that finance companies heavily exposed to the property sector were in trouble, Somprasong Land was unable to meet a foreign debt payment. The February baht episode was again largely foreign investor driven. In addition to

the commercial and investment banks, portfolio managers (mutual funds and proprietary trading desks) began to retrench. This time, hedge funds also reportedly took some short positions on the baht, using primarily long-dated six-month (due in August) contracts. In March, the Thai government announced it would buy \$3.9 billion in loans from finance companies extended to property projects facing liquidity problems, but then did not do so. Further pressures on the baht came from the unwinding of carry trades resulting from changes in global financial conditions. These included increases in interest rates in the United Kingdom and Germany in the spring of 1997 and the uptick in Japanese long interest rates when the outlook for the Japanese economy appeared to brighten after March, and the rise in short-term yen rates based on expectations that the Bank of Japan might raise rates later in the year. At this stage, IMF management and

staff again pressed the Thai authorities to take urgent action to correct problems in the balance of payments, recommending an adjustment of the exchange rate combined with a firming of monetary and fiscal policy to aid current account adjustment and resist a collapse of confidence. It was urged that such action should be taken while Thailand's foreign exchange reserves (reported at about \$35 billion) were still ample to permit a credible defense of an adjusted exchange rate for the baht.

Following a period of relative calm, the most severe attack on the baht came in May 1997. On the evening of Wednesday, May 7, reports circulated that the Hong Kong SAR branch of a major Thai bank had become a large seller of baht for dollars. Market participants surmised that Thai finance companies and corporates, whose external financing was becoming increasingly difficult in light of growing concerns about their credit quality, were scrambling to acquire dollars, while other domestic entities were beginning to flee. During the course of the evening, it also became known that the Bank of Thailand had directly contacted several foreign commercial and investment banks, offering to sell forward a large volume of dollars in exchange for baht. While there was some hedge fund activity, market participants' estimates of reserve losses (on both spot and forward markets) far exceeded what could be accounted for by the hedge funds. On Thursday and Friday, market participants estimated the Bank of Thailand sold \$6 billion, and the bulk of dollar buying appears to have been local, with net reserves falling from \$32 billion to \$26 billion.

On the following Monday, May 12, market participants reported that the Bank of Thailand was in the market again. Due to concerns about financial sector fragility, falling asset prices, and a slowing economy, the Bank of Thailand remained reluctant to raise interest rates, and the bulk of its interventions were carried out in the forward market. It is notable that during this period, three- and six-month interest differentials vis-à-vis U.S. dollar rates were less than 3 percent so that, for example, the cost of taking a short position against the baht for three months was a mere  $\frac{3}{4}$  of 1 percentage point. In an environment of capital outflows, which made the possibility of an appreciation of the baht extremely remote,  $\frac{3}{4}$  of 1 percentage point represented the maximum perceived downside risk to an investor from taking such a position. The upside, on the other hand, in the event of a discrete devaluation was substantial. These contracts presented, therefore, very attractive one-way bets. Market participants estimated that on May 12 and May 13 the Bank of Thailand lost some \$5 billion. On Wednesday, May 14, the speculative attack reached its peak, with the Bank of Thailand estimated to have sold over \$10 billion on that day alone. This—almost a week after the attack had begun—is when the bulk of positions, including those of hedge funds, are reported to have been taken.

The massive intervention on the forward market by the Bank of Thailand did little to reduce pressures on the baht. On Thursday, May 15, it stopped intervening, letting interest rates rise, and instituted capital controls segmenting the on- and offshore markets. The subsequent squeeze drastically raised the cost of carrying positions overnight, and the scramble for baht caused an increase in its reserves. The squeeze was felt more by those proprietary trading desks of commercial and investment banks that had taken shorter-dated positions rather than by the hedge funds whose longer-dated positions were well funded. Market participants estimated the Bank of Thailand's forward book at \$26 billion at the end of June 1997, of which the macro hedge funds accounted for some \$7 billion, "other" offshore counterparties for \$8 billion, onshore foreign banks for \$9 billion, and onshore domestic banks for \$2 billion. While some of the positions taken by banks, both domestic and foreign, were proprietary positions, many were undertaken as intermediaries on behalf of other counterparties. These also likely included the hedge funds, and so their positions could have been bigger than the reported \$7 billion of direct positions. Among the investor groups that took positions through the banks were many multinational corporations with direct investments in Thailand that, it would appear, had also shared the belief in the baht's peg, but noting the pressures moved to hedge their exposures.

While many market participants felt after the imposition of capital controls that a devaluation of the baht was inevitable, the timing, on July 2, took most by surprise. In the immediate aftermath of the baht's announced float, expectations of depreciation led the heavily indebted domestic corporate sector to rapidly purchase foreign exchange on the spot market in an attempt to hedge their foreign exchange exposures. This helped drive down the baht by about 15 percent in onshore and about 20 percent in offshore trading by the end of the day. Initial reactions to the float were, however, favorable. The stock market rose, and foreign investors were reported to be paying substantial premiums on the equity available to foreign residents. However, market sentiment quickly deteriorated due to concerns about the impact of the devaluation and high interest rates on the financial sector, and the view that the Bank of Thailand's massive buildup of forward foreign exchange liabilities had depleted "net" reserves and had therefore limited its ability to intervene in support of the baht. The reserve implications of forward market intervention are not in fact as straightforward as might appear. These are discussed in Box 2.11. By the time the baht was floated, the foreign exchange and proprietary trading desks of the commercial and investment banks reportedly had short foreign exchange positions on the baht and so profited from its devaluation, as did several macro hedge funds. The proprietary trading

**Box 2.11. Reserve Impact of Forward Foreign Exchange Market Intervention**

During 1997, the Bank of Thailand intervened substantially by selling outright forward contracts promising to deliver dollars for baht. Including its interventions on the currency swaps market, it had at one point built up forward liabilities in excess of \$25 billion. Market participants viewed the future delivery of dollars by the central bank as a one-for-one claim on Thailand's foreign exchange reserves, and the realization of the buildup of the large forward book, when compared with actual holdings of reserves, contributed to the view that the defense was unsustainable. The attack on the baht and the subsequent exchange rate depreciation were exacerbated by this perception.

Unlike debt, which involves the repayment of principal, a forward contract involves an exchange of principals. In a forward contract, counterparties promise to deliver a certain amount of one currency in exchange for a prespecified amount of another—the rate of exchange being the forward exchange rate prevailing at the time the contract is entered into—at a certain date in the future.<sup>1</sup> In Thailand, the Bank of Thailand entered into contracts with counterparties, both foreign and domestic, agreeing to supply dollars in return for baht at the specified forward exchange rate. The counterparties were thus short baht and long dollars.

A central bank's liability to deliver foreign exchange forward clearly represents a claim on its reserves. A critical issue, however, is how the counterparties obtain the local currency they have promised to deliver forward. This has direct implications for reserves. It should be noted that if the counterparty is, say, a foreign entity that does not normally use the local currency for transactions purposes, and has engaged in the forward contract for the explicit purpose of taking a position against the currency it would not, ignoring settlement lags, hold the local currency until it was time to deliver. In the case of Thailand, for example, if the counterparties had been in possession of the baht (that is, were long baht) when they entered

into forward contracts selling it forward (which stand-alone imply a short baht position), then their overall position would have been balanced and they would not profit from its subsequent depreciation.

There are a number of ways in which counterparties to the central bank can obtain local currency for delivery. Consider first the straightforward benchmark case where counterparties are foreign entities that obtain local currency directly from the central bank in exchange for foreign currency at the prevailing spot exchange rate. In this case, the purchase of local currency would result directly in an increase in the central bank's foreign exchange reserves. The subsequent delivery by the counterparties of the local currency and exchange for foreign currency, carried out at the transacted forward rate, would result in a loss of central bank reserves. The central bank would, therefore, first gain and then, as the contract is settled, lose reserves. The net effect on reserves would be the difference between the prevailing spot and contracted forward exchange rates, times the notional value of the forward contract settled. Suppose, instead, as is more likely, that the counterparties settle the forward contracts by purchasing local currency on the spot foreign exchange market. In this case, again, as long as the demand for local currency remains unchanged and the central bank intervenes in the domestic money market to sterilize any changes in money supply, the net effect on reserves will be exactly the same as above. To see this, consider the "first leg" of the transaction. The foreign entity's purchase of local currency and its delivery to the central bank results in a contraction of the domestic money supply and upward pressure on domestic interest rates. If the central bank sterilized this by selling the local currency in return for foreign exchange, thus restoring the level of domestic interest rates, in the process it will gain reserves exactly as above. The logic of the second leg is the same.

In summary, the reserve implications of central bank intervention in the forward market should, to a first approximation, be estimated as the depreciation of the exchange rate since the initiation of the forward contracts, times the notional value of the contracts. This would have implied, for example, a \$3.75 billion loss for a 15 percent devaluation with \$25 billion in forward contracts.

<sup>1</sup>The forward rate is quoted as a premium or discount over the spot rate and is determined as the differential between domestic and world interest rates so as to maintain covered interest parity.

desks and fixed-income desks at the commercial and investment banks incurred losses, however, from holdings of fixed-income instruments as spreads deteriorated.

In retrospect, it seems clear that if the exchange rate of the baht had been adjusted earlier before the massive loss of reserves and assumption of official forward liabilities, the outcome could potentially have been far different. If carried out in conjunction with a moderate firming of monetary and fiscal policy to reinforce credibility, use of reserves to defend an appropriately depreciated exchange rate might have avoided

much of the turmoil and contagion that followed the disorderly devaluation of the baht in early July. Of course, some market reaction might have greeted even a well-engineered exchange rate adjustment, and what exactly would have happened cannot be known. But the successful adjustment of the exchange rate of the Czech koruna in May 1997 and the successful defense of the exchange rate of the Brazilian real in October are only two of a list of examples of what is needed to avoid the type of turmoil and contagion that beset Thailand and much of Asia after the devaluation of the baht on July 2, 1997.

### *The Contagion*

The floating of the baht engendered among market participants the perception of a need for competitive devaluations among currencies in the region, and caused investors to take a closer look at the similar financial sector problems, albeit to different degrees, in the region.

Few investors appeared to foresee the depreciation of the Philippine peso, which followed quickly after the devaluation of the baht (Box 2.12). The lack of a forward market in the peso, a small offshore non-deliverable forward (NDF) market, and an inability to obtain credit onshore in pesos severely limited the ability of foreign investors to take positions against it. International commercial and investment banks with local operations and domestic banks, on the other hand, with access to peso credit onshore, were well placed to take short positions on balance sheet, and appear to have been the primary source of pressure on the currency.<sup>20</sup>

Like the Philippine peso, the Malaysian ringgit came under strong pressure in the immediate aftermath of the baht's devaluation. The initial pressure appears to have been generated by foreign institutional investors selling off equity positions owing to concerns about the level of equity prices and the prospects of an increase in interest rates, rather than any substantial buildup of speculative short currency positions because of sustainability considerations regarding external debt, the reversal of the carry trade which had—in the immediately preceding period—been limited in Malaysia, or the state of the domestic banking system.<sup>21</sup> Market participants reported that Bank Negara Malaysia intervened heavily—and it appears at first credibly—in defending the ringgit on the spot market. Market perceptions, however, that domestic considerations would not allow it to raise interest rates much then caused further pressures to build. On July 11, 1997, market participants reported that the central bank abruptly withdrew from the market, and the ringgit fell by 6 percent over the next week. Some hedge funds had taken short positions just prior to the depreciation, but the overwhelming pressure would appear to have come from other investors, with domestic entities playing a not inconsequential role. The hedge funds then closed out their short positions, and it appears that market participants did not anticipate the ringgit falling further. It would appear that subse-

quently several country-specific events—among them the banning of short selling on equity markets and restrictions on forward sales of the ringgit—were associated with a downward ratcheting of equity prices and the ringgit, and affected the confidence of all investors, not least that of domestic retail investors. In Malaysia, the practice of purchasing stocks on margin is widespread, and deleveraging by domestic retail investors played a role. In foreign exchange markets, exporters lengthened repatriation periods, reducing liquidity.

Domestic banks and corporates had been bullish on the Indonesian rupiah for some time, and besides the buildup of external debt, both had entered into substantial amounts of currency swaps and sold options against the rupiah's depreciation, using the premiums as a source of income. Both the domestic banks and corporates remained bullish on the rupiah following the devaluation of the baht. The rupiah had tended to stay at the appreciated end of the band, and had on previous occasions of band widening tended to move to the appreciated end. So when Bank Indonesia widened its intervention band from 8 percent to 12 percent on July 11, 1997 in a preemptive move designed to deter speculation, Indonesian banks bought up enough rupiah to push it up for a brief period. On the other side of these transactions were the international commercial and investment banks that had a bearish view on the rupiah, engendered by perceptions of the need for a competitive devaluation in the region, and saw the widening of the band as facilitating such a process. Market participants' awareness of the off-balance-sheet exposures of domestic banks and corporates, and the behavior of domestic corporates in Thailand that had rushed to hedge their foreign exposures, also served to create the impression that Indonesian entities were likely to switch sides quickly and led to the view that the rupiah was "vulnerable" to a sharp depreciation. Such views were borne out by subsequent events. There were substantial foreign investor flows out of the rupiah, led by the international commercial and investment banks, and it appears no action whatsoever by the hedge funds, and the domestic banks quickly changed sides—within two days—followed soon after by the domestic corporates, as domestic entities attempted to hedge not only their external debt but also their swaps and options positions.

Market participants reported that while they believed fundamentals warranted taking a short position on the Korean won during this period, it was exceedingly difficult to do so. Foreign investors could not do this onshore as they could not obtain access to domestic credit or the forward market, which was small anyway. Offshore, the NDF market was also small, with market participants reporting considerable time and effort (half a day) to put on relatively small positions of a few million dollars. Any attempt to build up a substantial position required a continuous presence in

<sup>20</sup>"On-balance-sheet" channels refer to the use of domestic currency credit that, when converted into foreign currency, create a short position on the local currency. The use of forwards or swaps to go short on a currency are often referred to as "off balance sheet," since this is where such transactions are typically recorded.

<sup>21</sup>Foreign borrowing by domestic corporates has been limited in Malaysia to those entities perceived as being naturally hedged (exporters) or for longer-term infrastructure projects.

**Box 2.12. Chronology of Major Events in the Asian Crisis and Its Spillover****1997**

*May 15* Thailand, after a week of selling pressure and massive intervention in the forward markets, announces wide-ranging capital controls, splitting the onshore and the offshore markets.

*June 27* The Bank of Thailand suspends the operations of 16 troubled finance companies and orders them to submit merger or consolidation plans.

*July 2* Bank of Thailand announces a managed float of the baht. The baht devalues by 15 percent in onshore markets, and by 20 percent in offshore markets.

*July 11* The Central Bank of the Philippines, announces that it will allow the peso to float in a wider range, abandoning the de facto peg. Bank Indonesia widens the rupiah trading band from 8 percent to 12 percent.

*July 14* Bank Negara Malaysia is reported as abandoning the defense of the ringgit.

*July 28* The government of Thailand requests IMF assistance.

*August 5* Thailand suspends a further 42 troubled finance companies.

*August 14* Indonesia abandons the rupiah trading band. The rupiah depreciates by 4 percent.

*August 20* Thailand and the IMF agree on a \$17 billion financial stabilization package.

*August 27* Malaysia imposes trading restrictions on the stock market including an effective ban on short selling.

*August 29* Bank Indonesia introduces selective credit controls on rupiah trading.

*October 8* Indonesia announces it will seek IMF assistance.

*October 17* Malaysia announces an austerity budget.

*October 20* The New Taiwan dollar depreciates by 3 percent.

*October 20–23* The Hong Kong dollar is perceived as vulnerable. The Hong Kong SAR stock market loses 23 percent of its value over four days of selling pressure. Overnight interest rates rise from 7 percent to around 250 percent. Korea and Thailand's sovereign ratings are downgraded by S&P.

*October 27* The Dow Jones Industrial Average loses 554 points, following the crash in Hong Kong SAR, the biggest point drop in history. Equity markets in Brazil, Argentina, and Mexico see their biggest single day losses as the crisis ripples across the globe.

*October 31* IMF and Indonesia agree on \$23 billion financial support package.

*November 1* Indonesia closes 16 troubled private banks. Leads to depositor run on others.

*November 10* In Thailand, opposition leader Chuan Leekpai takes over as Prime Minister.

*November 17* Korea abandons defense of the won.

*November 18* Korean finance minister resigns. Authorities announce a reform package.

*November 21* Korea requests IMF assistance.

*December 3* Korea and the IMF agree on a \$57 billion financial assistance package.

*December 8* Thai authorities close 56 of the suspended finance companies.

*December 23* Rating agencies downgrade Korea's sovereign rating to speculative grade. The won falls to nearly 2,000 per U.S. dollar.

*December 24* IMF and other lenders announce speeding up of disbursement of financial assistance and that international commercial banks would roll over short-term debts owed by Korean financial institutions.

*December 30* Foreign banks agree to roll over Korean debt.

**1998**

*January 2* Indonesia announces plans to merge four out of seven state-owned banks. Malaysia announces plans for mergers of finance companies.

*January 13* Thailand amends law for foreign investors in banks to be reclassified as domestic companies, allowing them to hold property.

*January 15* Indonesia and the IMF announce agreement on revised economic program aimed at strengthening and reinforcing the ongoing IMF-supported program.

*January 16* International lenders officially agree to roll over Korean short-term bank debt.

*January 20* Thailand allows full foreign ownership of securities firms.

*January 27* Indonesia guarantees commercial bank obligations, allows overseas investments in local banks, and announces a freeze on debt payments, formalizing the effective moratorium.

*January 30* Thailand lifts currency restrictions re-unifying the spot market.

*April 10* Indonesia signs new letter of intent on economic program with IMF.

*May 26* The Korean stock market index falls to an 11-year low.

*June 1* The Thai stock market index, continuing its slide from early March, falls to a 10-year low.

the market and would “reveal one’s hand” to the limited number of counterparties. Consequently there were few signs of speculation against the won by foreign investors during the period.

The hedge funds have been singled out as having played an important role in the onset of the Southeast Asian currency crises. It would appear, however, that they were only one among the groups of investors in the broader dynamic that unfolded and do not appear to have played a critical role—either as leaders or by cornering markets. While several hedge funds together took positions against the baht, the majority of these positions appear to have been taken when other major investor groups had already begun to get out of the baht, and they do not, therefore, appear to have led the speculative attack on the baht. Moreover, while they together took a quantitatively important position against the baht, the majority of these positions appear to have been taken when the Bank of Thailand began offering large positions against the currency. It would otherwise have been difficult for the hedge funds to build up substantial positions. The hedge funds also appear like most—if not all—other market participants to have underestimated the extent of its subsequent depreciation, thereby limiting their profits. The Thai baht is the only currency on which the hedge funds appear to have collectively taken a short position. The one other simultaneous buildup of hedge fund positions appears to have been on the Indonesian rupiah. These positions were, however, taken after its initial depreciation and were long positions, reflecting the view that the rupiah had overshot, and the expectation that it would appreciate. The lack of movement of the rupiah in the direction of the hedge funds’ positions, and in fact its depreciation after the positions were taken, imply that the hedge funds not only did not corner the market, but that their actions were dominated by those of other participants. It appears that only a few of the hedge funds took modest positions for short periods, at differing points in time, on the Malaysian ringgit. As noted above, the limited avenues available for taking positions on the Philippine peso suggest little role of the hedge funds in its depreciation.

### The Illiquidity of Foreign Exchange Markets

In the immediate aftermath of the currency depreciations, as expectations of depreciation led domestic entities to rush to hedge their external exposures, exporters began to hoard their foreign currency earnings, and portfolio capital began to flow out, the foreign exchange market increasingly became “one sided.” Exacerbated further by the imposition of capital controls, such as the segmentation of on- and offshore markets by the Bank of Thailand in mid-May 1997, as noted earlier, liquidity in regional foreign exchange markets dried up. As the currencies moved into uncharted ter-

ritories, market makers became increasingly reluctant to quote two-way prices because of the uncertainty in being able to offset positions. Volatility and illiquidity in and of themselves created a vicious cycle. The thinness and illiquidity of foreign exchange markets following the crisis meant that what were small transactions prior to the crisis began to move markets, increasing volatility. This, in turn raised bid-ask spreads to compensate for the increased risk to financial intermediaries, and further reduced liquidity.

### The Intensification of Exchange Rate Declines

Following the initial depreciations of the baht, peso, ringgit, and rupiah—which, as noted above, were at the time seen merely as exchange rate corrections—pressures intensified in the following months. These pressures were attributable to a number of factors. In Thailand, political uncertainty in the aftermath of the depreciation, as well as uncertainty about the prospects for a IMF-supported program, contributed to further pressures on the exchange rate. The official release of the Bank of Thailand’s outstanding forward foreign exchange liabilities—as part of the IMF-supported program—toward the end of August validated market estimates of the size of the forward book and overwhelmed positive market sentiment for the initiation of the program. The ability and commitment of the Thai authorities to carry out decisive policy actions, both with regard to macroeconomic policies and the rehabilitation of the financial sector, were viewed with skepticism.

As the magnitude and maturity structure of Thailand’s private short-term external liabilities became increasingly apparent, attention turned to similar problems in Indonesia. The rupiah came under increasing pressure as both domestic and foreign market participants rushed to hedge, and foreign lenders began to retrench. In Indonesia too, the ability of the authorities to inflict the pain of high interest rates and decisively deal with financial sector problems was met with little enthusiasm. There was repeated backsliding on announced policy intentions, exacerbating pressures in the markets. Depositor runs on banks in Thailand and Indonesia, and the recycling of liquidity to weak banks through the central banks, created further pressures on exchange rates. In Indonesia in particular, liquidity injections into banks were felt almost immediately in the illiquid foreign exchange markets. In Malaysia, pronouncements by the authorities blaming hedge funds for the crisis, and the coming to light of the UEM-Renong share purchase scandal, contributed to the erosion of sentiment—immediately felt across foreign exchange and equity markets—as they reinforced suspicions about the lack of corporate governance and the strong ties between local business and political leaders. Announcements by the authorities intending to continue with large infrastructure projects



also made market participants question the willingness of the authorities to deal with the crisis.

### The October Turbulence in Hong Kong SAR

In the week preceding October 20, 1997, the Taiwan Province of China authorities decided to stop intervening in support of the New Taiwan dollar.<sup>22</sup> This led to speculation that the Hong Kong Monetary Authority (HKMA) might also lose its willingness to defend the Hong Kong dollar. Selling pressures on the Hong Kong dollar intensified on October 21 and 22. Initial sales of Hong Kong dollars were broad based, and included domestic residents, although the importance of foreign investors increased over time. Much of the selling comprised small value tickets suggesting that it was hedging rather than speculative activity, sparked by market analysts' recommendations to investors to hedge their currency exposures. As domestic banks' sales of Hong Kong dollars collectively exceeded what they could settle by using their credit balances in settlement accounts with the HKMA, they bid aggressively for funds on the interbank market, and interbank interest rates shot up to 280 percent by noon on October 23. On that day the Hang Seng Index fell by more than 10 percent. The sell-off in equity markets appears to have been due also in part to deleveraging by some large local retail investors—a small number of whom reportedly account for a substantial component of the retail market—in response to tightening margin requirements and the increase in interest rates. Foreign institutional investors (mutual and pension funds) also contributed. In response to the increase in interest rates, domestic corporates were apparently quick to reverse flows, selling U.S. dollars for Hong Kong dollars to take advantage of the higher domestic interest rates, in the belief that the peg would hold, while many also bought back their stocks, explaining some of the sharp rebounds in equity prices.

A popular account of the turmoil in Hong Kong SAR's financial markets was that a number of large investors, and in particular the macro hedge funds, took small short positions against the Hong Kong dollar—"attacking it a little"—but aware of the HKMA's commitment to the peg, predicted a sharp increase in interest rates, and took much larger short positions in interest rate sensitive instruments, and in particular the equity market. However, there does not appear to be any evidence of a concerted strategy by any group of investors to simultaneously short the Hong Kong dollar and equity markets. While the sell-off in equity markets occurred in late October, a majority of the short positions on the equity market using futures index contracts would appear to have been taken

much earlier—in July.<sup>23</sup> These short positions appear to have been taken as a hedge against other long positions, as the market headed toward its all-time high in August. These short positions also appear to have been maintained—at roughly the same level—well after the sell-off in equity markets, with few if any holders of the short positions taking profits as markets fell, and the bulk of futures contracts expiring at end-October being rolled over into November. Neither was there any evidence of a concentration of positions. With regard to direct short sales of equity, during the period of turmoil, short-selling transactions contributed to less than 3 percent of total market turnover, suggesting little basis for believing that short-selling was an important contributor to the significant decline in the market. An important point with regard to the logic of a strategy of simultaneously short selling the currency and equity markets that should be noted is that a foreign investor shorting the equity market needs to put up local currency carry (that represents a long local currency position), which offsets any short foreign exchange position.<sup>24</sup> This effectively lowers the returns and raises the risks from a two-pronged strategy in the event the attack on the currency does turn out to be successful.

### Spillover in the Wake from Hong Kong SAR

This section highlights the structure of cross-border investment linkages in Brazil and Korea, and the channels they created for the propagation and transmission of pressures to these countries from the turbulence in Hong Kong SAR in late October 1997. As already noted, pressures at this time deepened on the already affected Asian countries partly because of rating actions by the major agencies, and these are discussed in Box 2.13.

Among the Latin American emerging markets, Brazil was perhaps the most severely affected in the spillover from the turbulence in financial markets in Hong Kong SAR in late October 1997. The prices of Brazilian Brady bonds fell by 18 percent in the week following October 24, the BOVESPA stock market index fell by 22 percent, and the real came under severe pressure, both on the currency futures market on the Bolsa de Mercadorias e Futuros (BMF) and on the spot market, with market participants reporting central bank reserve losses of \$10 billion in a matter of hours at the peak of the attack. Market participants unanimously reported that the pressures on the exchange rate, which were more intense than during the Tequila crisis in early 1995, were generated predominantly by domestic entities.

<sup>23</sup>The payoff in these contracts is linked to the future value of the Hang Seng Index.

<sup>24</sup>The carry arises from the need to put up local currency denominated margin on any futures or short positions acquired.

<sup>22</sup>See Hong Kong Special Administrative Region (1998).

The financial press had for some time been drawing parallels between Brazil and the affected Asian economies—a substantial current account deficit, financial sector vulnerabilities, and an overvalued (pre)fixed exchange rate offering a one-way bet to speculators. Such parallels caused nervousness among foreign investors in Brazil’s external debt securities, and increased pressures on multinational and domestic corporates and foreign investors in real securities to hedge their exposures. Market participants estimated that margin calls on highly leveraged positions of Brazilian financial institutions, particularly investment banks, on Brazilian Brady bonds with the major international investment houses accounted for 40 percent to 50 percent—and by some estimates more—of the capital outflows during the period. As other market participants observed these outflows and the effects of deleveraging by these institutions across markets in order to meet their margin calls, it sparked the ensuing wave of pressure that was felt on equity, futures, and foreign exchange markets.

The Brazilian financial institutions that had taken offshore leveraged positions with the major international investment houses had done so through both their onshore proprietary trading and asset management desks, and their offshore vehicles. These positions were concentrated in Brazilian Brady bonds as they felt they had a comparative advantage in assessing their own country risk. As they scrambled to meet margin calls on their Brady positions, deleveraging through sales of existing holdings exacerbated price pressures on the Brady market, while the liquidation of their domestic equity holdings pushed down the BOVESPA. At the same time, the BMF increased margin requirements, resulting in further margin calls. The lack of “Chinese” and “fire walls” between the investment banks’ proprietary and fund management desks caused clearing banks in New York to attribute the majority of the Brazilian investment banks’ deal flows to their proprietary desks, raising concerns about their ability to meet margin calls, and resulted in a reduction of credit lines, adding further pressures for deleveraging.<sup>25</sup> In some instances the lack of Chinese walls between the investment banks’ proprietary and fund management desks also increased the size of sell orders as managers took the same positions for themselves and their clients. During this period, the revelation that Korean entities had substantial holdings of Brazilian Brady bonds, and their anticipated “dumping” in response to pressures at home, also aggravated the downward spiral in prices.

There was substantial pressure on the currency futures market on the BMF. This reflected in part do-

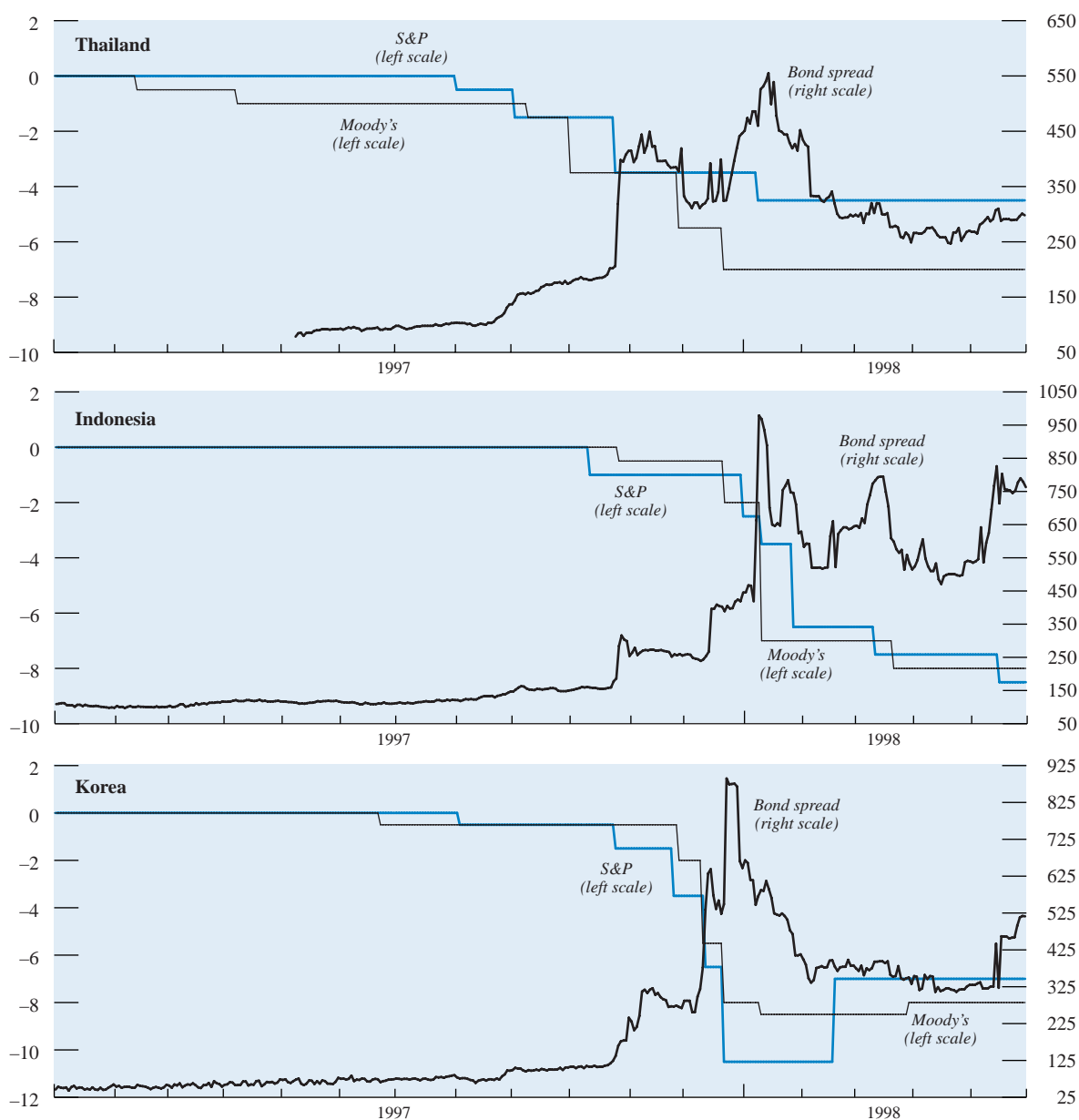
<sup>25</sup>Chinese walls refer to barriers to flows of information that are erected to avoid conflicts of interest within an institution. Fire walls refer to ringfencing or complete separation of activities between various divisions of an institution.

### Box 2.13. The Timing of Ratings Actions and the Behavior of Spreads

Credit ratings play an important role in the pricing of debt on capital markets. By providing an independent assessment of the default risk of an entity by type of obligation, the credit rating agencies can significantly reduce information costs to investors. The Asian crisis raised criticisms that the credit rating agencies were not only lax in foreseeing the vulnerabilities of the countries that eventually succumbed to crisis, but that they also responded to negative developments slowly, downgrading debtor countries only after the onset of crises, thereby exacerbating market price movements and increasing instability. This is not the first time that the agencies have been subject to such criticisms, and similar complaints have been voiced on several past occasions of large unanticipated changes in financial circumstances of entities.

As the comparison of ratings actions on long-term foreign currency obligations of the sovereign and the secondary market yield spreads for bond issues from Thailand, Indonesia, and Korea makes clear (see figure below), the ratings agencies were clearly late in downgrading the affected Asian countries.

- During the early part of 1997, as the problems in Thailand’s financial sector were gradually coming to light, Moody’s placed a negative watch on the sovereign’s long-term foreign currency rating, then lowered it a notch in mid-April, while Standard and Poor’s (S&P) made no change. It is notable that the severe speculative attack on the baht in May had no effect on the sovereign’s ratings or the spreads on its debt, and neither did the floating of the baht on July 2. It was not until early August that S&P placed the sovereign’s rating on credit watch, but this had little discernible impact on spreads. Spreads began to rise in the third week of August prior to the string of negative watches (outlooks) and downgrades by both agencies in September and early October. There were very sharp increases in spreads following the downgrade by S&P on October 24 in the midst of the turbulence in Hong Kong SAR’s foreign exchange and financial markets, and by Moody’s to below investment grade in late December. It is notable that spreads declined from a high of over 500 basis points in early January 1998 to 300 basis points in late February in the absence of any ratings actions whatsoever.
- The first rating action on Indonesia during 1997 came in early October as S&P downgraded the sovereign but was accompanied by little movement in spreads. Spreads then rose sharply in late October though there were no ratings actions, and again in mid-December prior to the downgrading by both Moody’s and S&P below investment grade in late December. The subsequent, unanimous downgrade in early January 1998 coincided with the peak in spreads.
- In Korea, despite the string of corporate bankruptcies and the growing awareness of financial sector vulnerabilities starting with the collapse of Hanbo Steel in January 1997, there were no actions by the agencies on the sovereign’s rating until Moody’s placed it on negative



Source: Bloomberg Financial Markets L.P.

<sup>1</sup>Bonds used: Kingdom of Thailand due 4/07; Republic of Indonesia due 8/06; Korea Development Bank due 11/03.

<sup>2</sup>The ratings index is created by assigning a single gradation move a value of (+/-) 1, while directional outlooks, credit watches, and ratings under review are assigned a value of (+/-) ½.

outlook in late June. The downgrade by S&P on October 24 by a notch was accompanied by a sharp increase in spreads, as were the rounds of unanimous downgrades in December. As in Thailand, spreads declined

substantially—from a high of 900 basis points in late December 1997 to 400 basis points in late January 1998 prior to the upgrades during February by both Moody's and S&P, after which they remained relatively stable.

mestic and multinational corporate demand to hedge exposures. It also reflected the international commercial and investment banks' own proprietary position taking, and their offsetting of NDF contracts offered by them offshore to a variety of counterparties, including the international macro hedge funds. As counterparties to the demand for short real positions on the BMF in turn attempted to hedge their exposures, these pressures were ultimately reflected in the spot market. Domestic banks' "excess" daily open (spot and forward) foreign exchange positions above prespecified regulatory limits, which are required to be deposited at the central bank at below market interest rates, grew during the period.

The central bank's defense of the real comprised, first, of a doubling of its basic lending rates. Second, it conducted spread auctions of foreign exchange on the spot market. Third, market participants reported that on the currency futures market, the federally owned Banco do Brasil took substantial positions against prevailing market sentiment. Fourth, the central bank increased the sale of dollar-linked bonds with the explicit intention of providing a hedge to those seeking one. Several features of the defense and the market's response are noteworthy. First, though short-term money market rates (for example, on 30-day certificates of deposits) had begun to rise before the central bank raised rates, markets were surprised by the magnitude of the increase. Second, following the increase in interest rates, pressure on the futures market diminished but continued, and was reflected in further increases in short-term money market rates and in currency futures contracts. Third, markets were startled by the Banco do Brasil's position-taking on the futures market. Compared, for example, with the Bank of Thailand's forward market intervention in May 1997, a key difference was that interest rates were raised substantially above prevailing rates. Besides raising the carry cost of taking short positions, market participants perceived significantly increased two-way risk from taking positions at these rates. That is, even if the real were to devalue, a short real futures contract would not necessarily yield a positive return. It would do so only if it depreciated beyond the (substantial) interest differential. Fourth, there was a marked increase in the stock of dollar-linked government paper, engineered with the explicit intent of providing a hedge to those seeking one, and the supply of these instruments—which guaranteed payment at the current (pre)fixed rates, thereby providing a safer hedge—was instrumental in alleviating pressure on the foreign exchange futures and spot markets. It is notable that rather than representing a change in the treasury's financing, the increase in dollar-linked government paper over the period represented entirely an increase in central bank issuance of such notes and sales of its existing holdings of dollar-linked treasury notes. The strategy succeeded in capping the increases

in the term structure of domestic currency interest rates and pressures abated. It is also noteworthy that unlike the Bank of Thailand's intervention in the forward market, as settlement is in local currency, these liabilities were not perceived to be a claim on reserves, and market reaction was not particularly negative.

An important element of Brazil's success in defending the real was the fact that the interest rate defense was followed through by a package of measures to rein in the fiscal deficit, which had been a persistent and growing source of investor concern. The successful passage through Brazil's congress of the fiscal package was pivotal in restoring investor confidence permitting interest rates to subsequently decline. The Asian crisis countries had a historical record of fiscal prudence and low outstanding stocks of government debt, though these traditional measures of government finance did not include the contingent liabilities stemming from losses in the financial sector. Initial IMF-supported programs in the crisis Asian countries included a tightening of fiscal policies to generate domestic savings, both to reduce the private sector savings-investment adjustment necessary in the face of the capital outflows and to pay for the losses in the financial sector. Except in Thailand, where the current account deficit was large, the initial fiscal adjustments were modest. As the crises evolved and deepened, and economic activity contracted well beyond initial expectations, targeted fiscal deficits in IMF programs widened as automatic stabilizers were allowed to operate and social safety net expenditures were increased. In Russia, the interest rate defense of the ruble in October 1997 proved successful. However, as little progress was made in addressing the low level of fiscal revenues—a persistent source of investor concern—intense pressures on the ruble reemerged recently.

Though Korea succumbed to the crisis only in the period following the turbulence in Hong Kong SAR's financial markets in late October, pressures had begun to build much earlier in 1997. Pressures began in fact at almost the same time that concerns about nonperforming assets in the financial sector in Thailand began to gain widespread attention, when Hanbo Steel declared bankruptcy in January with almost \$6 billion in debt to domestic banks. As the first large bankruptcy in Korea in a long time, it caused fears of a liquidity crisis among its creditor banks, and prompted the Bank of Korea to reportedly inject substantial liquidity into the financial system during the month. The Bank of Korea continued to provide support to the financial system in various forms over the next several months as corporate distress intensified with a string of high profile bankruptcies and near bankruptcies of the larger *chaebol*. The Sammi group went bankrupt in March, followed by the near collapses of Jinro and Dainong, and the Kia group began to show

signs of stress. These problems put immense pressure on the Korean merchant banks who specialized in corporate finance and who had borrowed offshore to lend to these and other *chaebol*.

With the placement of Kia under bankruptcy protection in mid-July 1997, pressures on banks intensified, and the government announced in late July that it would, in addition to the ongoing liquidity support to commercial banks, also provide—for the first time in 15 years—liquidity support to troubled merchant banks. By August, though there did not appear to have been any significant retrenchment by the international commercial banks from Korea, the terms of international credit available to Korean financial institutions began to deteriorate. Spreads for Korean financial institutions on international interbank markets began to widen while tenors shrank. Korean banks were reportedly unable to borrow for maturities of longer than a year, while some merchant banks reportedly could not borrow for maturities of more than a month. In response to the deteriorating external financing situation of banks, the government announced in late August a package of measures aimed at increasing confidence in domestic and international financial markets. These included official support and intervention in Korea First Bank, measures to facilitate the disposal of non-performing loans, and the announcement of guarantees of the foreign debt liabilities of Korean financial institutions, including both commercial and merchant banks, and covering both existing debt and new borrowings. Finally, external borrowing by public banks was to be stepped up and foreign exchange made available to domestic financial institutions. It was notable that Korean banks, which had accumulated substantial foreign assets over the previous two years, were either unwilling or unable to liquidate these assets to meet their liabilities.

In response to large capital inflows in the 1990s, as part of a program of gradual capital account liberalization, the government of Korea had liberalized regulations on capital outflows. Increases in outflows were to be expected following liberalization, as Korean entities attempted to diversify their assets. The high returns available in Korea relative to world capital markets meant, however, that Korean capital outflows systematically sought out high-yield high-risk investments. On emerging debt markets, the investments ran the gamut from Latin American Brady bonds, Russian GKOs, and a variety of emerging market Eurobonds that included especially regional credits and Korean offshore issues to Indonesian high-yield domestic debt instruments. This appetite for emerging market credits was most evident during 1996, when Korean entities are reported to have purchased some 40 percent of the debut Eurobond issue of the Russian Federation, more than 20 percent each of the United Mexican States' \$6 billion and Brazil's \$750 million issues, and to have bought up almost in

its entirety Colombia's DM 275 million issue. On loan markets, Korean banks had reportedly begun to syndicate loans for Russian entities onshore. In order to enhance yield, Korean entities also engaged in a variety of structured notes and other derivative products, including repos and swaps of securities, and total rate of returns swaps on a variety of instruments such as the equity and debt of Indonesian corporates.<sup>26</sup> Some of these products reportedly involved leverage ratios of 5 to 10. The nature of these instruments tended to limit their liquidity.

As noted above, in the period leading up to the turbulence in Hong Kong SAR in late October 1997, spreads for Asian credits on emerging debt markets rose modestly, while they fell for Latin American and other credits. The deterioration in sentiment against the emerging markets that accompanied the turbulence in Hong Kong SAR's financial markets, compounded by the downgrading of Thailand and Korea's sovereign credit ratings on October 24, and the consequent widening of spreads, resulted in margin calls to Korean financial institutions. While in and of themselves these margin calls were not large, when combined with the liquidity pressures that Korean banks already faced, they created substantial pressures on them to deleverage and liquidate their foreign assets. This exacerbated price pressures on emerging market debt instruments held by Korean banks. The turmoil in emerging debt market during the period was thus magnified by the size and composition of Korean financial institutions' foreign assets. International investors' awareness of Korean financial institutions' losses on these assets heightened concerns, and encouraged the subsequent rapid retrenchment of international bank claims which, as noted earlier, comprised in large part extensive credit lines extended to Korean banks. As the won began to depreciate, as in the Asian countries affected earlier, highly indebted domestic corporates rushed to hedge, exacerbating the downward pressure.

As pressures were felt by Korean entities attempting to access foreign exchange, market participants started becoming aware of the inability of the Bank of Korea to use a large proportion of its reserves that had been placed by it with foreign branches of domestic banks (see Box 2.5). With pressures being felt on the exchange rate, uncertainty about the "usable" reserves of the central bank, and the large demand for hedging and covering of margins by domestic entities, market participants were operating in an environment with great uncertainty and lack of information. The ensuing

<sup>26</sup>Total rate of return swaps are a generic name for any nontraditional swap where one party agrees to pay the other the total return on an underlying asset in exchange for a stream of cash flows based on the London interbank offered rate (LIBOR). Such swaps provide a mechanism for the user to gain the economic benefits from the asset without actually owning it or having it directly on its balance sheet.

panic-driven rush by domestic entities into the foreign exchange market exacerbated price pressures on Korea in November and December.

### The Winter Recovery

The first sign of a halt in the downward spiral of regional currencies came with a strong rebound in the Korean won in the last week of December 1997 (see Figure 2.5). Having depreciated by more than 50 percent in just five weeks, the won hit a low on December 23, one day after Moody's downgraded the sovereign's credit rating below investment grade. An announcement the following day that disbursements of \$10 billion of official assistance to Korea—from the IMF and several countries—would be accelerated and that international commercial banks would rollover short-term debts owed by Korean financial institutions caused the won to regain nearly 40 percent of its value by December 29.

The other affected Asian currencies continued to depreciate for several more weeks. The Philippine peso (January 7, 1998), the Malaysian ringgit (January 9), and the Thai baht, the Singapore dollar, and the New Taiwan dollar (all on January 12) hit lows at almost exactly the same time. In Thailand the turning point followed the strengthened implementation of several previously announced measures in the financial sector. The Malaysian ringgit and the Philippine peso also began a period of appreciation at about the same time, while the Indonesian rupiah continued to depreciate. Two weeks later, though Indonesian corporates were already failing to make payments on their external debts, the announcement of a de facto suspension of payments on short-term external debt and plans to establish a framework for orderly renegotiation with creditors, and a government guarantee of commercial bank liabilities to both domestic depositors and foreign creditors, appeared to calm markets. Amid speculation that Indonesia would institute a currency board, over the course of the next two weeks the rupiah almost doubled in value against the U.S. dollar. The gains were short-lived, however, and the Indonesian rupiah has continued to exhibit large cycles.

As capital began to flow back during the first quarter of 1998 into several of the Asian countries that succumbed to crisis—again to varying degrees across countries and with the continued exception of Indonesia—equity markets rebounded, strongly driven by the sentiment that markets had hit bottom. Korea, in particular, turned in dollar returns of over 75 percent during January and February. Foreign investor inflows were estimated at W 5 trillion (\$3.6 billion) into the equity market and W 1.5 trillion (\$1.1 billion) into the domestic bond market. All of the investment on equity markets went into purchases of the top-tier blue chip stocks, while on bond markets it went into sovereign

and quasi-sovereign credits. The majority of funds flowing into Korea and the other crisis countries during this period were reported to be “new” money, dominated by the hedge funds, while traditional investors such as mutual and pension funds, with very few exceptions, were reported to have stayed away. Since the inflows did not come from a diversified and broad investor base, and as hedge funds tend to be—relative to mutual and pension funds—much more active traders, the inflows were judged to be highly mobile, and the recoveries in equity markets, therefore, fragile. As concerns mounted about the depth of the recessions facing the crisis countries, the significant reforms that remained to be carried out, and the pipeline of issuers waiting to raise money through equity placements, equity markets in the region gave up much of their earlier gains during April and May. At end-May, the Korean equity market, for example, had fallen to an 11-year low, and the Thai equity market to a 10-year low.

Key elements that continue to significantly impact financial market sentiment with regard to Asian emerging market countries are the deterioration of the economic situation in these countries and the weakness in Japan. Developments in Japan have had an impact because of the prominent role of Japanese finance in Asia, the impact of weakening demand for imports from the rest of Asia, and the depreciation of the yen. Japanese financial institutions and corporates have been major players in the emerging markets in Asia. As Japanese financial institutions and banks have been under pressure to reduce their Asian exposure, recipient countries have experienced an intensification of the ongoing credit squeeze. Being a major market for exports from the rest of Asia, weak domestic demand in Japan has also had an adverse impact on the emerging markets in Asia. Furthermore, given the trade links between the affected Asian countries and Japan, a weakening of the yen is seen as an effective exchange rate appreciation in these countries, bringing further pressures to bear on the exchange rate and equity markets. Korea in particular competes with Japan in several export markets, and the depreciation of the yen has strong implications for its exports.

Throughout these developments, the Philippines' economy and financial markets were significantly less affected than those of the countries at the center of the crisis. This is probably attributable, in significant measure, to the late involvement of the Philippines in the external credit boom of the 1990s, to the sounder state of the banking system, and to the generally lower degree of leverage of Philippine enterprises, in comparison with Thailand, Indonesia, and Korea. Malaysia also was somewhat sheltered from the worst effects of the crisis, although the Malaysian equity market, which had the highest valuation ratio relative to GDP in the world before the crisis, took an enormous pounding. Because capital flows to Malaysia

had taken primarily the form of direct and portfolio-equity investment, rather than foreign currency debts intermediated by the domestic banking system, the financial sector and the corporate sector were much better insulated from direct damage from the substantial depreciation of the ringgit. The authorities, correspondingly, had greater room to allow continued domestic credit expansion without facing the same acute dilemma of other Asian countries with large foreign currency debts. It now appears, however, that the Malaysian economy will not escape a painful recession as the cost of correcting the excesses of earlier credit expansion. The Malaysian banking system, although starting from a sounder position than the systems in Thailand, Indonesia, and Korea, will also face significant losses and the need for adjustment.

Singapore and Hong Kong SAR have primarily been victims of the crisis elsewhere in Asia. Clearly, the collapse of economic activity in the region is having significant adverse effects on these two economies as service centers and as competitors in some products. Involvement of banks in both these economies in recycling credit to the region exposes them to probable losses, as in the failure of Peregrine; in Hong Kong SAR correction of the exceptionally high valuation of stocks and real estate is a separate (although partly related) source of difficulty. The strong capitalization and generally sound management and supervision of banks in these two economies should effectively limit severe problems to individual institutions without generating systemic threats as have occurred elsewhere in Asia. In Hong Kong SAR, the currency board has necessitated the firming of domestic interest rates when the peg has come under pressure, and this has contributed to downward pressures on equity and land values and on economic activity. In contrast, the flexible exchange rate policy of Singapore has enabled the authorities to cushion in part the impact of the crisis by allowing the Singapore dollar to depreciate against the U.S. dollar while also moving to lower domestic interest rates. Nevertheless, Singapore's economy, stock market, and financial system will not escape significant negative effects from the present crisis.

## Conclusions

Looking back to the countries at the center of the crisis, it is relevant to ask why the crisis deepened with a virulence that exceeded all expectations, inside or outside of the region. Part of the answer is probably that because no one expected these highly successful economies ever to suffer such catastrophes, inadequate attention was focused on growing vulnerabilities before the crisis started, and policymakers were generally unprepared to recognize these vulnerabilities and to act decisively and credibly once the crisis

was under way. Surely, with their generally sound records of policy management, no one would reasonably have anticipated the mismanagement that helped to deepen exchange rate depreciations and to spread financial turmoil in the initial stages of the crisis in several countries. In Thailand during the summer into the fall of 1997, in Indonesia beginning in November, and in Korea during December, political uncertainties, as well as uncertainties about the implementation and effectiveness of IMF-supported programs, clearly contributed to further downward pressures on financial markets and exchange rates. Market participants, especially in the crisis countries and elsewhere in the region, widely questioned the appropriateness of tight monetary policies agreed to in Fund programs in the context of very weak financial and corporate sectors and economies falling into recession. Thus, in the very difficult task of balancing the need for temporary monetary tightening to resist excessive depreciation against the damage to weak financial systems and highly leveraged economies from higher interest rates, central banks in the crisis countries found little domestic support for consistent and credible policies. This lack of support and the policy uncertainty it helped to engender probably acted to aggravate the crises. In contrast, in other emerging market countries (such as recently in the Czech Republic and Brazil), the need for firm monetary policies to resist an exchange rate crisis was better understood and accepted. Interest rates were firmed credibly at the onset of these other crises and were subsequently reduced as other measures (fiscal and structural) were put in place and confidence was restored. In Asia, the delay and equivocation in implementing these policies at an early stage has proved very costly.

Several features of the propagation of the crisis stand out. First, forward market intervention at modest interest differentials—which amounted to the offering of cheap one-way bets—by the Bank of Thailand fueled the attack on the baht and precipitated the subsequent tumble of other regional currencies. While international capital flows to Thailand—and the region—would have continued to slow as awareness of financial sector difficulties grew, the floating of the baht changed the then existing dynamic by precipitating sharp movements in currency values across the region, driven by the reactions of both domestic and foreign entities to the float. Second, a number of factors—the unwinding of carry trades by both domestic and foreign entities, the rush by domestic banks and corporates to hedge their substantial on- and off-balance-sheet exposures built up on the belief of fixed nominal exchange rates, and the thinness of foreign exchange markets—acted to magnify the initial depreciations. Third, with regard to the timing of market reaction, it is noteworthy that the bulk of outflows from the countries affected by the crisis took place relatively late, following rather than leading the initial

currency depreciations. These outflows reflected a reassessment of counterparty credit risks in light of the exchange rate depreciations. The ensuing liquidity squeeze created a downward spiral of exchange rate depreciations and credit quality that fed on each other, magnifying price movements relatively long after the initial depreciations. Finally, the form and structure of international finance had a direct bearing on the dynamics of the crisis and its spillover across countries and regions. The existence of leveraged positions on emerging market instruments—particularly debt and foreign exchange but also equity—and the margin calls in response to price movements in emerging market instruments, the subsequent rapid deleveraging, and the substantial size of intra-emerging market financial flows and linkages all played critical roles in the propagation and transmission of the crisis across markets. The “contagion” that was witnessed was not merely a manifestation of the souring of mature market investors’ sentiment, but was also a direct result of the nature of financial linkages across markets.

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