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The Asia Crisis: Causes, Policy Responses, and Outcomes¹

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Abstract

This paper tells the story of the Asian financial crisis by addressing four questions: What were the causes of the crisis, how did the crisis unfold, what were the policy responses, and what have been the outcomes? The paper takes the view that none of these questions can be understood without appreciating the fundamental vulnerabilities that left authorities without effective tools to counter sudden capital outflows. The pattern of output decline suggests that these vulnerabilities, particularly weaknesses in domestic financial systems, played a larger role than tight monetary policy in determining outcomes.

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I. INTRODUCTION

The severity of the Asian financial crisis surprised virtually all observers. The economies of Korea, Thailand, Indonesia and Malaysia had for many years been "miracles", with average annual growth rates since 1970 ranging from 6.9 percent in Indonesia to 8.4 percent in Korea. The transformation of these economies from poor, largely rural less-developed countries to middle income emerging markets has been one of the most remarkable success stories in economic history.

Following the Thai baht's devaluation in mid-1997, the region entered severe economic crisis. Growth was negative in 1998 in most countries in the region, and for the hardest hit, the recession was the deepest since World War II. Estimates suggest that real GDP declined in 1998 by 13.7 percent in Indonesia, 9.4 percent in Thailand, 6.7 percent in Malaysia, and 5.8 percent in Korea (Table 1). Dramatic reforms of many of the most important economic institutions are underway, from the Chaebol in Korea to banking systems throughout the region.

This paper attempts to tell the story of the Asia crisis, with a focus on Indonesia, Korea, Malaysia, the Philippines, and Thailand. The objective is to organize the story of what has taken place in terms of broader questions: What were the causes of the crisis, what were the policy responses and what were the outcomes?² The paper, having been written largely before the emergence of recovery in many of the crisis countries, concentrates on the initial policies and results.

Section II discusses the background and causes of the crisis. Section III reviews policy responses, while section IV discusses the main outcomes.

II. CAUSES OF THE CRISIS

It is possible to divide interpretations of the causes of the Asia crisis into two broad categories:

- The crises had their origins in **fundamental deficiencies** in the affected countries. In Thailand, some role was played by traditional macroeconomic problems, particularly current account deficits that became unsustainably large and an exchange rate that had become overvalued. Generally, though, the weaknesses in the crisis countries derived from the interaction of weak domestic financial institutions with large capital inflows. According to this interpretation, overinvesting in poor projects resulted from pervasive

²Other overviews and analyses of the Asia crisis include, among many others, IMF (1997), Lane et al. (1999), Kochhar et al. (1998), Adams et al. (1998), Furman and Stiglitz (1998), Radelet and Sachs (1998a, 1998b and 1999), Corsetti et al. (1998a and 1998b), World Bank (1998), and Goldstein (1998).

Table 1. Asian Crisis Countries: Basic Economic and Financial Indicators

(Averages, in percent of GDP, unless otherwise indicated)

	Indonesia					Korea					Malaysia					Philippines					Thailand				
	91-95	1996	1997	1998	1999 Proj.	91-95	1996	1997	1998	1999 Proj.	91-95	1996	1997	1998	1999 Proj.	91-95	1996	1997	1998	1999 Proj.	91-95	1996	1997	1998	1999 Proj.
GDP growth rate	7.8	8.0	4.7	-13.7	-0.8	7.5	6.8	5.0	-5.8	6.5	8.7	8.6	7.7	-6.7	2.4	2.2	5.8	5.2	-0.5	2.2	8.5	5.5	-1.3	-9.4	2.5
Inflation (percent change) 1/	8.6	6.6	9.7	77.6	7.6	5.5	4.9	6.6	4.0	1.4	4.1	3.3	2.9	5.2	3.1	8.9	5.2	6.1	10.4	4.3	4.8	4.9	7.6	4.3	-1.3
Trade																									
Exports (real growth) 2/	10.0	5.5	10.2	31.1	-5.6	13.1	11.4	21.1	13.8	14.3	15.7	15.4	17.2	-14.3	12.2	8.2	16.7	13.5	-14.3	8.9	14.2	-1.8	6.6	5.1	5.0
Imports (real growth) 2/	15.5	7.8	17.2	-25.4	-15.4	14.8	14.1	4.0	-22.4	30.5	19.3	16.7	13.5	-14.3	8.9	9.9	2.5	-1.4	24.4	0.1	15.4	-0.9	-10.0	-26.8	11.4
Terms-of-trade 3/ (percent change)	6.6	-4.0	13.3	-35.5	-10.8	-1.9	-5.4	-6.0	-3.6	0.0	6.1	2.5	-1.4	24.4	0.1	-13.2	15.4	17.2	-14.3	12.2	3.9	1.1	-1.9	-5.5	-2.4
Exchange Rate																									
Real effective exchange rate 1/ (percent change, appreciation -)	-3.3	-5.5	40.4	-5.8	-4.1	-1.8	1.7	35.7	-22.2	-0.3	-7.6	-4.4	23.3	0.6	-7.6	-36.9	-5.9	17.3	1.1	-3.1	-4.2	-5.2	33.0	-23.2	-12.3
Balance of Payments																									
Trade balance	2.2	0.7	3.0	15.3	10.3	-0.8	-2.9	-0.7	12.8	7.2	2.9	4.1	4.1	24.9	21.4	-10.3	-13.7	-13.5	0.0	0.9	-7.7	-8.9	-3.0	10.6	6.3
Current account	-2.4	-3.2	-1.8	4.0	2.4	-1.3	-4.4	-1.7	12.5	5.8	-7.0	-4.9	-5.1	12.9	11.7	-3.7	-4.7	-5.3	2.0	2.2	-6.3	-7.9	-1.9	12.4	8.3
Private Capital Inflows (net) 4/ of which: FDI	3.5	6.3	1.4	-3.1	...	2.8	5.1	-3.1	...	...	12.1	7.5	1.3	-6.3	...	3.3	9.4	0.8	0.7	...	9.5	5.6	-8.8	-14.5	...
Official capital inflows (net)	0.6	-4.9	4.3	2.6	...	-0.2	-0.1	2.5	...	...	0.0	-0.1	-0.2	-0.3	...	1.9	0.2	0.8	0.4	...	0.3	3.5	3.1	4.3	...
Reserve Cover																									
Short-term external debt (percent of reserves)	161.0	176.6	217.1	...	...	222.5	340.2	751.6	...	...	23.7	41.0	71.9	27.4	...	99.1	79.5	152.1	106.7	...	88.7	99.7	129.9	79.4	...
External Debt																									
External debt 6/	56.7	57.7	61.1	...	...	6.1	33.1	31.8	30.5	...	39.5	39.0	46.6	59.2	...	58.8	50.0	61.7	54.6	...	42.4	48.9	50.5	46.2	...
Public Finance																									
Government balance 7/	0.0	1.2	-0.7	...	...	-0.3	0.3	0.3	-5.0	...	-0.4	5.0	6.0	-2.6	...	-1.9	-0.4	-1.0	-3.0	...	...	2.8	-2.7	-5.5	...
Public debt 8/	36.2	24.1	...	...	...	8.3	6.2	10.9	...	...	59.0	45.8	50.2	54.6	...	57.4	52.6	66.4	72.9	...	8.6	3.6	...	...	...

Sources: WB World Debt Tables, IFS, and Fund staff estimates.

Notes

1/ For 1991-1995, December 1995 over January 1991. For 1999, May over December 1998, annualized. Otherwise, December over December of previous year.

2/ Exports and imports cover 1991 to 1995, not 1990 to 1995.

3/ For 1991, this is average TOT in 1995 compared to average in 1990. Otherwise, year average over previous year average.

4/ Includes errors and omissions.

5/ Reserves are reserves less gold (IFS line 1L), except for Korea where an adjustment was made to measure usable reserves for 1996 and 1997.

Short-term debt is World Bank data except Korea, which uses IMF staff estimates. These sources differ for many reasons, such as the inclusion in the IMF staff estimates of net foreign liabilities of the banking system.

The gap is substantial particularly for Korea. For Korea, average is 1993-1995, not 1991-1995.

6/ External debt is from IMF staff estimates except for Korea 1990-1995, which is from the World Bank.

All data is 1990-1995, not 1991-1995.

7/ General government balance including the interest costs of financial sector restructuring. Cross-country comparisons are not strictly accurate because of differences in definition (For Indonesia and Thailand data is on a fiscal year basis).

8/ Central government. For Korea, data are average 1993-1995, not 1991-1995.

moral hazard problems in domestic financial institutions and perhaps poor lending practices among creditors.³

- While there were indeed some structural and macroeconomic problems in the affected countries, these crises were largely avoidable **financial panics**--rational "bank runs" against otherwise viable economies. The most affected countries had a high ratio of short-term external debt to GDP. This implied that if foreign creditors became convinced that other creditors would not roll over their claims, there were not enough reserves to cover the maturing obligations. Panics became self-fulfilling. No major structural reforms or tightening of macroeconomic policy was required to avert or respond to the problems. As with a run on a solvent but illiquid bank, the solution would be to provide liquidity and reassure investors that they could safely maintain their investments.⁴

According to the first interpretation, important fundamental weaknesses help explain the incidence, unfolding and outcome of the crisis. However, one of the main arguments for the second interpretation is the absence of strong evidence that weak fundamentals can explain the crisis.⁵ This section thus looks for the fundamental weaknesses that may help explain the crisis. Another important argument for the second interpretation is that the unfolding of the crisis followed a pattern in which fears about the serviceability of short-term external debt, and the resulting panic, dominated assessments of the fundamental strength of the economies in question. This section thus also reviews the unfolding of the crisis with a view to understanding the dynamics of the crisis.

A. Macroeconomic Weaknesses

A distinguishing feature of the Asian crises is the lack of widespread macroeconomic problems prior to the crisis. While capital inflows to Asia surged in the 1990s, most of the economies in question managed to avoid the substantial exchange rate appreciations that have often been associated with large capital inflows, particularly in Latin America. Through a combination of tight fiscal policy and monetary policies aimed at sterilizing the monetary impact of these inflows, they generally avoided large appreciations against the U.S. dollar, the main currency against which they pegged their exchange rates.⁶ Policies of pegging largely to the relatively strong dollar did, however, lead to some appreciation against the yen in some of

³See for example Krugman (1998). Krugman (1999) has a somewhat different view.

⁴Radelet and Sachs (1998a)

⁵Furman and Stiglitz (1998) and Radelet and Sachs (1998a and 1998b) make this argument.

⁶See Diehl and Schweickert (1998) for a discussion of exchange rate policies, including the composition of currency baskets.

the countries since 1996, particularly Thailand and the Philippines. (Figure 1 shows the real effective exchange rate since 1990.)

Movements in the real exchange rate relative to trend are, of course, imperfect measures of real exchange rate overvaluation. An exchange rate that is not appreciated relative to some benchmark may be overvalued if the fundamentals determining the equilibrium real exchange rate have changed.⁷ If, for example, the capital inflows that supported a given real exchange rate reverse, the exchange rate would need to depreciate, and the previous rate might be considered overvalued.⁸

There are grounds, nonetheless, for holding that deviations in the real exchange rate from trend or long-term levels are good measure of overvaluation in some contexts. A strong regularity in the analysis of leading indicators of currency crisis is that these sorts of measures of overvaluation are associated with subsequent currency crises.⁹ More generally, periods of exchange rate overvaluation measured as deviations from purchasing-power-parity tend to be followed by sharp real, and usually also nominal, depreciation.¹⁰ Table 2 presents various measures of deviations of the real exchange rate from long-term trend. Real exchange rates appear not to have been much overvalued prior to the crisis by these measures, though all except Korea show some signs of overvaluation by some measures.¹¹

⁷Here "equilibrium" can be understood as that exchange rate that generates positions of internal and external balance over the medium term. See Clark et al. (1994) for a discussion of this and related issues.

⁸To ascertain whether an exchange rate is overvalued in more general terms requires a model of the relationship between the exchange rate and economic fundamentals, and this has proven difficult to estimate. Chinn (1998) tries to estimate a model of exchange rates for the Asian crisis countries in which overvaluation is measured as the deviation of the actual exchange rate from that predicted by such fundamentals as could be measured. His estimates suggest no major overvaluations prior to the crises of 1997, though the poor performance of the model suggests that little confidence be placed in this result.

⁹See Berg and Pattillo (1999a) and Kaminsky et al. (1998).

¹⁰See Goldfajn (1999).

¹¹The deviation from trend real exchange rate as defined in Kaminsky et al. (1998) and calculated for Asia in Berg and Pattillo (1999a) does show overvaluations for several of the countries, including Korea. This measure is different in that the degree of overvaluation is measured in comparison to previous episodes of overvaluation for that country. Thus, a relatively small percentage deviation from trend might show up as a relatively large overvaluation in a country that has had little history of overvaluation.

Figure 1. Asian Crisis Countries: Real Effective Exchange Rate
(1990 = 100)

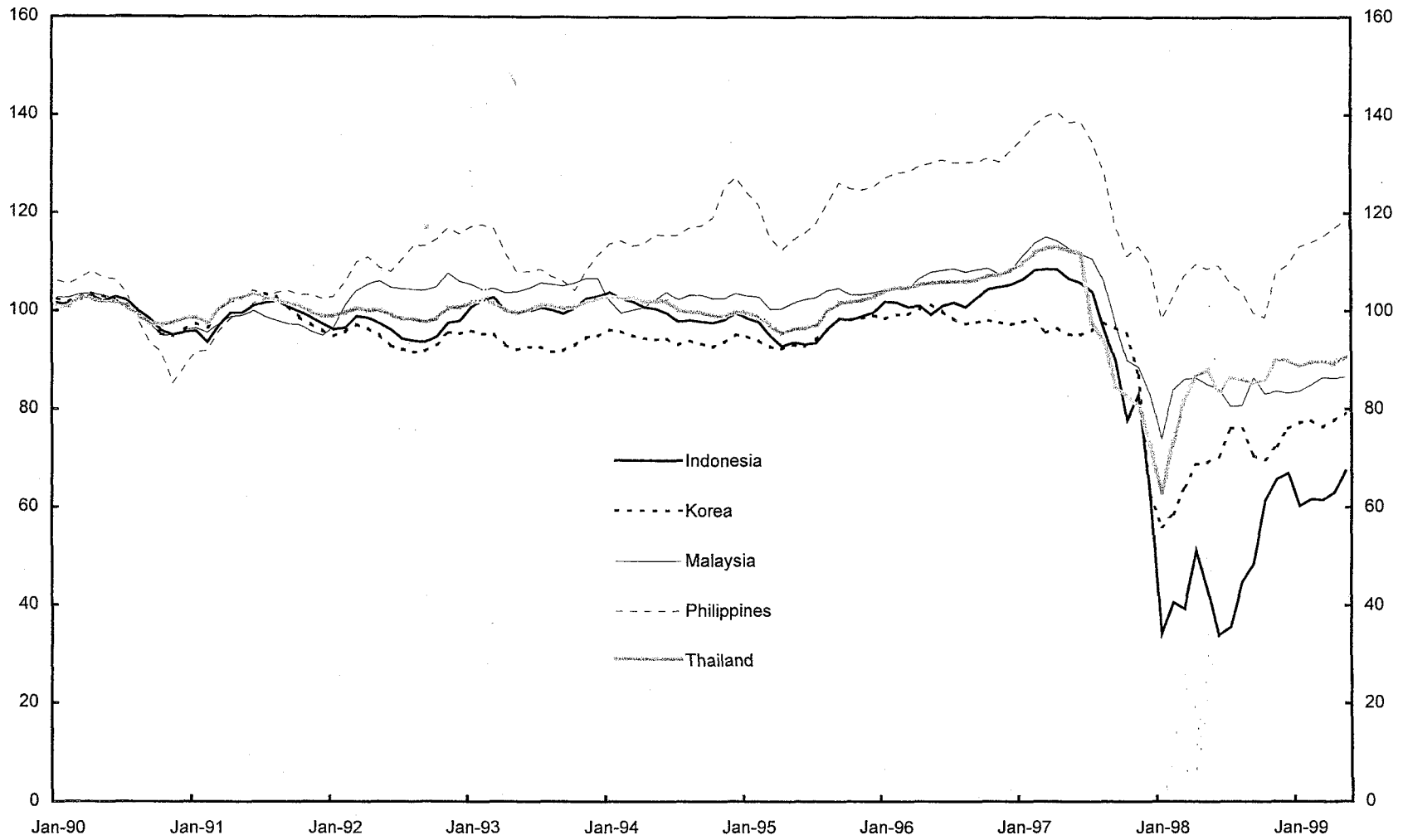


Table 2. Asian Crisis Countries: Vulnerability Indicators

	Indonesia	Korea	Malaysia	Philippines	Thailand
<u>Overall</u>					
Domestic debt/GDP (average, 1992 to 1996)	50	59	82	31	87
Domestic credit growth (1992 to 1996)	12	15	38	138	37
Incremental capital-output ratio					
1987-92	4	4	4	6	3
1993-96	4	5	5	6	5
<u>External</u>					
Short-term debt/reserves	188.9	217.0	45.3	849.3	121.5
M2/Reserves	614.8	665.4	364.8	465.6	380.5
RER overvaluation as of late 1996/early 1997					
Chinn(1998) 1/	-5.5	-9.1	7.9	19.1	7.0
Goldstein(1998) 2/	4.2	-7.6	9.3	11.9	6.7
Tornell(1998) 3/	6.8	4.6	4.5	15.7	5.5
Berg and Pattillo (1998) 4/	9.6	11.5	9.0	19.2	9.4
Export growth (dollar value), 96:H2/95:H2	9.1	-2.8	0.9	15.9	-4.5
<u>Banking system</u>					
Non-performing loans					
Pre-crisis estimates					
Official estimate for 1996	8.8	0.8	3.9	na	7.7
Alternate estimate	12.9	8.4	9.9	14.0	13.3
Actual non-performing loans as share of total loans in 1998					
JP Morgan	11.0	17.5	7.5	5.5	17.5
Goldman Sachs	9.0	14.0	6.0	3.0	18.0
Peak non-performing loans as share of total loans, 1998/1999					
J.P. Morgan	30-35	25-30	15-25	8-10	25-30
S&P	40+	25-30	20.0	n.a.	35-40
Recapitalization costs (Percent of GDP)					
J.P. Morgan	19.0	30.0	20.0	0.0	30.0
S&P	20+	20+	18.0	n.a.	34.0
Fiscal costs of recapitalization					
Low scenario	5.9	7.2	10.6	0.9	8.0
Medium scenario	11.6	15.7	18.1	0.9	15.1
High scenario	16.8	31.7	31.4	2.8	30.0
Exposure to property loans 5/	25-30	15-25	30-40	15-20	30-40
<u>Corporate sector</u>					
Debt/equity ratios 6/					
1991	190	480	90	160	170
1996	200	640	200	170	340
Profitability (return on assets)					
1991	6.3	2.0	4.8	7.0	8.0
1996	4.7	0.4	6.0	4.7	1.0

Sources: Domestic credit/GDP and Domestic credit growth are from Berg and Pattillo (1998), following Sachs, Tornell and Velasco (1996) definitions. Debt/equity ratios and corporate profitability from World Bank (1998); ICORs from Corsetti et. al (1998b); NPL pre-crisis estimates from BIS (1998) as reported in Goldstein (1998) and Corsetti et. al (1998b), who combine BIS, private sector and IMF information; Fiscal Costs of Recapitalization from World Bank (1998); Actual Non-Performing Loans in 1998 from Goldstein (1998); Peak non-performing loans and recapitalization costs from Adams et al. (1998); and exposure to property loans from Goldstein (1998).

Notes:

1/ Deviation from PPP (using producer price indices).

2/ Change in real effective exchange rate from June 1987 to May 1997

3/ Percent change in the real exchange rate from 1992 to 1996.

4/ Deviation of bilateral real exchange rate from trend, based on Kaminsky et al (1998) definition.

5/ Estimated share of property lending to the private sector, end 1997.

6/ For comparison, leverage is 80 percent on average in the U.K., 100 percent in the U.S., and 160 percent in Japan.

While evidence for real exchange rate overvaluation is generally lacking, large current account deficits did emerge in all of the countries, with Indonesia's the smallest at 3.3 percent of GDP in 1996. Large deficits themselves may not be a problem. Analysis of previous experience had concluded that it is important whether deficits are caused by declining savings rates or rising investment rates and whether, relatedly, the growth of exports will be strong enough for the future repayment of foreign debt.¹² On this basis, there appeared to be little grounds for alarm. Except in the Philippines, deficits were not caused by declines in savings; rather, investment was booming.¹³

On the other hand, several of the countries, particularly Thailand and Korea, suffered substantial export slowdowns, particularly in 1996 and 1997, despite the extremely high rates of investment (Table 1). This can be attributed to a variety of factors, including: the decline in world semi-conductor prices; increased competition from China, Vietnam and perhaps Mexico; and, particularly for Thailand and the Philippines, the effects of exchange rate appreciation in 1996 and 1997 driven by the strength of the dollar vis a vis the yen.¹⁴ Finally, Korea in particular suffered a sharp terms of trade decline (Table 2).

In sum, the macroeconomic situation at the end of 1996 presented troubling aspects in some countries, but there was no clear evidence of major macroeconomic problems.

B. Domestic Financial Vulnerabilities

The Asian crisis countries experienced tremendous capital inflows in the 1990s, ranging from some 3 percent of GDP in Korea to about 10 percent in Malaysia on a sustained basis. (Table 1). Most of these capital inflows, and associated investment booms, were intermediated through weak domestic financial institutions that were often undercapitalized and poorly regulated.¹⁵ Long periods of macroeconomic stability and high growth led to complacency on the part of foreign creditor banks, borrowers, and the authorities. Liberalization of domestic financial markets was not accompanied by appropriate supervision and regulation of financial institutions. Furthermore, corporate financial structure created a

¹²Ostry (1997).

¹³Of course, the Asia crisis itself has modified this view that current deficits are not a problem if they are financing investment. Section B discusses the investment booms.

¹⁴See Fernald et al. (1998) as well as Diehl and Schweikert (1998). The slowdown in export growth is correlated with the yen/dollar exchange rate for a variety of Asian countries over the 1991 to 1996 period. Among the five crisis countries, Korea has the highest correlation, suggesting the most competition with Japan, with a correlation of about 0.6, with Thailand next at about 0.4 (Kochhar et al. (1998)).

¹⁵See BIS (1998) for a discussion of the role of financial intermediation in the Asian crisis.

variety of governance problems, with in many cases high concentration of ownership, lack of competition in financial markets, ineffective supervision of management by outside owners, and substantial government involvement.¹⁶ The combination of weak financial sectors with strong capital inflows and credit booms created two related but distinct sets of potential problems: potential inefficiency of the resulting investments, and financial fragility of an overleveraged corporate sector.

Table 2 shows the size of the boom in private bank lending to GDP from 1992 to 1996. While there is important variance across the countries, the Philippines, Thailand and Malaysia in particular had large growth rates over the period (with the Philippines starting from a low base due to a contraction in the early 1990s). Rapid growth of the share of bank lending in GDP is not on the face of it evidence of over lending. It has, however, been found to be a fairly good, if crude, measure of over lending and incipient weakness in banking systems in cross-country studies.¹⁷ Figure 2 shows how the Asian economies compare to other countries in this regard. They were both highly leveraged (with a high stock of private credit to GDP) and rapidly becoming still more so, compared to most other countries.

A counterpart to a stock of private credit in relation to GDP was, in many countries, a high ratio of debt to equity in the corporate sector. As Table 2 shows, Indonesia, Korea, Thailand and to a lesser extent Malaysia, especially, had very high debt/equity ratios. Moreover, in the countries where credit expanded the fastest, banks accepted increasingly narrow interest margins, suggesting little provision for risk.¹⁸

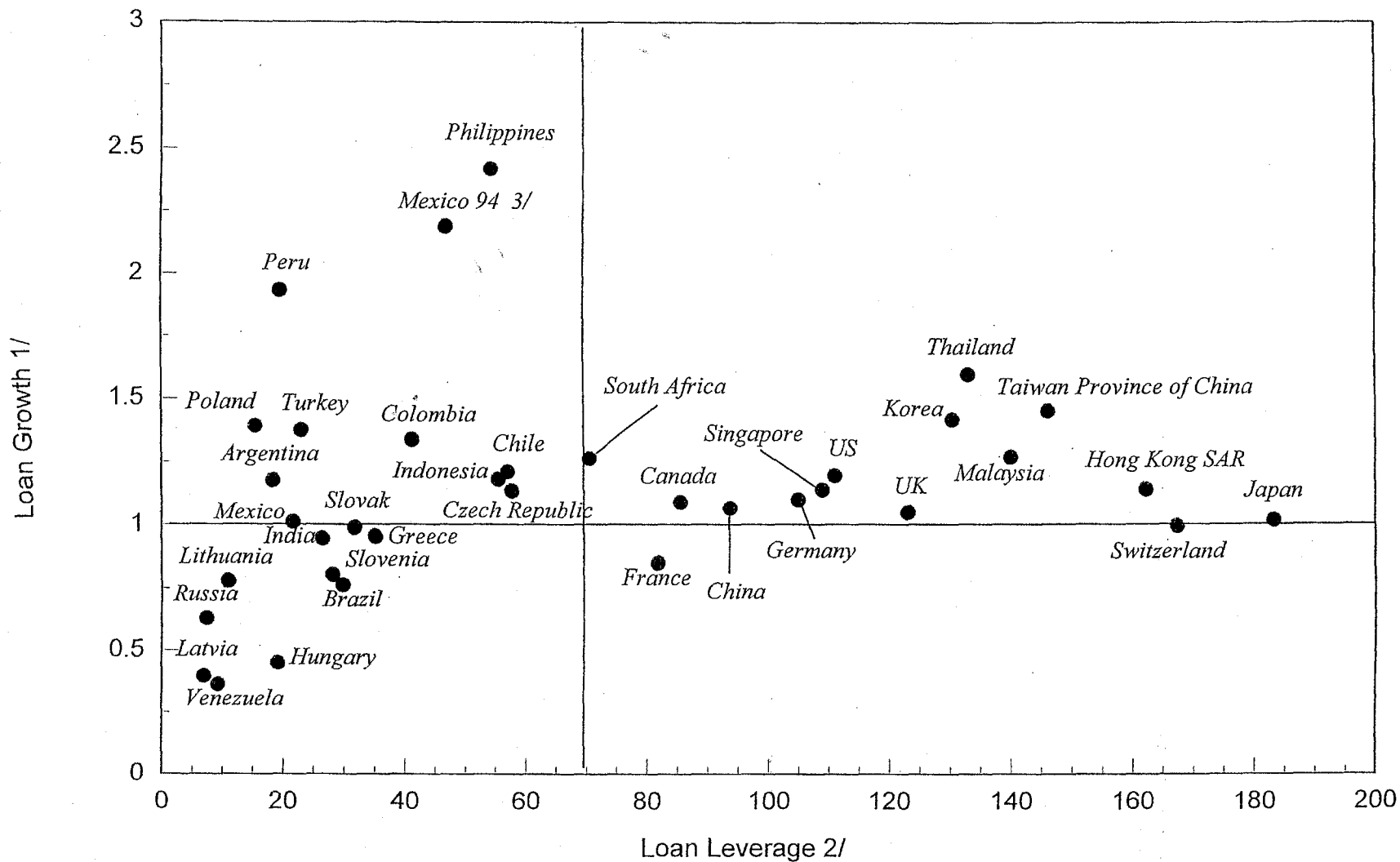
There is some reason to believe that this increase in lending was not efficiently used. The investment boom in many countries was concentrated in sectors with already excessive capacity in part through government direction and towards non-traded sectors, particularly real estate. The aggregate evidence of low or declining efficiency of investment is mixed. Incremental capital-output ratios (ICORs) are a crude measure of the efficiency of investment, and as shown in Table 2 on domestic vulnerabilities, the ICORs rose (signifying more investment for a given amount of output growth) in the 1996/1997 period compared to previously, though from low levels. On the other hand, Sarel (1997) finds that total factor productivity growth in East Asia had not decreased in the 1990s compared to previously.

¹⁶See Gobat (1997) for a discussion of corporate governance in Korea and World Bank (1998) for the region as a whole.

¹⁷Kaminsky et al. (1998) find that growth in bank credit helps predict bank and currency crises in a panel of some 23 countries since 1970. Sachs et al. (1996) find that growth in bank credit as a share of GDP helps explain the pattern of the Tequila effect in the wake of the Mexico crisis. And Corsetti et al (1998b) find that a lending boom helps predict the severity of the currency crisis across countries in 1997.

¹⁸BIS (1998).

Figure 2. Financial Sector Lending: growth and leverage, 1990-96



Sources: Adams et al. (1998)

1/ 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.

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

3/ Loan growth from 1990-1994 and loan leverage is as of year-end 1994.

Note: The following countries' loan growth started at different years: Hong Kong SAR, Slovenia and Poland (1991), Malaysia (1992), and Russia, Czech Republic, Slovak, Latvia and Lithuania (1993).

Microeconomic evidence that much of this lending being channeled inefficiently is more readily available. For Korea, Borensztein and Lee (1999a) demonstrate that credits were systematically allocated to sectors with poorer economic performance. In the other countries under consideration, much of the lending went to finance equity purchases and land. As Table 2 shows, the share of bank lending to the property sector in several Asian economies was very high. Meanwhile, there were construction booms throughout the region, including in Bangkok (Thailand), Jakarta (Indonesia), Kuala Lumpur (Malaysia), and Makati (Philippines).¹⁹

Rapid growth of credit to the in non-traded-goods sector, including real estate, is not necessarily a sign of investment inefficiency, of course. A turnaround of asset prices prior to the crash is, however, characteristic of financial panics that follow speculative booms (Kindleberger (1978)). There is some evidence that markets were recognizing that overbuilding had taken place. As Figure 3 shows, there were declines in residential property prices in Thailand, Indonesian and perhaps Malaysia, though the price of office real estate appeared to be stable right up to the crisis. Fears that large quantities of real estate due to come into the market would depress prices were reportedly widespread in several of the countries. Equity prices had dramatically turned around in some of the countries (Figure 3). Moreover, property sector stocks were declining much more rapidly than others. The Thai stock market, most dramatically, fell by 51 percent from 1993 through 1996, with the property sector declining 73 percent. In Indonesia, the overall stock market did not register important declines, but the property sector was down 33 percent from 1994.²⁰

An important aspect of the credit boom was a rise in financial fragility. With a large growth in bank lending heavily collateralized by high-priced property, and non-financial corporations in many cases highly leveraged, any slowdown in growth, increase in interest rates, or decline in asset prices would result in large increases in bankruptcy. With banks not well-capitalized, this in turn would put immediate pressure on the solvency of the banking system. The large size of the banking system and corporate debt relative to GDP, in turn, magnifies the economic significance of financial distress.

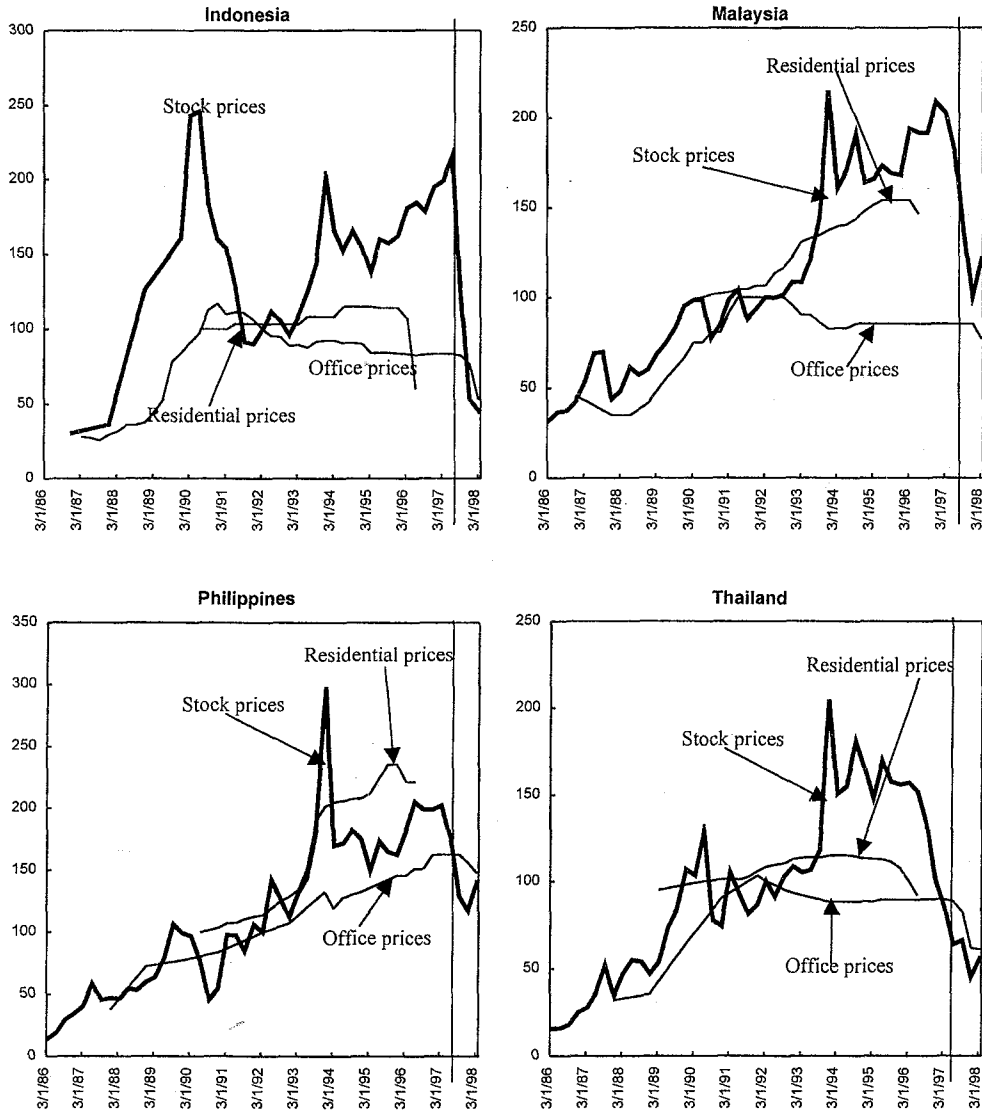
It is important to emphasize that deep financial fragility is related to but not the same as inefficiency of the underlying investments. Inefficient investment allocation would in itself tend to lead to lower growth. Where corporations and financial institutions are also highly leveraged, however, even a relatively small increase in the quantity of non-performing loans could result in widespread bankruptcies.

The share of non-performing loans in the banking system is a problematic measure of the health of the banking system, as poor loan portfolios can be disguised until the crisis forces

¹⁹Alba et al. (1998)

²⁰Corsetti et al. (1998a).

Figure 3. Asian Crisis Countries: Real Estate and Stock Prices
(Indices, March 1992 = 100) 1/



Sources: Adams et al. (1998).

1/ Real estate and stock prices in local currencies, except for Indonesia, where prices are in US dollars. Vertical line at June 1997.

their recognition. Official estimates for 1996 show little problem for Korea and Malaysia but indicate elevated rates of non-performing loans for Indonesia and especially Thailand (Table 2). Corsetti et al. (1998b) present alternate estimates that combine IMF, private sector and official estimates (also shown in Table 2). These show substantially higher rates of non-performing loans for the crisis countries than the official data, and also show higher rates than for a comparison group of Latin American countries.²¹

For some of the countries, market participants seem to have recognized sharp deteriorations in the quality of the banking system prior to the crisis. For Korea, an index of bank stock prices fell by 67 percent from its peak (August, 1991) to the date of its currency crisis (October 29, 1997), while the value of the Thai banking index fell by 92 percent from its peak in January 1994 to the onset of the crisis on July 2, 1997.

In some countries, the financial situation was clearly unsustainable. Thai corporations experienced a very sharp deterioration, accelerating since 1995. For example, the share of profits going to pay interest expenses went from under 30 percent in Thailand in 1991 to about 45 percent in 1996. Major non-bank financial institutions were beginning to go bankrupt by 1996. Korean firms were following a risky strategy of high leverage and very low profitability. About 70 percent of profits went to cover interest in the mid-1990s, jumping to about 85 percent in 1996. Profit rates for the largest 30 Chaebol were already dangerously low by 1996. After 1996 their performance deteriorated rapidly. In the 12 months leading up to June 1997, six of the largest 30 Chaebol went bankrupt. Malaysia, Indonesia and the Philippines were more stable. In Indonesia, Malaysia, and the Philippines, the ratio of profit to interest costs was stable at roughly 30 to 40 percent, still high by international standards.²²

Domestic financial weakness, in sum, manifested itself in high and growing leverage, some evidence of overinvestment in certain areas, and a banking and financial system highly vulnerable to a change in the economic climate.

C. External Vulnerability

An important counterpart to domestic financial fragility in some countries was external vulnerability. Several countries, notably Korea, Indonesia and Thailand, and to some extent the Philippines, built up high levels of short-term external debt relative to reserves (Table 2 shows the ratio of short-term debt to reserves on the eve of the crisis, while Table 3 shows

²¹The size of the non-performing-loan portfolios post-crisis and the cost of recapitalizing the banking system are estimated to be large, running up to as much as 30 percent of GDP (Table 2). While these may give some indication of the scale of the pre-crisis problems, they cannot be used to demonstrate that such problems caused the crisis, as the financial sector collapses in the affected countries are clearly influenced by the crisis under any interpretation.

²²World Bank (1998).

Table 3. Asian Crisis Countries: Short-Term External Debt and Reserves

International Reserves 1/ (In billions of U.S. dollars, end of period)					
	Indonesia	Korea	Malaysia	Philippines	Thailand 2/
1993	11.3	20.2	27.2	4.7	24.5
1994	12.1	25.6	25.4	6.0	29.3
1995	13.7	32.7	23.8	6.4	36.0
1996	18.3	29.4	27.0	10.0	37.7
Mar-97	19.0	21.1	27.7	10.4	37.1
Jun-97	20.3	25.3	26.6	9.8	31.4
Sep-97	20.3	22.4	22.2	9.4	28.6
Dec-97	16.6	9.1	20.8	7.3	26.2
Mar-98	15.8	24.4	19.8	7.8	26.9
Jun-98	17.9	37.2	19.7	9.0	25.8
Dec-98	22.7	...	25.6	9.2	28.8

Short-Term External Debt 3/ (In billions of U.S. dollars, end of period)					
	Indonesia	Korea	Malaysia	Philippines	Thailand
1990	11.1	22.8	1.9	4.4	8.3
1991	14.3	25.1	2.1	4.9	12.5
1992	18.1	25.2	3.6	5.3	14.7
1993	18.0	40.3	7.0	5.0	22.6
1994	19.5	58.4	6.2	5.7	29.2
1995	26.0	78.6	7.3	5.3	41.1
1996	32.2	100.0	11.1	8.0	37.6
1997	36.0	68.4	14.9	11.8	34.8
1998	...	...	7.0	...	25.0

Short-Term External Debt (Percent of GDP)					
	Indonesia	Korea	Malaysia	Philippines	Thailand
1993	11.4	8.4	11.1	9.3	18.1
1994	11.0	10.6	8.7	8.9	20.4
1995	12.9	12.9	8.5	7.1	24.4
1996	14.3	13.5	11.2	9.5	20.3
1997 4/	15.9	11.1	15.1	14.1	18.8

Short-Term External Debt (Percent of international reserves)					
	Indonesia	Korea	Malaysia	Philippines	Thailand
1993	159.7	199.1	25.5	107.7	92.5
1994	160.4	227.6	24.3	95.0	99.5
1995	189.4	240.7	30.6	82.8	114.2
1996	176.6	340.2	41.0	79.5	99.7
Jun 1997 5/	158.5	395.3	41.6	81.5	119.9
Sep 1997 5/	159.0	446.5	49.9	84.6	131.4
Dec 1997	217.1	751.6	71.9	162.3	133.1
1998	...	...	27.4	...	86.7

Sources: World Bank, IFS, and Fund staff estimates

Notes:

1/ Reserves are reserves less gold (IFS line 1L), except for Korea where an adjustment was made to measure usable reserves for 1996 and 1997.

2/ Thailand also had sold dollars forward in the amount of \$4.8 billion as of end-December 1996,

\$12.2 billion as of end-February, 1997, and \$29.4 billion as of end-June 1997 (Nukul Commission Report (1

3/ Short-term debt is World Bank data except Korea, which uses IMF staff estimates. See fn 5 of Table 1.

4/ Measures as a share of 1996 GDP.

5/ Short-term debt from end-1996.

short-term debt, reserves, and the ratio of short-term debt to reserves through time). Vulnerability can also be measured as a level of M2/reserves, which captures the possibility of flight from domestic financial assets to foreign currency. Here too, many of the crisis countries had relatively high ratios.²³

This buildup happened for two main reasons. First, financial and external deregulation were sequenced in ways that in some cases encouraged accumulation of short-term external debt. In Korea, regulations favored short-term foreign borrowing by financial institutions and strongly discouraged corporations from borrowing abroad directly. In Thailand, the Bangkok International Banking Facility (BIBF), opened in 1993, greatly facilitated foreign borrowing by residents. A significant proportion of this lending was, it is believed, unhedged by borrowers and, particularly for finance companies, concentrated in the property and hire-purchase sector.

A second cause of excessive buildup of short-term external debt was the incentive that the fixed exchange rate regime and sterilization of capital inflows gave to intermediate foreign loans. Sterilization of capital inflows raised interest rates on domestic deposits, while the apparently durable fixed exchange rate regime led market participants to neglect the possibility of a devaluation. The resulting interest differential in favor of foreign borrowing led domestic banks to intermeddle between foreign banks and domestic borrowers. The interbank market generally takes the form of short-term credits, leading to a rise in short-term liabilities. It may also be that foreign creditors were increasingly unwilling to take long-term exposure to these domestic institutions.²⁴

An important cause of the final run-up in external vulnerability was the response of the authorities in some countries to the worsening situation in 1996 and 1997. In Korea, for example, usable reserves began declining starting in the first part of 1997 as reserves were placed with foreign subsidiaries of Korean banks that were becoming illiquid in dollars.

An important component of vulnerability is the credibility of the government with regard to its ability to suffer (or inflict) pain in defense of the currency. Weak banking systems and low reserves can interact to undermine the ability of the authorities to defend the

²³Tornell (1998) finds that M2/reserves is an important predictor of the incidence of the Asia crisis in 1997. Radelet and Sachs (1998b), in contrast, find that reserves/short-term external debt helps predict crisis in the 1994-1997 period. Data on external debt (especially in Korea and Indonesia) and usable reserves (especially in Korea and Thailand) were not available prior to the crisis. The data in Table 1 reflect what we now know.

²⁴International banking regulations may have played a role in shaping the nature of the capital inflows. Basle standards implied that short-term bank lending to Korea (a new OECD member) received a risk-weighting of zero, much more favorable treatment than that accorded longer-term lending.

currency. A country with low reserves cannot tolerate capital flight, but weak banking systems make interest rate defenses more costly. In this environment, an attack can easily become self-fulfilling

D. Changes in the External Environment

In addition to their own vulnerabilities and, in some countries, the dynamics of deteriorating macroeconomic and financial situation, some countries suffered external shocks prior to the crisis. Perhaps the major development in the external environment that helped create the conditions for the crises of 1997 was the surge of capital inflows in the 1990s, as discussed above. But some aspects of the external situation began to turn negative for some of the crisis countries, helping precipitate the crisis. These include some external factors that reduced export growth, discussed in section A above. Finally, the ongoing banking and financial problems in Japan may have led to a slowdown in capital outflows from Japan to other Asian economies.²⁵

E. Putting the Pieces Together

The above discussion has focussed on a cross-country comparison of basic features of the economies under consideration. The conclusion was that a variety of fundamental weaknesses characterized many of the economies under consideration prior to the crisis. The importance of these weaknesses in explaining the outbreak of the crisis argues in favor of the "fundamentals" interpretation of the crisis, the first of the two broad stories outlined at the beginning of this section. However, it would be premature to conclude that there is nothing to the second story. Clearly, changes in investor sentiment and the external environment helped precipitate the crisis, particularly after Thailand devalued.

As argued above, many of the fundamental weaknesses created situations of vulnerability to changes in investor sentiment, changes in the external environment, or other negative shocks. This interpretation may be seen as containing elements of both views that were outlined above: the crisis was caused by fundamentals to the extent that the weak fundamentals discussed above created a situation of profound vulnerability to negative shocks. One important component of the change in environment for many countries was clearly the change in investor sentiment that was triggered by events in Thailand and then spread through the region. But the evidence reviewed above suggests that a variety of macroeconomic, domestic/financial and external vulnerabilities left many of these countries vulnerable to such

²⁵The appreciation of the dollar vis a vis the yen, and hence those Asian currencies linked to it, may be considered an external factor. The maintenance of a tight dollar link was a policy decision, however, particularly in the many countries where the composition of the basket to which the currency was pegged was not public.

shifts in sentiment, so that to attribute the cause of the crisis to the change of sentiment itself would miss much of the picture.²⁶

The analysis so far has not focussed on one important element that help explain the nature of the crisis: the dynamics of the onset of the crisis. According to the view that the crisis was ultimately due to panic-driven “runs” against otherwise viable exchange rate regimes, there would have been no particular deterioration of fundamentals prior to the actual onset of the speculative attacks.²⁷ Evidence of deteriorating fundamentals, conversely, would suggest that the panic associated with the attacks and their aftermath may have been only the last dramatic act in the onset of the crisis.

Appendix I reviews the run-up to the crises country-by-country, complementing the more issue-oriented discussion above. To summarize the conclusions, Thailand’s crisis can be understood as the result of deterioration in a wide set of fundamentals, with external shocks helping to bring the crisis to a head. Korea also faced deteriorating fundamentals, particularly in terms of domestic/financial and external vulnerabilities. Indonesia, Malaysia and the Philippines did not show clear signs of deteriorating positions, suggesting that the shock to investor sentiment resulting from the Thai and later Korean crises played a larger role in causing their crises. To differing degrees, though, they displayed fundamental vulnerabilities to this change in sentiment. In Indonesia, some evidence of vulnerability of the domestic financial system was available, and in external vulnerability in the form of high levels of short-term debt existed, though aggregate data was unavailable prior to the crisis. Malaysia, and to perhaps a lesser extent the Philippines had domestic financial systems that to varying degrees were financially fragile and vulnerable to external shocks. Neither the Philippines nor especially Malaysia displayed the sort of external vulnerability that characterized Thailand, Korea and Indonesia.

This conclusion is consistent with the results of estimating a simple probit model of balance-of-payments crises over a panel of developing countries including the Asian crisis countries and estimating out-of-sample crisis probabilities for 1997 (Berg and Pattillo (1999b)). We find that a simple model composed of four traditional macroeconomic variables

²⁶This distinction between a deterioration of fundamentals leading to a crisis and a zone of vulnerability in which negative shocks may cause a crisis is important in the theoretical literature on currency crises as the first situation characterized so-called “first generation” models of currency crisis while the latter characterizes some “second-generation” models. See Flood and Marion (1998) for a review of this literature.

²⁷I use the term “speculative attack” in the spirit of the literature on collapsing exchange rate regimes, as in Krugman (1979). The speculators in question may be foreign banks or domestic firms or investors, for example. In particular, there should be no implication that they are “speculators” in the sense of hedge funds or other such investors. See Eichengreen et al. (1998) on the role of hedge funds in the Asia crises.

(the current account deficit, exchange rate overvaluation, export growth, reserve losses) and one "second generation" variable (short-term external debt/reserves) explains the pattern of crisis in 1997 fairly well and in particular generates crisis probabilities above 25 percent for Indonesia, Korea, Malaysia and Thailand. Consistent with the conclusions reached above, Thailand's probability of crisis rises steadily from 1994 until the crisis, while those of Korea, Malaysia and Indonesia are fairly high and stable during 1996. For Thailand and Malaysia, the traditional variables explain much of the vulnerability, while for Korea and Indonesia the ratio of short-term debt/reserves is key.

III. POLICY RESPONSE

This section focusses on the policy response of the crisis countries following their flotation and devaluation in response to speculative attacks.²⁸ Before proceeding, however, it is important to emphasize that there was scope for policy response prior to the final collapse of the pegged regimes. As signs of trouble began to emerge in many of the crisis countries, interest rates were kept largely stable, fiscal policy was largely neutral (or expansionary, in the case of Thailand), and structural reforms were slow in coming. Thailand and Korea represent the clearest cases here. The main initial response in both countries to capital outflows in 1997 was to intervene heavily and non-transparently in the foreign exchange markets in the defense of the currency. (Figure 4 shows the paths of nominal interest and exchange rates in the crisis countries from the beginning of 1997.)

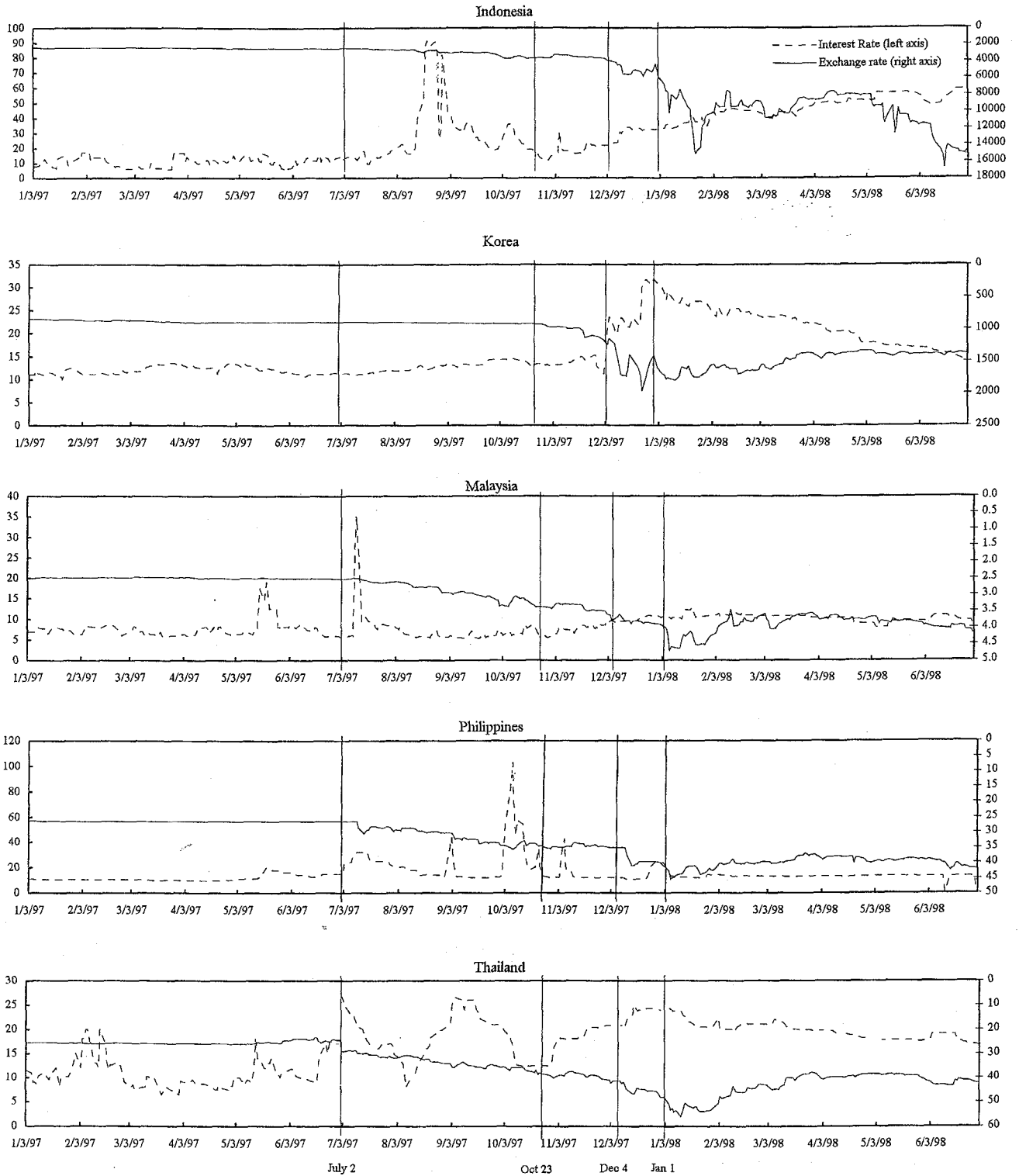
As each country floated its currency, it was faced with the question of how to adjust policies in response to the sharp capital outflows. The objectives were to restore nominal equilibrium and confidence, minimize output losses, and avoid external debt default. With the partial exception of Malaysia, all the countries maintained open capital accounts and floated their exchange rates. The policy response rested on three legs: access to official external finance, fundamental systemic reform, and adjustments to monetary and fiscal policy.

A. External finance

The most severely affected crisis countries, Thailand, Korea and Indonesia, experienced external liquidity crises as investors came to doubt that adequate reserves were available to service maturing foreign debts. As this doubt became widespread, panic set in. The adequacy of reserves of course depends on capital flows themselves, but for these three, a "bad equilibrium" was possible in which investors, believing other investors would flee, would

²⁸ Appendix II describes chronologically the evolution of the crisis from July 1997 through mid-1998.

Figure 4. Asian Crisis Countries: Interest Rates and Exchange Rates



Source: Bloomberg and IMF staff estimates.

Notes: Interest rates are representative overnight interest rate, nominal annual yields. Exchange rate is measured in national currency units per US dollar.

conclude that there were not enough reserves, was possible. Notably, the ratio of reserves to short-term external debt was substantially above one for each of these countries.²⁹

The provision of emergency official liquidity support was designed to cushion the blow of the rapid capital outflows that characterized the crisis. Table 4 shows the size of official support in each of the three countries with the most severe international liquidity crises.³⁰ A total of 17 billion dollars of support was committed to Thailand, 42 billion to Indonesia, and 58 billion to Korea.

The packages for Indonesia, Korea and Thailand were not large enough to cover all potential external debt service over the near term, including stocks of short-term debt and scheduled amortizations of medium and long-term debt. They instead relied on the assumption of some roll-over of maturing foreign debt, as well as some adjustment of the current account, to close the financing gap generated by capital outflows. The countries thus needed to convince at least some investors to remain.³¹

In the event, the support and associated policy packages did not immediately reassure investors and end capital outflows in these countries. In this context, an important component of external financial relief came in the form of organized moratoria. The revelation at the time of the IMF program announcement on December 4 that Korea had almost no usable reserves left, and doubts about the size of the official support package, brought foreign credit roll-over rates to very low levels and raised serious concerns of default. By late December, with default appearing imminent, the program was strengthened and IMF disbursements further front-loaded, and the situation began to turn around.

An important factor in this improvement was the late-December agreement of private bank creditors to roll-over their short-term claims on Korean banks while negotiating their conversion into medium-term loans. This voluntary roll-over required an understanding that no "haircuts" would be taken, that is that interest rates on the new loans would be somewhat higher than the original short-term credits and that principal would be secure, as well as strong support of creditor banks' governments. Agreement was finally reached in April to restructure \$22 billion of this debt into medium-term obligations.

²⁹This point is strongly emphasized in Radelet and Sachs (1998a).

³⁰In addition, the Philippines was in the third year of its IMF program. The Philippines did not receive a major "rescue package."

³¹In assessing the size of these packages, however, it is important to emphasize that in the cases of Indonesia and Korea none of the bilateral support, characterized as a "second line of defense," has been disbursed. The bilateral support for Thailand has been made available in line with IMF disbursements.

Table 4. Asian Program Countries: Official Financing

	Pledged		Disbursed 1/	
	Dollars	Percent of 1997 GDP	Dollars	Percent of 1997 GDP
Indonesia	42.3	20	12.1	6
IMF	11.2	5	8.8	4
AsDB and World Bank	10.0	5	3.3	2
Bilateral	21.1	10	0.0	0
Korea	58.4	13	28.7	6
IMF	21.1	5	19.0	4
AsDB and World Bank	14.2	3	9.7	2
Bilateral	23.1	5	0.0	0
Thailand 2/	17.2	11	14.1	9
IMF	4.0	3	3.4	2
AsDB and World Bank	2.7	2	2.0	1
Bilateral 3/	10.5	7	8.7	6

Sources: Fund staff estimates.

Notes

1/ IMF Disbursements as of 1/17/99 except as noted.

2/ Disbursements as of 8/1/99

3/ Excludes \$500 million commitment from Indonesia.

The debt standstill, along with a front-loading of IMF support and firmer implementation of reforms, caused fears of default in Korea to recede. Roll-over rates on external debt increased and the won began to recover by January. By April, the stock of short-term debt had shrunk to about \$40 billion dollars with the finalizing of the debt restructuring agreement in April. In this same month Korea returned to private capital markets with a successful \$4 billion dollar sovereign issue.³²

In Indonesia the official support package was also insufficient to cover maturing foreign obligations, in this case largely short-term foreign-currency bank lending to non-financial corporations. After the announcement of the program at the end of October, foreign loans continued to be withdrawn. The exchange rate stayed reasonably stable until early December, when rumors of president Suharto's ill health and the collapse of the Korean won precipitated a sharp decline in the rupiah. Rollover rates on external credits fell to very low levels and fears of imminent default intensified.

No comparable organized restructuring or "bailing in" of Indonesia's external creditors has been achieved. Several factors contributed to this outcome. First, Indonesia's policy implementation was uneven, as discussed below and in Appendix II, so that the prerequisites for restructuring of external obligations to achieve success were lacking. Second, Indonesia's external debt was owed by hundreds of non-financial corporations. Little information was available on what was due to whom when, greatly complicating any effort to organize a voluntary roll-over. Moreover, Korea's extension of a government guarantee to all claimants on domestic banks, including foreign creditors, facilitated the negotiations by removing issues of borrower credit risk. Indonesia was not in a position to undertake such a blanket guarantee, in part because the above-mentioned informational gaps and more generally because of the moral hazard that would have resulted. Instead, illiquid Indonesian borrowers were expected to achieve restructuring agreements with their foreign (and domestic) creditors. To facilitate this process, Indonesia has recently implemented a program to encourage voluntary restructuring of short-term external debts, with the government providing limited support in the form of exchange rate guarantees.

The result of this decentralized process has been that while no organized and quick roll-over was achieved, substantial numbers of private debtors have gone into arrears with foreign creditors. Many of these creditors, without government guarantees, can be expected to lose principal as financial distress is worked out over time. In the meantime, however, the access of Indonesian firms to credit has been rendered more difficult by the overhang of existing obligations.

³²Yields on sovereign dollar-denominated bonds in Korea (Figure 5) started rising in October but shot up in December before beginning to recede (though the LTCM and Russian crises in the summer of 1998 caused a further rate jump).

Figure 5. Asian Crisis Countries: Stock Market and Dollar Spreads

Figure 5a. Stock Market Indices
(Dollar values, Jan 1997 = 100)

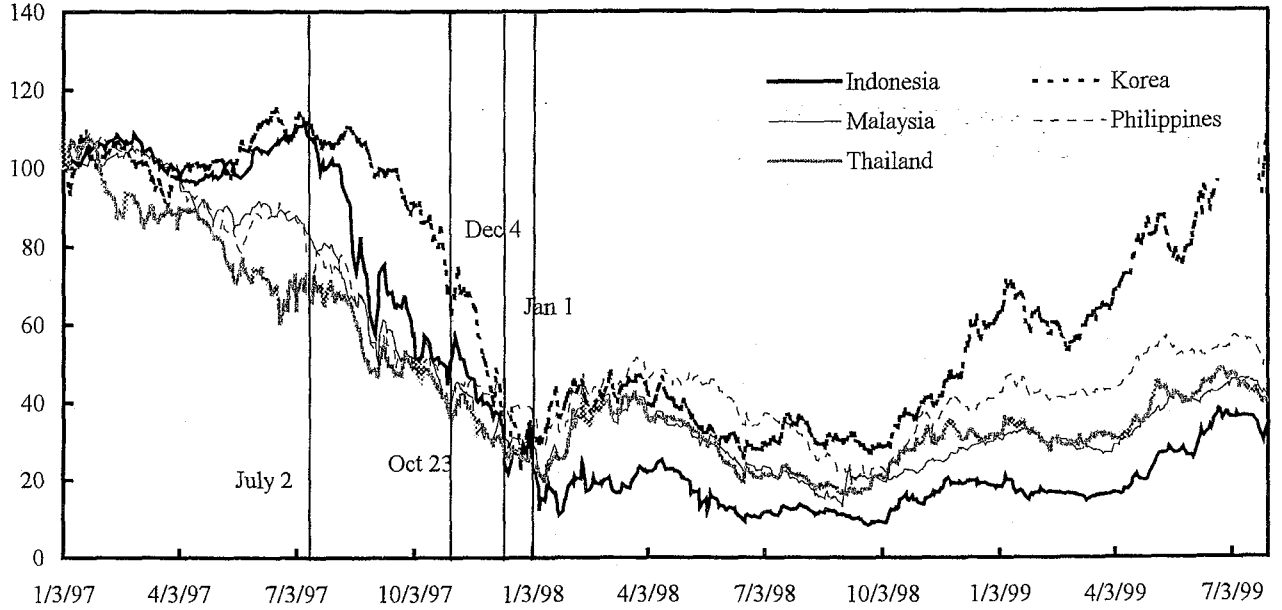
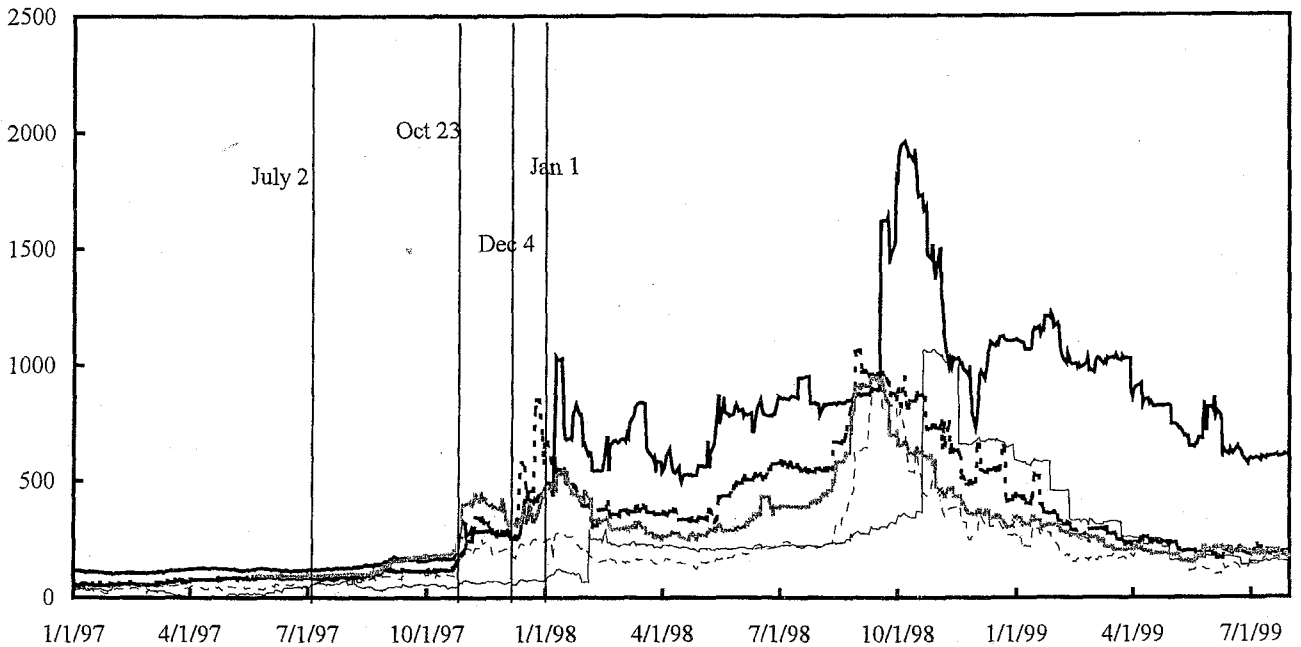


Figure 5b. Spreads on Dollar-Denominated Sovereign Bonds
(basis points)



Source: Bloomberg and IMF staff estimates

Thailand's official support package was also smaller than upcoming foreign currency obligations. However, neither a restructuring agreement nor widespread defaults on external obligations ultimately ensued. Many foreign creditors maintained their exposure without the sort of explicit restructuring observed in Korea. This was partly because foreign banks based in Thailand accounted for more than half of Thailand's private external debt maturing in 1998. These banks, largely Japanese institutions borrowing from their own headquarters, were willing to agree to maintain their exposure.

This account raises several important issues. First, would larger packages have averted the problems? In one view, the problems in Asia were essentially liquidity crises, due to "bank runs" against otherwise viable economies. In this case adequate external finance could have restored the previous situation with little cost, while underfunded programs would not help.³³

The primary objection to this analysis is that there were large problems of fundamentals in the various countries, and to lend freely without addressing them would not eliminate the conditions that generated the crises in the first place. For example, as described in Section II the Thai crisis was considered likely *ex ante* and was attributed in part to policy mistakes in Thailand.³⁴

A second issue is whether more aggressive "bailing in" of private creditors might have been appropriate. This suggestion presents various difficulties. First, there is a tension between the need for speedy resolution of liquidity crises and the time required to coordinate a solution with creditors. The Korean case appears, in retrospect, relatively easy in this respect, in that a fairly small number of creditors (lending to a small number of debtors) held a large share of the obligations, and important creditor governments were strongly motivated to help persuade creditors to cooperate. Second, the rapid negotiation of a coordinated restructuring implies a strong role for the government; this was facilitated in Korea's case by the government's guarantee of the foreign liabilities in question. The Indonesian authorities were unwilling to countenance a full-scale nationalization of obligations of in many cases insolvent private firms, complicating a coordinated restructuring.

Even in the Korean case, creditor banks achieved rollovers and restructuring without loss of principal and at rates that were higher than the original lending rates. Forcing banks to reduce their principal or otherwise "take a hit" would have greatly complicated and delayed the restructuring negotiations at a critical time. Ultimately, the rapid return of Korea and

³³Zettelmeyer (1999) analyzes the role of external support packages in liquidity crises. In particular, he shows that underfunded programs may not halt the "rush for the exit" by investors fearful of default, where an underfunded program is essentially one that is not large enough to finance all external debt service due.

³⁴It is not clear that IMF members were willing to countenance even larger programs or more bilateral assistance. It may still be asked whether they should have done so.

Thailand to credit markets represents a parallel with Mexico's 1994/1995 crisis and a contrast with the debt crises of the 1980s, in which protracted negotiations with creditors extended for many years prior to a return to market access.

In sum, the general approach followed was not to fully finance external liquidity gaps but, following the diagnosis that fundamental weaknesses had set the stage for these crises, to provide external finance a cushion while demanding reforms, to solve the underlying problems. Thus, the next two components of the policy response were designed to complement the assistance packages by encouraging the return of foreign capital and setting the stage for a return to sustainable growth.

B. Financial sector and structural reforms

The problems that lay at the heart of the crisis in most of the countries were weaknesses in the financial and corporate sectors. The shock of a decline in investor confidence, collapses in the exchange rate, increases in interest rates, and declines in real activity magnified initial weaknesses and left large elements of the financial and corporate sectors in deep financial distress. As the rate of non-performing loans grew and financial distress spread, much of the financial sector in many of the countries was effectively bankrupt. As a measure of the depth of the problem, Table 2 shows that the estimated total cost of recapitalizing the banking systems to internationally accepted standards ranges from about 20 to 30 percent of GDP (except for the Philippines). As market participants and policy-makers focussed increasingly on these problems, the undertaking of structural reforms in these areas became a key component of the effort to restore growth and convince investors to stay.³⁵

The measures taken have varied substantially from country to country, but important common elements can be found.³⁶ The closure of insolvent financial institutions was a key feature of programs in Thailand, Korea and Indonesia. The Thai authorities suspended 16 finance companies in June and a further 42 in August 1997. All but two were permanently closed in December. They intervened in four weak domestic banks in December 1997. Indonesian authorities closed 16 small banks in early November 1997 and another 7 in April 1998. In Korea, 14 merchant banks were closed between December 1997 and April 1998.

³⁵The coordinated roll-over of bank debt to Korea presents an important case in point. The creditor banks involved in negotiations with the Korean authorities demanded various structural reforms to strengthen the financial system as a condition for their participation in the debt restructuring agreement.

³⁶Kochhar et al. (1998) present a summary of the important structural measures in the crisis countries. See also Baliño and Udibe (1999) on Korea.

These closures did not always achieve the desired objective of protecting the financial system from its weakest elements. Particularly in Indonesia, but also in Thailand and to a lesser extent in Korea, the initial closures were followed by a "flight to quality" in which depositors moved out of institutions perceived to be weak into stronger institutions or, in Indonesia, into currency or foreign exchange. The situation in Indonesia was aggravated by several factors: depositors and creditors were not fully protected; the authorities acted with lack of conviction in dealing with the weak institutions; and serious doubts existed about the health of remaining financial institutions.

Given the insolvency of many or most financial institutions, a vital area of reform involved the recapitalization of the financial system. One set of measures in this area have been changes in the regulatory environment designed to encourage a faster recapitalization through the injection of private capital, such as increases in minimum capital requirements. A larger private role can strengthen management more quickly, particularly if foreign investors are involved. However, there are limits to how fast private capital can be injected into weak banks. Thailand has focussed on raising capital privately, except for four intervened banks. Progress has still been slow, and the pressure on Thai banks to recapitalize themselves has had a constricting effect on the desire of these banks to extend credit, possibly aggravating the output decline. The Indonesian authorities announced a sharp increase in minimum capital requirements for banks and tightened provisioning guidelines in January 1998 but later reversed this decision. Korean banks that could not meet minimum capital requirements with tighter provisioning rules were required to submit plans to achieve this in early 1998.

Given the scale of the recapitalization problem and the dangers involved in allowing undercapitalized institutions to continue to function, an injection of public capital into these financial systems has been a necessary component of reform. An important step in this direction has been the establishment of a clear mechanism by which the authorities could inject resources to take over, manage and ultimately sell bad assets of the banking system. The Thai authorities announced the creation of the Financial Sector Restructuring Authority and an Asset Management Corporation in October 1997, the Indonesian authorities created the Indonesian Bank Restructuring Agency to take over management of weak banks and to take over and dispose of non-performing assets of the banking system in January 1998. In Korea the Korea Asset Management Corporation created a special fund to buy impaired assets from banks.

A final component to the programs to strengthen the financial system has been a set of reforms to provide the basis for stronger performance in the future. As the immediate danger of bank runs has subsided, it has become clear that deep problems remain in many areas of functioning of the financial system. Thus, all the countries have enacted measures to strengthen of regulation and supervision, capital adequacy requirements, and loan provisioning and classification rules.

Progress has been disappointingly slow in bringing the financial systems to health. In part, this reflects the complex and institutional nature of the problems. It has also raised a

number of ongoing policy debates. One issue that has generated substantial controversy early in the crisis was the extent to which authorities should rescue failing financial institutions or, alternatively, close insolvent institutions. The provision of support to distressed financial institutions has important benefits. It is well-understood that attacks on even strong financial systems can become self-fulfilling, and there is an important role for coordinated public intervention to provide liquidity. Moreover, bank failures can so harm confidence that authorities in many countries find it advisable to provide assistance to even insolvent institutions in times of crisis.³⁷

The protection of institutions from failure has important short and long-run costs, however. The long-run cost is that reforms postponed may be reforms that never happen, particularly since the press of crisis provides impetus that will subsequently be lacking. Moreover, such intervention magnifies the moral hazard problems that contributed to the crisis in the first place. The short-run cost derives from this problem; investors are likely to interpret such failures to reform as evidence that the underlying weaknesses will not be solved and the crisis will continue.

An emerging consensus is that closures of insolvent institutions, while vital, should be carried out with an eye to minimizing depositor panic. Indonesia's lack of deposit insurance has been blamed for triggering the deepening of the crisis that followed the bank closures. However, Thailand announced a full guarantee in August 1997. In an environment of weak implementation and doubts about the adequacy of reserves and the health of the financial system as a whole, this did not serve to stop the flight to quality. While carefully preparing bank restructuring is clearly the ideal, what to do in the middle of the crisis is less clear.³⁸

As concern has moved from stemming panic to (re)constructing viable financial systems, other issues have come to the fore. Most importantly, initially highly leveraged arrangements and subsequent devaluations, increases in interest rates, and collapse in activity

³⁷This fairly rapid move to close insolvent financial institutions contrasts with Mexico's approach in 1995. There, the authorities allowed all major institutions to keep functioning during the crisis, initially intervening only in cases of criminal behavior by bank managers or owners. While there were only very limited domestic bank runs in Mexico, the process of resolving the crisis in the banking industry has proved long and politically difficult.

³⁸Radelet and Sachs (1998a) argue that Indonesia's bank closures were a decisive mistake in turning a precarious situation into a full-blown panic. Full deposit guarantees should have been clearly provided. However, the importance of this factor is difficult to assess. In this regard it is worth noting that Indonesia's exchange rate remained fairly stable from the time of the bank closures in early November until the fears about President Suharto's health and fears of default in Korea dominated market sentiment in early December.

have left many firms and banks effectively bankrupt. Such highly indebted firms and banks can act as a drag on aggregate demand and reduce the efficiency of investment.³⁹

One component of a strategy has been to rely on private sector recapitalization of the banking system while encouraging decentralized workouts of distressed corporations. As discussed, however, private sector-led recapitalization takes a long time. Thus, the authorities are faced with the prospect of allowing dangerously undercapitalized banks to continue to function. Moreover, an important aspect of banking system weakness is the constraints it may place on monetary policy. Fear of worsening an already weak financial system played an important role in restraining aggressive use of monetary policy in Thailand prior to the July devaluation, Korea prior to its October/November crisis, and all the countries since then. Thus, an additional benefit of providing strong public support to financial institutions can be that it strengthens the hand of monetary policy.

A larger public role can return banks to financial health faster, but greatly increases the government role in the financial system, a development at odds with longer-term objectives. Korea, Thailand, Indonesia and Malaysia have all provided substantial public support to the banking system, on the order of 15 to 30 percent of GDP. Much of this was initially provided in the form of loans to provide liquidity. As the poor financial state of the supported institutions has become clear over time, it has also become necessary to recognize that much of this support will not be repaid. The authorities are thus in the process of implementing programs to manage this takeover.

The development of the crisis suggests that a more systematic approach to recapitalizing the banking sector may be preferable. Early attempts to emphasize private-sector-led recapitalization have given way to more centralized approaches, as it has become evident that allowing insolvent institutions to continue to function is neither efficient nor conducive to avoiding moral hazard. For example Thailand, in the face of disappointment with the pace of market-based recapitalization, announced a new program in August 1998 that involved a greater commitment of public funds to assist in the recapitalization of viable banks and finance companies as well as stronger incentives to accelerate corporate restructuring.⁴⁰

³⁹See footnote 57 on the evidence for a "credit crunch."

⁴⁰While some stabilization of the health of the Thai financial system has subsequently been observed, some private estimates suggest that roughly half of the recapitalization remains to be done.

The challenge that has not been resolved is how to speed the resolution of financial and corporate debt in a way that does not exacerbate the moral hazard problems.⁴¹

Other structural reforms have complemented financial sector policies in setting a new direction for the economy. In several countries, perhaps most notably Korea and Indonesia, close relationships between the government, the financial system and parts of the private sector now appear to have resulted in weaknesses in corporate governance and reductions in confidence by foreign investors that have amplified the crisis in important ways. Thus, some attention has been paid in all the IMF program countries to issues such as transparency, corporate governance, and corruption.

Feldstein (1997) and Radelet and Sachs (1998a, 1998b, and 1999), among others, argue that a focus on these difficult institutional issues is inappropriate for the IMF and that their inclusion in IMF programs has *worsened* confidence by emphasizing weaknesses that are inherently hard to correct and not a fundamental part of the current problem. The diagnosis in Section II suggests, in contrast, that at least some these issues were part of the problem. Moreover, many observers have identified increased attention to institutional issues such as poor corporate governance and corruption as an important part of the “wake-up call” aspect of contagion in international financial markets. In this view, markets were demanding these sorts of reforms in light of the weaknesses revealed by the crisis. Finally, to the extent that these sorts of problems were either part of the reason for the crisis or just recognized after the fact, the provision of substantial support without conditionality could result in a moral hazard problem whereby countries avoid necessary adjustments because of the provision of official support.

The implementation of structural reforms has, not surprisingly, been slow. Thus, structural reform measures did not succeed in restoring confidence sufficiently rapidly to avoid the need for adjustment of macroeconomic policy.

⁴¹The tightening of capital adequacy and provisioning requirements, in part to encourage private sector recapitalization, stands in some contrast to the response of Mexican authorities to their banking crisis in 1995 (though the provisioning requirements were to be phased in over a 2 ½ year period). The move to international accounting standards that had been scheduled for 1996 was postponed until 1997 and the bank recapitalization process involved substantial public resources. This reduced the degree to which the banking system was constrained from expanding credit after the crisis, though the continued doubts of market participants about the true strength of Mexican financial institutions may have hurt confidence.

C. Macroeconomic Policy

Monetary policy⁴²

Much has been made of the role of tight monetary policy in Asia. The evidence that policy was in fact tight is surprisingly hard to come by. A close examination of the pattern of interest rates reveals that these rates are not remarkably high in the crisis countries (Figures 6 and 7). The real interest rate measures present a somewhat complex picture, largely because these depend on inevitably poor measures of expected inflation, and because the situation varies substantially from month to month and country to country. Some generalizations are possible, however.

First, there was little or no attempt to raise interest rates prior to the various floatations. Thus, Thailand in early 1997 and Korea until December did not substantially raise rates on a sustained basis. (Figure 4 shows daily interest and exchange rates from 1997.) Indonesia's real rates move up somewhat only in August, as a result of its brief but vigorous defense of its peg, then collapse as inflation picks up. Second, average real interest rates measured using ex poste actual inflation (Figure 7a) are remarkably low for most countries for most time periods. Korea's real rate was below 10 percent during all of 1997, while the Thai real rate broached 10 percent during August and September. The Philippines represents somewhat of an exception, with rates above 30 percent in July and again around 15 percent in October.

A third conclusion from these figures is that Thailand's nominal interest rate showed a tendency to return fairly rapidly to pre-crisis levels in the fall of 1997 following peaks in July and September. Fourth, interest rates finally rose substantially in early 1998 in Korea and Thailand, as the currencies finally stabilized. Fifth, Malaysia generally had lower interest rates than the other countries, by all measures.⁴³ Finally, rates have subsequently come dramatically

⁴²Goldfajn and Baig (1998) analyze in detail the question of the role of monetary policy in the aftermath of currency crises, with particular attention to Asia. The data referred to here is largely from that source.

⁴³Despite the government's announced change of direction towards a looser monetary policy in September 1998, there is little sign of a break at that point -- Malaysia's interest rates generally trend down with the other countries.

Figure 6. Asian Crisis Countries: Nominal Interest Rates and Expected Dollar Returns

Figure 6a. Nominal Interest Rates

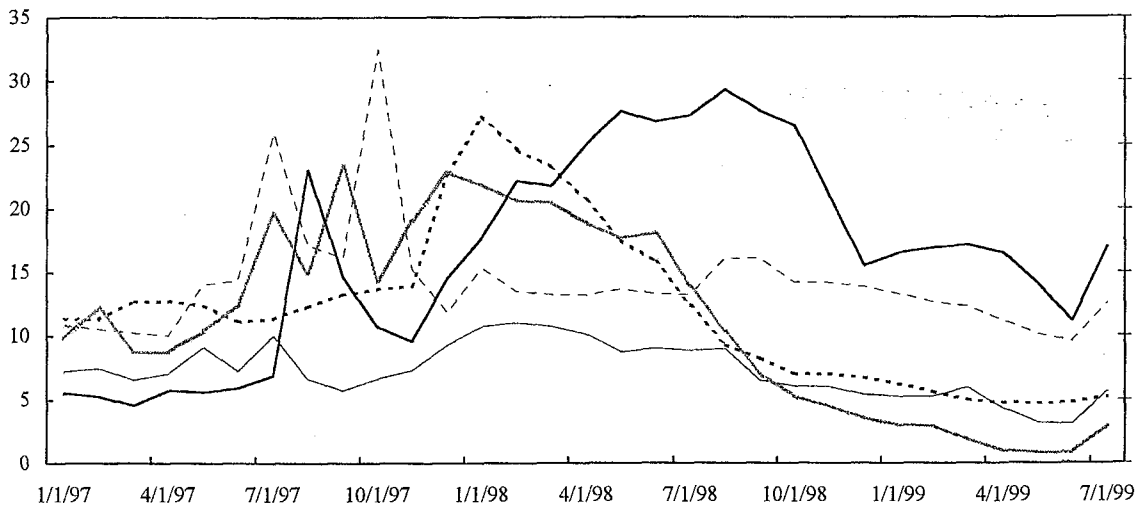
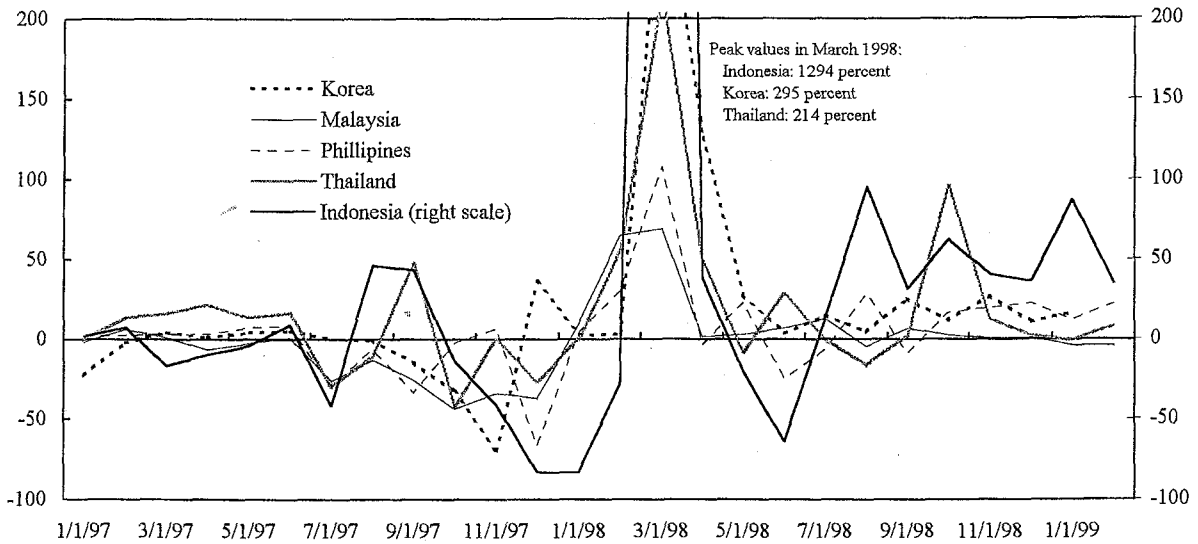


Figure 6b. Expected Dollar Returns
(annualized yields, based on survey expectations of exchange rates)



Source: Bloomberg, IMF staff estimates, and Goldfajn and Baig (1998)

Notes: Exchange rate forecasts are from Financial Times Currency Forecasts, various issues.

Figure 7. Asian Crisis Countries: Real Interest Rates

Figure 7a. Expected Inflation Measured as Actual One-month-ahead Inflation

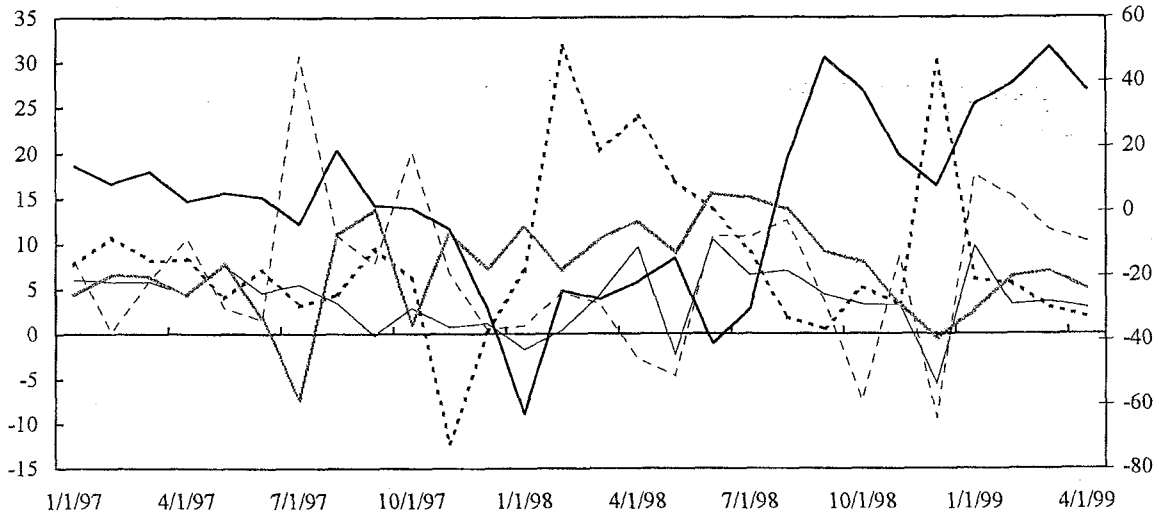
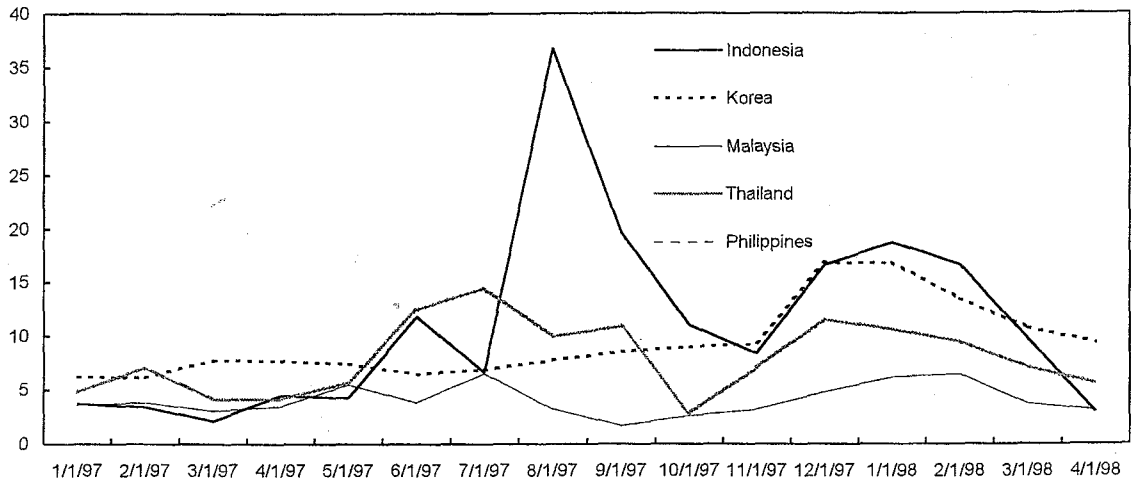


Figure 7b. Expected Inflation Based on Survey



Source: Bloomberg, IMF staff estimates, and Goldfajn and Baig (1998).

Notes: Interest rates are representative short-term rates. Inflation expectations for 7b are from Concensus Economics, various issues.

down with the stabilization of the currencies. Thus, by June 1998 real rates and even most nominal rates were below where they were prior to the crisis (Indonesia is the exception).⁴⁴

So far, we have examined interest rates compared to the rate of inflation. In a small open economy such as those under consideration here, it is natural to compare the yield on domestic assets to the yield on foreign assets. Thus, with free capital mobility it is plausible to suppose that investors demand that the return on domestic assets, adjusted for expected changes in the exchange rate and a risk premium, should be the same as the return on foreign assets. The risk premium is not directly observed, but it is informative to look at the expected dollar return on domestic assets, as measured by the domestic interest rate adjusted for expected depreciation of the currency. Figure 6b shows these returns, where expected depreciation comes from a monthly survey of currency traders.⁴⁵ Figure 6b is broadly consistent with the data on real rates, in that it shows that interest rates were not high enough to yield positive expected dollar returns until early 1998, for most countries, at which point the currencies did in fact stabilize.

There is also little sign of a substantial contraction in monetary policy in the monetary and credit aggregates. As shown in Lane et al. (1999) and Ding, Domaç and Ferri (1998), there was no contraction in real money in Korea, Indonesia or Malaysia and only a relatively small decline in Thailand in the first several months of the crisis. Similarly, real credit aggregates declined only in the first half of 1998, and even here only moderately. Of course, it is difficult to deduce much from the behavior of aggregates (some of which are partly dollar-denominated). However, as stressed in Lane et al. (1999), this is in sharp contrast to other crisis episodes, such as Mexico in 1995, when real monetary aggregates fell much more sharply.

Interest rates and monetary aggregates are only very indirect indicators of the stance of monetary policy. A tighter monetary policy stance would tend to lead to higher real interest rates, but the level of interest rates is a function not only of the monetary policy stance but also of the demand for money and interest-bearing assets. If an investor suddenly perceives

⁴⁴We have focussed here on ex poste real rates. Of course, it is not necessarily the case that market participants expected inflation to be as high as it actually was. On the one hand, the devaluations and resulting inflationary pressures were presumably surprisingly high; on the other, pass-through into prices has been lower than might have been expected (as discussed below). We have used the CPI as the price deflator. Goldfajn and Baig (1998) and Lane et al. (1999) look a variety of other definitions of real interest rates. The choice of deflator does not appear to be critical. An important caveat is that these figures use short-term policy interest rates. Lending rates would generally be substantially higher, though in practice they did not always increase as much as short-term rates, either because of expectations of declines in short rates or market imperfections of various sorts.

⁴⁵See Goldfajn and Baig (1998) for details.

higher risk, he will demand higher returns. These higher returns could be achieved through some combination of higher interest rates or depreciated exchange rates, which would increase the expected appreciation of the currency. Thus, a worsening of confidence or increase in risk premia would tend to result in some combination of increased interest rates and a depreciated exchange rate.⁴⁶ In this light, higher interest rates can be interpreted partly as a result of the size of the shock the economy has suffered and partly as a function of the policy choice regarding how to absorb this shock.⁴⁷

The shock in Asia is the more-or-less sudden decline in investor confidence and capital outflow. Table 5 give a variety of crude measures of the size of the shock to be absorbed by monetary policy, as well as its division between changes in the exchange rate and changes in interest rates. The first two rows show percent changes in the nominal and real effective exchange rates from June 1997 to March 1998. The next rows show the corresponding changes in nominal and real interest rates (as defined above).⁴⁸ One measure of the shock to be absorbed is the change in the spread on dollar-denominated sovereign issues between June 1997 and March 1998, as a straightforward if imperfect estimate of country default risk. Another is the change in the current account, which measures the total change in the supply of foreign savings to the country. Finally, we can also measure the shock by looking at changes in interest rates and exchange rates together. This implies that we interpret the combined responses as resulting from the external shock, even though each individually also represents a policy response.⁴⁹

⁴⁶In the long run, a permanent increase in the risk premium may require a commensurate rise in interest rates to achieve exchange rate stability. If investors demand a higher risk premium, a constant interest rate would result in an overshooting depreciation so that the resulting expectation of appreciation could compensate for the higher risk. But an expectation of appreciation is not consistent with long-run exchange rate stability. Ultimately, then, interest rates have to increase.

⁴⁷To the extent that this capital outflow can be accommodated by reserve declines, neither interest rates nor exchange rates need change. Thailand and Korea, for example, did respond to the initial shock through reserve sales rather than interest rate increases or exchange rate declines. This discussion focusses on just interest rate and exchange rate changes partly for simplicity and partly because after the devaluations most of the shock was in fact absorbed through the exchange rate and interest rate, rather than further sales of reserves.

⁴⁸Given the differences in policy response and shocks through time, the results will depend to some extent on which date is chosen. I chose March 1998 more-or-less arbitrarily. Footnote 50 notes a case in which this choice matters.

⁴⁹Here we again ignore, for simplicity, the loss of reserves as a source of accommodation to the shock.

Table 5. Asian Crisis Countries: Policies and Outcomes
(Percent changes, June 1997 to March 1998, unless otherwise indicated)

	Indonesia	Korea	Malaysia	Philippines	Thailand
Exchange rate change					
Nominal	-74.8	-40.9	-32.9	-32.2	-37.6
Real effective	-62.8	-32.6	-23.0	-22.9	-26.9
Nominal Interest Rates	31.7	12.1	3.5	-1.1	8.0
Size of Shock					
Change in sovereign spread on dollar yields	497	286	189	133	103
Current account adjustment (percent of 1997 GDP) 2/	7.2	16.9	17.9	6.7	20.3
Interest rate + change in exchange rate (nominal)	106.5	53.0	36.4	31.1	45.6
Memo items					
Growth in 1998	-13.7	-5.8	-6.7	-0.5	-9.4
Stock market (US\$)	-50	-46	-79	-31	-58
Stock market (local currency)	-27	-38	-38	-22	-18

Notes

1/ deviation of growth rate from trend values for 1997 and 1998 (average).

2/ 1998 current account/GDP- 1996 current account/ GDP.

The main conclusion that emerges is that both large increases in interest rates and large real exchange rate depreciations are generally associated with large shocks. For example, Indonesia has the largest increase in sovereign spread, the largest real depreciation, and the biggest increase in nominal interest rates. Korea, which has the second largest increase in sovereign spreads, has the second largest exchange rate depreciation and the second largest increase in interest rates. The Philippines, in contrast, has the smallest increase in sovereign spreads, the among the smallest interest rate increases and exchange rate depreciations. Malaysia also stands out here and more generally as having allowed almost the entire shock to be born by the exchange rate.⁵⁰

This interpretation is consistent with the proposition that tighter monetary policy, all else equal, strengthens the exchange rate. An important argument in the context of the Asian crisis economies has been that by further reducing output, and weakening banks and firms balance sheets, tighter monetary policy may have the effect of driving away rather than attracting foreign capital. In this case, even countries with bad shocks (as measured for example by swings in the sovereign spread) could have accommodated by keeping interest rates relatively low and while suffering a relatively small exchange rate decline.⁵¹

This argument cannot be ruled out *a priori*. Experience in the crisis suggests, in fact, that there may be times when a contraction of monetary policy can have little positive effect. If, for example, foreign investors are convinced that insufficient foreign exchange is available to the country to service debts, or that their private counterparts are on the edge of financial bankruptcy and default on all obligations, tighter domestic liquidity may not help. In these cases, which may at times have been observed in some countries during the crisis, supportive measures such as the provision of external financial assistance and measures to restructure private debts are a vital complement to an adequately tight monetary policy in stabilizing the exchange rate.

The broader experience suggests, however, that as long as supportive policies are appropriate monetary policy does not have a “perverse” effect. Indeed, experience in many countries suggests that firm monetary policies, backed by appropriate structural and other reforms, can stabilize exchange rates and allow real interest rates to decline fairly rapidly as confidence returns. We have observed this pattern in some of the more successful of the Asian crisis countries. The sequence in Korea and Thailand, in particular, would seem to have been that the implementation of sufficiently tight monetary policy along with some sustained implementation of supporting measures in early 1998 brought exchange rate stability and a

⁵⁰The use of the March 1998 date for comparison exaggerates the lack of interest rate response by the Philippines, which was periodically strong, as Figures 5, 6 and 7 show.

⁵¹We do not see such countries, but it could be argued that the measures of shocks employed are endogenous to the policy response, with tight monetary policy raising sovereign spreads and causing bigger current account swings.

rapid subsequent decline in interest rates. An monetary policy geared towards exchange rate stability in the Philippines has also resulted in sharp but fairly short-lived increases in rates. The implementation of a relatively loose monetary policy in Indonesia in late 1997 and early 1998 led to both relatively large depreciations and continued high nominal and real interest rates, as confidence in nominal stability was slow to return.

Fiscal Policy

Table 6 shows fiscal balances from 1996 (actual) through 1998, both in original programs and actual outcomes. The initial fiscal policy response to the crisis was to enact some contractionary measures. In Thailand, this was justified in part by the need to reduce the excessive current account deficit, driven in part by fiscal expansion in 1996 and 1997, in a context in which growth was expected to be slower than previously but still strongly positive. In the other program countries, initial planned contractions were much smaller, given the smaller initial macroeconomic imbalances. In this case, the fiscal adjustment was driven in part by the need to finance the large looming expenditures involved in recapitalizing the financial system. The need to preserve scarce foreign investment and domestic credit for private sector firms, at a time when government borrowing to finance the financial system workout, argued against large increases in government borrowing for other purposes.

A further argument in favor of fiscal restraint was related to the potential effect of fiscal policy on confidence, that is on expectations regarding future policy. All of the effected countries, with the partial exception of the Philippines, had a reputation for strong fiscal discipline. Nonetheless, as the magnitude of the problems were revealed, particularly in the financial sector, and as policy-makers faced unprecedented economic and in some cases political pressures, doubts emerged as to the sustainability of the policy regime. While initial debt stocks were low, they were clearly growing rapidly and there was a case that demonstrating fiscal resolve might signal that the problem would not be allowed to grow out of control. The fiscal costs of the banking system restructuring are estimated to be enormous in most of the countries, ranging from 17 percent of GDP in Indonesia to 32 percent in Korea (though only 3 percent in the Philippines) according to one World Bank estimate (Table 2). These large increase in government borrowing suggest caution in other sorts of fiscal expansion.⁵²

As the depth of the recessions became more apparent, the arguments in favor of expansionary fiscal stances gained strength. Concerns regarding “crowding out”, that is the negative effect of fiscal deficits on the availability of credit for the private sector, became outweighed by the need to stimulate aggregate demand.

⁵²The economic impact of these quasi-fiscal deficits was presumably felt when the deficits were incurred before the crisis, not when they were recognized.

Table 6. Asian Crisis Countries: Programmed and Actual Fiscal Balance

	1996	1997 <i>Original Program 1/</i>	1997 Actual	1998 <i>Original Program 1/</i>	1998 Preliminary Actual
Central government balance (percent of GDP)					
Indonesia 2/	1.2	0.8	-1.1	1.0	-3.6
Korea	0.3	...	0.3	0.2	-5.0
Malaysia	1.1	...	-2.6	...	-1.5
Philippines	-0.6	0.0	-0.8	...	-2.7
Thailand 3/	1.9	-1.1	-0.9	1.0	-2.6
Real GDP Growth in 1998					
Indonesia				7	-13.7
Korea				3	-5.8
Malaysia				7	-6.7
Philippines				4	-0.5
Thailand				3.5	-9.4

Source: Kochhar et. al. (1998) for programs, IMF staff estimates for actuals.

Notes

1/ Original program refers to the first program negotiated with the authorities after the onset of the crisis. For the Philippines, the program already in place in July, 1997 was envisaged to run through end-1997.

2/ Fiscal year 4/1 to 3/31

3/ Fiscal year 10/1 to 9/30

There is no clear general answer on the appropriate fiscal policy in this context, and in fact policy has varied substantially across countries and especially in time. As Table 6 shows, the economic downturns have manifested themselves in increases in the fiscal deficit (only Malaysia showed a larger surplus in 1997 than in 1996). When these changes are decomposed into those resulting from changes in the economic environment (such as GDP growth and the exchange rate) and those resulting from policy measures, it appears that the increase in the deficit in Korea and Thailand in 1998 is a result of both factors, while the much more substantial rise in Indonesia reflects dramatic effects of the recession and exchange rate collapse only modestly resisted by policy measures.⁵³

It is important to emphasize that these figures reflect only imperfectly the cost of the financial restructuring programs, which as mentioned above have added several tens of percent of GDP to the level of recognized public debt in several of the countries.

IV. Outcomes

The establishment of exchange rate stability has been a protracted and difficult process. Real exchange rate declines have been huge (Figure 8a and Table 1). The exchange rates of the countries under consideration have to a large extent moved together (though Indonesia is, as elsewhere, the exception). While the Philippines weathered the shock of the July baht depreciation without much disruption, it was buffeted again by the attack on the Korean won and the collapse of the Indonesian rupiah in December and January. As a result, it took substantial movement towards resolution to the worst of the regional crisis as a whole for some measure of exchange rate stability to be restored after January 1998.

The simultaneous depreciation of most of the region's exchange rates, including continued weakening in Japan, makes the evaluation of appropriate equilibrium exchange rates a particularly difficult exercise. Nonetheless, most observers have concluded that devaluations went well beyond any degree justified by long-run fundamentals. The substantial appreciations observed in 1998 for some countries, particularly for Thailand and Korea, are consistent with this view.⁵⁴

Inflation has been restrained, despite the large depreciations, even compared to other crisis cases (Figure 8b and Table 7). This presumably reflects, *inter alia*, the flexible nature of the economies and the substantial output gap that has restrained wage increases.

⁵³See Adams et al. (1998), page 50. The division of changes in the fiscal balance into a component due to policy and one due to economic changes is fraught with difficulties. The conclusions drawn here are thus subject to some ambiguity.

⁵⁴See Goldfajn and Gupta (1999) for a discussion of the path of the real and nominal exchange rate in a large sample of developing countries following large depreciations.

Figure 8. Asian Crisis Countries: Real Exchange Rate and Inflation

Figure 8a. Real Effective Exchange Rate
(January 1997 = 100)

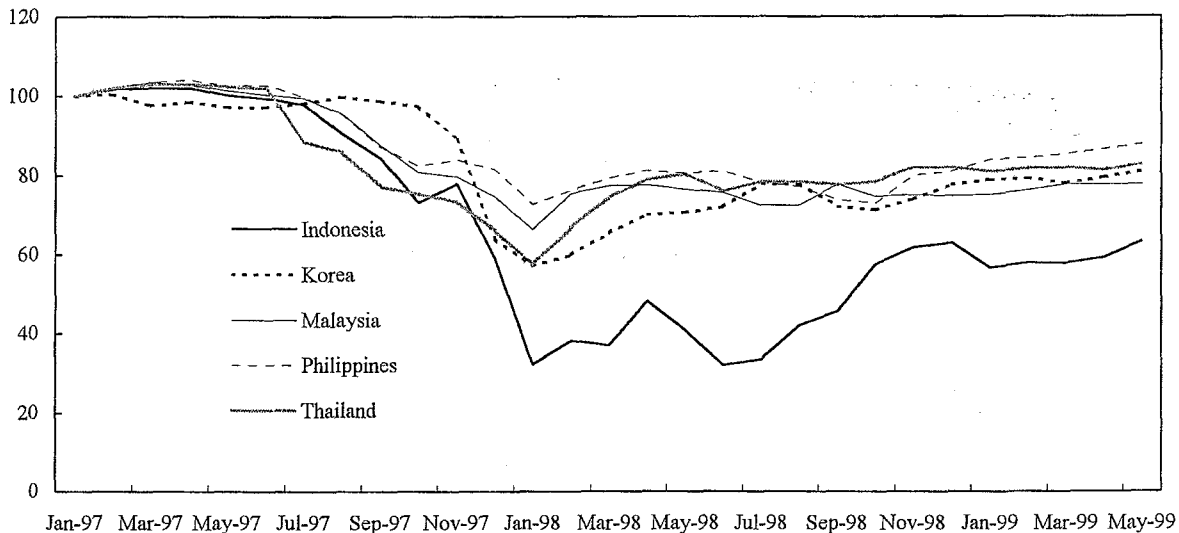
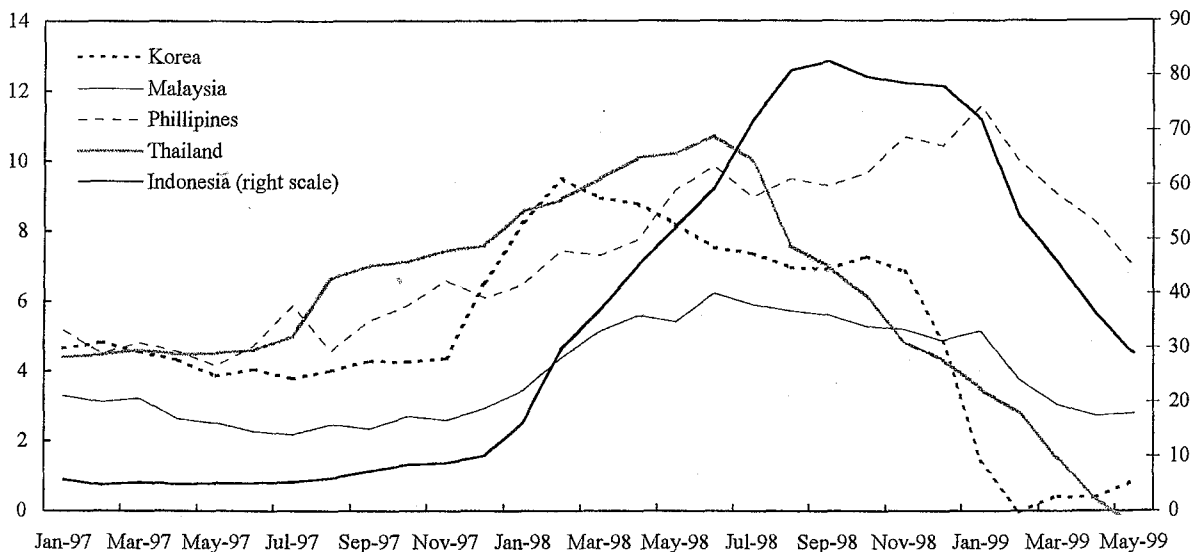


Figure 8b. Inflation
(12 month percent change)



Source: IFS and IMF staff estimates

Table 7. Asian Crisis Countries: Inflation, Depreciation and Passthrough Coefficients for Selected Crisis Cases

	CPI Inflation 1/	Depreciation 2/	Passthrough Coefficient 3/	
			(After 1 year)	(After 2 years)
Asia:				
Indonesia	54.4	434.8	0.11	
Korea	8.3	43.9	0.17	
Malaysia	5.8	37.1	0.14	
Philippines	10.3	37.3	0.25	
Thailand	10.8	46.8	0.21	
Other Cases:				
Chile (82)	31.2	92.6	0.34	0.43
Mexico (82)	108.3	269.6	0.40	0.40
Mexico (94)	48.5	122.5	0.40	0.40
Sweden (92)	4.8	52.3	0.09	0.16
U.K. (92)	1.7	32.4	0.05	0.14

Source: Goldfajn and Gupta (1998) and Stone (1998)

1/ Annualized rates based on June, 1997 - May, 1998 for Asian countries. First 12 months of the crisis for other cases.

2/ Based on NEER for Asian countries June 1997 - June 15, 1998. First 12 months of the crisis for other cases and bilateral rates with respect to the dollar.

3/ CPI inflation divided by depreciaton.

External adjustment has been rapid, with current account swings as high as 17 percent of GDP between 1996 and 1998 in Thailand (Table 1). Only the Philippines appears to have escaped a sharp reversal. The current account adjustments have taken place largely through decreases in imports, as export growth appears to have remained fairly sluggish in dollar terms outside the Philippines (Table 1). This appears to be due in large part to continued declines in the terms of trade, as relative prices of important exports such as electronics continue to decline, as well as declines in demand from Asian trading partners.

Output declines were very large in 1998 (Table 1). These collapses in output have been much larger than initially expected. Why did output decline so much? First, the worst-affected countries, in particular Thailand, Korea and Indonesia have had to accommodate a very sharp outflow of foreign capital. The resulting current account adjustments are of magnitudes that have typically been associated with very sharp output responses in other countries.⁵⁵ Second, the real depreciations and stock market declines have resulted in huge drops in wealth. Third, the rise in financial insolvency and collapse of important parts of the banking system in most of the countries can be expected to have direct negative consequences on the availability of credit and the level of investment. Finally, the collapse in confidence resulted in dramatic falls in consumption and, along with a recognition of overcapacity, also reduced investment.

More generally, adjustment to the misallocation of capital in the pre-crisis boom years is difficult and costly. Somewhat speculatively, the dramatic output declines and simultaneous recognition of long-standing weaknesses in the allocation of capital are somewhat reminiscent of the early stages of the transition from socialism in Europe. While the analogy is only suggestive, one lesson from that transition is that if directed investments have led to overcapacity in some areas, then the recognition of these losses reveals itself as a contraction in output, and the financial work-out is extremely costly.

It is important to recognize that the first four factors mentioned are plausibly a result as well as a cause of output decline, while the last risks being tautological to the extent that the size of the output collapse is considered to be evidence for a prior misallocation. A recession will tend to result in a rapid turnaround of the current account, declines in the value of stock markets, and an increase in financial distress. The thrust of this paper, however, has been to identify and characterize the vulnerabilities that set the stage for the crisis. As argued in the first section of the paper, the crises were the result of an interaction of domestic and external vulnerabilities with changes in the external environment. The output collapses that resulted from the financial panics and speculative attacks reflect these same weaknesses.

⁵⁵Milesi-Ferretti and Razin (1998) review the experience of a broad sample of countries with rapid current-account reversals. Dornbusch et al. (1995) discuss the aftermath of four external and financial crises, though their focus on episodes of exchange rate overvaluation may be inappropriate in the Asian case.

A look at the cross-country pattern of output declines sheds some light on this hypothesis. Among the five countries under consideration, those with both external and internal vulnerabilities have observed the largest declines in output. The next hardest hit had weak domestic financial systems (Malaysia) but a relatively small external financing gap. The Philippines represents a country that has largely avoided a domestic financial crisis and an external debt crisis, and as a result has observed the smallest change in its growth rate. The implication of the Malaysia-Philippines comparison is that weaknesses in the domestic financial system appear more critical than the sorts of external “panic” explanations of the crisis, at least in terms of explaining the impact of the crisis on real activity.

What role is there for post-devaluation policy mistakes in explaining the output declines? With regard to monetary policy, the section on this topic has emphasized that both higher interest rates and weak exchange rates reflect the change in market sentiment towards these countries. Monetary policy may shape this trade-off, and thus effect real output. The relationship is bound to be complex, however. Both high interest rates and weak exchange rates are damaging to the real economy. High interest rates weaken balance sheets and increase default risk as well as reducing the incentive to invest and raise the cost of working capital. Collapsing exchange rates, which also hurt firms with foreign debts and thereby increase default risk, as well as causing inflation and weakening overall confidence.

As discussed above, there is little compelling evidence that monetary policy was remarkably tight in the crisis countries. Looking at the cross-country patterns is again revealing. Indonesia, with probably the weakest monetary policy response, also had the most dramatic real collapse. Cause and effect are hard to disentangle here, as the weak state of the banking system and sudden withdrawal of foreign capital may have rendered a stronger response extremely difficult. Again, the Malaysia - Philippines comparison is interesting. Malaysia mounted the weakest interest rate defense of its currency of any of the crisis countries, essentially allowing the exchange rate to bear the entire burden of adjustment. The Philippines, in some contrast, was fairly aggressive in resisting currency fluctuations with monetary policy. Malaysia's output decline has nonetheless been much sharper. While as discussed above other explanations of the differing outcome are available, this suggests at least that a strong monetary policy is neither necessary nor sufficient for a large output collapse.

The role of other potential policy mistakes, such as possibly excessive tightening of fiscal policy or excessive (or insufficient action) to address problem banks, has been discussed above. To summarize, fiscal policy may have played some role in exacerbating the output declines, in that it seems likely that if the size of the recessions had been known ex ante then policy would have been loosened.⁵⁶ The example of Indonesia also suggests, however, that there was legitimate concern at least in some cases that weak policy responses in general, combined with deep structural problems and external vulnerability, could cause a deeply

⁵⁶As suggested in Lane et al. (1999).

destabilizing panic. On the role of financial sector policy, it seems likely that the general collapse of confidence and ultimately public order in Indonesia had a lot to do with the exceptionally large real output decline. The link with the closure of problem banks, much emphasized for example in Radelet and Sachs (1998a), is difficult to establish.⁵⁷

With the exception of Malaysia, all the crisis countries have continued with a policy of floating the exchange rate and maintaining and even increasing capital account liberalization. Malaysia, contrast, attempted to avoid the dilemma of choosing between high interest rates or a weak exchange rate through the establishment of an exchange rate peg, a looser monetary policy with some return to directed credit, and selective controls on capital flows in September, 1998. On balance, it would seem that to date these policy changes have not proven as damaging as some feared but also have not led Malaysia toward notably faster recovery than, say, Thailand or Korea. Malaysia's monetary policy was generally looser than the other countries prior to the announced change in policy direction, while exchange rate stability had largely returned before the move to the pegged exchange rate regime. Moreover, while Korea has appreciated sharply since last September, Thailand's real effective exchange rates has appreciated about as much as Malaysia (7 percent and 6 percent respectively through May 1999).

V. CONCLUSION

The discussion of causes of crisis began with the question of whether these crises should be best thought of as resulting from fundamentals inconsistent with the exchange rate regime, as in traditional accounts of currency crisis, or whether they were essentially

⁵⁷There is little systematic evidence that a credit crunch contributed to the output decline, despite the plausibility of the hypothesis. There are some anecdotal indications that a lack of credit, particularly for working capital, halted otherwise viable economic activity. On the other hand, more systematic evidence comes from Dollar and Hallward-Driemeier (1998), who find that Thai firms put access to credit last on their list of problems in 1997/1998. It is clear that with the crisis came a reevaluation of credit risks that led in some cases to an increase in the spread of risky bank loans over presumably less risky government debt (Ding, Domaç and Ferri (1998)). Moreover Domaç and Ferri (1998) find that increases in such interest rate spreads precede declines in economic activity in Korea. A flight to quality of bank deposits was also evident in most of the crisis countries. While there was a generalized increase in fear of and assessment of credit risk, the implications for financial sector policy are far from clear. To some extent, an increase in aversion to risk may be a part of the solution, not part of the problem. For example, it is reassuring that, according to Borensztein and Lee (1999b), enterprise profitability is a factor determining the quantity of bank credit obtained in Korea for the first time in 1998. Moreover, Ghosh and Ghosh (1999) find that credit demand fell by more than credit supply at the aggregate level in Indonesia, Korea, and Thailand. See the discussion of the credit crunch hypothesis in Box 10 of Lane et al. (1999), as well as Ito and Pereira da Silva (1998) for an alternate view.

mismanaged panic attacks by volatile capital markets on countries that had built up too much short-term debt. The evidence suggests that weak and deteriorating fundamentals and violent reactions in capital markets were both important.

The Thai crisis was predictable on the basis of a variety of macroeconomic and microeconomic weaknesses. Moreover, the situation was deteriorating through 1996 and the first part of 1997. It is thus not surprising that most models that are designed to predict currency crises, even those formulated and estimated on pre-1997 data, are able to identify Thailand as a country at risk of crisis in 1996.⁵⁸

The other countries clearly suffered from the spill-over from Thailand. The "contagion" may have reflected concerns about competitiveness as the baht devalued.⁵⁹ It may also have reflected financial market linkages. But it appears also to have reflected a degree of what has been called the "wake-up call" effect: as market participants observed the effects of financial sector weakness and excessive buildups of short-term debt in one country, they seem to have reconsidered their assessments of other "similar" countries.

The crises in the other countries cannot be understood, however, without appreciating the fundamental vulnerabilities that left the authorities in the countries without effective tools to counter speculative attacks. The build-up of short-term external liabilities was, in retrospect, a deep problem, particularly in Korea and Indonesia. The problem was magnified in Korea by the initial reaction of the authorities to the attacks, which was to deplete reserves without a serious supporting package in an ultimately failed defense of the exchange rate. As in Thailand, this meant that when intervention was abandoned in November 1997, the ratio of reserves to short-term external liabilities was extremely high and market participants extremely hesitant to roll over obligations. Countries that implemented various sorts of capital controls to discourage speculation, such as Malaysia and Thailand at various times, do not seem to have benefited. Apparently, if there is a time to implement capital controls it is not when capital is beginning to flee.

Weaknesses in domestic financial systems were a key reason for the virulence with which the crisis spread. Undercapitalized financial systems characterized by over leverage and large property sector loans were extremely vulnerable to an increase in interest rates, severely restricting the ability of the authorities to conduct an interest rate defense of the exchange rate. Countries such as Indonesia and Korea that also had built up large stocks of short-term external debt were particularly at risk, as in the absence of large hikes in real interest rates, the capital outflows led immediately to fears of default and still higher risk premia.

⁵⁸See Berg and Pattillo (1999a).

⁵⁹Though the World Bank (1998) casts doubt on this explanation.

Indeed, a comparison of the outcome in Malaysia and the Philippines suggests that vulnerability to attack and its negative effects on growth was more a function of the state of the banking system than of the ratio of short-term debt to reserves or other direct measures of external vulnerability. Malaysia had a strong external position and little external debt, short-term or otherwise. The Philippines, on the other hand, was fairly heavily indebted and had a ratio of short-term external debt to GDP near one. The crisis has revealed weaknesses in the Malaysian banking system, however, that have forced fiscal and structural adjustments similar in many respects to those adopted in other crisis countries. And the Malaysian economy is suffering much more severely than the Philippine in terms of the impact of the crisis on growth, the real value of the stock market, and other indicators of the state of the economy.

Stability of the exchange rate proved exceedingly difficult to obtain. The stability observed after early January 1998 was associated with: (i) apparent resolution of the most urgent external financing gap in Korea; (ii) signs of clear progress on structural reform, particularly some prospect of resolution to banking sector problems in the form of resolute disposition of insolvent institutions and measures to provide confidence that deposits were safe and recapitalization would proceed, if necessary with public resources; and (iii) firm monetary policies. The more aggressive implementation of reforms by new governments in Korea and Thailand served to further strengthen confidence. In Indonesia, in contrast, many of these elements have been inconsistently observed, in a context of deep social and political unrest.

With recovery underway in most of the countries, these conclusions are in part reflected in the output paths through early 1999 (shown in Figure 9, with Mexico 1994/1995 for comparison). Korea, in particular, looks quite similar to Mexico during its 1994/1995 crisis. Indonesia, at the other extreme, stands out for the depth of its output decline, though it too shows some signs of recovery. Korea's experience suggests that the commonly-expressed view that recovery in Asia will require a full resolution of problems in the financial sector may be no more true for some Asian countries than it was in Mexico.⁶⁰ Moreover, high growth rates observed in the Asian countries just before the crisis imply that Korea, Malaysia and the Philippines have already achieved levels of real GDP higher than those observed as recently as early 1996. These countries, along with Thailand, managed to avoid the economic and political collapse that characterized Indonesia. For them, issues of short-run stabilization now recede before the question of whether the crisis can provide a window for policy-makers to make structural reforms that promise continued high growth over the long term.

⁶⁰Krueger and Tornell (1999) argue that while overall growth was strong in Mexico, the non-traded sector suffered from the poor functioning of the financial sector.

Figure 9. Asian Crisis Countries and Mexico: Real GDP
(Seasonally adjusted)

Figure 9a. Index, 1997 Q3 = 100 (Mexico starts in 1994 Q3)

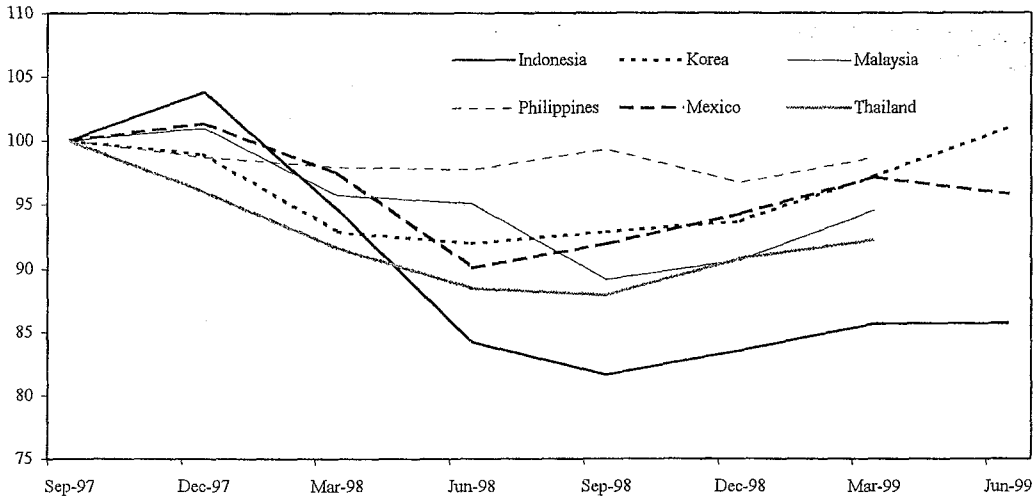
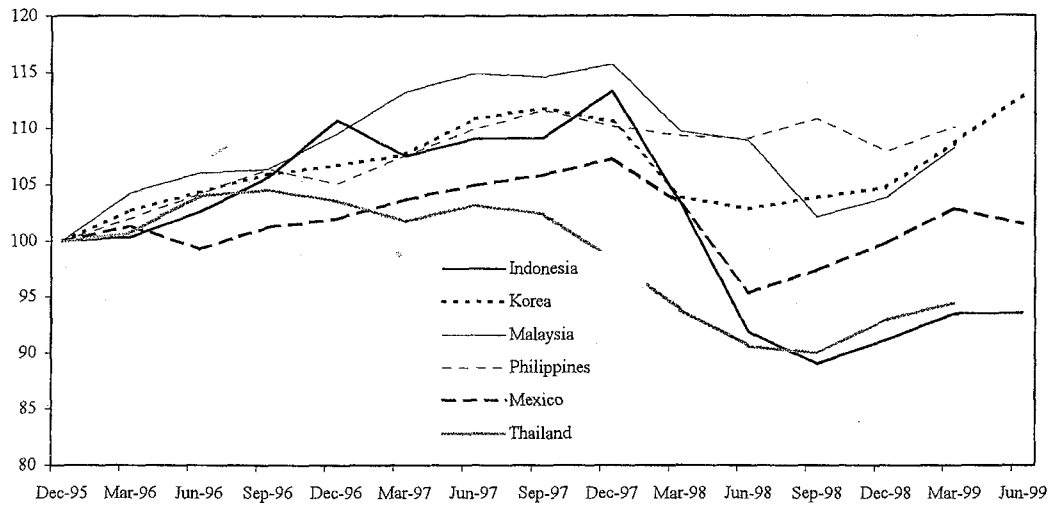


Figure 9b. Index, 1995 Q4 = 100 (Mexico starts in 1992 Q4)



Source: IFS, IMF Staff Estimates, Bloomberg, and author's calculations

The Run-Up to the Crisis⁶¹

Thailand

Thailand's crisis was in many ways predictable on the basis of a deterioration in all the areas of weakness mentioned above. The macroeconomic situation was deteriorating by 1996. During 1993-95, demand pressures intensified, leading to higher inflation and a sharp widening of the current account deficit. As monetary and fiscal policies were tightened, the combination of the pegged exchange rate and increasingly open capital account resulted in large capital inflows, much of which were short-term. At this point, the macroeconomic problems interacted with the weak financial system to create domestic and external vulnerabilities. The capital inflows were intermediated primarily by commercial banks and finance companies, leading to rapid credit growth--especially to the property sector--and growing concerns about asset quality. At the same time, many domestic companies acquired large unhedged foreign exchange positions, as a result of rapid borrowing in dollars.

The situation deteriorated sharply during 1996. Export growth slowed sharply, in part due to an appreciation of the baht as the dollar, to which the baht was pegged, appreciated, and partly due to increased competition particularly from China.⁶² Though imports slowed as well, the current account deficit remained high. As market confidence ebbed, the stock market dropped steeply and the property sector weakened, exacerbating the deterioration in asset quality in the financial system. In the 12 months leading up to the July devaluation, the government took over the Bangkok Bank of Commerce, several banks' credit ratings were downgraded, the largest finance company was intervened and merged with a bank, and there were runs on several finance companies' deposits. Capital inflows slowed and there were four, increasingly intense, speculative attacks on the baht after July 1996. As the situation worsened, Moody's downgraded short-term sovereign ratings in September 1996 and long-term sovereign ratings in March 1997. Aggravating the situation was a sharp deterioration of the fiscal stance, with a deficit forecast to grow by more than three percent of GDP in 1996/97.

In the face of the worsening external environment, the Thai authorities policy response was piecemeal. The Bank of Thailand began in early 1997 supporting the currency largely

⁶¹For purposes of dividing the discussion into causes, policy responses and outcomes, the discussion of the run-up ends with the announcement of an IMF agreement in the case of Korea, Indonesia and Thailand, and with the end of the pegged exchange rate regime in the case of Malaysia and the Philippines (which did not have new IMF programs). Only for Indonesia is there an important distinction between the end of the peg and the announcement of the program, with the peg ending in August and the program not announced until October.

⁶²See Bond and McDermott (1997) for a discussion of the factors behind the export slowdown.

through an unreported forward sale of baht, with the stock of forward sales outstanding rising from about 5 billion dollars at the end of 1996 to about 30 billion at the end of June 1997, roughly equal to the stock of reserves. Meanwhile, several percent of GDP was spent by the government supporting financial institutions in the first half of 1997. As the May speculative attack mounted, the authorities accelerated their forward sales of foreign exchange and in June suspended 16 finance companies that had received several times their equity in support. None of these measures succeeded in defeating the pressure on the exchange rate. Short-term interest rates had been kept fairly low, but they finally increased above 20 percent in late June as pressure mounted. Finally, the authorities allowed the exchange rate to float on July 2.

Korea

Korea was characterized by a deteriorating financial situation in the financial and corporate sector well prior to the final attack on the won in October 1997. As discussed above, already low ratios of corporate profits to interest costs fell further in 1996, partly do to an external shocks in the form of a sharp deterioration of the terms-of-trade and abetted by the appreciation of the won vis a vis the yen in 1996. Six Chaebol went bankrupt in 1996 and first half of 1997. Meanwhile, the banking system grew weaker as well into 1997. Non-performing loans tripled to 7.5 percent of GDP at end-September 1997 from end-1996. An index of bank stock prices fell by 67 percent from its peak (August, 1991) to late October, much more than an index of manufacturing stocks.

External finance began drying up for Korea even prior to the Thai devaluation in July 1997, a investors became increasingly concerned about the looming domestic financial problems. Usable reserves had already begun to fall and short-term external debt accumulated in the first half of 1997 as the situation deteriorated (Table 5). The Bank of Korea reported reserves of about \$33 billion at the end of 1996, \$29 billion at end-March and \$31 billion at end-October 1997. In fact, though, many of these reserves had already been placed with foreign branches of Korean banks that had become illiquid. When Korean banks used these dollars to satisfy demands for dollars from creditors who did not roll over dollar obligations, the reserves were essentially used. These deposits of unavailable reserves already amounted to \$3.5 billion at the end of 1996, but with overseas branches of Korean banks coming under increasing liquidity pressure with the growing weaknesses in the corporate sector, the Bank of Korea extended further support, so that the stock rose to \$8 billion by end-March 1997.⁶³

The Korean won came under increasing pressure after the Thai devaluation and particularly after the devaluation of the New Taiwan dollar in mid-October and the subsequent brief but violent attack on the Hong Kong yuan. The authorities responded with In response, authorities announced an intent to defend the won and address financial sector problems. The majority party proposed to clean up debt-ridden banks and encourage foreign investment, but the bill failed to pass the legislature. After substantial foreign exchange intervention but little

⁶³See Adams et al. (1998).

increase in interest rates, Korea abandoned the defense of the won on November 17. Korea began to negotiate an IMF package on November 21 and announced its agreement on December 4th.

Indonesia

Indonesia appeared in early 1997 to be in substantially better shape than Thailand on essentially all counts. The export slowdown was smaller, reserve growth was strong, the fiscal stance was not loosening, the current account deficit was smaller, the exchange rate was less appreciated, and the recourse earlier to a more flexible exchange rate regime implied more ability to withstand shocks. There was little evidence of property price declines in Jakarta, and little sign of weakness in the stock market.

There were important vulnerabilities, however. The stock of short-term external debt had risen to high levels, though information was extremely scarce as the debt was contracted not by the government or banking system but largely by private non-financial corporations directly with foreign creditors. Within the banking sector, growth in exposure to property lending had been rapid (rising from 11 percent to 20 percent of total loans in three years). Moreover, there was a lack of aggressive bank closures with insolvent institutions continuing to function.

After the Thai devaluation, the rupiah came under pressure as Indonesia's large stocks of short-term external debt and weak banking system left it vulnerable to capital outflows. Indonesia mounted a vigorous interest rate defense, with over-night rates rising to near 100 percent, but with fears of banking system collapse mounting the authorities chose to allow rates to come down and to float the rupiah on August 14. By end-October, Indonesia was already as hard hit as Thailand. Indonesian corporates were finding it increasingly difficult to rollover maturing short-term external credits. The recourse of these debtors to foreign exchange markets to replace the lost foreign exchange placed increasing pressure on the rupiah as well as on local currency interest rates. The damage the resulting high interest rates were doing to the banking system reduced confidence in the ability of the authorities to maintain policies, and indeed they responded by lowering interest rates, which in turn worsened the downward pressure on the exchange rate. The weakness in the banking system was thus a result of the maturing short-term external debt, aggravated by thinness of financial markets, with the banking system already badly hurt by increases in interest rates and declines in the exchange rate.

At the end of October Indonesia announced a \$23 billion external assistance package led by the IMF with support from the World Bank and Asian Development Bank as well as bilateral donors.

Malaysia

Malaysia's situation prior to the crisis looked strong in many ways. In terms of macroeconomic indicators, growth was strong but overheating was reduced in 1996, with the current account deficit declining. The financial sector appeared robust, with measured non-performing loans declining from 20 percent of total loans in 1990 to under 4 percent in 1996. Capital adequacy ratios in the banking system appeared high, while the supervisory and regulatory framework was generally deemed strong. There was little dependence on foreign capital, particularly, short-term flows, with strict controls on short-term borrowing, net foreign exchange positions of banks, and off-balance-sheet activities.

There were some important warning signs nonetheless. The current account deficit at over 5 percent of GDP was still large. Exports had slowed, in large part due to falling foreign demand and some real appreciation of the ringitt, though also because of increased competitive pressures from China and elsewhere. In terms of domestic financial vulnerability, domestic credit growth remained strong, particularly in the consumption and property sectors. While property prices were fairly stable, there were concerns that a coming surge of supply could depress prices, particularly in an economic downturn.

After the Thai devaluation, the ringitt came under strong pressure and was floated, after brief interest rate defenses and some intervention, on July 14.

The Philippines

The Philippines was in a period of improved economic performance. Macroeconomic stability had been established, with stronger fiscal performance and good economic growth. The banking system was still recovering from serious problems early in the decade. External vulnerabilities appeared the most pronounced, with short-term external debt representing a fairly high fraction of reserves at the end of 1996 at about 70 percent. The amount subject to rollover risk, however, was judged to be relatively small. The degree of dollarization in the banking system was a source of concern, with foreign currency deposits of about \$11 billion.

The peso also came under pressure after the Thai devaluation and was floated, after brief interest rate defenses and some intervention, on July 11.

The Unfolding of the Crisis

The evolution of events in each country cannot be understood except in the context of the unfolding of the crisis in the region.⁶⁴ This section briefly reviews the major developments in Indonesia, Korea, Malaysia, the Philippines and Thailand from July 2, 1997 to May, 1998. The crisis as a whole can be divided into five phases.⁶⁵ (Figures 4a and 4b show daily interest and exchange rates by country for the entire period, while Figures 5, 6, and 7 show nominal exchange rates, stock market indices, and spreads on dollar-denominated sovereign issues respectively).

1. Weakness in ASEAN Countries: July 2 to October 23, 1997

After the Thai devaluation, the currencies of **Indonesia**, the **Philippines**, and **Malaysia** came under the most pressure. The **Philippine** peso and the **Malaysian** ringitt were floated, after brief interest rate defenses and some intervention, on July 11 and July 14 respectively. **Indonesia** mounted a vigorous interest rate defense, with over-night rates rising to near 100 percent, but with fears of banking system collapse mounting the authorities chose instead to float the rupiah on August 14.

On August fifth **Thailand** unveiled an austerity plan and program to restructure the financial sector in the context of the IMF support package, which was approved on August 20th. The financial program was designed to be a comprehensive plan to (i) identify and close insolvent institutions to preserve the system; (ii) provide a government guarantee of bank depositors to maintain confidence; and (iii) implement broad-based structural and regulatory reforms to provide stronger framework for the long term. 58 finance companies (including 16 already identified prior to the devaluation) were to be suspended. The announcement of the program had a brief positive impact but did not stem the tide, partly due to continued concerns about the health of the financial system and lack of information about the government's policy commitments.

Through October, all four currencies tended to weaken, as a stream of bad news emerged. The existence of **Thailand's** \$23 billion in outstanding forward contracts surprised markets in October. While the implications of these forward contracts for Thailand's usable reserve position was not well understood, the initial reaction was to calculate reserves net of this amount, which apparently left the central bank with little "net" reserves. Fears grew about the solvency of the Thai banking system, with Standard & Poor's downgrading seven

⁶⁴Adams et al. (1998) discuss and Baig and Goldfajn (1998) document statistically the importance of contagion in the crisis.

⁶⁵This five-fold division comes from and the discussion in this section draws heavily on Adams et al. (1998) as well as various IMF Staff Reports. Baig and Goldfajn (1998) provide a useful chronology of important events.

institutions in September. Meanwhile, **Malaysian** authorities issued contradictory policy statements and attacked "rogue speculators" as the source of the problems in the region. Growth and profit forecasts were revised downward in all the countries. In the **Philippines**, concerns regarding the health of the banking system were relatively muted.

By October 22, exchange rates had fallen by 51 percent in Indonesia, 60 percent in Thailand, 34 percent in Malaysia and 32 percent in the Philippines (The Korean won had remained stable).

2. Crisis Spreads to Korea: October 23 to December 4, 1997

The second stage began with the devaluation of the New Taiwan dollar in mid-October and subsequent brief but violent attack on the Hong Kong dollar and ended with Korea's IMF agreement in early December. The attack on Hong Kong's currency board was followed by pressure on a number of emerging market exchange rates worldwide, including Brazil and Russia. While the ASEAN countries maintained some stability, the **Korean** won came under increasing pressure. Korea announced an intent to defend the won and address its financial sector problems. The majority party proposed to clean up debt-ridden banks and encourage foreign investment, but the bill failed to pass the legislature. After substantial foreign exchange intervention but little increase in interest rates, Korea abandoned the defense of the won on November 17. Korea began to negotiate an IMF package on November 21 and announced its agreement on December 4th.

Meanwhile, the **Indonesian** rupiah came under increasing pressure. Although relatively unscathed early on, Indonesia was already as hard hit as Thailand by end-October. Indonesian corporates were finding it increasingly difficult to rollover maturing short-term external credits. The recourse of these debtors to foreign exchange markets to replace the lost foreign exchange placed increasing pressure on the rupiah as well as on local currency interest rates. The damage the resulting high interest rates were doing to the banking system reduced confidence in the ability of the authorities to maintain policies, and indeed they responded by lowering interest rates, which in turn worsened the downward pressure on the exchange rate. The weakness in the banking system was thus a result of the maturing short-term external debt, aggravated by thinness of financial markets, with the banking system already badly hurt by increases in interest rates and declines in the exchange rate.

At the end of October **Indonesia** announced a \$23 billion external assistance package led by the IMF with support from the World Bank and Asian Development Bank as well as bilateral donors. Monetary policy was to be geared to defend the exchange rate, though with consideration given to the effects of high interest rates on the financial system. The strategy of the financial sector package was to preserve a healthy core by eliminating unviable banks, to avoid a spread of panic. On November 1 the authorities closed 16 banks and placed a number of others under receivership as part of a broader program to improve supervision recapitalize, and implement broad structural reforms. The initial reaction was not as positive as had been hoped for. Confidence in the banking system was not restored, as deposits fled from weak

banks that had not been closed to state and foreign banks and out of the system entirely, while foreign loans continued to be withdrawn. The authorities responded by increasing liquidity, lowering interest rates back towards pre-crisis levels. Nonetheless, the exchange rate stayed reasonably stable during this period.

3. **Near-Default in Korea, Collapse in Indonesia: December 1997**

In the third phase, from late November to late December, the situation in **Korea** and **Indonesia** deteriorated sharply, bringing renewed pressures on the rest of the countries. The revelation at the time of the IMF program announcement that **Korea** had almost no usable reserves left, and doubts about the size of the official support package, brought foreign credit roll-over rates to very low levels and raised serious concerns of default. Bank closures failed to restore confidence in the banking system, in part because of doubts about many remaining banks. The election of dissident Kim Dae-jung as president on December 18 initially raised further concerns, as he had been the candidate least supportive of the IMF agreement. In **Indonesia**, rumors that president Suharto was gravely ill precipitated a further sharp slide in the rupiah at about the same time as the won moved sharply lower, in early December. As rollover rates on external credits fell to very low levels, fears of imminent default intensified towards the end of December, both in Indonesia and Korea.

On December 24, the announcement of a strengthened **Korean** program, supported by further IMF disbursements and bilateral support, began to help turn around the climate, with roll-over rates on external debt increasing. Discussions began between creditor banks and **Korean** authorities about a concerted roll-over of short-term credits into medium-term loans, with the strong support of creditor banks' governments.

The **Malaysian, Philippine** and **Thai** currencies were all caught up in the worsening external climate through this period as all fell to new lows, with the won and the rupiah, in early January.

4. **The Beginning of Recovery: January to May 1997**

The **fourth phase**, beginning in early January, marked the bottom of the crisis and the beginnings of recovery for most of the countries, as well as signs of more substantial differentiation among the countries by investors. Late December agreement by most of **Korea's** creditor banks to roll-over their claims while negotiating a voluntary rescheduling, along with IMF and bilateral support and firmer implementation of reforms, caused fears of default in Korea to recede and the won recovered. The stock of short-term debt had shrunk to about \$40 billion dollars with the finalizing of the debt restructuring agreement in April. In this same month Korea returned to private capital markets with a successful \$4 billion dollar sovereign issue. Meanwhile, the GDP decline appeared to be much steeper than hoped. Small and medium enterprises, in particular, faced a cut-off of credit in part due to the devastation in the merchant banking sector that had served them disproportionately.

The **Thai** baht also recovered strongly, partly on strong policy implementation by the new government that took office in December. The implementation of the financial restructuring plan gained momentum, as four weaker banks were taken over and depositors protected, and new loan classification and provisioning rules were approved at end-March. Bank recapitalization, largely through private capital injections, proceeded faster than many market participants had expected. GDP growth estimates continued to fall, however, and corporate debt problems worsened.

The **Malaysian** ringitt and the **Philippine** peso also recovered strongly from early January lows.

Indonesia's path diverged somewhat during this fourth phase. The rupiah weakened sharply throughout January, with a brief pause in mid-month. By this point, the severity of the decline in the real economy was apparent. Most firms were technically bankrupt and many were defaulting on external and internal payments. The financial position of the banks continued to deteriorate. Funds continued to flee the banking system and the currency, and by early January foreign interbank lines of credit were being cut even to state banks.

Many factors contributed to this poor performance. The authorities failed to demonstrate strong commitment to the reform program. On monetary policy, the central bank felt that it could not tighten without causing payments problems. The budget announced on January 6 appeared to be based on unrealistic economic assumptions. There was backtracking on important elements of the structural reform program. Some important steps were taken, however, including to restructure the financial sector, reduce tariffs, and increase excise taxes.

The January 15 adjustment to the program focussed on an enlarged structural reform agenda, to eliminate virtually all barriers to external trade, abolish almost all domestic monopolies, and significantly increase transparency in the public sector. It also emphasized a strengthening of the social safety net. The announcement of this program failed to stem the decline, however.

The rupiah started a protracted recovery at the end of January, when new measures to restore the banking system to health and carry out a broad range of reforms were implemented. A guarantee of the rupiah value of depositors and bank creditors (excluding subordinated debt holders) was announced, while a "bridge bank" (the IBRA) was created to rehabilitate and restructure unsound banks, recapitalizing banks and purchasing bad loans. Almost immediately, funds started flowing back into the banking system. With regard to the foreign debt situation, the authorities, with the support of the IMF and bilateral creditors, encouraged debtors and creditors to group together to develop a framework for debt restructuring that was to be private sector-led, voluntary, and without public subsidy or guarantee. They also promised stronger structural reforms: monopolies, trade deregulation, marketing arrangements eliminated, FDI barriers and external tariffs reduced.

Indonesia's recovery was partial and interrupted, however. While the exchange rate appreciated from its lows, weak implementation of structural reforms, a failure to restore confidence in the banking system, and fears of social unrest and doubts about the survival of the Suharto regime continued to generate capital outflows. Foreign credit lines, including trade credits, continued to be cut.

Towards the end of this phase, some clearer signs of progress were evident in Indonesia. While the plan to voluntarily restructure external corporate debt did not make much progress by mid-March, a corporate debt initiative announced as part of the April revision to the IMF program provided some confidence. The April program included a commitment to firm monetary policy, a revamping and acceleration of bank restructuring, far-reaching structural reforms, and some budget loosening to accommodate subsidies and financial costs while still depending on foreign financing, and a new corporate debt workout mechanism with a limited government role. Augmented official financing and efforts to encourage the maintenance of foreign credit lines and trade credit would, it was hoped, combine with the other measures to restore stability to the exchange rate.

5. Renewed Weakness as Yen Slides: Starting Mid-May 1997

The fifth phase began in mid-May, with a further round of weakness triggered largely by renewed weakness in the Japanese yen and related concern regarding the possibility of a devaluation of the Chinese renminbi. Most of the currencies weakened but stabilized by June. Estimates of the depth of the recessions in all the countries continued to mount. Nonetheless, restructuring programs seemed to be well under way in most of the countries. With the improving situation, authorities have been able to bring interest rates gradually down without weakening exchange rates, particularly in **Thailand** and **Korea**. In **Indonesia**, political and social unrest intensified in May, eventually resulting in the fall of the Suharto government.

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