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Origins of the Crisis

Financial crises are seldom generated by one or two isolated factors.[1] The Asian financial crisis is no exception. In what follows, I analyze its multiple origins.

Financial-Sector Weaknesses

Each of the ASEAN-4 economies experienced a *credit boom* in the 1990s, that is, the growth of bank and nonbank credit to the private sector exceeded by a wide margin the already rapid growth of real GDP (see part A of table 4). The credit boom was stoked in part by large net private capital inflows and directed in good measure to *real estate and equities*.[2] As illustrated in part B of table 4, exposure to the property sector accounted for roughly 25 to 40 percent of total bank loans in Thailand, Indonesia, Malaysia, and Singapore and more than that in Hong Kong.[3] Data on

1. Goldstein and Reinhart (forthcoming 1998) show that in most emerging-market banking and currency crises of the past 25 years, a high proportion of warning signals were flashing.

2. Montiel and Reinhart (1997) argue that the sterilization policies followed by the host (capital inflow) countries played an important part in setting the stage for the subsequent crisis; specifically, sterilization operations kept domestic interest rates in the host countries higher than would otherwise have been the case, thereby inducing both larger net inflows and a high share of interest-sensitive short-term flows.

3. In Thailand, Indonesia, and Malaysia, this exposure was compounded by high (80 to 100 percent) loan to collateral ratios. Also, most of banks' exposure to the property market reflects exposure to property developers rather than to homeowners; see Goldstein and Hawkins (1998).

Table 4 Growth and composition of bank lending, 1990-96 and 1998

A. Growth of bank credit to the private sector relative to the growth of GDP

	1990-94	1995	1996
Thailand	10.0	11.1	5.8
Indonesia	10.4	4.4	5.7
Malaysia	3.1	10.5	13.1
Philippines	10.7	27.4	31.5
Hong Kong	8.8	8.9	–6.1
Singapore	0.8	7.8	5.7
Korea, South	2.6	2.2	–0.6
Mexico	25.7	–0.6	–36.0

B. Estimates of the share of bank lending to the property sector

	end-1997
Hong Kong	40-55
Singapore	30-40
Thailand	30-40
Malaysia	30-40
Indonesia	25-30
Korea, South	15-25
Philippines	15-20

Sources: Bank for International Settlements (1997); Eschweiler (1998).

exposure of banks to the equity market are harder to come by, but the rising ratio of stock market credit to GDP in Malaysia and the large-scale holdings of equities by South Korean banks have contributed to the strains in these economies.[4]

This overextension and concentration of credit left the ASEAN-4 economies vulnerable to a shift in credit and cyclical conditions. When that shift came, induced initially by the need to control overheating and later on by an export slowdown and by an effort to defend exchange rates with high interest rates against strong market pressures, it brought with it, inter alia, falling property prices and a rising share of nonperforming

4. The highly leveraged state of the Malaysian economy may explain why the authorities have been reluctant to use an aggressive interest rate defense to slow the decline in the ringgit. According to estimates reviewed in Eschweiler (1997a), the impact of a rise in the short-term interest rate on GDP is higher in Malaysia than in the other ASEAN-4 economies. Walsh (*Sydney Morning Herald*, 22 October 1997) documents that in 1997 the ratio of stock market credit to GDP in Malaysia was higher than that in the United States just prior to the Great Depression.

bank loans.[5] Reflecting the significant amount of office space coming on stream, most private analysts conclude that the fall in real property prices in Asian emerging economies has still not fully run its course.[6] Because the credit boom began and ended earlier in Thailand and Indonesia than in Malaysia and the Philippines, the effects were first visible in the former two countries.

While there is considerable variation across the different studies, private-sector estimates of peak and actual nonperforming bank loans point to extreme banking difficulties (that is, shares of nonperforming to total bank loans in the 15 to 35 percent range) in Thailand, South Korea, and Indonesia, and some analysts see Malaysia's banking industry as also in bad shape (see table 5).[7] The same studies suggest that banks in the Philippines have not been as devastated as in the worst-hit group but nevertheless are much more fragile than the strong banking systems of Hong Kong and Singapore.[8]

In Thailand and Indonesia, vulnerability was also heightened because banks and/or their corporate customers—in seeking to minimize their borrowing costs—agreed to shoulder rollover and currency risk; that is, *too much of their foreign borrowing was undertaken at short maturities and/or denominated in foreign currency*.[9] At the time, this was not thought to be such a risky strategy because the Thai baht and the Indonesian rupiah had been stable with respect to the US dollar for many years and because the combination of weak economic activity, a huge stock of bad loans in the banking system, and a public antipathy to bailing out banks seemed to point to the continuation of low interest rates in Japan. Nevertheless, these liquidity and currency mismatches eventually took their toll—in motivating speculative attacks, in magnifying the consequences of subse-

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5. See Bank for International Settlements (BIS) (1997). BIS (1997) also provides evidence that property-price booms in Asian emerging economies have tended to be more pronounced than those in larger industrial countries—an outcome that it attributes in part to the rapid pace of industrialization and urbanization in Asia that in turn contributes to an extremely strong demand for new buildings.

6. See, for example, Eschweiler (1997a).

7. By ''peak'' nonperforming loans, I mean estimates of the maximum level of nonperforming loans for the duration of the crisis (usually taken to encompass 1998–99).

8. Banks in the Philippines hold relatively high levels of capital (see Eschweiler 1998).

9. The contention that vulnerability was linked to the composition of external borrowing rather than to the overall external debt burden is supported by cross-country comparisons of the ratios of external debt to GDP and external debt to exports. Specifically, only Indonesia among the five most adversely affected Asian economies has a relatively high debt burden relative to exports—and one that is still lower than those of Argentina and Brazil. Relative to GDP, Thailand and the Philippines have higher debt burdens than their neighbors but not ones outside the range experienced by many developing countries. See Radelet and Sachs (1998) and Goldstein and Hawkins (1998).

Table 5 Estimates of actual and peak nonperforming bank loans in selected Asian emerging economies

Study	Thailand	Korea, South	Indonesia	Malaysia	Philippines	Singapore	Hong Kong
Jardine Flemming (1997)							
PNPL/TL	19.3	na	16.8	15.6	13.4	3.8	na
PNPL/GDP	20.0	na	10.8	22.9	7.2	3.8	na
Ramos (1998), Goldman Sachs							
ANPL/TL	18.0	14.0	9.0	6.0	3.0	2.0	2.0
PNPL/TL	>25.0	>25.0	>25.0	12.0-25.0	10.0-15.0	>8.0	>8.0
PNPL/GDP	40.0	34.0	16.0	17.0	7.0	9.0	13.0
Jen (1998), Morgan Stanley							
ANPL/TL	18.0	14.0	12.5	6.0	na	na	na
Peregrine (1997)							
ANPL/TL	36.0[a]	30.0	15.0	15.0	7.0	4.0	1.0
Eschweiler (1998), JP Morgan							
ANPL/TL	17.5	17.5	11.0	7.5	5.5	3.0	1.8
BIS (1997), official estimate for 1996							
ANPL/TL	7.7[b]	0.8	8.8	3.9	na	na	2.7

na = not available
PNPL = Peak nonperforming loans (1998-99)
ANPL = Actual nonperforming loans (1997 or 1998)
TL = Total loans

a. Includes finance companies.
b. Estimate for 1995.

Table 6 Liquidity and currency mismatches as of June 1997

	Ratio of short-term debt to international reserves	Short-term debt as a percentage of total debt	Ratio of broad money to international reserves
Korea, South	3.0	67	6.2
Indonesia	1.6	24	6.2
Thailand	1.1	46	4.9
Philippines	0.7	19	4.9
Malaysia	0.6	39	4.0
Singapore	na	na	1.0

na = not available

Sources: World Bank (1998); Goldstein and Hawkins (1998); IMF, *International Financial Statistics*.

quent exchange rate changes, and in limiting the authorities' room for maneuver in crisis management.[10]

After the Bank of Thailand drained much of its net international reserves in defense of the baht, the rollover of its large short-term debt obligations became problematic. In Indonesia, the main problem was currency mismatching on the part of corporations.[11] Once the value of the rupiah could no longer be assured, and even more so after the currency was floated, belated efforts by Indonesian corporations to hedge their large short foreign-currency position in the market helped to fuel the rupiah's decline. And, as the rupiah fell, its adverse effect on the debt burden of firms only acted to sap market confidence and to stoke the currency's further decline. In South Korea, too, the rollover of short-term foreign-currency-denominated debt—this time on the part of banks—eventually became the action-forcing event of that crisis.

Table 6 presents several indicators of liquidity/currency mismatch for the Asian emerging economies. Taken as a group, these indicators support the view that South Korea, Indonesia, and Thailand were more ''mismatched'' than their neighbors in the run-up to the crisis.[12] The contrast

10. Calvo and Goldstein (1996) show that similar liquidity and currency mismatches made Mexico more vulnerable than its Latin American neighbors to attack in 1994 . Grenville (1998) emphasizes the differences between the effects of hedged versus unhedged exchange rate changes. Mishkin (1997) makes a persuasive case that heavy reliance on foreign-currency-denominated borrowing not only makes it easier to get into a crisis but also makes it harder to get out of one (because the borrowing country cannot reduce the real value of its liabilities by undertaking a devaluation).

11. Perry and Lederman (1998) and Ito (1998a) show that the ratio of external debt (owed to international banks) to international reserves for the nonbank private sector was much higher in Indonesia in mid-1997 than it was in the other four Asian-crisis economies.

12. See also Perry and Lederman (1998) for other indicators of liquidity and currency mismatch, including the ratio of net foreign assets of the banking system to M2 and the ratio of short-term debt owed to international banks to international reserves. They reach a similar qualitative conclusion on the relatively high vulnerability of South Korea, Thailand,

would be even sharper if *net* rather than gross international reserves were used in such ratios, because Thailand's commitments in the forward exchange market and South Korea's lending of reserves to commercial banks meant that the figures on gross reserves conveyed a misleading impression of the authorities' usable liquid assets.[13]

The buildup of credit booms and liquidity/currency mismatches in the ASEAN-4 countries would not have progressed so far had it not occurred against a backdrop of long-standing weaknesses in banking and financial-sector supervision.[14] As in many other emerging economies, loan classification and provisioning practices were too lax.[15] There was too much ''connected lending'' (lending to bank directors, managers, and their related businesses), with all the attendant dangers of concentration of credit risk and lack of arms-length credit decisions (''crony capitalism''). There was excessive government ownership of, and/or government involvement in, banks.[16] Banks often became the ''quasi-fiscal'' agents of governments, providing an oblique mechanism for channeling government assistance (off-budget) to ailing industries. In most of these economies (Hong Kong and Singapore are notable exceptions), bank capital was inadequate relative to the riskiness of banks' operating environment.[17] Based on past behavior, there was a strong expectation that, should banks get into trouble, depositors and creditors would get bailed out, and bank supervisors lacked the mandate to counter strong political pressures for

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and Indonesia—not only within East Asia but also relative to most emerging economies in Latin America.

13. In this connection, Bhattacharya, Claessens, and Hernandez (1997) estimate that on the eve of the Thai crisis, the ratio of short-term gross external liabilities to net international reserves was on the order of six in Thailand versus less than two in Indonesia and less than one in both Malaysia and the Philippines. Ito (1998a) mentions the lending of South Korean reserves to commercial banks in assessing the adequacy of reserves.

14. See Folkerts-Landau et al. (1995) and Lincoln (1997). Common weaknesses in banking supervision in emerging economies are discussed more extensively in Goldstein (1997a), Goldstein and Turner (1996), and IMF (1998a).

15. A common practice, known in the literature as ''evergreening,'' is to provide a troubled borrower with new loans so that he/she can continue to make payments on the old loan. A good loan classification system would grade a loan according to a forward-looking and comprehensive evaluation of the borrower's creditworthiness—not simply on the payment status of the loan; that is, it would evaluate the loan on the basis of the likelihood that the borrower could meet the next 10 payments, not exclusively on whether the borrower made the last payment. In addition, in several of the crisis countries, loans could be delinquent for 6 to 12 months before they were classified as nonperforming (versus 3 months in the US system). See Goldstein (1997a), Basle Committee on Banking Supervision (1997), and IMF (1998a) for further discussion of good loan classification and provisioning practices.

16. See Williamson and Mahar (1998) for figures on the size of the state-owned banking sector in selected emerging economies.

17. See Goldstein and Turner (1996).

regulatory forbearance.[18] On top of all this, the quality of public disclosure and transparency was poor. For example, the 1997 Bank for International Settlements *Annual Report* contains a missing entry for Thailand's share of nonperforming loans in the banking system for 1996, and estimates of nonperforming loans by outside analysts tended to be on the order of two to three times larger than the last published official figures (see table 5). In South Korea, the discrepancy between official and private estimates of nonperforming loans was even larger still.

But how did banks and their customers in these countries obtain the external financing that helped to support such lending decisions? After all, it takes two to tango. It is well to recall that the 1990s were a period of *bountiful global liquidity conditions*. During that time, over $420 billion in net private capital flows went to Asian developing countries. Private capital flows rebounded quickly after the Mexican crisis: 1996 was a record year for private net flows to emerging economies; moreover, spreads declined, maturities lengthened, and loan covenants weakened.[19] The nearness of a major financial center—namely, Tokyo—with extremely low interest rates also gave rise to a large ''carry trade,'' where funds could be borrowed directly from Japanese institutions or intermediated via US lenders. Moreover, the Bangkok International Banking Facility (BIBF)—created with incentives to promote Bangkok as a regional financial center and intended to raise funds from nonresidents and lend them to other nonresidents (''out-out'' transactions)—turned out to be merely a conduit for Thai banks and firms to borrow abroad (''out-in'' transactions).

Last but not least, and much like Mexico ''before the fall,'' the ASEAN-4 economies were widely viewed by lenders to be among the most attractive sovereign borrowers among emerging markets.[20] After all, over the past decade they had integrated themselves into the world economy and had recorded unusually rapid rates of economic growth, high saving and investment rates, and disciplined fiscal positions. The latter factor may

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18. Krugman (1998a) and Dooley (1997) stress implicit and explicit government guarantees as a key factor in motivating large capital inflows into these economies. Calomiris (1997) attributes the greater frequency of banking crises in the past several decades primarily to the expansion of the de facto official safety net. Goldstein (1998b) argues that government guarantees need to be viewed in conjunction with financial liberalization and other factors to explain the greater incidence of banking crises during this period. See also the discussion in chapter 3.

19. One recent study by Cline and Barnes (1997) found that the sharp decline in average spreads on emerging-market Eurobonds between the second quarter of 1995 and the third quarter of 1997 was considerably greater than could be accounted for by improved economic fundamentals in the borrowing countries.

20. South Korea, Malaysia, Thailand, and Indonesia were among the group of 10 developing countries that attracted the largest amounts of net private capital flows during 1990–95; see Goldstein and Hawkins (1998). Grenville (1998) provides a summary of many of the strengths of the ASEAN-4 economies prior to the crisis.

also have given lenders confidence that, should local financial institutions encounter difficulties, the public sector would have the resources to provide assistance.[21] In short, (aside perhaps from their financial sectors), they were seen as among the best students in ''Policy Reform 101.''

External-Sector Problems

In 1996, Thailand had a current account deficit equal to 8 percent of its GDP. Over the 1990s as a whole, Thailand had a cumulative current account deficit equal to 36 percent of its 1996 GDP.[22] In 6 of the past 15 years, Thailand's current account deficit equaled or exceeded 6 percent of GDP. The other ASEAN-4 economies have also run relatively large current account deficits in the 1990s, albeit not as pronounced as in Thailand.

Until quite recently, these current account imbalances were widely viewed as benign. Indeed, it was frequently concluded that these were ''good'' deficits in two respects: first, they did not reflect a saving-investment deficit in the public sector; and second, foreign borrowing was being used mainly to increase investment (rather than consumption), thereby building the capacity to service those debts. In both these dimensions, Asian current account deficits were frequently said to be more sustainable than Latin American current account deficits.

In the run-up to the crisis, however, there were at least five counts on which *concerns about current account imbalances* in the ASEAN-4 countries could well have become deeper.

First, the *quality of investment* in these countries was less impressive than the quantity. Even investment ratios of 30 to 40 percent do not look so attractive when corporate governance is very poor, when so much of private investment is directed toward either speculative activities (e.g., real estate) or industries where overcapacity was likely to be a problem over the medium term, and when too much public investment is directed toward either overambitious infrastructure projects or inefficient government monopolies. In this connection, a recent World Bank report (1998) documents that incremental capital-output ratios (the inverse of which is sometimes taken to be a proxy for the productivity of investment) increased sharply in Thailand and South Korea as between 1985–90 and 1990–96.

Second, the behavior of *real effective exchange rates* over the past two years or so pointed to a deterioration in competitiveness in much of emerging Asia. The currencies of the ASEAN-4 economies followed the

21. See Claessens and Glaessner (1997).

22. See Bhattacharya, Claessens, and Hernandez (1997).

Table 7 External sector problems

	Real effective exchange rate overvaluation (versus June 1987 to May 1997 average)	Current account balance (percentage of GDP)		Merchandise exports (annual percentage growth)	
	June 1997	1995	1996	1995	1996
Thailand	6.7	–7.9	–7.9	23.1	0.5
Indonesia	4.2	–3.3	–3.3	13.4	9.7
Malaysia	9.3	–10.0	–4.9	20.3	6.5
Philippines	11.9	–4.4	–4.7	28.7	18.7
Hong Kong	22.0	–3.9	–1.3	14.8	4.0
Singapore	13.5	16.8	15.7	13.7	5.3
Korea, South	–7.6	–2.0	–4.9	30.3	3.7
Taiwan	–5.5	2.1	4.0	20.0	3.8

Sources: IMF, *International Financial Statistics;* IMF, *World Economic Outlook;* JP Morgan website, 1998; Council for Economic Planning and Development, Republic of China, *Taiwan Statistical Data Book, 1997.*

US dollar down against the Japanese yen in the first half of the 1990s but then followed the dollar up against the yen thereafter. In the process, they recorded an appreciation of their real (trade-weighted) effective exchange rates relative to trend (where trend is captured by the 1987–97 average). By that measure, at the end of June 1997, the Thai baht stood about 7 percent above its long-term average; the corresponding figures for the Indonesian rupiah, the Malaysian ringgit, and the Philippine peso were 4, 9, and 12 percent, respectively (see table 7).[23] To be sure, long-term averages of actual exchange rates should be regarded as only a rough proxy for equilibrium exchange rates. Nevertheless, such calculations convey the strong impression that the ASEAN-4 countries were *not* experiencing huge misalignments prior to being attacked. At the same time, given that these real appreciations occurred in the context of large current account imbalances, they were a source of increased vulnerability. Here, it is also worth noting that empirical analyses of early-warning indicators of currency and banking crises in emerging economies find that real exchange rate overvaluation has historically been among the very best performing leading indicators.[24]

23. As shown in table 7, the Hong Kong dollar was, by this measure, the most overvalued currency. It should be noted, however, that recent research Dodsworth and Mihaljek (1997) and Hawkins and Yiu (1995) indicates that the equilibrium rate for the Hong Kong dollar may well have been appreciating over the 1983–94 period because of large productivity differentials (along classic productivity-bias lines) between tradable and nontradable goods (where tradables include financial services). This would make the overvaluation smaller than such deviation-from-trend figures suggest.

24. See Kaminsky and Reinhart (1996), Goldstein (1998a), and Goldstein and Reinhart (forthcoming 1998).

Third, *1996* was a year in which many emerging Asian economies experienced a significant *slowdown in merchandise export receipts* (see table 7). In Thailand, merchandise exports were practically flat (0.5 percent increase) in 1996, after rising by 23 percent in 1995. In South Korea, merchandise exports grew by less than 4 percent in 1996—a big change from the 30-percent-plus growth rate of a year earlier. In Malaysia, Indonesia, and the Philippines an export slowdown was likewise in evidence, albeit on a more moderate scale. It was recognized at the time that some of the export slowdown was attributable to temporary factors, including a decline in the growth of world trade and an inventory glut in the global electronics industry.[25] Still, the 1996 slowdown probably raised doubts about whether emerging Asia's export machine was going to remain the dominant force it had been in the past.

A fourth element of concern was the *competition faced by the ASEAN-4 economies from China*. More specifically, some analysts perceived a shift in regional comparative advantage toward China and away from the ASEAN-4 economies.[26] I call it a ''perceived'' shift because the evidence in favor of this view is less than decisive. For example, Kwan (1997) has noted that the share of Japanese foreign direct investment (FDI) going to China was strongly on the rise between 1992 and 1995–96, whereas the share going to the ASEAN-4 countries was constant. He also notes that analyses of the product composition of exports suggest that ASEAN-4 exports are more ''similar'' to Chinese exports than are exports of some other Asian economies (South Korea, Taiwan, Singapore)—and this could be seen as disadvantageous to the ASEAN-4 in view of China's relatively low labor costs. On the other hand, Fernald, Edison, and Loungani (1998) have conducted a battery of tests on China's export competition with the rest of developing Asia. They report that there was a strong similarity in export growth between greater China and the rest of developing Asia in the 1994–96 period and conclude that export competition from China is

25. According to IMF figures, the volume of world trade grew by 5.6 percent in 1996—down from over 9 percent in 1995. Developments in the global electronics industry are important because of the high weight of electronics in total exports for the Asian emerging economies. Hale (1997) reports that the electronics sector accounts for 57 percent of Singapore's exports, 49 percent of Malaysia's, 40 percent of the Philippines', and 17 percent of Thailand's. In a similar vein, Fernald, Edison, and Loungani (1998) calculate the share of semiconductors and some related capital goods in the exports of Asian economies to the United States. Singapore tops the list at 83 percent; the corresponding figures for other emerging Asian economies are as follows: Malaysia, 61 percent; Taiwan, 57 percent; South Korea, 54 percent; the Philippines, 54 percent; Thailand, 37 percent; greater China, 19 percent; and Indonesia, 10 percent. The BIS (1997) reports that US dollar prices of semiconductors declined by roughly 80 percent in 1996.

26. Thurow (1998), for example, has argued that the swing of the ASEAN-4 economies from trade surplus to deficit is directly traceable to China's decision to concentrate on increasing exports as its engine of economic growth.

unlikely to have been an important factor contributing to the 1997 Asian financial crisis.

Fifth, looking down the road for 1998 and 1999, some observers may well have seen (in 1997) the sustainability of Asian external deficits threatened by *overproduction* in certain industries and by *intense export competition* among countries. Concerns about global overproduction have recently been voiced over a set of industries, including some (memory chips, automobiles, steel, petrochemicals, lumber, base metals, frozen chickens, etc.) that are important for Asian emerging economies.[27] In addition, the heavy historical dependence of these countries on export-led growth may have painted a picture of slowing overall growth prospects. On the importing side, given exchange rate and cyclical developments, the United States may have looked to many like the logical candidate to absorb a healthy share of emerging Asia's exports. But the United States was on its way to a current account deficit in 1997 of almost $170 billion. Would US import-competing industries, organized labor, and US policymakers accept passively an increase in the US external deficit to say, $230–300 billion in 1998, while ASEAN-4 countries, South Korea, and Japan increased significantly their import penetration of the US market?[28] Couldn't there be a protectionist backlash in the United States against much increased imports from Asia?

When you put it together—large current account deficits, deteriorating quality of investment, appreciating real exchange rates, a marked export slowdown in 1996, worries about China ''eating the lunch'' of the ASEAN-4 and concerns about overproduction, intense export competition, and potential protectionist pressures—it's not hard to see why external sector developments in the run-up to the crisis constituted a second element of vulnerability.

Contagion

Any serious analysis of the Asian currency crisis must also accord a role to contagion of financial disturbances. Past empirical work on contagion has established that contagion is typically greater during periods of turbulence than during more tranquil times, that it operates more on regional than on global lines, and that it usually runs from large countries to smaller ones.[29] On this last count, the Asian currency crisis is unusual, in that it originated in a relatively small country (Thailand) and spread to

27. See, for example, Farrow (1997).

28. Hale (1997) has argued that the US current account deficit in 1998 might well increase to $300 billion.

29. See Calvo and Reinhart (1996).

Table 8 Bilateral trade shares with Thailand, 1996

	Exports to Thailand (as a percentage of total exports)
Korea, South	2.0
Indonesia	1.8
Malaysia	4.1
Philippines	3.8
Singapore	5.7
Taiwan	3.1
Hong Kong	1.0

Sources: IMF, *Direction of Trade Statistics Yearbook, 1997;* Goldstein and Hawkins (1998).

a wide set of economies, both large (South Korea, Japan, Brazil, Russia) and small.[30]

In addressing the issue of what was driving this contagion, it seems unlikely that the main explanation could be bilateral trade or investment shares with Thailand. Given Thailand's size, these bilateral relationships are simply too small to generate such wide-ranging contagion (see table 8). In addition, if it were bilateral linkages with Thailand that were paramount for the pattern of contagion, one would have expected to see Malaysia, Singapore, and Taiwan more affected than either Indonesia or South Korea—the opposite of what has in fact taken place.[31]

There are, instead, two more-plausible channels of contagion. One is the *''wake-up call'' hypothesis*. In short, it says that Thailand acted as a wake-up call for international investors to reassess creditworthiness of Asian borrowers, and when they did that reassessment, they found that quite a few Asian economies had weaknesses similar to those in Thailand, namely: weak financial sectors with poor prudential supervision, large external deficits, appreciating real exchange rates, declining quality of investment, export slowdowns (in 1996), and overexpansion in certain key industries. As countries were written down to reflect this reassessment of creditworthiness, the crisis spread. Goldstein and Hawkins (1998) show that a weighted average of fundamentals that gives higher weight to those fundamentals where Thailand was relatively weak is more consistent with the ordinal ranking of which Asian economies were most affected by the crisis than are rankings predicated on either the extent of bilateral

30. In the case of Japan, however, it would be more accurate to say that lines of causation ran in both directions.

31. See Goldstein and Hawkins (1998).

interdependence with Thailand or the strength of fundamentals irrespective of similarities with Thailand.[32]

I refer to it as a wake-up call because to judge from most market indicators of risk, private creditors and rating agencies were asleep prior to the outbreak of the Thai crisis.[33] Eschweiler (1997a) shows that offshore interest rate spreads on three-month government securities gave no warning of impending difficulties for Indonesia, Malaysia, and the Philippines and produced only intermittent signals for Thailand.[34] Sovereign credit ratings issued by the major private credit-rating agencies were even less prescient. As documented in several studies (Radelet and Sachs 1998; World Bank 1998), long-term sovereign ratings issued by Moody's and Standard and Poors remained unchanged during the 18 month run-up to the crisis.[35]

The second channel of contagion results from the *competitive dynamics of devaluation*. As one country after another in a region undergoes a depreciation of its currency, the countries that have *not* devalued experience a deterioration in competitiveness, which in turn makes their currencies more susceptible to speculative attacks. In short, what was an equilibrium exchange rate *before* competitor countries devalue is not likely to remain

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32. Goldstein and Hawkins (1998) measure the relative impact of the crisis on individual Asian emerging economies by the decline in exchange rates and equity prices in the second half of 1997 and by the revision in forecasted 1998 real GDP growth rates between June and December 1997. Their measures of bilateral interdependence with Thailand include export shares, geographic distance, telephone traffic with Thailand, and export similarity to Thailand. The fundamentals they consider include: excess credit growth, the ratio of short-term external debt to international reserves, the ratio of broad money to reserves, the ratio of external debt to GDP, the banking system's risk-weighted capital ratio, a median estimate of the share of nonperforming bank loans, Moody's financial-strength bank credit ratings, the ratio of the current account deficit to GDP, international reserves, the extent of the 1996 export slowdown, and three alternative measures of overvaluation of the real exchange rate. Further details of this calculation are available from the authors upon request.

33. Two alternative explanations for why market signals did not produce much early warning of the crisis are that creditors did not have accurate information on the creditworthiness of Asian borrowers (e.g., external debt turned out to be much larger, and international reserves much smaller, than indicated by publicly available data) and that creditors were awake but expected governments (and/or the IMF) to bail them out in case of trouble.

34. As regards exchange market pressures, Eschweiler (1997b) notes that there was some indication of concerns in the unregulated options market for Thai baht (in addition to some earlier attacks on the baht) but also that the Indonesian rupiah was trading on the strong side of its intervention band right up to the outbreak of the crisis. Equity prices turned in a more mixed performance (Eschweiler 1997b; Radelet and Sachs 1998). The Thai, Malaysian, Filipino, and South Korean stock markets were in decline prior to the crisis, but in South Korea's case, the decline began so early that its interpretation is ambiguous; also, equity prices were not declining in the case of Indonesia.

35. The sovereign ratings issued by Euromoney and Institutional Investor did not perform well either. Much the same could be said for stand-alone credit ratings for individual Thai banks.

Table 9 Asian intraregional trade, 1996

	Export share (as a percentage of total exports)	
	Emerging Asia	Japan
Thailand	36.8	16.8
Korea, South	37.8	12.3
Indonesia	26.4	28.8
Malaysia	46.8	13.4
Philippines	25.7	17.9
Hong Kong	47.2	6.6
China	37.3	20.4

Source: Lipsky, Brainard, and Parker (1997).

an equilibrium rate *after* the fact. These competitive dynamics of successive devaluations were a factor in the ERM crisis of 1992–93, and they provide a partial explanation for why some Asian currencies came under increasing pressure after the initial depreciations of the Thai baht and Indonesian rupiah. As shown in table 9, the Asian emerging economies have important trade links with one another, and they also compete in third-country markets. Indeed, it is because of these competitive pressures that Williamson (1996) has proposed that these countries adopt a common currency peg. The mechanism of competitive devaluation also explains why questions continue to be asked about whether China will eventually be pressured to devalue (so as to offset the decline in competitiveness linked to the depreciations of the Asian-crisis countries).

Some even go farther (with this competitive devaluation story) and regard the 1994 currency reform cum devaluation of the Chinese yuan as initiating the 1997 round of devaluations. I find this claim unpersuasive. Because of the large share of transactions conducted in the parallel exchange market before the 1994 reform (probably as high as 80 percent), the ''effective'' devaluation itself was not so large;[36] in addition, China has run higher inflation rates than the (trade-weighted) average of its main trading partners in the 1990s. The bottom line is that China experienced a significant real *appreciation* of its effective exchange rate from the first quarter of 1994 through 1997 (on the order of 50 percent).[37] To the extent that there is evidence of intense export competition between China and the rest of emerging Asia, it takes place in 1989–93—not since then.[38]

36. See Liu et al. (1998) and Fernald, Edison, and Loungani (1998). According to Fernald, Edison, and Loungani (1998), the effective nominal depreciation relative to the US dollar was roughly 7 percent.

37. See Fernald, Edison, and Loungani (1998).

38. See Fernald, Edison, and Loungani (1998).

The *contagion to South Korea* is not hard to understand.[39] As noted earlier, South Korea—like Thailand—was an outlier as regards liquidity/maturity mismatches. In addition, it shared with the other Asian-crisis countries long-standing and serious weaknesses in its financial sector and in prudential oversight of banks—much of it tied to government-directed lending to large corporations (*chaebols*), large equity holdings by banks, lax accounting procedures, and a lack of transparency on the part of both banks and corporations. Moreover, the *chaebols* have very high debt-to-equity ratios, and 1996 saw about half of the most important *chaebols* either declare bankruptcy or post losses. By mid-1997, the equity market had already fallen by 60 percent from its previous peak.

Nor can the contagion to *Japan* be considered a matter of financial disturbances elsewhere in the region spilling over to an otherwise healthy economy. Japan has been delinquent in not dealing forcefully and directly with the now-long-standing and massive bad loan problem in its financial sector (recently acknowledged by Japanese authorities to be roughly 80 trillion yen in the banking system). Economic growth in the 1990s has been slower there (on average) than anywhere else in the G-7, and recent projections—including a recent (April 1998) IMF (1998b) forecast of zero growth in 1998—suggest that recovery (along with a rebound in property prices) is still some way off. The long-running steep decline in the equity market has also meant that Japanese banks, which count unrealized gains in their equity holdings as part of their capital, have on several occasions come under risk of breaching their regulatory capital requirements, with consequences not only for their funding costs in the interbank market (the so-called ''Japan premium'') but also for concerns about forced asset sales to a declining market.[40]

Against this background, it is not surprising that the crisis in emerging Asia—with its adverse implications for Japanese exports and bank loans to these countries and with its spillover to the Japanese equity market—has taken a toll on Japan. As indicated in table 10 Japan conducts a larger share of its total trade with the Asian-crisis countries than does any other G-7 country.[41] Similarly, the World Bank (1998) has estimated that loans to the Asian-crisis countries account for 43 percent of the capital of Japanese banks (versus 27 percent for the G-7 countries as a group).

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39. Young and Kwon (1998) provide an in-depth analysis of South Korea's vulnerabilities prior to the crisis.

40. For further discussion and explanation for Japan's poor economic performance in the 1990s, see Posen (forthcoming 1998).

41. The geographic pattern of Japanese foreign trade exaggerates the impact of the crisis on Japanese GDP (at least relative to the European G-7 countries) because Japan has much lower ratios of trade to GDP than do the European G-7 countries; see IMF (1997b). In addition, the impact of the crisis on Japan depends, as noted earlier, on whether one includes (as part of the crisis) the depreciation of the yen against the US dollar and European currencies over this period (see Liu et al. 1998).

Table 10 Industrial countries' merchandise trade shares with Asian economies (as a percentage of total trade)

	ASEAN-4 countries	Asian newly industrialized economies	Asian newly industrialized and developing economies	Major emerging market economies
United States	5.0	11.3	21.8	36.7
Japan	12.2	18.2	40.9	43.7
Germany	2.0	3.5	8.6	17.9
France	1.5	2.8	7.4	10.3
Italy	1.4	2.9	6.7	15.0
United Kingdom	2.5	5.2	10.3	14.7
Canada	1.2	2.8	5.9	8.6
G-7 total	4.3	7.9	17.0	24.9

Source: IMF, *World Economic Outlook: Interim Assessment, December 1997.*

And as the number of countries affected by the crisis has grown, the normal channels of trade and capital flow interdependence have also been at work, including some linkages that help to explain the contagion to emerging economies outside the region. For one thing, the crisis-induced growth slowdown in Asia has contributed to a *weakening of primary commodity prices* that puts downward pressure on economies that depend heavily on such goods for exports.[42] For example, Mexico, Venezuela, and Ecuador have been adversely affected by the decline in oil prices. Because more of its total exports go to Asia than do the exports of any other Latin American economy and because copper bulks large in its exports, Chile has also been relatively hard hit by the feedback from the Asian crisis. Less expected, difficulties at South Korean banks have had knock-on effects as far away as Russia and Brazil, because these banks were heavy purchasers of Russian GKOs (government bonds) and Brazilian Brady bonds and because they liquidated much of their holdings during the turmoil. And on and on.[43]

42. See Perry and Lederman (1998).

43. The emphasis in this chapter has been on the underlying vulnerabilities and transmission mechanisms that were responsible for the Asian financial crisis. A different question is whether it is possible to identify clear, short-run triggers for the crisis—much in the same way that the negative outcome of the Danish referendum on the European Monetary Union was a key event for the 1992 ERM crisis or that the Colosio assassination of March 1994 was a key event in the run-up to the Mexican peso crisis. While a host of candidates have been proposed as triggers for the first or second wave of attacks—ranging from heightened expectations of yen appreciation and/or of interest rate increases in Japan in the late spring of 1994, to the devaluation of the new Taiwan dollar in October 1997, to alleged IMF-generated panic associated with its structural policy recommendations for Thailand and Indonesia, and to negative terms-of-trade shocks for key Asian export goods in 1996 and 1997—I confess to finding each of these factors less convincing as triggers than some key events in the two earlier major exchange rate crises of the 1990s.