
Crisis, Adjustment, and Reform in Thailand's Industrial Firms

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New data on Thailand's industrial firms shed light on the origins of the East Asian financial crisis and on the response of the manufacturing sector to the structural adjustment program supported by the international financial institutions. Before the crisis, Thai firms had declining profitability, but they nevertheless maintained high levels of investment, often in domestically oriented areas (notably the auto sector). Thai firms financed these investments with short-term borrowing from financial institutions, which in turn borrowed short term on foreign markets. That only 40 percent of firms provided audited financial statements to their banks meant that the financial sector had poor information for assessing the true riskiness of these investments. The financial structure was thus vulnerable even to small shocks.

How well did the adjustment program deal with the crisis? Thai firms had difficulty increasing their exports quickly because of investment in the wrong sectors, a decline in regional demand, and bottlenecks that included red tape and poor customs administration. Because of the poor export response, the brunt of adjustment had to come through compression of demand and of imports. In retrospect, the macroeconomic program—which assumed quick export recovery—was too tight.

Devaluation is not the policy of the Thai government.
— Japanese auto parts producer, May 1997

The anonymous entrepreneur quoted above borrowed \$40 million—short term—in Singapore to finance a factory in Thailand that produced auto parts for a Japanese assembler selling in the Thai market. Taking on the debt seemed like a good idea to the Japanese producer in late 1996 and early 1997. But by October 1997, with the Thai baht devalued and the region in recession, the entrepreneur had halted production and was waiting for the ax to fall.

The currency and financial crises in East Asia were touched off when Thailand devalued the baht on July 2, 1997. Within weeks Malaysia and Indonesia devalued their currencies, and the Philippine and Korean currencies also began to weaken. Stock markets across the region fell as investors pulled out their capital. Thailand quickly reached an agreement with the International Monetary Fund (IMF) for a bailout package and in return initiated the recommended reform measures, tightening monetary and fiscal policies. Although the aim was to bolster the exchange rate and to restore investor confidence, the rise in interest rates, the fall in government spending, and sharp declines in consumer and investment demand led to a recession. With similar policies enacted by Thailand's neighbors, the downturn soon spread across the region.

The speed and severity of the East Asian currency and financial crises took both investors and economists by surprise. Even economists who were not bullish about Asia in the long term, such as Paul Krugman (1998), admit that the crises caught them off guard. Debate is heated about the origins of the crises and about the best policy response by individual governments and the international community.

The possible causes of any financial crisis fall into three categories:

- Exogenous shocks or developments in international markets
- Economic mismanagement on the part of the crisis countries
- Intrinsic instability in international financial flows, which presumably results from failures in the international financial architecture governing those flows.

Because no single element is likely to have caused the East Asian crisis, the issue is the degree to which each of these different factors contributed to its onset and severity.

One of the interesting things about the East Asian crisis is that it was not precipitated by an exogenous shock. The global economy had been growing reasonably well, with stable commodity prices and low interest rates. Several specific developments, however, did affect the East Asian countries now in crisis. China had emerged as a major export competitor, and in the wake of the North American Free Trade Agreement (NAFTA), Mexico had become a formidable competitor as well. Furthermore, in the run-up to the crisis, the U.S. dollar gradually appreciated against the yen, which disrupted the exchange rates of countries, such as Indonesia and Thailand, that were de facto pegged to the dollar. But none of these developments can qualify as a major shock, a fact that shifts the focus to the other two potential causes.

With some risk of caricature, we can refer to these as the "bad policy" and "bad luck" hypotheses. The "bad policy" view is that countries such as Thailand made major mistakes in macroeconomic management and—more important—in the governance of the financial and corporate sectors. The policy regime encouraged borrowing abroad to invest in what we call the "wrong capital stock"; this borrowing was bound to lead to major problems sooner or later.

The “bad luck” view holds that the East Asian countries were the victims of a shift in investor expectations that became self-fulfilling but that did not have to happen. As Steven Radelet and Jeffrey Sachs (1998: 3) put it:

To be sure, there were significant underlying problems besetting the Asian economies, at both a macroeconomic and microeconomic level (especially within the financial sector). But these imbalances were not severe enough to warrant a financial crisis of the magnitude that took place in the second half of 1997. . . . A combination of panic on the part of the international investment community, policy mistakes at the outset of the crisis, and poorly designed international rescue programs have led to a much deeper fall in (otherwise viable) output than was either necessary or inevitable.

This view emphasizes weaknesses in international financial architecture (no lender of last resort or bankruptcy proceedings to bring about orderly workouts). It also suggests that for individual countries such as Thailand, it was chance or bad luck that led to a financial run and brought them down.

Although the origins of the crisis have been hotly debated, analysis of the microeconomic foundations of the crisis has been hampered by the lack of systematic, high-quality data at the level of the firms or industries involved. From October 1997 to March 1998, working with the Ministry of Industry in Thailand, we conducted a survey of 1,200 randomly chosen plants in five tradable goods industries—auto parts, electronics, food products, garments, and textiles—to gather relevant production and financial information for the preceding three years. A range of questions about the existing situation, borrowing practices, major bottlenecks to increased competitiveness, human resources, and so on was also included. (Details of the sample are provided in the appendix.) These data can be used to examine some of the specific hypotheses that have been offered to explain the onset of the crisis, including

- The withdrawal of credit from viable firms (because of developments in the international capital market or other exogenous changes)
- A mismatch of short-term borrowing and the maturation of real investments financed by credit
- Failure of manufacturing firms that borrowed abroad to hedge their risk
- Continuing high levels of investment by firms despite declining profits.

Our findings support the view that poor policy is an important factor explaining the crisis. Specifically, policy incentives induced firms to take risky financial positions, financing long-term investment with large amounts of short-term debt. Firms that borrowed in foreign currency did not hedge their positions. Even before devaluation and the start of the recession in mid-1997, financial profitability had dropped sharply in these tradable goods industries. Thai firms were earning poor returns from their investments before international investors lost confidence in Thailand, even though

investment continued at a high level. Because only 40 percent of firms provided audited statements to their banks, the financial system—which had borrowed unhedged abroad—was slow to understand and respond to the problem of inefficient investment.

We also look at long-term structural issues of concern to firms. The interrelated issues of customs administration, red tape, and corruption are perceived as major bottlenecks to increased production and exports, more important than weaknesses in the financial system. Thailand also has well-known human resource problems—a shortage of technical and engineering skills and the high relative pay of production workers—and these are confirmed by this survey.

The data also show that the initial adjustment process undertaken in the fall of 1997 did not work smoothly. The five tradable goods industries that we surveyed should benefit from the standard adjustment package of fiscal and monetary austerity plus devaluation. In fact, capacity utilization and employment fell in all five sectors between the first half of 1997 and the second half. Domestic demand dropped sharply—a critical development for the textile and auto parts industries, which are domestically oriented. Auto parts manufacturing is the classic example of investing in the wrong capital stock: domestic demand is likely to be depressed for years, and shifting to exports will be difficult, given the cartelized nature of the industry and worldwide overcapacity. Even large export firms in electronics, food products, and garments were in trouble in Thailand because of a drop in foreign demand. Interestingly, the survey uncovered little evidence of a classic credit crunch—firms with orders but unable to obtain working capital.

Thus, the main story is that the combination of investment in tradable goods sectors oriented primarily to the domestic economy, the drop in regional demand, and bureaucratic bottlenecks (such as inefficient customs administration) made it difficult for Thailand to increase exports quickly. Hence the brunt of adjustment had to fall on the compression of domestic demand and imports. In light of this weak export potential, the initial adjustment program was probably too tight and caused an unnecessarily deep recession. Once the severity of the decline (as measured in part by these data) was evident, the austerity policies were moderated. In the spring of 1998 the Thai government started to relax its previous goal of achieving a 2 percent budget surplus.

In summary, there is ample evidence that Thailand made policy mistakes and that these mistakes created a vulnerable environment in which even mild changes in the international market could set off a serious downturn. At the same time, it is hard to understand the severity of the crisis without appealing to failures in the international architecture governing capital flows. In other words, bad policy ignited Thailand's crisis, but it was bad luck to have to face a world economy that was ill equipped to limit investor panic or to provide a framework for orderly workouts between international creditors and debtors. Looking to the future, the combination of a more

stimulative macroeconomic stance and a credible program for addressing structural weaknesses is the best hope for restoring confidence in Thailand, although the country will find it difficult to prosper as long as the region is suffering.

Macroeconomic Context

Although no one predicted the depth of the East Asian crisis, an examination of the macroeconomic variables points to several signs, evident before July 1997, that the existing situation was unsustainable. A correction was in order, even if not of the magnitude that has since unfolded. This is particularly true of Thailand, the country held responsible for setting off the regional crisis by devaluing the baht. The case for self-fulfilling panics is strongest for Indonesia, but even for that country, the evidence clearly shows that poor policy management and weak supervision and regulation contributed to the fragile position of the corporate and financial sectors.

Relative prices and interest rates affect the decisions firms make, particularly about investment allocation, financial structure, and the markets to target. The effect is clear in the aggregate data and is reinforced by findings from the newly available microdata.

As in neighboring countries, the Thai government was committed to a monetary policy that was inconsistent with domestic developments and the state of the financial sector. Officially, the baht was fixed to a basket of currencies, but in practice it was pegged to the U.S. dollar. Despite a burgeoning current account deficit, the Bank of Thailand repeatedly stated its commitment to the official rate of exchange. This exchange rate policy had two primary effects. The first was a loss in international competitiveness that stemmed from the choice of peg. The second was heightened borrowing from abroad that was encouraged by the implicit guarantee of an exchange rate parity.

Pegging the baht to the dollar had proved beneficial in earlier years because the dollar had depreciated relative to the yen and the deutsche mark, which made Thai exports attractive. But between 1994 and 1996 the dollar appreciated almost 40 percent relative to the yen. With Japan as one of the primary destinations for their goods, Thai firms found their exports declining sharply—not only to Japan, but also to third markets in which they competed with Japanese producers. A further effect was that direct investments from Japan slowed down, depriving countries of the long-term investments that are crucial sources of innovation and productivity growth.

With the exchange rate assumed to be fixed, firms took advantage of the lower interest rates on offshore loans and significantly increased their borrowing from such sources. This option was greatly helped in 1993 by the establishment of Bangkok International Banking Facilities (BIBFs), which loosened regulations on foreign borrowing by Thai banks. Believing that the exchange rate regime would be maintained, firms undertook large, unhedged positions.

With the nominal exchange rate fixed and domestic prices climbing, the rise in the price of tradables relative to nontradables, while not unprecedented, was still considerable. Between 1994 and mid-1997, according to IMF statistics, the real appreciation was about 20 percent; as a result, export growth, which had been close to 20 percent, turned mildly negative in 1996 and fell in the first half of 1997. The current account deficit reached 8 percent in 1996.

The monetary authorities made some attempt to sterilize capital inflows as a means of limiting the growth of domestic credit, but the rise in domestic interest rates, together with the commitment to the baht-dollar exchange rate, made offshore borrowing even more attractive. In 1996 almost two-thirds of all private capital flows to developing countries went to East Asia. As a share of the receiving country's gross domestic product (GDP), those inflows were by far the largest for Thailand, equaling 15 percent of GDP between 1994 and 1996. Private capital flows accounted for 5 percent of GDP in the Republic of Korea and in Indonesia and approximately 8–10 percent in Malaysia and the Philippines. In Thailand the net foreign liabilities of the financial institutions rose from 6 percent of deposits to one-third of deposits by 1996 (World Bank 1998).

The increase literally swamped domestic financial institutions with funds. The quality of the intermediation of these funds was critical. With banks providing the bulk of all financial services, the ability to supervise and regulate the banks was the key to determining how the funds were allocated. In practice, neither Thai firms nor Thai banks had much experience with such volumes of capital, and there was scant supervision. Consequently, much of this money was channeled into risky projects and highly cyclical sectors. Nonproductive investment in sectors such as real estate expanded dramatically. In Bangkok the amount of new office space quadrupled between 1994 and 1997. The boom in domestic assets reinforced an optimistic investment cycle, particularly since real estate was often used as collateral for further borrowing. The growth rate of loans is striking: close to 25 percent in 1996, the second-highest rate in Asia and more than double the growth rate of nominal GDP (World Bank 1998).

Thailand's experience demonstrates that high rates of investment are not sufficient to sustain a large current account deficit and an expansion of domestic credit. Although most of the new funds were invested rather than consumed, the investment was often misdirected. The concentration of resources in real estate has received considerable attention, but in fact, large amounts of investment went to industry. Here, too, many of these funds appear to have been allocated inefficiently. Few investments were directed to activities that would earn foreign exchange; rather, they were used to update facilities for domestic production or to buy low-return assets. These choices, along with real exchange rate appreciation, were associated with the sharp decline in financial profitability. The accumulation of the wrong capital stock still has consequences for the ability of firms to increase exports now that the asset bubble has burst and the baht has depreciated so drastically.

Microeconomic Foundations of the Crisis

At the microeconomic level, the two main points to emerge from the survey data are, first, that industrial firms continued to invest at a high level in 1996 and the first half of 1997 despite a sharp drop in sales, exports, and profitability, and, second, that much of this investment was financed by short-term borrowing that was not backed by collateral or by audited financial statements. This pattern of corporate and financial management left the country vulnerable to even small external shocks.

The five sectors covered by the survey differ in the extent of their export orientation, as seen in table 1. With the exception of the textile sector, 1995 was a growth year for both exporters and nonexporters. This was the heyday of the Thai boom. In sharp contrast, 1996 was a year of small increases in output (electronics, garments, and textiles) or decline (auto parts and food products). Hardest hit were medium-size exporters (those that shipped between 5 and 50 percent of their total output abroad), which declined more than 10 percent from their 1995 levels. Exports of domestic firms fell more than 20 percent, a sharp erosion of the competitiveness of firms without foreign linkages.

The survey also provides information on primary export markets, which differ considerably from sector to sector (table 2). The garment industry is focused on Europe and the United States (whose economies have continued to hum along fairly well), whereas the electronics industry exports to Japan and other Asian economies. Although the auto parts industry is not an overwhelming exporter, it is linked almost exclusively to Asian countries.

In this kind of survey, the information on profits is likely to be among the most problematic, but it should be possible to pick up broad trends. The most striking feature is the decline in profits for four of the five sectors in 1996; food processing was the exception, with its losses declining (table 3). Most of the downturn was concentrated in domestic firms and in firms that export less than half their output. These findings are consistent with the story that emerged from the output data—that domestic firms had lost international competitiveness.

While output and profitability were declining, firms continued to expand employment and—most strikingly—investment. Employment in firms with direct foreign investment surged between 1994 and 1995, then leveled off to a steady 3–5 percent increase in 1995 and 1996 (table 4). The growth of the capital stock was much more rapid. Such growth can be measured either as changes in total reported assets or as reported investment relative to the previous year's capital stock (and, fortunately, the two approaches provide a consistent story). The growth rate of assets of domestic firms did slow, from 22.5 percent between 1994 and 1995 to 14.9 percent between 1995 and 1996. Even so, this latter figure is particularly striking because it shows a high rate of growth of the capital stock during a year in which output and exports declined and profits were negative. The measure of investment

Table 1. Output and Growth Performance, Thailand

(percent, unless otherwise noted)

<i>Sector</i>	<i>Fiscal year</i>	<i>Output (babi)</i>	<i>Growth</i>	<i>Growth of domestic sales</i>	<i>Exports</i>	<i>Share of output exported</i>
Garments	1994	28,363,202	—	—	—	73.3
	1995	32,985,333	16.3	-1.2	22.7	77.3
	1996	34,385,143	4.2	7.2	3.4	76.7
Textiles	1994	48,784,260	—	—	—	33.4
	1995	43,865,237	-10.1	-8.3	-13.7	32.1
	1996	44,637,853	1.8	-3.7	13.4	35.8
Electronics	1994	155,699,056	—	—	—	72.6
	1995	204,569,102	31.4	31.0	31.5	72.7
	1996	210,347,504	2.8	6.0	1.6	71.9
Food processing	1994	42,072,321	—	—	—	62.6
	1995	63,820,112	51.7	31.5	63.8	67.5
	1996	50,032,865	-21.6	29.8	-46.3	46.2
Auto parts	1994	27,340,674	—	—	—	13.3
	1995	34,584,003	26.5	29.4	7.6	11.3
	1996	34,004,553	-1.7	-3.4	11.6	12.8
<i>FDI status</i>						
Domestic firms	1994	121,279,849	—	—	—	47.9
	1995	153,585,235	26.6	11.3	43.3	54.2
	1996	137,995,920	-10.2	3.9	-22.0	47.0
Foreign invested	1994	180,956,784	—	—	—	67.5
	1995	226,213,890	25.0	25.8	24.6	67.3
	1996	235,380,778	4.1	7.0	2.6	66.3
<i>Export status</i>						
Nonexporters	1994	60,385,825	—	—	—	0.4
	1995	70,198,695	16.3	16.1	n.a.	0.6
	1996	72,637,061	3.5	2.8	n.a.	1.2
Median exporters	1994	65,005,821	—	—	—	25.5
	1995	92,621,358	42.5	19.1	110.8	37.7
	1996	82,158,800	-11.3	2.4	-33.9	28.1
Large exporters	1994	176,867,866	—	—	—	92.3
	1995	217,003,733	22.7	25.3	22.5	92.2
	1996	218,612,058	0.7	27.0	-1.5	90.1
<i>Total (942 firms)</i>	1994	302,259,512	—	—	—	59.6
	1995	379,823,786	25.7	18.3	30.7	62.0
	1996	373,407,918	-1.7	5.5	-6.1	59.2

— Not available.

n.a. Not applicable.

Source: Thai Competitiveness Survey.

Table 2. Largest Export Markets, Selected Sectors, Thailand
(percent)

<i>Sector</i>	<i>Asia</i>	<i>United States</i>	<i>Europe</i>	<i>Latin America</i>	<i>Africa</i>	<i>Other</i>	<i>Total firms</i>
Auto parts	64.0	16.0	11.0	1.0	4.0	4.0	96.0
Electronics	64.0	21.0	11.0	0.0	3.0	1.0	142.0
Food processing	74.0	16.0	5.0	0.0	4.0	1.0	80.0
Garments	23.0	35.0	35.0	0.0	5.0	1.0	202.0
Textiles	41.0	28.0	22.0	1.0	6.0	2.0	108.0
Total number of firms	301.0	158.0	125.0	3.0	29.0	12.0	628.0
Percent	48.0	25.0	20.0	0.0	5.0	2.0	100.0

Source: Thai Competitiveness Survey.

Table 3. Net Profit as Share of Total Output, Selected Sectors, Thailand
(percent)

<i>Sector (number of firms)</i>	<i>1994</i>	<i>1995</i>	<i>1996</i>
Auto parts (89)	6.17	5.69	5.13
Electronics (134)	4.26	3.78	2.45
Food processing (46)	0.46	-1.02	-0.45
Garments (208)	1.55	2.37	1.04
Textiles (157)	1.91	1.64	-0.43
<i>FDI status</i>			
Domestic (490)	1.67	1.63	-2.38
Foreign invested (144)	3.99	3.53	3.10
<i>Export status</i>			
Nonexporters (363)	3.57	3.12	-2.39
Median exporters (79)	6.15	5.62	4.25
Large exporters (192)	1.50	1.72	1.41
<i>Total (634)</i>	<i>3.24</i>	<i>2.96</i>	<i>1.44</i>

Source: Thai Competitiveness Survey.

relative to assets was even higher—a change of 18.5 percent between 1995 and 1996 for domestically owned firms and a similar 18.4 percent for those with foreign investors. About two-thirds of the total investment was in machinery and equipment, and one-third was in plants and land (unfortunately we cannot determine the share that was devoted to real estate investment). However, even non-real estate investments—including those financed by borrowing abroad—are not necessarily profitable. Although the data show clear signs of trouble by 1996, investment continued to expand at a high rate.

Table 4. Measures of Expansion, Thailand

<i>Sector</i>	<i>Change in employments</i>	<i>Change in total assets</i>	<i>Total investment as a percentage of total assets</i>	<i>Investment in machinery as a percentage of total assets</i>
<i>Domestic</i>				
1995	5.4	22.5	24.0	16.7
1996	3.5	14.9	18.5	11.3
<i>Foreign invested</i>				
1995	27.8	21.1	21.8	15.7
1996	3.7	17.7	18.4	13.6
<i>Total</i>				
1995	11.0	22.1	23.3	16.4
1996	3.6	15.7	18.5	12.0

Source: Thai Competitiveness Study.

How Did Firms Finance This Investment?

The figures confirm that the financial positions of Thai firms were particularly vulnerable. Firms were highly leveraged and extremely reliant on short-term financing. The mismatch of the maturity of their liabilities and their investments meant that changes in interest rates and the availability of credit were likely to have powerful effects.

At the end of 1996 debt-equity ratios were close to 2.5, on average, and in some cases above 5 (table 5).¹ About 35 percent of the firms had debt-equity ratios above 3—substantially lower than in Korea or Japan, but still much higher than emerging-market standards. Thus the Bank of Thailand's decision to raise interest rates to try to contain the depreciation of the baht had serious implications. The debt-equity ratios show that many firms had indeed borrowed heavily but since the onset of the crisis were acting to reduce the extent of their liabilities.

Among the five sectors, the textile industry had the highest debt-equity ratios and food processing the lowest. Setting aside the currency effect, the auto parts industry was the only sector that increased its debt-equity ratio after the crisis. Because this sector had the largest number of firms with long-run financing, shielding them from the fluctuations in interest rates, auto parts firms were more reluctant than other sectors to lower their debt positions, and it is likely that the value of their equity has fallen the most dramatically due to the utter collapse in their domestic demand.

Not surprisingly, large firms and exporting firms had higher debt-equity ratios than small firms and nonexporters (see table 5). Joint ventures, however, had lower ratios than local firms, a fact that is consistent with their ability to gain access to

Table 5. Profile of Manufacturing Firms, Thailand

<i>Firm characteristics</i>	<i>Size</i>			<i>Export orientation</i>			<i>Firms receiving foreign direct investment</i>			<i>Total</i>
	<i>Small</i>	<i>Medium</i>	<i>Large</i>	<i>None</i>	<i>Some</i>	<i>Major</i>	<i>Local</i>	<i>Some</i>	<i>Major</i>	
<i>Financial indicators</i>										
Short-term debt/total financing (percent)	84.0	81.0	80.0	83.0	79.0	82.0	8.0	85.0	77.0	81.0
Median debt-equity ratio	1.2	1.9	2.1	1.7	1.7	2.0	2.0	1.4	1.7	1.8
Mean debt-equity ratio	2.0	2.5	2.7	2.4	2.2	2.5	2.6	1.9	2.3	2.4
Share with audited statements (percent)	22.0	36.0	62.0	32.0	57.0	48.0	35.0	54.0	48.0	39.0
Share offering collateral (percent)	52.0	65.0	59.0	57.0	58.0	63.0	36.0	47.0	70.0	59.0
<i>Firm composition</i>										
Number of employees	43.0	123.0	796.0	132.0	491.0	538.0	202.0	435.0	643.0	288.0
Share that export (percent)	30.0	58.0	86.0				47.0	78.0	96.0	57.0
Share foreign invested (percent)	13.0	25.0	48.0	14.0	45.0	48.0	n.a.	n.a.	n.a.	28.0
<i>Response to the crisis (percent)</i>										
Current capacity utilization	56.0	65.0	71.0	59.0	65.0	73.0	62.0	66.0	76.0	64.0
Share with few workers	60.0	51.0	52.0	62.0	59.0	42.0	57.0	58.0	39.0	55.0
Optimistic about future growth	13.0	24.0	29.0	15.0	22.0	35.0	19.0	25.0	35.0	22.0
<i>Total</i>	390.0	396.0	362.0	648.0	141.0	342.0	882.0	223.0	122.0	1,227.0

n.a. Not applicable.

Source: Thai Competitiveness Survey.

equity finance through their foreign parent or partner firms. Firms in the provinces had mildly higher debt-equity ratios than those in Bangkok.

With the onset of the crisis, debt-equity ratios fell across all types of firm. Large firms experienced the greatest decline; currently the degree of leverage differs little by firm size. Of course, the exchange rate effect significantly increases the ratios of firms with foreign currency liabilities, but as discussed below, at the time of the survey it was not readily apparent that these firms were reducing their foreign liabilities.

The more recent the information on debt-equity positions, the stronger the trend in the decline in the ratio. This could be consistent with a credit crunch, as loans are not being rolled over and the firms are carrying less debt. But it is also consistent with firms cutting back on their use of credit in the face of falling domestic demand. (It may also be due to some sample selection bias; that is, the most indebted firms were already bankrupt or were reluctant to participate in the study.)

Borrowing in Foreign Currency

With the dramatic depreciation of the baht, the costs of debt servicing for firms with extensive debt denominated in foreign currencies soared. The results of our survey, however, suggest that the problem is not as extensive in the manufacturing sector as might be feared. The large majority of firms borrowed only in baht, and those that did borrow in foreign currency were generally the more efficient firms. The issue is more severe in the private banking sector, particularly in the case of financial institutions that borrowed offshore and then lent domestically, assuming the exchange rate risk themselves. Of the 1,200 firms surveyed, only 140—predominantly large exporting firms with ties to foreign companies—reported that their liabilities were denominated in foreign currencies. Three-fourths of these reported that their foreign currency debt was less than the value of their baht-denominated debt at the end of 1996; half of the 140 said their foreign currency liabilities were less than 50 percent of the value of their baht liabilities in 1996. Interestingly, the maturities of the different liabilities are not highly correlated. Firms with foreign currency liabilities were less reliant on short-term loans, and their short- and longer-term liabilities tended to be in different currencies. It is true that firms with foreign currency debt were generally more leveraged; firms with low debt-equity ratios rarely had any foreign currency liabilities.

Debt denominated in foreign currency does not need to be an issue unless firms do not hedge their positions. Because they assumed that the pegged exchange rate would remain in effect, however, only 19 percent of Thai firms with substantial foreign-currency-denominated debt had hedged some of their debt, and only 12 firms had fully hedged their positions. There is some natural hedging if firms export their goods, but most of the firms that borrowed in foreign currency did not export the majority of their goods. These statistics do not change when comparing firms' positions at the end of 1996 and at the time of the interviews in late 1997 or early 1998.

Equally worrying is that most firms had not altered their exposure to currency fluctuations in the months after the initial depreciation of the baht. Since most of the foreign currency debt was due within a year, these firms faced substantially higher financing costs in baht. Although a heavy reliance on short-term finance compounds the difficulties for firms with foreign liabilities, the relative lack of long-term finance is a more pervasive problem.

Reliance on Short-Term Financing

Leveraged debt or exposure to exchange rate fluctuations is less of a problem if the changes are likely to be temporary and if most of the debt matures over a period of several years. Thai firms, however, were not only highly indebted but also had borrowed in predominantly short-term instruments. Thus, the effects of the depreciation and the rise in interest rates were felt all the more keenly. This problem is not unique to the East Asian crisis, nor is Thailand's heavy reliance on short-term financing unusual for the region. But compared with other middle- and high-income countries, its firms have some of the lowest ratios of long-term debt to total assets. On average, almost 80 percent of liabilities are short term. In 1996, 56 percent of survey respondents said that they relied exclusively on short-term financing; by 1997 the number had risen to 59 percent. No clear patterns of characteristics identify firms with greater access to longer-term financing. What can be said is that before the crisis, there was little difference in the reliance on short-term financing across firm size or export status (although large exporting firms were slightly more likely to depend exclusively on short-term finance), but after July 1997 only large firms reduced their share of short-term debt.

An examination of debt-equity ratios together with the maturity of liabilities shows that before the crisis, firms with low debt-equity ratios tended to rely on short-term financing. One explanation is that these firms would not qualify for much financing. Conversely, firms with less reliance on short-term financing tend to have high debt-equity ratios and greater access to capital on more favorable terms.

The crisis has reinforced the case for improved access to longer-run finance. A better matching of liabilities and asset maturities would shield firms from much of the impact of monetary shocks. Another lesson is that while longer-term finance is desirable, firms must demonstrate that they qualify for it. Thus, improvement in issues of corporate governance and transparency must go hand in hand with financial reform.

Transparency and Disclosure

A main criticism of the East Asian financial systems is that there is insufficient transparency and disclosure of financial information, making it difficult to assess the risk

for potential borrowers. This is true not only for the financial sector but also for the manufacturing sector. To get at the issue of transparency and disclosure, the survey asked firms whether they had to provide audited statements to qualify for a bank loan and whether the loan required collateral. Only 40 percent said they were required to provide audited account statements to receive bank credit. There is little correlation between the need for audited statements and reliance on short-term credit, so many longer-run loans were offered with little objective disclosure of the firm's position. At the same time, those without audited statements were much more likely to have very low debt-equity ratios, and vice versa, which would be consistent with the disbursement of only small loans to firms whose books are not audited.

Sixty percent of respondents, most of them foreign-owned firms, said that their loans were backed by collateral. Many firms with short-term debt used collateral; firms with little short-term debt did not. Sixty-five percent of firms with high debt-equity ratios provided collateral, as did 72 percent of those providing audited statements but only half of those without audited statements.

Collateral offers some insurance to the lenders, but many firms with viable business plans have insufficient collateral to qualify for the necessary financing. Increasing the use of audited statements would give financial institutions a better view of the creditworthiness of an operation and a more reliable way to assess the true risks involved.

Response to the Adjustment Program

Thailand got into trouble because it had an incentive regime that encouraged firms to take out short-term loans in foreign currency to finance long-term investments—many of which were aimed at the domestic market. This system was inherently risky, and weak accounting and transparency rules made it even more difficult for financial institutions to assess the true risks involved. When foreign lenders began to lose confidence in the economy and devaluation became necessary, Thai financial institutions and firms sustained large losses.

The withdrawal of foreign capital required an adjustment of the current account, and Thai authorities adopted a standard structural adjustment program with support from the IMF. The objective of the program was to compress domestic demand while limiting any fall in output; that is, to reduce imports and increase exports. The data show how well the adjustment process worked in its initial phase. The sectors covered by the survey—including the major export industries—are the sectors that should have benefited from real devaluation and increased their exports. If they did not, it is important to understand what bottlenecks were holding them back.

Capacity Utilization

Almost three-fifths of firms reported that they operated at a lower capacity at the time of the survey (six to nine months after the adjustment was implemented in July 1997) than they had at the end of 1996. More than 60 percent had already reduced production in the first half of 1997 relative to 1996. This general pattern holds for all sectors and is consistent with the evidence that export growth fell substantially after 1995.

Some areas of the economy managed better than others. Large firms were operating at a higher capacity than small firms and experienced significantly less of a drop-off. The same was true for firms with links to foreign companies relative to wholly domestic firms, and for exporters versus those that produced solely for the local market. In the second half of 1997, there was a 17 percent gap in capacity utilization between nonexporters and exporters, a 15 percent gap between small and large firms, and a 12 percent gap between local and foreign-linked firms.

Although before July 1997 more than 40 percent of firms had planned to expand, almost half of them had abandoned this path by the first quarter of 1998. Only 8 percent of the firms that in 1997 were not planning to expand decided to do so in 1998. Only 17 percent of firms reported increased capacity utilization after July 1997; one-fourth also expanded in the first half of 1997. The large majority of these firms were exporters, but their increase was modest, averaging about 13 percent. Fewer than a third of them expected to increase their capacity utilization by the end of 1998.

Auto parts makers were the hardest hit, largely because of the domestic orientation of the industry, and were the most pessimistic about their prospects. A factory visit gives a vivid picture of new plants full of machinery to produce for the local market—standing idle. By the beginning of November 1997, most large auto assemblers had announced that they were suspending operations (or severely cutting back production) for three to six months. One ray of hope came with the announcement in 1998 that Toyota would be shifting some production to Thailand (to export to Japan) to take advantage of lower costs of production. The tariff and nontariff barriers in the auto industry, however, suggest that exports from this sector hold little promise of increased growth for the sector overall.

Employment

The human dimension of the decline in capacity utilization is reflected in the reduction in employment levels. Eighty percent of firms with lower capacity utilization had cut back on the number of employees. Thus, close to 60 percent of firms employed fewer workers at the time of the survey in early 1998 than they did in July 1997. Very few firms reported firing workers; almost all the reduction came from attrition.

Exporters were only slightly less likely than nonexporters to reduce their employee rolls. Auto parts manufacturers, which tend to have small work forces, suffered the most; only one in four had the same number of employees at the time of the survey as before the onset of the crisis. The reduction in other sectors was less dramatic. In textiles and electronics, slightly more than 50 percent of firms had fewer workers than they did in July 1997, while the figure in garments and food was about 45 percent.

Looking at the capacity utilization and employment results together, it appears that export firms were only slightly better positioned than domestically oriented firms. Large exporters did not experience falls in capacity utilization, but neither did they increase production, and half of them employed fewer workers at the time of the survey than they did before July 1997. Finally, both small and large producers for the domestic market cut back on capacity utilization and employment.

Perceived Causes of the Slowdown

The causes for the slowdown, as reported by the firms, call into question the common explanation of a credit crunch. Sixty percent of firms said that a substantial decline in domestic demand and higher input costs as a result of a depreciated baht were the primary sources of difficulty. In fact, only a third of the firms cited access to capital as a major problem, although substantially more said the cost of capital was a problem. The cost of capital was brought up by two-thirds of the food and textile companies and by about half of the auto parts, electronics, and garment firms. The cost of capital was particularly hard on small firms and nonexporters, and it affected domestic firms more than foreign firms. Small firms, nonexporters, and firms without foreign ties put greater emphasis on the decline in domestic demand than did large firms, exporters, and foreign-owned firms. These results are entirely consistent with the responses regarding changes in capacity utilization and employment.

There is substantial variation across sectors in the perceived causes of the slowdown. Textile firms stressed the effects of the depreciation of the baht, and auto parts makers were most worried about the drop in domestic demand. Firms in the food processing industry were least concerned about the fall in demand, but a third still reported it to be a significant problem. Access to capital was virtually unmentioned in the electronics sector, but more than 40 percent of textile firms cited it as a problem.

Nonexporters were encountering greater difficulties from the crisis than were exporters—one piece of evidence supporting the potential for exporters to expand and lead the way out of the current hardships. Yet more than 40 percent of exporters, particularly in the electronics and garment industries, saw a drop in foreign demand as a significant difficulty. With half of firms' exports traditionally targeted within the region and with the surge in the supply of electronic components, the fall in foreign

demand was not unexpected, but it makes the traditional path to recovery a more illusory one.

Firms were also asked to rank the difficulties of access to finance—particularly in the longer run—on a scale of 1 to 5 (with 1 meaning no problem and 5 a severe problem). About 20 percent said it was a major problem, and 24 percent reported that it was no obstacle at all. Interestingly, it was more of an issue for large firms, particularly large food processors.

Comparing the results in the short run with those over a longer period of time, it appears that the immediate impact of the crisis on manufacturers did not primarily concern finance. As a longer-term development goal, however, particularly in an environment where firms are trying to expand, finance is still an issue that needs to be addressed. Certainly there is a heavy reliance on short-term borrowing. The average bank debt-to-equity ratio in the sample is more than 200 percent, and almost all of the debt is short term. The fact that interest rates have not risen too drastically may explain why access to finance is not identified as a first-order problem.

Financial Characteristics and Impact of the Crisis

Linking the information on the financial characteristics of firms to their responses to the crisis suggests that the firms that might have been considered vulnerable are in fact some of the sounder ones. That is, at the time of the survey, firms with high debt-equity ratios or foreign currency liabilities had maintained higher rates of capacity utilization and remained relatively more optimistic about the future. This underlines the importance of looking at characteristics such as size, export orientation, and links to foreign firms when assessing firms' overall vulnerability. It should also be noted, however, that these data come from responses gathered in the first six months of the crisis, and sustaining high levels of debt or foreign liabilities becomes increasingly difficult as time goes by.

At the same time, businesses with higher debt-equity ratios were more likely to find access to capital an issue (43 percent, compared with 21 percent of those with low debt-equity ratios), suggesting that financial institutions were reluctant to continue lending to highly indebted firms. Interestingly, access to capital was more likely to be an issue for firms that were required to put up collateral than for those with unsecured loans. This is consistent with the banks' increasing demand for collateral to back loans.

Not surprisingly, the more leveraged firms were almost twice as likely to see the cost of capital as a bottleneck. Despite the depreciation of the baht, the cost of and access to capital were less problematic for those firms borrowing in foreign currency. The fall in domestic demand was also less of an issue for those firms, in part because many of the firms borrowing in foreign currency were large exporting firms with foreign partners.

Companies that were highly leveraged at the onset of the crisis were the most pessimistic about the prospects of increasing their level of output. Strikingly, firms that borrowed in foreign currency (generally, large joint ventures that export) were significantly more optimistic about the likelihood that their output would rise. Firms that relied purely on short-term financing were significantly more pessimistic: 45 percent said their output would decline, and only 11 percent thought it would rise. Concerns that were less reliant on short-term financing were more evenly split; close to a third said output would rise, and the same percentage thought it would decline.

An accurate measure of the degree to which there is a credit crunch in Thailand is difficult to obtain. It is not sufficient to show that interest rates are rising or that the amount of new lending is lower. Rather, one needs to show the extent to which profitable investments are not being financed that otherwise would have been. Falling debt-equity ratios and canceled plans for expansion are consistent with a credit crunch but do not prove that viable projects are not being funded. These responses are also entirely consistent with a fall in domestic demand for credit. And, except for large firms, the share of short-term debt went up in 1997 compared with 1996.

Some additional evidence does support a credit crunch. For one thing, the cost and reported difficulty of obtaining capital were rising during the time in which the interviews were held. Another potentially worrying sign was the increasing reliance on short-term finance by many of the firms one would expect to be well positioned to recover quickly from the impact of the crisis—exporters and joint ventures. This reinforces the point that one of the most important areas in which financial reform will aid firms is in increasing access of profitable firms to longer-run finance.

Bottlenecks to Long-Term Productivity Growth

In addition to assessing the impact of the crisis, the survey gathered information on the determinants of firms' competitiveness. That portion of the survey covered a range of questions about long-term productivity growth and competitiveness, including quantitative data on inputs, outputs, and value added, as well as qualitative information about various problems and bottlenecks. Although the input and output data are beyond the scope of this article, it is important to record firms' perceptions of the bottlenecks that retard their long-term development.

The survey asked respondents to rank the bottlenecks to production and productivity growth on a scale of 1 (no problem) to 5 (a severe problem). The exporting firms in the sample had three clear reactions. First, they expressed a serious concern about the interrelated issues of corruption, customs administration, and red tape. Second, they voiced a similarly large concern about labor market issues: labor costs in general, and the availability of technical labor in particular. Third, they raised no great concern about access to finance (not surprising for these international firms) or

infrastructure (moderately surprising, given the visible problems). As noted earlier, nonexporting firms said that finance was an issue, but overall they were less concerned about it than were exporters—a worrying sign for the prospects of an export-led recovery. There were some differences in perceived bottlenecks between foreign and domestic firms. Both groups worried about corruption, customs administration, red tape, and labor costs, but access to finance was more of a concern for domestic firms.

By sector, the electronics industry cited red tape, corruption, and the lack of technical workers as serious bottlenecks. Garment and textile firms were also troubled by labor costs, although garment firms were more concerned about customs administration and red tape. The electronics and garment industries were the strongest exporters. Auto parts and food products ranked labor costs and red tape as the two greatest problems. High labor costs were the common thread in all of the sectors. Considering that the survey was taken shortly after a major devaluation, this problem is a bit of a surprise.

Concerns about corruption are echoed in international surveys covering a wide range of countries. Compared with countries at the same level of income, corruption is high in Thailand. Firms also report a large degree of regulatory discretion, a characteristic that is highly associated with corruption (World Economic Forum 1998). Corruption in the customs administration is a particularly severe problem for exporters and other businesses that need imported machinery and inputs in order to participate in the international division of labor.

A smooth adjustment to the shock of the East Asian financial crisis required Thailand to *compress demand while limiting the decline in output*, something that could be accomplished only if exports increased. The real devaluation—which raised the relative price of tradables—should have spurred such an increase. Indeed, the structural adjustment program supported by the international financial institutions assumed a good export response.

What went wrong? In sectors burdened with worldwide overcapacity (notably auto parts), there was little scope to use the vast capital stock that had been put in place. More generally, since half of all external sales go to other Asian economies, the regional recession made any increase in exports unlikely.

It is noteworthy that the survey found little evidence that lack of credit hampered firms, either in production or in exports. In fact, it found that red tape and poor customs administration were larger issues than the availability of finance. Nonetheless, reforms to raise accounting standards, require financial disclosure, and impose prudential regulation of financial institutions remain important so that firms can gain greater access to longer-run finance and improve the match of maturities between available loans and investment projects.

In retrospect, given the weak potential for increasing exports quickly, the macroeconomic program was too tight. Fiscal and monetary contraction led to a sharp

Table A-1. *Characteristics of the Sample of Firms, Thailand*

	Total	Average number of employees	Size			Volume of exports			Foreign direct investment	
			Small	Medium	Large	Small	Medium	High	Yes	No
<i>Sector</i>										
Garments	334	232	125	130	72	151	26	138	56	278
Textiles	306	275	102	98	83	189	41	47	60	246
Electronics	229	543	49	64	104	96	36	83	130	99
Food	122	465	26	32	51	56	8	47	35	87
Auto parts	236	233	88	72	52	156	30	27	64	172
<i>Export status</i>										
Small	648	132	304	220	106	648	n.a.	n.a.	93	555
Medium	141	491	19	39	72	n.a.	141	n.a.	63	78
Large	342	538	38	115	172	n.a.	n.a.	342	163	179
Total	1,227	288	390	396	362	648	141	342	345	882

n.a. Not applicable.

Source: Thai Competitiveness Survey.

decline in domestic demand. Because this drop in demand was not mitigated by an increase in exports, the decline in output was unnecessarily large. Once the extent of the decline was evident, fiscal and monetary policies were eased to provide more stimulus to the economy.

Appendix: Overview of the Competitiveness Study

The findings presented here are based on responses from more than 1,200 firms that were interviewed in the last quarter of 1997 and the first quarter of 1998. The detailed survey was designed to learn about firms' production, labor force training and turnover, technology acquisition, and financial structure. Questions sought information from 1994, 1995, and 1996, as well as from the period immediately following the onset of the crisis. These firms (employing a total of more than 350,000 workers) were drawn from five of the major tradable goods sectors, which should have been relatively well positioned to take advantage of the large depreciation of the baht. The five sectors selected, based on their shares in exports and GDP, were auto parts, electronics, food processing, garments, and textiles.

Each sector is well represented. The inclusion of fewer food processing firms reflects the smaller number of establishments in this sector (table A-1). More than half the firms surveyed export at least some of their output, although the share of firms that export varies from sector to sector. Electronics and garments have the most exporters: two-thirds of the firms export, while only 50 percent of auto parts and textile firms do. In this regard, the sample is representative of the industries more generally: electronics and garment firms are more export oriented, while auto parts and textile firms are more geared to the domestic market. This distinction is important in understanding the differences across sectors in the reaction to the crisis.

There is a good dispersion in the size of firms. Care was taken to include small and medium-size enterprises because they represent the bulk of firms and were most likely to have trouble coping with the recession. In this analysis, firms were divided into three categories based on total employment: small (under 50 employees), medium-size (50 to 150 employees), and large (more than 150 employees). The thresholds were chosen so that each category accounted for about a third of the total. Electronics and food processing have a noticeably higher proportion of large firms than do the other three sectors.

About 30 percent of the firms have a significant relationship with a foreign firm, either as a joint venture or as a wholly owned subsidiary of a foreign parent. Such relationships are most common among electronics firms and least common in garment firms. The tie to a foreign firm could be an important factor in giving firms access to capital or to markets overseas. Therefore it is not surprising that in the sample, close to 84 percent of firms with foreign ties export, compared with 51

percent of local firms. Part of the difference is also due to the fact that foreign firms tend to be larger. The average number of workers in a foreign exporting firm is 700, compared with 347 for local exporters; it is 185 for foreign nonexporters, compared with 83 for local nonexporters.

Notes

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1. The survey gathered information on firms' balance sheets from before the crisis as well as after its onset. The date of collection of the post-July 1997 data varies from the end of the third quarter of 1997 (when less impact might be expected) to the end of the first quarter of 1998. During this period, the baht-dollar exchange rate moved considerably, from 35 baht to the dollar, to 52, and back to nearly 40. This fluctuation raises the issue of the appropriate exchange rate to use in calculating the debt-equity ratios for firms with foreign liabilities. In the analysis for 1997, the exchange rate of 36.5 prevalent at the end of the third quarter of 1997 is used.

Another solution would be to maintain the use of the pegged value of the baht before devaluation (25 baht per dollar). This would allow for a measure of the change in the "real" debt-equity position. Clearly, the actual ratios are considerably higher for firms with foreign currency liabilities, but using an exchange rate of 25 does not alter the averages by very much because the number of firms with a significant share of their liabilities in foreign currency is small.

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