
Corporate Performance in the East Asian Financial Crisis

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The sharp decline in the once-stellar performance of East Asian corporations following the 1997 financial crisis has sparked an intense debate. Some observers argue that external shocks, including a drop in aggregate demand and a shortage of working capital, explain the corporate sector's poor performance. Others assert that the difficulties were apparent well before the crisis and that the risky financial policies pursued by these firms left them vulnerable. A survey of the literature shows little microeconomic evidence to support either view.

This article compares the growth and financing patterns of East Asian corporations in the years before the crisis with those in other countries. It finds little microeconomic evidence that corporate growth was weakening but some support for the argument that many firms had a weak financial structure that left them vulnerable to an economic downturn. Based on a sample of more than 850 publicly listed firms in the four crisis countries—Indonesia, Malaysia, the Republic of Korea, and Thailand—and two comparators, Hong Kong (China) and Singapore, it appears that firm-specific weaknesses already in existence before the crisis were important factors in the deteriorating performance of the corporate sector.

The East Asian crisis has sparked a large body of literature seeking to explain its causes, onset, and evolution. Whether sudden shifts in market expectations and confidence were the primary source of the financial turmoil has been hotly debated. Proponents of this view argue that although some macroeconomic and other fundamentals may have worsened in the mid-1990s, the extent and depth of the crisis can be attributed not to a deterioration in fundamentals but rather to the panicky reaction of anxious domestic and foreign investors (Furman and Stiglitz 1998; Radelet and Sachs 1998). Others argue that the crisis reflected structural and policy distortions in the region, including weak macroeconomic policies, and that fundamental imbalances triggered the crisis (Corsetti, Pesenti, and Roubini 1998).

The contributions of macroeconomic weaknesses, moral hazard, regulatory deficiencies, and the inherent instability of financial markets have all been investigated in depth (see Kaminsky and Reinhart 1999 for a review of recent work). Only more recently have variables in the corporate sector itself—performance, financial structure, and corporate governance—been included as explanatory factors. Some observers have gone so far as to attribute the East Asian debacle to these factors (Harvey and Roper 1999; Johnson and others forthcoming; Krugman 1999). In hindsight, it has become apparent that the corporate financial structure of many companies was too weak to withstand the combined shocks of increased interest rates, devalued currencies, and sharp declines in domestic demand. Yet poor performance and risky financial policies were not notable features of East Asia's economic ascent before the financial crisis—quite the opposite. Considered by observers to be an important contributor to the East Asian miracle, the corporate sector was generally viewed as being very competitive and adept at exploiting new market opportunities. As a consequence it attracted considerable amounts of foreign capital. Hence, it is unclear whether the corporate structure compounded the financial crisis or whether corporations were the innocent victims of a financial crisis brought on by other factors.

In this article, we review the performance and financing patterns of East Asian corporations in the years immediately before the crisis. We analyze the return on assets, in real local currency and in dollars, and the debt burden of 5,500 firms in nine economies in the region and two comparator countries, the United States and Germany. We find that while performance was perhaps weakening in some East Asian countries, returns on assets were generally high; in many of the nine economies, returns averaged twice as high as those recorded in Germany and the United States. The high levels of investment dictated a heavy reliance on external financing, and because outside equity was used sparingly, debt levels were high in most of these economies and in fact were increasing in Malaysia, the Republic of Korea, and Thailand. Short-term borrowing became increasingly important, especially in Malaysia, Taiwan (China), and Thailand. Some of the vulnerabilities in corporate financial structures that are now seen as factors in triggering and aggravating the crisis were thus already in existence in the early 1990s.

We survey the nascent literature on the role of the corporate sector before and during the crisis as well as the interaction between characteristics of the corporate sector and developments in the general economy. One way to assess the relative importance of external financial shocks and underlying weaknesses would be to compare the operational performances of firms that had different exposures to these financial shocks. A dearth of data and the elapse of time since the crisis, however, make it difficult to separate out the causes and consequences. Much of the literature has been qualitative in nature, and very little of it has involved analyzing individual performance of corporations during or following the crisis.

We therefore provide a preliminary empirical assessment of the importance of various factors by reviewing the performance of a sample of publicly traded firms in four crisis economies, Indonesia, Korea, Malaysia, and Thailand, and two comparators, Hong Kong (China) and Singapore, before and during the East Asian crisis. We find that little can be explained by a firm's financial and other characteristics or by the institutional environment of the particular country. Idiosyncratic shocks appear to have been the most important factors in the sharp deterioration in corporate performance. Nevertheless, of the variance that can be explained, we find that firm-specific, nonfinancial characteristics were most important. Industry-specific shocks and the institutional environment also contributed to the decline in profitability, and financing patterns had a strong influence on operational performance.

Corporate Performance and Financing

The data used here are based on annual reports of the companies listed on the major stock exchanges and come from the *Worldscope* database (see Claessens, Djankov, and Lang forthcoming a). This data set is unbalanced; that is, the number of observations varies from year to year. We have excluded companies that reported fewer than three times between 1988 and 1996, financial and banking institutions, and companies that did not report all of the following variables: net sales, net income after taxes, total assets, and the value of common equity.

Our first measure of performance is the real rate of return on assets (ROA), in local currency, calculated as the earnings of a firm before interest and taxes divided by total assets, minus the annual inflation rate in the country. The advantage of this measure is that it is not influenced by the liability structure of the firm because it excludes interest payments, financial income, and other income and expenses. At the same time it is not a complete measure of firm productivity (unlike total factor productivity) because it does not control for inputs other than capital.

East Asian corporations have had quite different ROAs, ranging from relatively low profitability in Hong Kong, Japan, Korea, and Singapore to high real ROAs averaging 9 to 10 percent in Indonesia, the Philippines, and Thailand (table 1). Returns in Malaysia and Taiwan fell between these two groups, but at about 7 percent, they were close to the high performers. All these ROAs were high compared with the returns of corporations listed on the DAX in Germany and on the New York Stock Exchange in the United States, which were about 5 percent. The comparison indicates that the corporate sector's contribution to the East Asian miracle was significant during most of this period.

A further comparison of corporate performance in all the countries that report to *Worldscope* reveals that Thailand, the Philippines, and Indonesia posted the highest returns in this sample of 46 economies, followed by Taiwan and Malaysia (figure 1).

Table 1. *Return on Assets in Real Local Currency, Selected Economies, 1988–96*
(percent, medians)

<i>Economy</i>	1988	1989	1990	1991	1992	1993	1994	1995	1996	1988–96
Hong Kong (China)	5.1	5.3	4.9	4.8	4.5	3.8	3.9	3.9	4.1	4.6
Indonesia	—	—	9.4	9.1	8.6	7.9	7.4	6.2	6.5	7.1
Japan	5.7	5.4	4.6	4.7	4.8	4.5	4.1	3.8	3.6	4.1
Korea, Rep. of	4.4	3.9	4.1	4.0	3.9	3.6	3.4	3.6	3.1	3.7
Malaysia	5.4	5.6	5.4	6.2	6.0	6.5	6.3	6.1	5.6	6.3
Philippines	—	—	—	7.1	6.4	8.1	8.5	6.8	8.4	7.9
Singapore	4.9	4.5	4.2	3.9	5.2	4.6	4.5	3.9	4.0	4.4
Taiwan (China)	—	—	—	5.1	6.2	6.5	6.8	6.5	6.6	6.7
Thailand	10.8	11.0	11.7	11.2	10.2	9.8	9.3	7.8	7.4	9.8
Germany	5.3	5.5	5.5	5.7	5.6	5.2	5.1	4.9	5.0	4.7
United States	4.7	4.8	5.1	4.9	5.2	5.4	5.3	5.2	5.2	5.3

— Not available.

Source: *Worldscope database.*

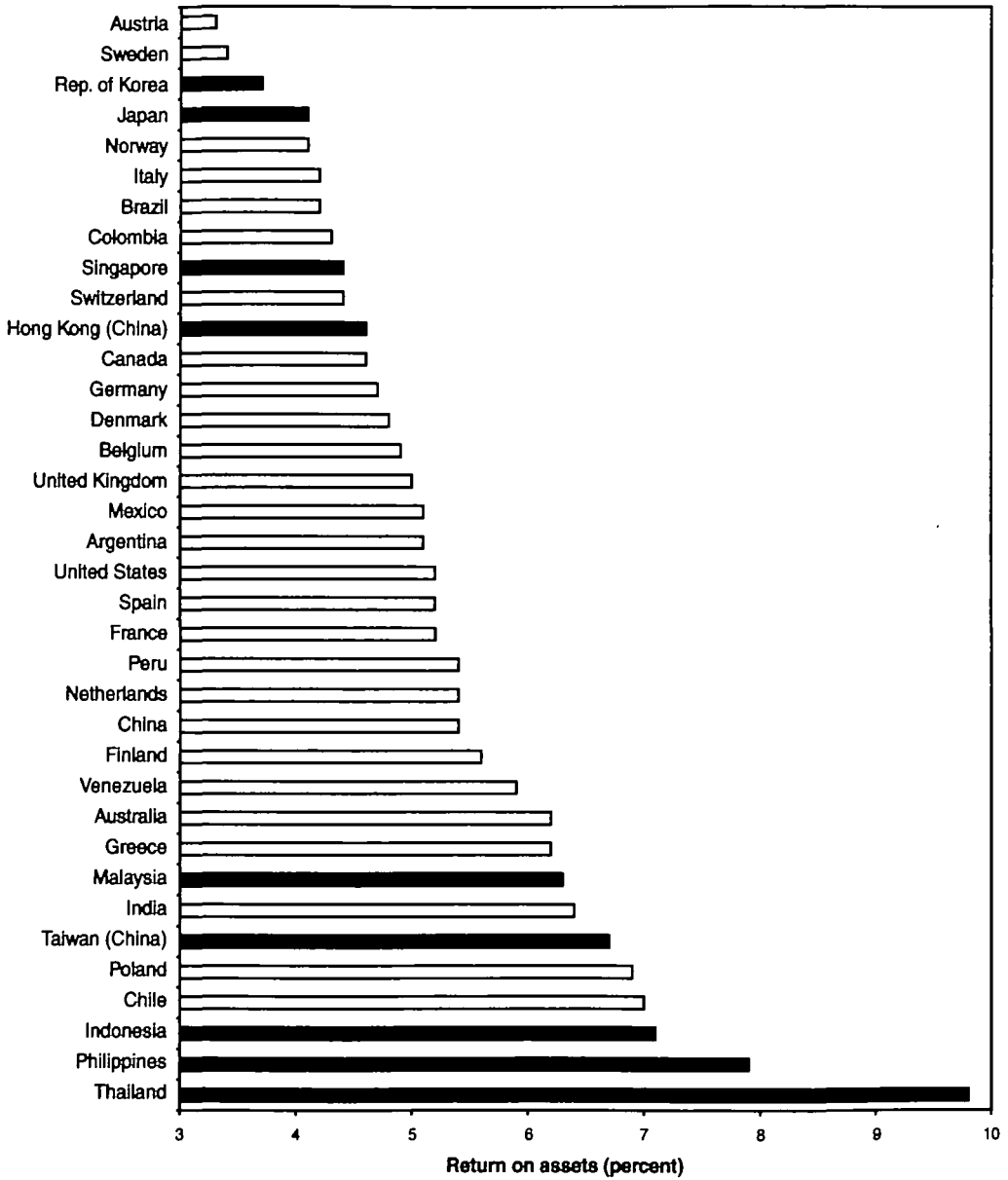
At the other end were Korea and Japan; Singapore and Hong Kong also had relatively low ROAs in real local currency.

Table 2 shows ROAs in U.S. dollars, adjusted for the effects of currency movements. This measure of performance represents the point of view of an international investor who can allocate resources across several countries. With the exceptions of Japan (6.6 percent) and Taiwan (8.4 percent), ROAs in all the East Asian countries were higher than the U.S. median (8.7 percent). The Philippines (18.7 percent), Thailand (14.7 percent), and Indonesia (13.0 percent) posted the highest average returns over the 1988–96 period.

An examination of the data shows the degree of risk inherent in the liability structures of East Asian corporations. High rates of investment meant that companies had to turn to external financing to make up for the lack of capital from retained earnings. In fact, firms in these countries have always relied on high levels of external financing, primarily from the banking system. Leverage, measured by the ratio of total debt divided by equity, remained well above that in industrial countries (table 3). The most highly leveraged economy over this period was Korea; the lowest was Taiwan. Malaysia and Singapore were also low; leverage in the Philippines, while rising, was well below that of Indonesia and Thailand.

In the few years just before the crisis, leverage increased in Japan, Korea, Malaysia, and Thailand. Japan had reduced its leverage in the early 1990s, possibly in the course of a financial retrenchment, but when faced with a shortage of equity and other sectoral difficulties, companies there subsequently rolled over these loans. The rise in leverage in the Philippines probably resulted from reforms in the mid-1980s that revived the country's corporate and financial sectors and resulted in better financing possibilities.

Figure 1. *Return on Assets in Local Currency, Selected Economies, 1988–96*



Source: *Worldscope* database; authors' calculations.

Table 2. Return on Assets in Nominal U.S. Dollars, Selected Economies, 1988–96
(percent, medians)

<i>Economy</i>	1988	1989	1990	1991	1992	1993	1994	1995	1996	1988–96
Hong Kong (China)	8.0	8.4	7.2	12.9	14.3	12.5	11.5	8.0	10.3	10.3
Indonesia	—	—	16.0	13.7	12.6	15.3	11.7	10.7	11.2	13.0
Japan	6.5	-6.0	13.3	14.8	7.0	16.2	15.6	1.0	-9.2	6.6
Korea, Rep. of	25.1	10.3	7.3	7.2	6.4	5.9	12.1	9.9	-1.0	9.2
Malaysia	-0.8	8.8	7.2	9.9	14.8	6.1	15.5	12.2	9.5	9.2
Philippines	—	—	—	23.2	21.2	5.4	29.4	7.5	16.5	17.2
Singapore	8.9	9.4	15.6	13.6	6.9	9.3	16.4	9.0	6.8	10.7
Taiwan (China)	—	—	—	6.2	12.0	4.6	12.4	6.3	8.9	8.4
Thailand	13.9	14.6	19.3	16.9	13.4	13.1	16.6	13.2	11.5	14.7
United States	8.7	9.6	10.5	9.1	8.3	8.4	7.9	8.0	8.1	8.7

— Not available.

Source: Worldscope database.

A comparison by country of the average leverage ratios of East Asian corporations from 1988 to 1996 shows that firms in Korea were the most highly leveraged, followed, in order, by companies in Japan, Thailand, Indonesia, and Hong Kong. At the opposite extreme, firms in Taiwan were the least leveraged, followed by Malaysia, Singapore, and the Philippines. The pattern across other regions is also interesting. Western European countries typically displayed high ratios of debt to assets, reflecting the bank-based nature of their financial systems, with Swiss firms almost as highly leveraged as Japanese firms. In contrast, corporations in Latin American coun-

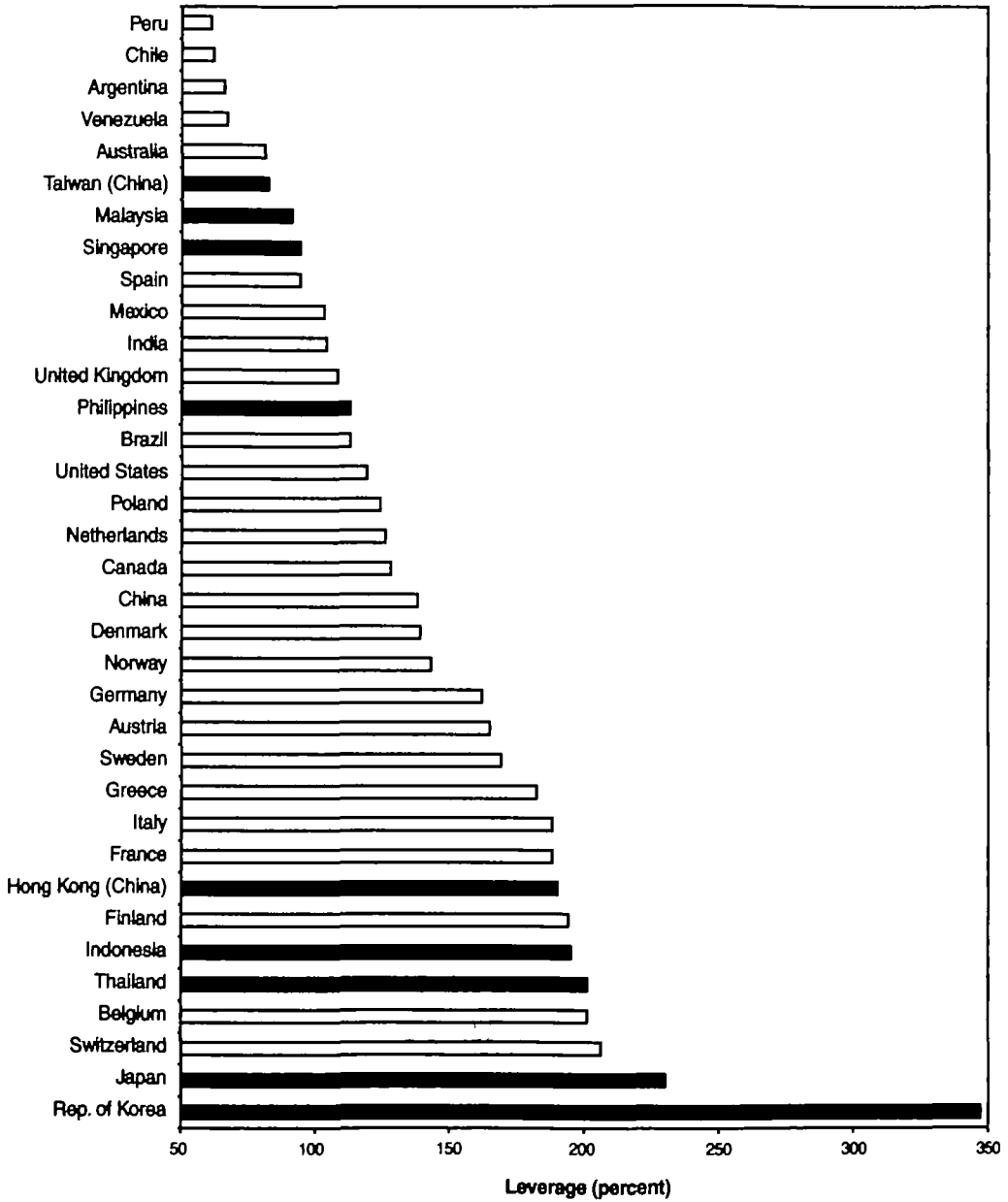
Table 3. Ratio of Debt to Equity, Selected Economies, 1988–96
(percent, medians)

<i>Economy</i>	1988	1989	1990	1991	1992	1993	1994	1995	1996	1988–96
Hong Kong (China)	1.832	2.311	1.783	2.047	1.835	1.758	2.273	1.980	1.559	1.902
Indonesia	—	—	—	1.943	2.097	2.054	1.661	2.115	1.878	1.951
Japan	2.994	2.843	2.871	2.029	2.042	2.057	2.193	2.367	2.374	2.302
Korea, Rep. of	2.820	2.644	3.105	3.221	3.373	3.636	3.530	3.776	3.545	3.467
Malaysia	0.727	0.810	1.010	0.610	0.627	0.704	0.991	1.103	1.176	0.908
Philippines	—	—	—	0.830	1.186	1.175	1.148	1.150	1.285	1.129
Singapore	0.765	0.922	0.939	0.887	0.856	1.102	0.862	1.037	1.049	0.936
Taiwan (China)	—	—	—	0.679	0.883	0.866	0.894	0.796	0.802	0.820
Thailand	1.602	1.905	2.159	2.010	1.837	1.914	2.126	2.224	2.361	2.008
Germany	1.535	1.552	1.582	1.594	1.507	1.534	1.512	1.485	1.472	1.514
United States	0.798	0.848	0.904	0.972	1.059	1.051	1.066	1.099	1.125	1.034

— Not available.

Source: Worldscope database.

Figure 2. *International Comparison of Leverage, Selected Economies, 1988–96*



Source: Worldscope database; authors' calculations.

tries (Argentina, Chile, Colombia, Peru, and Venezuela) carried low debt ratios, reflecting the less-developed banking systems of these countries (figure 2).

Long-term debt as a share of total debt was low in East Asia during the entire period (1988–96), accounting for less than a third of all loans in Malaysia, Taiwan, and Thailand (table 4). Japan and the Philippines had the highest shares, at 48 and 52 percent, respectively, while the other economies in the region hovered around 43 percent. In contrast, long-term debt accounted for about three-quarters of total corporate debt in the United States and about 55 percent in Germany. Despite the close attention paid to the role of short-term debt in precipitating the financial crisis, the data do not suggest a massive buildup in such debt, at least up to the end of 1996. In fact, only Japan's share of long-term debt decreased during this period.

An international comparison of the maturity of debt structures shows that most companies in East Asian countries ranked below those in European and Latin American countries in their share of long-term debt.¹ Only in the Philippines was the average share of long-term debt more than 50 percent. In general, businesses in richer countries tend to have more long-term debt (Demirguc-Kunt and Maksimovic 1998). But many companies in higher-income East Asian countries rely less on long-term debt than would be expected on the basis of their per capita income level. Japan, for example, ranks below many other members of the Organisation for Economic Cooperation and Development (OECD). Whether this pattern of debt set the stage for the East Asian financial crisis is addressed in the next section.

The Role of the Corporate Sector in Financial Crises

Four hypotheses have been proposed to explain the role of corporate performance and financing patterns in triggering and aggravating the East Asian financial crisis. We look at each in turn.

Hypothesis 1

The first view asserts that the weak corporate performance after the crisis was due largely to the aggregate shocks experienced by the East Asian economies, including declines in domestic and external demand, a withdrawal of (short-term) capital flows, a devaluation of currencies, and an increase in domestic interest rates (Furman and Stiglitz 1998).

Empirical work on the importance of aggregate shocks has been limited, although Dollar and Hallward-Driemeier, in an accompanying article in this issue, suggest that it played an important, yet not an exclusive, role in the deterioration of the corporate sector. Respondents to a survey of about 4,000 small and medium-size firms in late 1998 and early 1999, for example, said that the four most important

Table 4. Long-Term Debt, Selected Economies, 1988–96

(percent, medians)

<i>Economy</i>	<i>1988</i>	<i>1989</i>	<i>1990</i>	<i>1991</i>	<i>1992</i>	<i>1993</i>	<i>1994</i>	<i>1995</i>	<i>1996</i>	<i>1988–96</i>
Hong Kong (China)	59.7	59.5	53.8	56.5	44.7	44.7	40.7	37.3	36.4	44.9
Indonesia	—	—	—	52.4	40.8	39.6	41.6	41.8	43.3	43.1
Japan	49.9	54.1	53.8	49.9	49.4	51.7	47.7	44.4	40.8	48.4
Korea, Rep. of	55.7	47.2	49.8	49.8	44.2	43.7	41.4	40.4	41.5	43.7
Malaysia	35.8	35.5	32.5	27.1	26.9	26.6	27.2	27.8	29.9	29.2
Philippines	—	—	—	57.2	53.1	50.3	50.2	49.8	51.4	52.2
Singapore	57.2	55.4	54.1	33.8	33.8	33.9	40.2	38.6	41.1	43.3
Taiwan (China)	—	—	—	53.9	44.4	32.8	34.6	34.3	38.9	35.9
Thailand	58.1	49.8	38.8	34.3	25.2	26.4	27.6	32.9	32.8	30.9
Germany	56.8	55.4	54.5	53.9	55.2	55.4	55.4	55.3	54.7	55.3
United States	77.7	77.2	76.3	76.7	75.8	76.2	75.2	74.6	74.1	75.9

— Not available.

Source: Worldscope database.

causes of the decline in performance were a fall in domestic demand, an increase in the cost of inputs (caused by the currency depreciation), and a rise in interest rates and labor costs (Colaço, Hallward-Driemeier, and Dwor-Frecaut 1999). The surveys do not provide a quantitative measure of the importance of these shocks, however, nor do they permit an assessment of the degree to which they were aggregate exogenous shocks or episodes that were exogenous to the firm or to the country. It is possible, for example, that the most vulnerable countries were those whose firms were most exposed to international trade or were already highly leveraged at the outset of the crisis. It is also possible that the corporations in these countries took on riskier projects to cover the higher costs of borrowing.

One way to disentangle the relative importance of various shocks would be to explore the possibility that although the effects of these shocks are likely to differ by industry, they need not differ across firms in the same industry. In countries open to international trade, firms in the same industry producing tradable goods, for example, are likely to have been similarly affected by a decline in aggregate external demand. Because each country has a different industrial structure, these differences could explain some of the variation in countries' performance. So far, this type of analysis has not been conducted.

Hypothesis 2

The second view argues that the poor corporate performance after the crisis reflected prior fundamental weaknesses (Corsetti, Pesenti, and Roubini 1998). As noted, however, there was very little indication of declining profitability before the crisis. Ac-

counting measures do not adjust for risk, however, and the relatively high rates of return posted by firms in the region may have been inadequate for the degree of risk undertaken by East Asian corporations. Harvey and Roper (1999) find supporting evidence for this view. Using rates of return on stocks, they find that although capital markets in the region mobilized substantial amounts of new funds and enhanced their liquidity, risk-adjusted returns on the shares of the companies concerned were well below those generated in other equity markets in the 1990s, especially in industrial countries.

This line of reasoning assumes that before the crisis, weak firms operating with a high degree of risk were not being disciplined sufficiently through competition and monitoring by shareholders or creditors (foreign as well as domestic). Poor performers were not forced to adjust and raise their rates of return sufficiently to compensate investors for the risks taken. Instead, distressed firms were allowed to operate while their losses continued to grow. Anecdotally, there are many examples of firms that continued to function even though they were technically insolvent. For example, Alphatec, a Thai semiconductor maker, was declared bankrupt in 1996 but did not close down until 1999. In general, very few enterprises declared bankruptcy, suggesting that firms continued to borrow and that banks continued to overlook the rise in bad loans. Of course, there were many successful corporations as well, as the generally high rates of corporate growth attest, so the presence of some weaker corporations does not fully explain the systemic nature of the financial crisis.

This argument may also presume that profitability was overstated, in part because of the need to attract external financing. The lack of transparency may thus have postponed the crisis. A cross-country comparison by La Porta, Lopez-de-Silanes, and Shleifer (1998) suggests that relatively weak accounting standards in East Asian countries may have allowed firms in crisis-affected countries to shelter their actual financial position and continue in business even after they were no longer financially viable. Furthermore, creditors' rights were weakly enforced because the judicial systems in these countries were often inefficient. And some evidence supports the view that weak corporations relied excessively on new financing. In a cross-sectional sample of publicly listed corporations in Thailand, for example, an increase in leverage in 1996 over 1995 was correlated with declines in profitability—evidence that struggling firms relied on increased external financing to overcome declining earnings (Alba, Claessens, and Djankov 1998).

Several studies have shown that ownership structure may encourage a lack of discipline and induce risky behavior. In many East Asian countries, shared ownership and other links between banks and corporations were extensive and could have skewed the market's allocation of resources toward influential borrowers, introducing excessive risk. Claessens, Djankov, and Lang (forthcoming b) show that about two-thirds of the publicly listed corporations in East Asian countries belong to larger groups, many of which include one or more financial institutions. Such links reduce the disciplining

role that would otherwise be played by external financiers, who have an incentive to monitor their investments carefully. In Korea, for example, many conglomerates (called *chaebols*) had ownership links with nonbank financial institutions; the larger conglomerates were often linked with a main bank. Kim (1999) shows that Korean firms with ownership links to financial institutions were more highly leveraged and had more short-term debt than other firms. Ownership links also played a role in Indonesia, where many banks belonged to business groups, and in Thailand, where a small number of families owned both banks and corporations (Laeven 1999).

Governments also influenced the financial sector by owning banks directly and by granting preferential access to resources; government influence in turn injected a political dimension into lending decisions. In Indonesia, for example, about 50 percent of the banks were state-owned; in Korea, the government had traditionally been influential in the banking sector (Cho and Kim 1995). This influence may be associated with increased risk-taking and poor allocation of assets, weakening the financial sector in the process. Claessens and Glaessner (1997) note that an inadequate regulatory and supervisory framework allowed well-connected borrowers to become even more highly leveraged. Moreover, the process of financial liberalization, including capital account liberalization, may have made credit more readily available to the largest—but not necessarily the most efficient—firms.

Weak corporate governance may also have affected firms' behavior. Although a lack of shareholder rights is often cited as one cause of the crisis, the region was not out of step with other emerging economies in this respect. But equity protection was less effective than that in OECD countries; although creditors had the same protections in both sets of countries, what was missing in the East Asian economies was the enforcement of these rights (La Porta and others 1999). Moreover, measures commonly used to assess transparency and evaluate the environment for private business transactions show a high incidence of corruption in East Asian countries (Kaufmann, Kraay, and Zoido-Lobaton 1999).

Lack of transparency and weak governance bear major responsibility for the East Asian crisis, according to Johnson and others (forthcoming). Their model identifies a channel through which weak corporate governance results in more stealing by managers, which in turn leads to a sharp currency depreciation and ultimately to a recession. They find empirical support for their model in a sample of 25 developing countries. Other economists, however, reject this notion. Stiglitz and Bhattacharya (2000), for example, argue that increased transparency in the form of disclosure requirements is unnecessary because markets can and do provide optimal incentives for disclosure. Under certain circumstances, they note, disclosure of the information could actually exacerbate fluctuations in financial markets and precipitate a financial crisis. Furman and Stiglitz (1998) point to the fact that even countries with solid legal and regulatory systems and no transparency problems, such as Sweden, have had financial crises.

Hypothesis 3

A third strand of the literature relates to imperfections in financial markets. Aggregate and financial shocks affecting financial institutions can affect the corporate sector by curtailing credit, including working capital and trade financing, to borrowers with valuable trading and investment opportunities (see Kashyap and Stein 1994 for a review). Shocks, whether real (changes in the terms of trade), financial (increases in world interest rates and declines in external financing), or regulatory (increased capital adequacy requirements or tighter loan classifications), can cause a real or perceived shortage of capital for banks. As a result, banks may become unwilling to lend even to viable corporations and instead may prefer to invest excess liquidity in safe assets, such as government bonds. Such a decision will curtail the amount of financing available for investment (or even for working capital), which can impair firms' performance.

A credit crunch can originate from weak financial institutions or from tightened regulation and supervision. The latter has been analyzed extensively in the context of the Basle Accord of 1989, which tightened capital adequacy rules for some classes of internationally active banks. A review of the data (BIS 1999) suggests that the effects of these tighter rules on aggregate credit provision have been minimal, although there is some evidence that borrowers from weaker banks have been affected. Most of this work applies to industrial countries, however, where shocks have been small and where many alternative financing instruments have been available. Given East Asia's unbalanced financial systems, which are dominated by banks (Greenspan 1999), and the fragile state of some banking institutions even before the crisis, it is likely that, at least initially, East Asian corporations suffered a credit crunch induced by weaknesses in the banking sector and a tighter regulatory framework (Domaç and Ferri 1999).

Increased uncertainty about whether and at what price loans will be available can also result in a shortage of loanable funds (Stiglitz and Weiss 1981). These effects can be particularly severe for bank lending because banks are more likely than other financial intermediaries or markets to lend to firms that suffer from a greater degree of informational asymmetries. Thus small and medium-size firms are likely to be harder hit by shocks to the banking system or by a tightening of regulations and supervision. Furthermore, a so-called balance-sheet effect can further amplify the effect of shocks on corporations (see Bernanke and Gertler 1995 for a review). In the presence of informational asymmetries and principal-agent relationships (in which managers run firms for the benefit of owners and creditors), a borrower's net worth becomes an important determinant of the amount of credit available, even though it is the economic prospects of the project being financed that should determine the availability of financing. When the net worth of a firm deteriorates, its supply of credit may be curtailed quite sharply, even when it has viable new investments. Again,

the generally high leverage of East Asian corporations could have exacerbated the impact of a credit crunch. Because interest payments account for a large share of the cash flow of such firms, small shocks would have had a large effect on borrowers' net worth.

Several papers have tried to model these relationships in a domestic context (Agénor and Aizenman 1999; Chan-Lau and Chen 1998; Kim and Stone 1999) and in an international context (Greenwald 1999). Generally, weaknesses in the financial sector along with tighter regulation and supervision appear to have contributed to corporate distress. There has been a presumption, with some supporting empirical evidence, that the tighter rules for financial institutions affected the supply of loanable funds in several countries (Ding, Domaç, and Ferri 1998; Ghosh and Ghosh 1999). This credit contraction, in turn, was likely to have led to a decline in output. In some countries and over time, the importance of credit contraction may have been diminished by the reduced demand for funds as the financial situation deteriorated and the prospects for returns on new investment worsened. Indeed, Ghosh and Ghosh (1999) find that in Korea and Thailand (but not in Indonesia), the binding constraint was the slowing demand for funds rather than an inadequate supply of credit. Although survey results confirm the importance of access to credit (see Dollar and Hallward-Driemeier in this issue), it is not clear to what extent the lack of access to credit reflected the poor prospects of the firms and the state of the financial sector.²

Although all corporations were affected to some degree, those with riskier financing patterns were more likely to be denied credit. Dollar and Hallward-Driemeier provide some support for this argument, showing that smaller firms that did not rely as much on foreign exchange financing faced a less severe credit crunch. But the degree of informational asymmetries, as reflected in the type of financing firms obtained, probably mattered for continued access to external financing. Domaç and Ferri (1999) find that in Korea, small businesses were particularly vulnerable to shocks that affected smaller regional banks, which normally provided them with most of their funding.

Changes in net worth were also likely to have been important in reducing the supply of financing. East Asian corporations had relatively high levels of debt before the crisis and were thus at risk of easily depleting their net worth. Even relatively small shocks could have lowered net worth significantly and thereby led to a sharp cut in external financing. Harvey and Roper (1999), who analyze the effects of risky financial structures on subsequent East Asian corporate performance, argue that corporate managers bet their companies by trying to offset declining profitability with ever-increasing amounts of borrowing in foreign currencies. Those bets turned sour when local currencies plunged and companies could not generate enough funds to pay their debts. Claessens, Djankov, and Ferri (1999) estimate that about 30 percent of corporations in crisis-affected East Asian countries were insolvent in the fall of 1998. More than twice as many corporations in these countries suffered illiquidity.

With banks mired in bad debts and external financing scarce, firms had to cut back on production and sales, including exports.

Even operationally viable firms were overburdened with debt, and banks were unwilling to provide capital to these firms until their debts had been resolved. This process can take a considerable amount of time where there are multiple creditors and weak frameworks for restructuring failed entities. Meanwhile, corporate value may be lost. The rapid rise in the share of nonperforming loans in bank portfolios also suggests the importance of financial shocks in precipitating the crisis, although the numbers do not allow one to differentiate the causes of the nonperforming loans (aggregate versus idiosyncratic shocks). More generally, a systemic financial crisis can exacerbate the effects of market imperfections (Greenwald 1999; Stiglitz 1999). As a result, firms that are operationally viable but financially distressed may suffer from a lack of working capital and other financing and be unable to maintain ongoing operations.

These explanations do not contradict the fact that many firms confronted problems arising from high leverage and low (risk-adjusted) rates of return and were thus very much at risk. One explanation of the preference for high levels of debt—apart from the need for external financing to maintain high growth rates—may be that it enabled large shareholders to retain control over firms' operations and thus to continue to benefit from a disproportional share of firms' cash flows. Had firms instead relied on equity financing, the bondholders would have controlled the decision to expand into new businesses, based on clear, objective criteria. Claessens, Djankov, and Lang (2000; forthcoming b) find that many firms in East Asia were controlled by a few large shareholders. Two-thirds of those controlling owners also held senior management positions and thus had ample opportunity to divert profits and indulge in high levels of risk. In cases where only a few owners held all or substantially all control, greed was a strong incentive. Empirical evidence reveals that minority rights were often violated in firms controlled by inside shareholders. Valuations of such companies were far below those of comparable firms, suggesting large-scale expropriation (Claessens and others 1999b).

Ownership structures may also have mitigated or exacerbated the impact of the shocks. Claessens and others (1999a) show that ownership structures can explain excessive diversification, which lowered firms' market valuation before the crisis. Group affiliation may also have been a factor because it could have allowed for more diversification of risk. Indeed, Claessens and others (1999a) find that the market valuation of companies associated with groups was 3 percent higher after the crisis than that of nonaffiliated firms, suggesting that there were some benefits from diversification within the group. It appears that group affiliation gives rise to tradeoffs: lower performance in normal times, but some risk diversification in turbulent periods. At the same time, group affiliation was found to be associated with expropriation.

Hypothesis 4

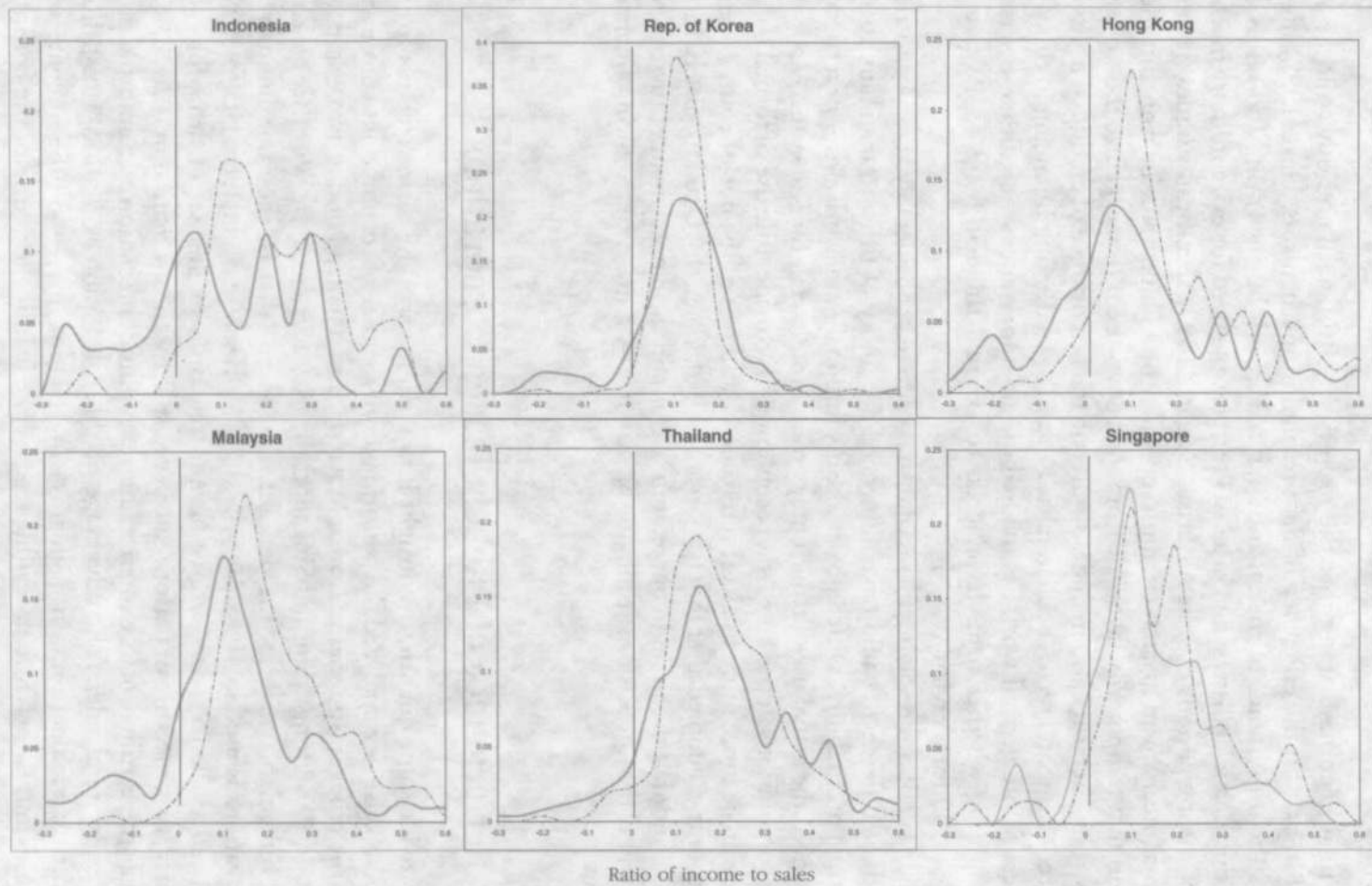
The final hypothesis states that the real effects of financial and other shocks depend in part on the efficiency of debt resolution mechanisms. Hart (1999) highlights the importance of the institutional framework in preventing and resolving systemic financial distress and discusses the possible need for extraordinary mechanisms during periods of systemic crisis. Stiglitz (1999) specifically argues that the optimal mechanism in such circumstances may be a bankruptcy or reorganization system that temporarily favors debtors and allows them to reorganize their operations. This literature also includes studies on the importance of creditors' rights to enforce claims and recover collateral as a means of facilitating financing in times of distress. More general work has focused on the importance of creditors' rights in determining whether firms have access to external financing (see La Porta and others 1999 for a review).

Frameworks for resolving financial distress differed considerably across countries, and these differences could have influenced the ability of firms to maintain operations and profitability. Differences in the institutional framework also appear to have influenced the actual use of bankruptcy procedures. Except for Korea and Malaysia, large corporations in the East Asian economies have made little use of formal bankruptcy procedures; more use has been made by all firms of the out-of-court systems that countries adopted after the crisis began. Indeed, Claessens, Djankov, and Klapper (1999) find that the strength of creditors' rights and the enforcement of these rights influenced firms' decisions to file for bankruptcy as a means of resolving financial distress.

The Performance of Publicly Traded Corporations

To provide some quantitative insight into the impact of the various factors in the financial crisis, we analyzed the performance of a subset of corporations before and after the crises in Indonesia, Korea, Malaysia, and Thailand and in two comparator countries, Hong Kong and Singapore. The data are from the *Worldscope* database, but in this analysis, the data set is balanced (that is, the same number of observations is used in 1996, 1997, and 1998). Because we include data for 1998 and need a balanced data set, we have to rely on a smaller set of firms for each country. As a measure of performance, we use firms' profit margin on sales, calculated as the earnings before interest and taxes plus depreciation and amortization, divided by total sales. The advantage of this calculation is that, as a cash-flow measure, it excludes interest payments, financial incomes, and other income and expenses and is therefore not influenced by the liability structure of the corpora-

Figure 3. Ratio of Operating Income to Sales, Selected Economies, 1996 and 1998



Source: Worldscope database; authors' calculations.

tion. This makes it possible to study the effects of real and financial shocks on operational performance.

The data set consists of 857 firms, of which 104 are in Hong Kong, 50 in Indonesia, 219 in Korea, 191 in Malaysia, 71 in Singapore, and 222 in Thailand. The data cover firms of different sizes; the median size is 1,099 employees, with the largest company employing almost 40,000 people and the smallest only 38. Sales volumes range from slightly less than \$1 million in 1996 U.S. dollars to about \$6.6 billion; the mean sales volume is \$68 million. Overall, the data set covers primarily large firms, mainly because they have to be listed on a stock exchange to be included in the database and publicly traded companies tend to be large.

The postcrisis deterioration in performance across countries and firms can be illustrated by plotting the margins by country for all firms both before and after the crisis (figure 3). Note that the distributions shift to the left as margins deteriorate for all countries and that the number of firms with negative margins increases sharply in all countries. For the median firm, the margin on sales falls by 6.7 percentage points. The most seriously affected firms were in Indonesia, where median margins fell by 11.4 percentage points. The variability of margins across firms in each country also increased significantly, as shown by the distributions in 1998, which are wider (more fat-tailed) than the bell-shaped curves of 1996. The larger variability highlights the importance of analyzing the contribution of various groups of factors to individual firm performance.

To illustrate the importance of the various factors in explaining changes in performance, we run regressions using the firms' margin in 1998 as the dependent variable. The control variables are divided into four groups, corresponding to the roles of aggregate shocks, the nonfinancial characteristics of firms, the financial characteristics of firms, and country characteristics. The first group consists of industry and country dummy variables and aims to capture the country- and industry-specific shocks to which a firm may be exposed.³ The dummies also capture some of the differences in market structures across industries, differences in foreign exchange depreciations, and other changes in the degree of relative competitiveness.⁴ The second group includes the firms' nonfinancial characteristics before the crisis, including sales margin, real sales growth, and logarithm of sales (in U.S. dollars as a measure of size), all measured in 1996. The third group captures the firms' financial structure and ownership variables before the crisis, including the leverage ratio (defined as total debt divided by the market value of equity), the share of short-term debt in total debt, and ownership concentration (as measured by the percentage of control rights held by the two largest shareholders). The fourth group depicts the institutional environment of the country in which the firm operates. It includes indexes of the protection of shareholders' rights and creditors' rights and of the country's judicial efficiency in enforcing these rights.

We include these independent variables in a cross-sectional, pooled regression to try to explain the 1998 margins on sales. Specifically we estimate the following regression:

$$\begin{aligned} \text{margin}_{i,98} = & \alpha_0 + \sum_c \alpha_c D_c + \sum_j \alpha_j D_j \\ & + \beta_1 \text{size} + \beta_2 \text{margin}_{i,96} + \beta_3 \text{sales growth}_{i,96} \\ & + \gamma_1 \text{ownership concentration} + \gamma_2 \text{leverage}_{i,96} + \gamma_3 \text{short-term debt ratio}_{i,96} \\ & + \delta_1 \text{judicial efficiency index}_c \times \text{equity rights index}_c \\ & + \delta_2 \text{judicial efficiency index}_c \times \text{creditors' rights index} + \varepsilon_{it} \end{aligned}$$

where i indicates firm I , j refers to the industry, and c is a country index. Greek letters indicate coefficients to be estimated. To facilitate interpretation, we also standardize the firm- and country-specific variables to obtain a normal distribution with a mean of 0 and a variance of 1.5.⁵ The results for different specifications are contained in table 5.

The first specification (column 1) controls for country and industry characteristics. Differences in 1998 margins across countries and industries are reflected in the coefficients. For countries, and controlling for other factors, the regression shows that firms in Thailand had significantly higher margins, 1.5 percentage points higher, than did firms in Hong Kong, the base economy. Among industry classifications, the commerce and construction industries had statistically significant lower margins compared with manufacturing, the base category, while the service industry had statistically significant higher margins. These cross-industry differentials in margins suggest that some of the causes of firms' financial distress were sector-specific shocks.

The next specification (column 2) includes firm characteristics before the crisis to help explain postcrisis margins. We examine both nonfinancial and financial characteristics of firms. Not surprisingly, firms with higher margins and sales growth before the crisis also had higher margins afterward; that is, firms that were performing relatively better before the crisis were also less affected by the crisis. Put differently, underlying prior weaknesses may have been a factor in firms' weak performance in 1998. This finding extends even to larger firms, which might have been expected to fare better than smaller ones because of greater diversity of products or preferential access to financing. However, postcrisis performance is not consistently affected by firm size (measured by the logarithm of total sales in dollars in 1996), suggesting that larger firms were not necessarily better able than smaller ones to weather the crisis.

In this specification, ownership concentration, as measured by the share held by the top two owners, has no significant relationship to postcrisis performance. Although insider control and connected lending have often been blamed for the problems of East Asian corporations, firms with concentrated ownership structures appeared to be no less able than other firms to manage the crisis. Other financial

characteristics did play a role, however. In particular, firms with higher leverage and a higher proportion of short-term debt tended to perform more poorly (and the coefficients are statistically significant in the median regression) than did firms without those characteristics. This finding is consistent with the view that the financial structures of East Asian firms before the crisis contributed to their poor performance afterward, suggesting that financial market imperfections and the credit crunch were important factors leading to lower operational performance.

The last specification (column 3) relates the postcrisis performance of a company to its country's institutional environment. These regressions drop the country dummies to focus on institutional differences only. Most of the coefficients found to be statistically significant in earlier regression results retain their significance here. We

Table 5. Empirical Results
(dependent variable: 1998 profit margin divided by sales)

	(1)	(2)	(3)
Constant	0.048 (0.016)**	0.089 (0.010)**	0.134 (0.006)**
<i>Country</i>			
Singapore	0.039 (0.024)	0.040 (0.015)**	
Malaysia	0.026 (0.019)	0.007 (0.013)	
Korea, Rep. of	0.049 (0.018)**	0.059 (0.014)**	
Indonesia	-0.007 (0.026)	-0.033 (0.018)	
Thailand	0.118 (0.018)**	0.085 (0.015)**	
<i>Sector</i>			
Diversified	0.014 (0.024)	-0.009 (0.016)	-0.018 (0.019)
Commerce	-0.057 (0.017)**	-0.059 (0.011)**	-0.071 (0.013)**
Utilities	0.027 (0.021)	-0.040 (0.014)**	-0.030 (0.017)
Services	0.127 (0.022)**	0.002 (0.015)	0.011 (0.017)
Agricultural goods	-0.043 (0.025)	-0.004 (0.017)	0.003 (0.020)
Mining	0.023 (0.054)	0.028 (0.035)	0.030 (0.042)
Construction	-0.048 (0.022)*	-0.052 (0.014)**	-0.043 (0.017)*

(Table continues on the following page.)

Table 5 (continued)

	(1)	(2)	(3)
<i>Organizational factors</i>			
A. Log (sales 96)		0.003 (0.004)	0.002 (0.005)
Margin 96		0.099 (0.004)**	0.098 (0.004)**
Sales growth 96		0.009 (0.002)**	0.008 (0.002)**
<i>Financial structure</i>			
B. Ownership concentration (top two owners)		0.005 (0.006)	0.002 (0.005)
Leverage 96		-0.015 (0.003)**	-0.014 (0.003)**
Short-term debt 96		-0.011 (0.004)**	-0.013 (0.004)**
<i>Institutional environment</i>			
C. Equity rights × judicial efficiency			0.004 (0.014)
Creditors' rights × judicial efficiency			-0.029 (0.014)*
Observations	857	857	857
R-squared	0.04	0.13	0.12

* Significant at 5 percent.

** Significant at 1 percent.

Note: The *R* squares reported for the median regressions are pseudo *R* squares.

All firm- and country-specific variables (except the industry dummies) are standardized to variables with means of 0 and variance of 1.

A constant (not reported) is included in all regressions.

Definitions of variables: labor is the total number of employees; sales is sales revenues in US\$1,000; ownership concentration is the sum of ownership stakes of the largest two shareholders; margin 96 is EBITDA (earnings before interest and taxes, depreciation added) sales in 1996; sales growth 96 is the real sales growth rate in 1996; leverage 96 is the sum of short-term and long-term debt over the market value of equity in 1996; diversified is a dummy variable indicating whether the firm operates in more than one 2-digit SIC industry; creditors' rights is an index measuring the protection of creditors, which ranges from 0 to 4 and is taken from La Porta and others (1999); shareholders should have "equity" rights; judicial efficiency is an index of the quality of judicial enforcement, which ranges from 0 to 10 and is taken from La Porta and others (1999).

Source: Worldscope database.

interact the judicial efficiency index with indexes of equity rights and creditor rights to account for the combined effect of the strength of the laws and the quality of their enforcement. The results suggest that firms in countries with better protection of equity rights had better postcrisis performance. An increase in the equity rights index is associated with higher margins, although the coefficient is not statistically significant at conventional levels. This suggests that in countries with better equity rights, firms might have been better disciplined by owners and thus might have had structures and operations better able to withstand the shock of the crisis. A higher level of the effective creditors' rights index in the country is associated with poorer firm performance. The negative and significant coefficient for the interaction term between creditors' rights and the judicial efficiency index suggests that a stronger protection of creditor rights coupled with an efficient judicial system contributed to lower postcrisis margins. This finding may be consistent with the notion that when firms' financial distress is caused by exogenous external shocks, an overly vigorous protection of creditor rights might result in too many bankruptcies and losses in output.

We analyzed the contribution of each set of variables in explaining the percentage of variations in firm performance after the crisis. Firm-specific nonfinancial characteristics are the most important in explaining the variations in margins in 1998, accounting for roughly 5.7 to 6.3 percent of total variation, or about one-half to two-thirds of all variation that was explained. A firm's financial structure and industry affiliation were roughly equally important, each accounting for between 1.1 and 2.3 percentage points of total variation. The least important factor was the country's institutional environment, which contributed between 0.5 and 1.6 percentage points of total variations in margins in 1998.

In sum, the regressions were unable to explain nearly nine-tenths of the total variations, suggesting that the effects of idiosyncratic shocks, rather than aggregate shocks, were very large. Of the variance that could be explained, the results suggest that firm-specific characteristics, both financial and nonfinancial, were the most important in explaining postcrisis performance.

Although the financial fragility of the corporate sector may not have triggered the crisis, it did contribute to its depth and severity. This suggests that countries and the international financial community need to pay more attention to the status of the corporate sector and its links with the financial sector and the rest of the economy. One option would be to use balance sheet and other financial information to monitor financial risks in the corporate sector, but such surveillance will be limited by the paucity of data, the potentially rapid changes in corporate financial structures, and the analytical difficulties in identifying risk factors and linkages. The East Asian financial crisis showed that risks arising from the corporate sector typically occurred because of institutional weaknesses, including weak property rights, poor bankruptcy and accounting procedures, lack of transparency, and weak or perverse incentives.

Corporate sector vulnerabilities thus might be more successfully limited by assessing and remedying these deficiencies and the resulting weak risk management practices.

Notes

At the World Bank, Stijn Claessens is lead economist in the Financial Sector Policy Group, Simeon Djankov is a financial economist in the Financial Sector Policy Group, and Lixin Colin Xu is an economist in the Development Research Group. The authors would like to thank Ying Lin for able research assistance and the reviewers for helpful comments.

1. We present the share of long-term, rather than short-term, debt because the latter can underestimate the amount of liabilities with a short maturity; short-term debt excludes, for example, trade credits.

2. Krugman (1999) argues that the corporate balance sheets may have been at fault, apart from macroeconomic or other weaknesses. In particular, a depreciation of the domestic currency causes an increase in the currency value of foreign-denominated firm debt, at the same time that firms face declining sales and higher interest rates. The resulting balance-sheet problems and reversal of capital flows weaken the corporate sector and, in turn, the financial system. This triggers a further currency depreciation with a current account surplus to accommodate the capital reversal deficit and financial system weakness. Krugman ascertains that the risks of such an event occurring are higher when corporate profitability is low relative to the cost of funds to financial institutions.

3. We classify firms into the following industry groups: commerce, utilities (including communications, electric, gas, transport, and water and sanitation services), services, mining, construction, agriculture and manufacturing. When a firm is in more than one industry, we classify it as diversified.

4. They do not, however, correct for differences in market structures and (potential) competition across countries. To the extent that firms produce traded goods, these country differences should not be important; but they will be important for other goods. Also, the regressions do not try to control for the effects of exchange rate changes, which differed by country, on firm's performance measures.

5. Because the margin and some right-hand-side variables have outliers, we conduct median regressions, which provide more robust estimates than ordinary least squares.

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