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15

*Corporate Financing
Patterns and Performance in
Emerging Markets*

The sustainability of financial flows to developing countries depends heavily on the health of the corporate sector, which has been at the center of several recent crises. Corporate borrowers now account for more than a fifth of cross-border debt flows, compared with less than 5 percent in 1990, and flows of foreign direct investment (FDI), the dominant form of external financing for developing countries, are ultimately tied to corporate performance. This study examines corporate balance sheet data for major emerging markets to document trends in, and relationships between, corporate financial structure and corporate performance in the 1990s.

The chapter is organized as follows. The first section examines shifting patterns of corporate debt dependence in three major regions: East Asia and the Pacific, Europe and Central Asia, and Latin America and the Caribbean. The second section addresses vulnerability to short-term debt, while the third section examines trends in corporate profits. The final two sections are devoted to the benefits and risks associated with external borrowing.

The authors would like to thank Jack Glen and William Shaw for comments on an earlier draft.

Shifts in Corporate Sector Debt Dependence

It is widely accepted that excess corporate leverage was at the heart of the financial troubles of many East Asian developing countries in 1997–98.¹ Their total corporate debt grew at a compound annual rate of 16 percent between the end of 1990 and the end of 1997, swelling from \$717 billion to \$2.4 trillion (or from 80 to 105 percent of national income). Their debt-equity ratio, valued at the market price of equity, rose from 3.8 at the end of 1990 to 4.2 at the end of 1997. The foreign debt of the corporate sector (mainly debt owed to banks) grew at a compound annual rate of 27 percent during the same period, far more rapidly than overall debt. As a share of total corporate debt, foreign debt rose from 6 to 10 percent.

The corporate collapses in East Asia and the Pacific in 1997–98 produced sharp overall declines in gross domestic product (GDP) and forced severe and wrenching adjustments in corporate balance sheets; the severity of the adjustments reflected the need for a sharp and sustained shift in the private sector's financial balance. That shift has occurred. The aggregate current account balance of crisis countries in the region (the four crisis countries—Indonesia, Korea, Malaysia, and Thailand—plus the Philippines) shifted from a deficit of 4.8 percent of GDP in 1996 to a surplus of 2.6 percent in 1998. Over the same period, the budget balance of the region moved from a surplus of 0.2 percent of GDP to a deficit of 1.3 percent. The implied swing in the private sector's financial balance—equivalent to 8.9 percentage points of GDP—was carried out largely by a severe compression of spending.

One key result of this shift into financial surplus was that companies in East Asia were able, in the aggregate, to arrest and partly reverse the sustained rise in corporate debt relative to GDP that occurred through the first half of the 1990s.

The corporate “deleveraging” in East Asia had three other important dimensions. First, there was a sharp drop in foreign borrowing. The share of foreign debt in total corporate debt rose steadily between 1990 and 1997 for East Asian economies as a whole and through 1998 for the four crisis economies, but this ratio has fallen sharply since then. Asian companies paid dearly for their brief foray into international borrowing, and the experience has made them far more cautious about foreign currency borrowing, even as their economies have recovered. Also, the shift to a flexible exchange rate regime, by reducing implicit guarantees against

devaluation risks, has reinforced firms' reluctance to take on foreign debt. The result is that the foreign currency debt of Asian corporations is now in short supply relative to the demand and is trading at relatively tight spreads compared to similarly rated paper from borrowers in other regions.²

Second, some effort has been made to diversify sources of domestic funding. In East Asia, for example, important efforts have been made to strengthen bond markets, helping to reduce dependence on bank finance. However, the range of financing instruments available in emerging markets remains limited when compared with more developed markets such as the United States. One of the strengths of the U.S. financial system is its diversity of funding sources, ranging from commercial banks through a rich array of money and capital markets. Thus when bond market credit suddenly dried up in the United States in 1998, corporate borrowers were able to turn to banks. Likewise, when the market in short-term commercial paper slumped early in 2002, companies were able to issue longer-term bonds and swap into short-term liabilities.

Third, debt-equity ratios in the region have declined as the result of efforts to pare down debt (especially foreign debt) and raise equity participation in the economy. FDI in Asia has been relatively high since the crisis years, contributing to a shift in the pattern of foreign liabilities away from debt and toward equity. The shift has been far from uniform, however. China has been the key beneficiary of stepped-up FDI, while Indonesia has seen a steady exodus of foreign equity capital since 1998.³

These significant adjustments have helped Asian corporations to insulate themselves from global market pressures in recent quarters. In 2001–02, for example, Asian corporations were better insulated from the downturn in the global economy and the deterioration in high-risk debt markets than were their peers in the main industrial economies. In East Asia, with external financing (especially short-term financing) much reduced, there was no significant flight of foreign capital, and domestic lenders remained comfortable with their exposures.

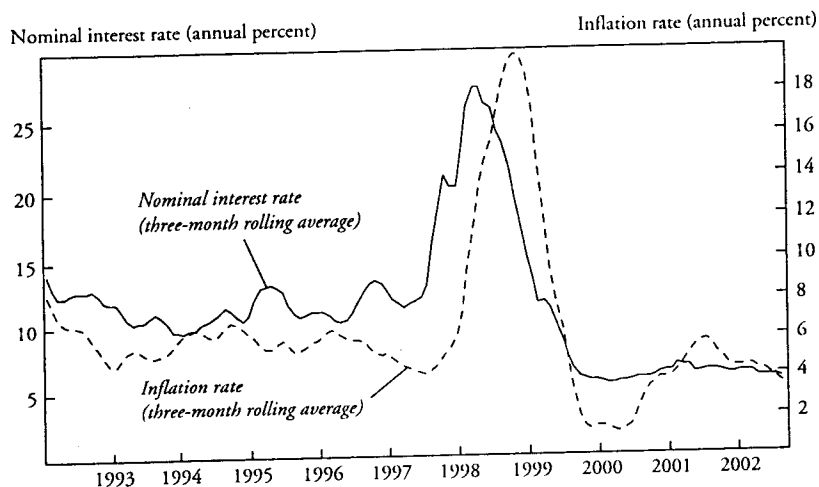
One important difference between 1997–98 and 2001–02 was the trend in local interest rates. In 1997–98, these rose sharply, contributing to a serious deterioration in the quality of corporate credit and undermining the willingness of both domestic and external creditors to maintain exposures. By contrast, regional interest rates generally fell in 2001–02, giving companies a cushion that allowed them to ride out the downturn far more easily (figure 15-1).

2. See World Bank (2003, ch. 3).

3. See World Bank (2003, ch. 4).

1. See Dadush, Dasgupta, and Ratha (2000); Dasgupta and others (2000); Radelet and Sachs (1998); World Bank (2000).

Figure 15-1. *Benchmark Interest Rates and Consumer Price Index Inflation, East Asia, 1992–2002*



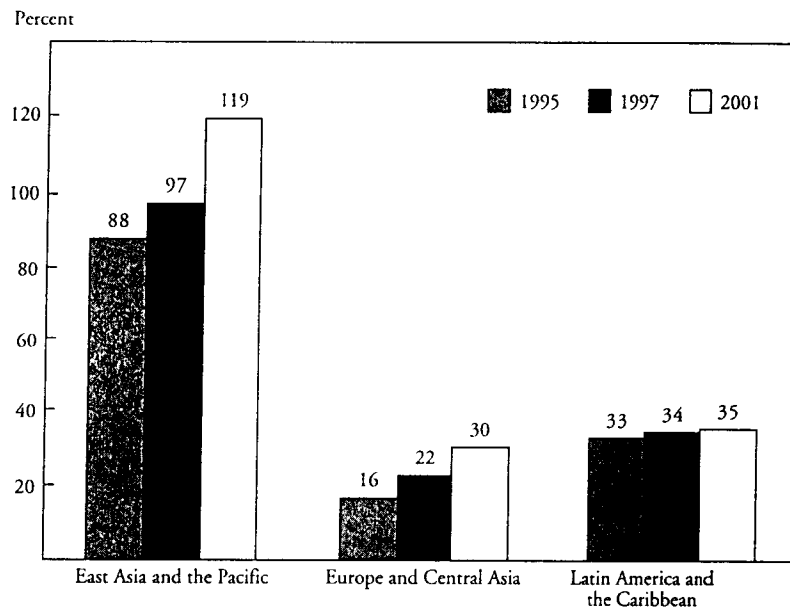
Indeed, the low level of regional interest rates is a key ingredient to the sustainability of what remains, after several years of painful adjustment, a very high ratio of corporate leverage. While corporate debt has been trimmed in some economies, it has risen sharply in others—notably China. As a result, debt levels (as a share of GDP) remain very high in East Asia compared to both Latin America and Eastern Europe (figure 15-2).

Similar regional trends (seen from top-down macro data) are also evident from firm-level data (see appendix A). The average debt-assets ratio for East Asian firms in the sample reached a peak of 68 percent in 1997; it has since fallen (see figure 15-3).⁴ By contrast, the leverage ratio of Latin American firms dropped during the Mexican crisis in 1995 but has risen steadily ever since. By 2001 the leverage ratios of East Asia (54 percent) and Latin America (45 percent) had become similar.

While companies in East Asia have been reducing their dependence on foreign currency debt, however, companies in Latin America and Eastern Europe have been raising their dependence. The share of foreign lending to firms in East Asia has fallen steadily from its peak in 1996, whereas the share of Latin America and Eastern Europe has risen (figure 15-4). The

4. See also Mako (2001).

Figure 15-2. *Corporate Debt as a Percentage of GDP, by Region, 1995, 1997, and 2001*

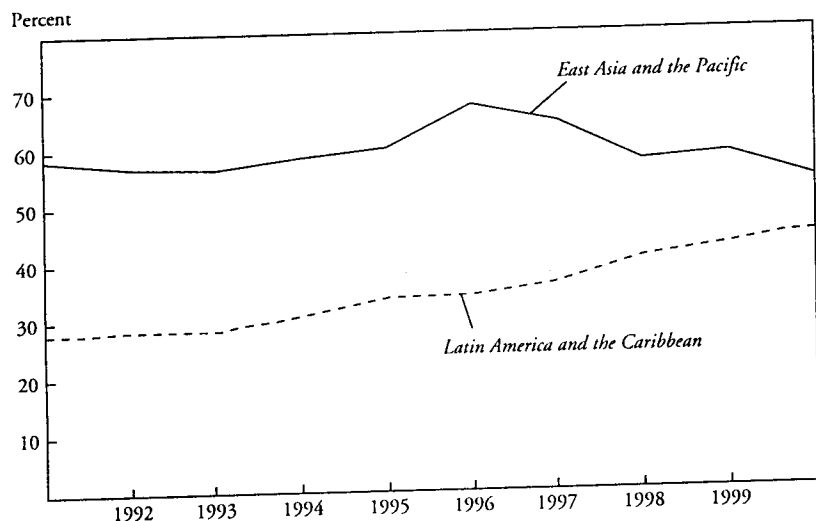


result? As of 2000, the share of total corporate debt accounted for by borrowing from abroad had risen to almost one-third in both Latin America and Eastern Europe (figure 15-5). Expressed as a share of GDP, the foreign debt of the corporate sectors in the two regions was at or above the peak seen in East Asia in 1997 (figure 15-6).

In conclusion, the overall level of corporate leverage remains the main risk facing East Asia; heavy dependence on external debt is the main risk for firms in Eastern Europe and Latin America.

Short-Term Corporate Debt Vulnerability

Companies in developing countries face the challenge of transforming, in a sustainable way, the typically short-term capital they raise from sources outside the firm into fixed, long-term capital suitable for financing the illiquid real assets that make up the physical capital of the firm. For com-

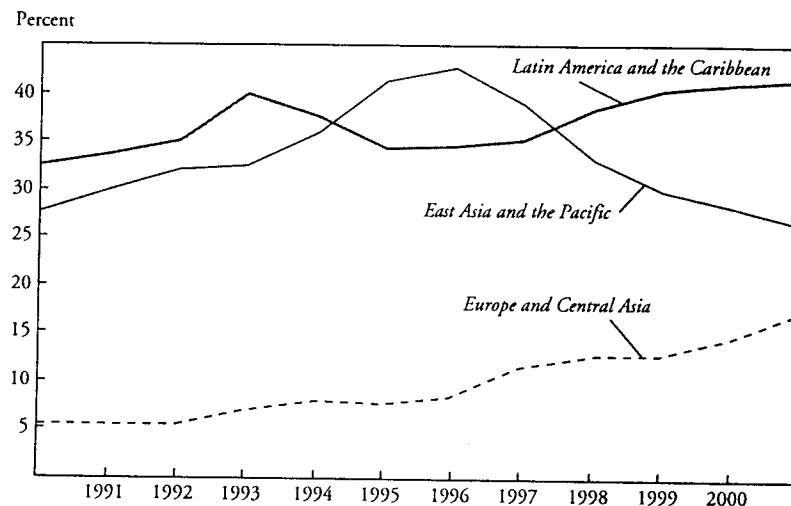
Figure 15-3. *Leverage Ratios, East Asia and Latin America, 1992–2001^a*

a. Ratio of debt to assets.

panies in mature economies with deep, well-developed equity markets, this transformation is usually not an insuperable challenge, although the evaporation of market access for several previously high-flying firms in the United States and Europe in 2001–02 illustrates that sudden corporate collapses can occur in even the most sophisticated capital markets.

Firms operating in developing countries, however, often have little choice but to finance fixed-asset accumulation with short-term liabilities. For companies operating in East Asia, such liabilities made up about 62 percent of total corporate debt in 2001. In Eastern Europe, the share was even higher—66 percent. Latin America had the lowest ratio of short-term debt to total debt: just 50 percent. The dependence on short-term finance in East Asia and Eastern Europe indicates that their primary source of funds remains banks: longer-term markets are either nonexistent or just beginning to reemerge after a period of dormancy.

The low dependence of Latin American firms on short-term finance does not reflect the availability of local long-term financing but rather the *overall* lack of local financing from outside the firm. That lack is a legacy of local instability. While more acute in some countries (Argentina) than

Figure 15-4. *Share in Foreign Lending to Emerging-Market Corporations, by Region, 1990–2001*

others (Chile), the low level for the region as a whole is a sign of poor financial intermediation. Firms in Latin America must depend on internal financing and, as previously noted, funds from abroad.

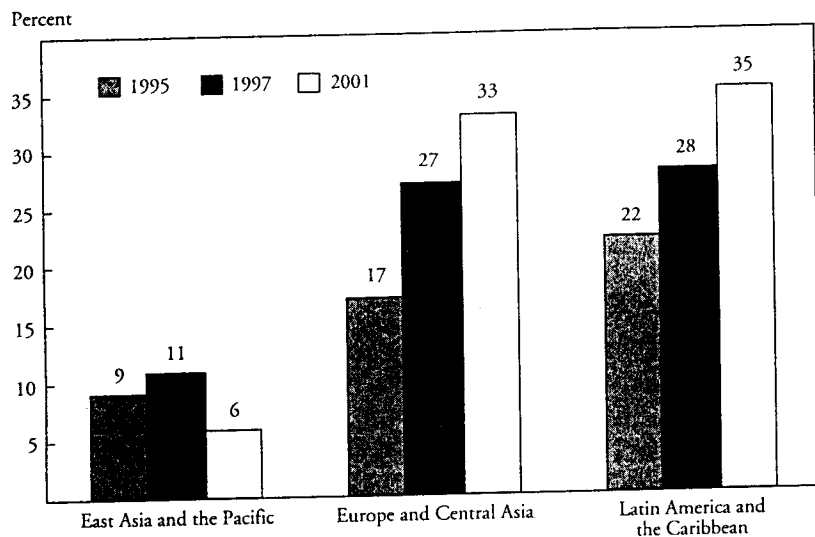
In Eastern Europe and Central Asia, persistent instability since the collapse of the Soviet Union, coupled with high and variable inflation, has kept corporate financial structures short. As convergence with the European Union proceeds, however, a lengthening of the maturities of corporate debt should be expected and encouraged.

The Downward Trend in Corporate Profits

Profitability is at the heart of corporate health. If the capital employed in an enterprise is not generating an adequate return, the flow of new capital to the firm will dry up. Eventually the holders of the existing stock of capital will seek to exit. The past five years have seen examples of such reversals in large parts of East Asia and in the telecom sectors of the G-7 economies.

To complicate the picture, recent accounting scandals in the United States have reminded us not only that the measurement of profits can be

Figure 15-5. *Share of External Financing in Corporate Sector Debt, by Region, 1995, 1997, 2001*



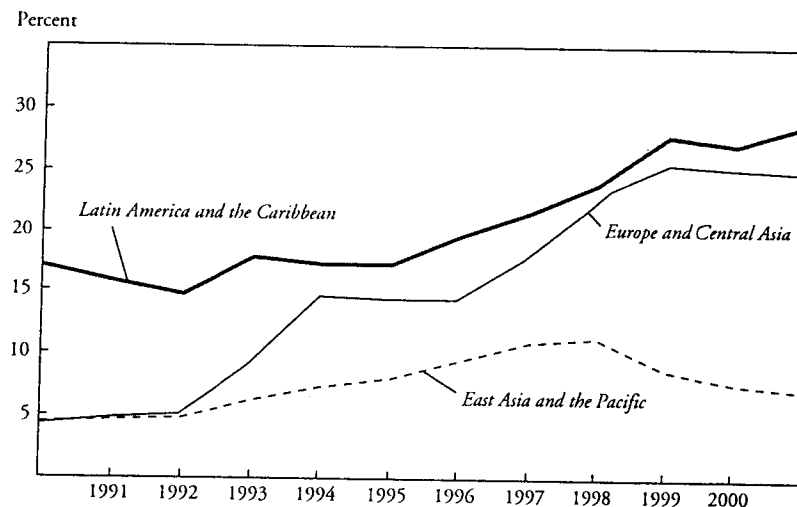
ambiguous but also that the quality of corporate accounting can leave much to be desired.

An examination of the trends in net earnings of the countries in our sample for the period 1992–2001 (table 15-1) yields several important conclusions.⁵

—Profits are low. In 1999–2001, profit margins were about 4.4 percent of sales and 3.0 percent of assets. By way of comparison, the return on assets achieved by the U.S. nonfinancial corporate sector in 1999–2001 was 4.9 percent.

5. The concept of earnings is total earnings, not the narrower and (more arbitrary) concept of operating earnings. In addition to uncertainty over how to measure earnings for a given company, the shifting sample size of our corporate database makes it difficult to compute measures of aggregate profitability that can be compared across time and countries. For example, it does not make sense to add profits, as the number of firms in our sample size varies each year. The alternative—to add together just the earnings of companies for which data are available for the full sample—involves a huge loss of information and a considerable risk of bias, as it would reflect (by definition) the selection of firms that existed throughout the period. As survivors, these firms might well be expected to have a higher-than-average rate of profitability. Given these constraints, the most meaningful measures of profitability that are available across regions and across time are net earnings of the sample companies as a percentage of sales (profit margins) and net earnings as a percentage of total assets.

Figure 15-6. *Corporate Foreign Debt as a Percentage of GDP, by Region, 1990–2001*



—Profits do not appear to be rising. The low point in 1998 is understandable in view of the recession that year in many developing countries, but average returns for 1999–2001, the last three years of data, were significantly worse than earlier in the decade. This evidence is consistent with the pattern of returns on FDI.⁶

—Profit margins and returns on assets are lowest in Asia. Both were negative in 1998; neither has recovered well. In part, the results reflect the higher leverage ratios of firms in the region; returns on equity are probably not as low as they appear.

—In the past two years, margins and returns have been higher in Europe and Central Asia than elsewhere in the developing world. Russia has bounced back strongly from collapse in 1998. Elsewhere in the region, profit rates have been relatively more stable than in Russia, consistent with the pattern of structural improvement in the region after the corporate collapses of the early 1990s.

To get a longer view of the evolution of profits, we combined the data from our sample with similar data available for the 1980s.⁷ Although there

6. See World Bank (2003, p. 78).

7. For example, Glen, Singh, and Matthias (1999); Singh (1995).

Table 15-1. Measures of Profitability for Nonfinancial Firms in Emerging Markets, 1992-2001

Measure	1992-2001											
	Average	Standard deviation	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
<i>Ratio of net income to assets</i>												
All countries	3.1	0.9	3.9	4.0	3.4	3.7	3.2	2.4	1.1	2.5	3.2	3.2
Emerging Europe and Asia												
Total	5.9	2.3	6.1	7.1	7.1	7.7	5.8	4.5	-0.1	6.0	8.3	6.2
Excluding Russia	6.2	1.2	6.1	7.1	7.1	7.7	7.0	6.4	4.9	6.1	6.3	3.6
Asia												
Total	2.2	1.3	2.7	2.9	3.8	3.9	2.5	0.5	-0.3	1.9	1.5	2.2
Excluding China	1.9	1.4	2.7	2.8	3.8	3.8	2.5	0.4	-0.4	1.6	0.6	1.6
Latin America	3.5	1.0	4.9	4.8	2.6	2.6	3.3	4.3	3.1	2.0	3.8	3.4
<i>Ratio of net income to sales</i>												
All countries	4.6	1.2	5.2	5.5	5.8	5.6	5.1	4.2	1.8	4.0	4.6	4.6
Emerging Europe and Asia												
Total	6.7	2.8	5.5	6.3	6.6	6.9	7.5	7.5	-0.1	7.6	10.3	9.1
Excluding Russia	6.0	0.9	5.5	6.3	6.6	6.9	6.7	6.3	5.2	6.1	6.7	3.9
Asia												
Total	2.9	1.7	3.6	3.7	5.1	5.1	3.6	0.8	-0.4	2.8	1.9	2.8
Excluding China	2.6	1.9	3.5	3.6	5.0	4.9	3.5	0.5	-0.5	2.3	0.8	2.0
Latin America	7.5	2.1	10.3	10.2	6.7	6.3	7.8	10.0	6.4	4.2	7.0	6.0

is some discontinuity between the two data sets, their general patterns are similar, allowing a comparison of trends in profit margins since the mid-1980s (figure 15-7). Two trends stand out:

—Margins were generally lower in the 1990s than in the 1980s. India is the exception.

—Margins were more volatile in the 1990s. Again, there is one important exception (Brazil), where the relative stability offered by the successful currency program after 1994 stands in contrast with the earlier period of volatility and hyperinflation (1985-93).

Why were profits in many developing countries lower and more volatile in the 1990s, especially as the decade progressed? Because underlying nominal growth of GDP is the key driver of profits, the shocks to GDP brought on by the numerous crises of the 1990s are the main cause of the weakness in profits.

Other developments contributed as well. The trend toward lower inflation across the developing world added further downward pressure on nominal GDP growth and on profits. An otherwise welcome trend toward more open, integrated markets reduced the prices—and profits—of what had been local monopolies. In Brazil, for example, the liberalization of the trade regime in the early 1990s, which helped to bring greater competition to domestic goods industries, also restrained the margins of domestic producers.⁸ Similarly, the emphasis on privatization of state-run monopolies, especially in utilities, helped to restrain both inflation and profits.

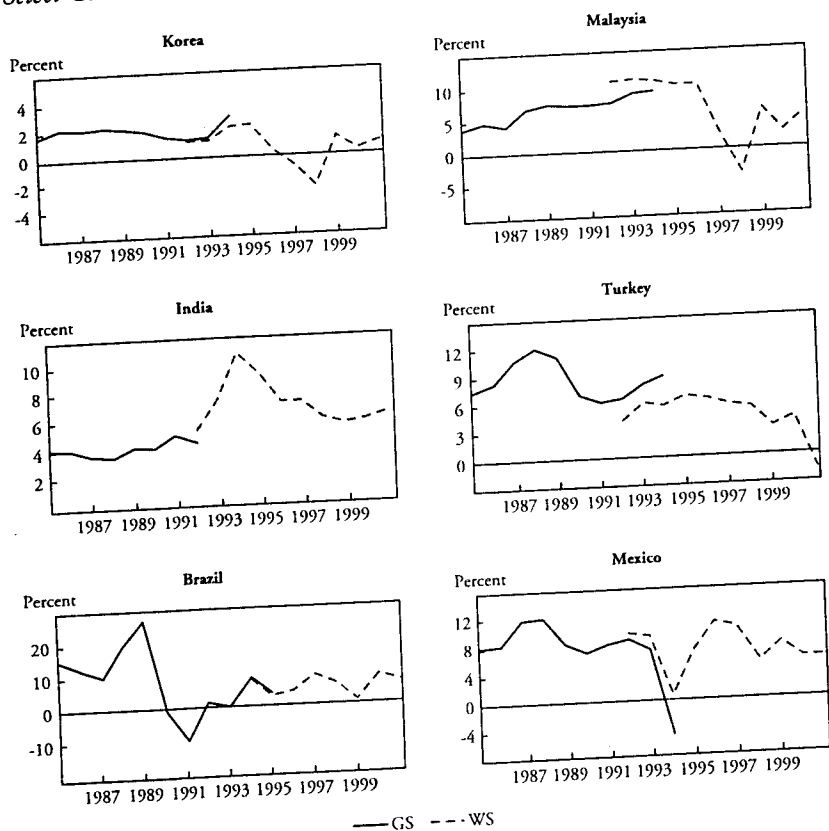
Finally, the rise in debt costs resulting from significant devaluations—and other events surrounding currency crises, such as sharp drops in real GDP—hit profit margins very hard in Mexico in 1994 and in Korea and Malaysia in 1998.⁹

Are profits in developing countries so low as to constitute a problem? Not necessarily. As nominal GDP grows in developing countries, so will profits. But policymakers and analysts would be well advised to pay attention to trends in these variables if, as expected, the primary flow of foreign capital (both debt and equity) to developing countries remains oriented largely to the private business sector. If profit performance continues to lag as the economy improves, the sustainability of the current pattern of financing flows dominated by FDI will be very much in question.

8. Glen, Lee, and Singh (2001).

9. Forbes (2002).

Figure 15-7. *Ratio of Net Income to Sales of Nonfinancial Firms, Select Countries, 1985–2001*



Source: Data for the 1980s are from Singh (1995); data for 1992–2001 are from *Worldscope*. Authors' estimates.

Borrowing from Abroad and Corporate Performance

Financing from abroad brings with it both risks and advantages. A firm can reduce its cost of capital by accessing international markets, which have a larger base of investors and are more liquid. And because international markets have better trading and clearance systems, more competition among traders and investment bankers, and better listing and monitoring standards, they are more efficient than local markets. International-market access, when

successful, may also make a firm more attractive to domestic investors by signaling that the firm is willing to commit to higher standards of corporate governance and disclosure and to protection of minority rights.¹⁰

But international finance also entails risks. A currency devaluation may increase the debt burden of borrowing firms, especially those that have only local currency earnings.¹¹ Unanticipated changes in global interest rates can hurt profitability. And abrupt changes in investor sentiment may make it difficult to roll over debt. The various emerging-market crises of the last decade brought all these risks into sharp focus.

Indeed, an assessment of the relationship between external (international) financing and corporate performance reveals that among nonfinancial firms, market participants (that is, firms that had outstanding foreign debt) tended to show lower profitability than nonparticipants.¹² However, it would be wrong to conclude that borrowing abroad is excessively risky for all firms in developing countries. For example, firms that had foreign sales—and firms that were able to roll over debt—were, on average, more profitable than firms that did not.

Not surprising, market access over the period 1992–2001 was positively associated with firm size. The average assets of firms that participated in international markets were \$2.4 billion during 1998–2001, more than five times the average size (\$470 million) of firms that did not have outstanding foreign debt. Within the category of international-market participants, firms that were able to roll over debt (that is, continue market access) were even larger, having average assets of \$4.9 billion. Firms that had outstanding debt but did not undertake new borrowing were much smaller, with assets averaging around \$1.8 billion. The association between market access and size is to be expected, given that large firms are less vulnerable than small firms to adverse shocks and are more creditworthy in the eyes of investors.¹³

Firms that borrowed abroad were more highly leveraged than firms that did not. Foreign and domestic debt as a share of assets was 53 percent dur-

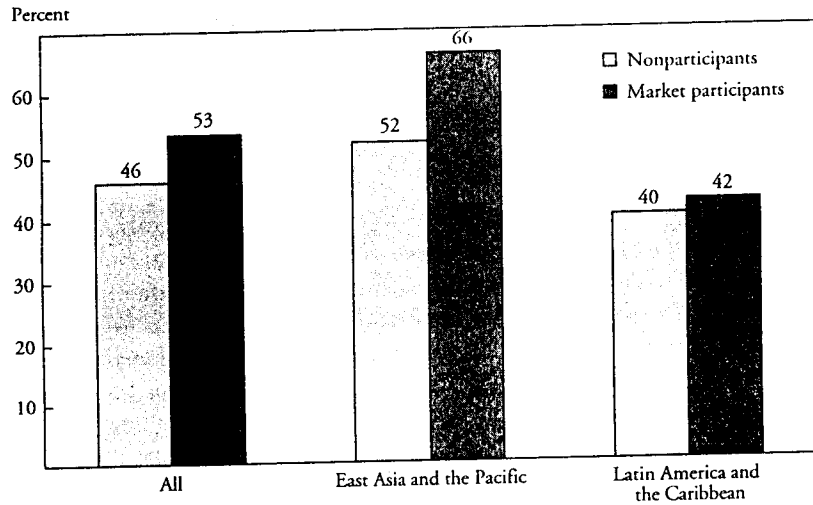
10. The growth of international market access in the 1990s was driven by improvements in macroeconomic environment in emerging-market economies, lifting of capital controls allowing firms to raise financing abroad, and establishment or improvement of legal systems that protect the rights of minority shareholders. See Levine (1997) for a review.

11. Forbes (2002).

12. International market participants among banks and other financial companies showed much higher profit rates than nonparticipants. When financial and nonfinancial companies are combined together, again market participants reported higher profit rates.

13. Besides, large firms tend to attract government support, especially during cyclical downturns ("too big to fail"), which further improves their ability to raise debt. Also, larger firms can negotiate better terms with creditors.

Figure 15-8. *Debt as a Percentage of Total Assets, by Market Participation and Region*



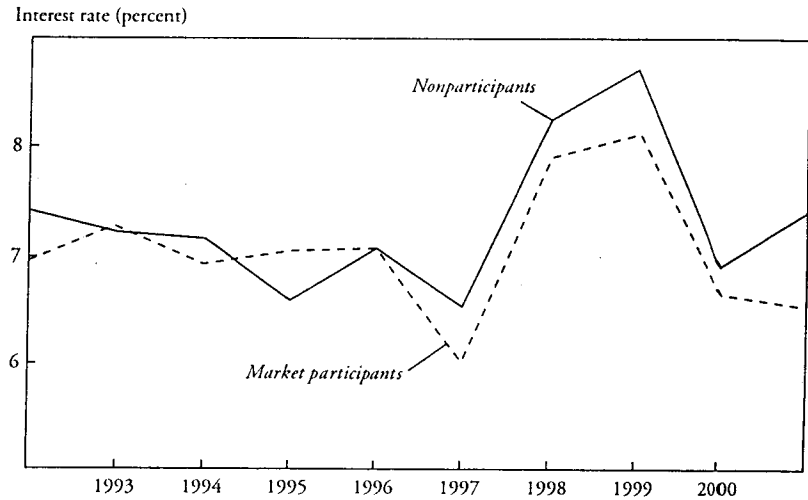
ing 1998–2001 for market participants—higher than the share of debt to assets (46 percent) for firms that did not borrow abroad (figure 15-8).

Even though market participants were more highly indebted, their average cost of credit—or average interest rate, defined as interest expenses as a percentage of debt—was lower than that of nonparticipants through much of the 1990s (figure 15-9).

Prior to the Asian crisis in 1997, average interest costs paid by firms declined as industrial countries cut interest rates during the mid-1990s and emerging-market spreads tightened. Following the Asian crisis, interest costs rose for all firms, but firms that had access to the wider international debt markets were able to obtain cheaper credit than those that did not, although they may also have suffered valuation losses as a result of denominating their debt in foreign currency prior to a sharp depreciation. Such mark-to-market debt losses are, however, reflected in the overall profit data analyzed below.¹⁴

14. For firms in developing countries, these valuation losses are one of the biggest components of the difference between operating earnings and overall earnings (we use the latter in this study).

Figure 15-9. *Corporate Profit Rates in Major Emerging Markets, by Market Participation, 1992–2001*

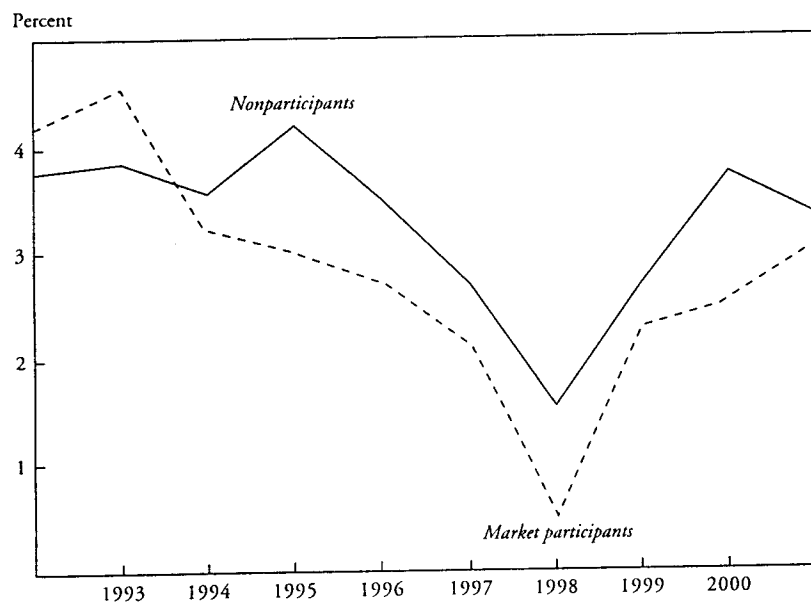


Except for the early 1990s (1992–94), firms that participated in international debt markets reported lower profits as a share of assets than did nonparticipating firms (figure 15-10). The average profit rate during 1998–2001 for market participants was 2 percent compared with 3 percent for nonparticipants (figure 15-11). Evidently, the lower interest costs available from market participation were not sufficient to generate a higher rate of profit for the participating firms, even though many of them had more assets than nonparticipating firms.¹⁵ The profit rates between market participants and nonparticipants reached a low in 1998, the year interest rates spiked and currency-related losses were at their peak.

While this finding does highlight the risks associated with foreign borrowing, it does not necessarily imply that these risks outweigh the benefits (such as low interest rates) that market participation brings. In fact, this

15. This is similar to the view that smaller firms generate higher returns, a well-known result for small capitalized firms in the United States from Fama and French (1992). Some studies, however, have found evidence to the contrary: larger emerging-market firms tend to have larger returns on assets (see International Monetary Fund 2002a).

Figure 15-10. *Corporate Profits as a Percentage of Total Assets in Major Emerging Markets, by Market Participation, 1992–2001*

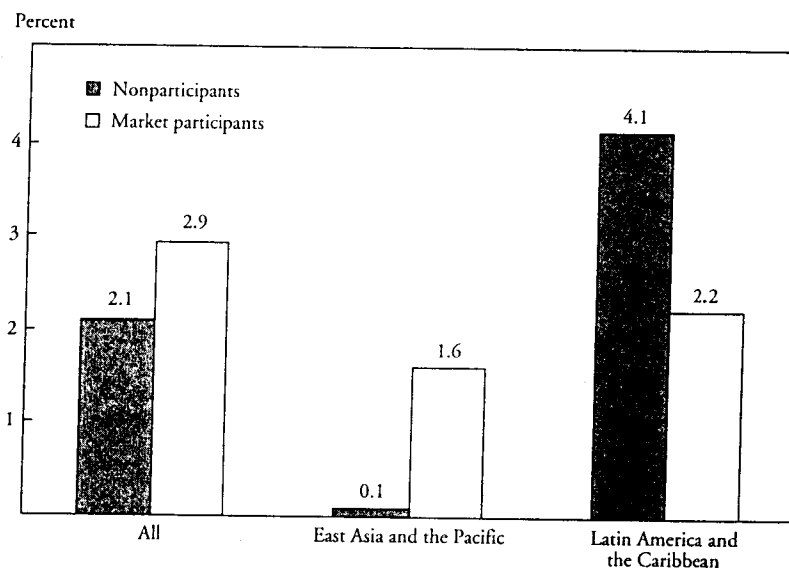


finding does not hold true in Latin America where, unlike in East Asia and in Europe and Central Asia, market-participating firms reported higher profit rates than nonparticipating firms (figure 15-11).¹⁶ Even in East Asia, the lower profit rates reported by market-participating firms may be explained, in part, by the fact that only firms with low profitability (and high investment) may have needed external financing.¹⁷ Also the profit performance of firms that were able to maintain access to external credit

16. The profit rates computed for nonparticipating firms may be underestimated due to sample selection bias, since firms that underperform may drop out of the sample and only relatively better-performing survivors are included in the calculation. Another factor that may affect the comparison of market participants and nonparticipants (especially in East Asia) is that commercial banks were borrowing internationally and on-lending the proceeds in local currency terms to domestic corporations (Dasgupta and others 2000, p. 332). As a result, foreign currency borrowing by nonbank financial corporations is underreported, reducing the number of market-participating firms. When both financial and nonfinancial firms are included, market participants reported higher profits than nonparticipants.

17. Claessens, Djankov, and Lang (1998).

Figure 15-11. *Profits as a Percentage of Total Assets, by Market Participation and Region, 1998–2001*

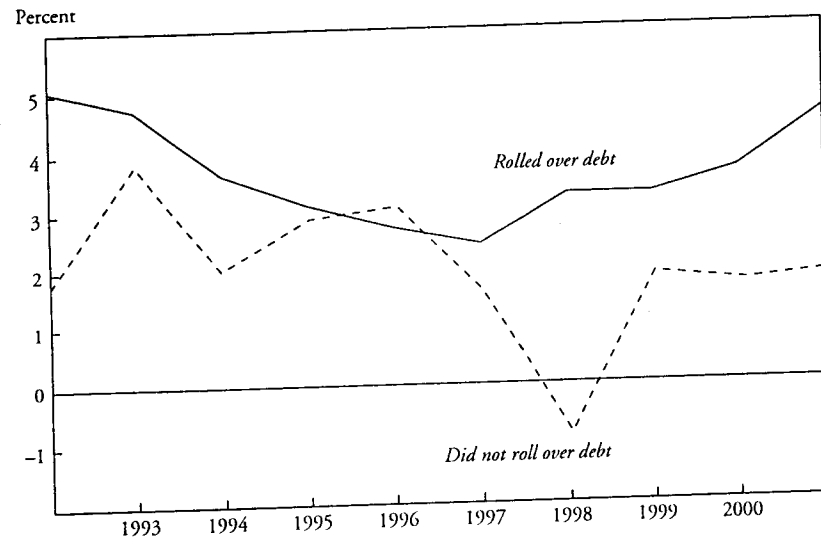


markets—and to roll over some of their foreign debt—was better and less affected by cycles than the profit rate of firms that had outstanding foreign debt but could not (or did not) roll it over (figure 15-12). Moreover, the most profitable firms in this sample were those that not only participated as borrowers in international markets but also had foreign sales (figure 15-13).¹⁸ For this group, however, profit margins slipped significantly after 1997. This is somewhat surprising, as the more competitive real exchange rate enjoyed by many developing countries since then should have raised profit margins in the tradable sector. The exchange rate benefits must have been eroded by (a) deflationary pressures in global goods markets in recent years and (b) losses resulting from foreign currency debt, which the existence of foreign exchange earnings allowed some companies to take on.

Corporate finance is therefore a key influence, but it is not the only factor that affects corporate performance. Other factors, such as the domestic

18. Legal requirements for reporting foreign sales on firm balance sheets vary across countries. Thus the data used here can potentially underestimate the number of firms with foreign sales.

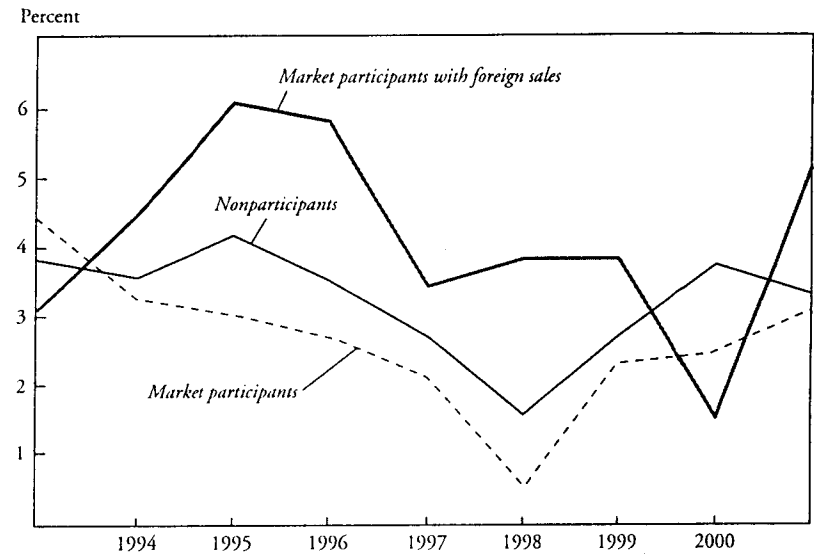
Figure 15-12. *Profits as a Percentage of Assets in Major Emerging Markets, by Type of Market Participant, 1992–2001*



economic cycle, international economic cycles, and terms of trade changes, are also important. The most important determinant of corporate performance in the oil and gas sector seems to have been world crude oil prices (figure 15-14). Corporate profit rates for firms in the oil and gas sector declined sharply (from nearly 9 percent in 1996 to -1.3 percent in 1998 for market participants and from 6.5 percent to -2.2 percent for nonparticipants), when oil prices crashed from \$18 a barrel to \$12.5 a barrel. But during the upturn in oil prices in 1999 and 2000, the average profit rate of nonparticipants rose to 18 percent compared with only 11 percent for market participants. This divergence in profits seems to be related to the divergence in leverage (figure 15-15): while leverage for market participants rose from 38 to 43 percent from 1998 to 2000, the leverage for nonparticipants declined from 37 to 27 percent over the same period. Thus higher debt service associated with higher leverage could have cut into the profitability of market participants.

This example also sheds some light on the direction of causality between profitability and leverage: even if more profitable oil firms accessed international debt markets, an exogenous shock (in the form of changes in oil

Figure 15-13. *Profit as a Percentage of Assets in Major Emerging Markets, by Market Participation, 1993–2001*



prices) produced a greater effect on firms that had higher leverage. In this case, an increase in leverage caused a reduction in profit rates.

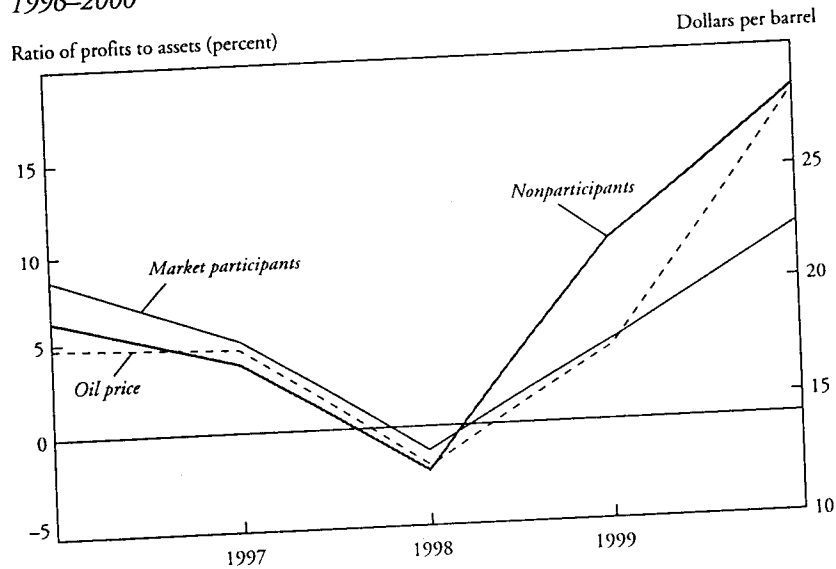
Firm Leverage, Borrowing from Abroad, and Corporate Performance: Regression Analysis

In order to undertake a more formal analysis of the relationship between corporate performance (as measured by the profit rate or earnings before interest and taxes) and corporate finance (firm leverage), we performed regression analysis using variants of the following model:

$$(15-1) \quad \text{Performance}_{it} = c_0 + c_1 * \text{Leverage}_{it-1} + c_2 * \text{Market participant}_{it} + c_3 * \text{Leverage}_{it-1} * \text{Market participant}_{it} + d * (\text{Control Variables}) + \epsilon_{it}$$

where *Leverage* (debt as a percentage of assets) is lagged one period; the indicator for market participation takes the value of 1 for market partic-

Figure 15-14. Profit Rates for Firms in Oil and Gas Sector in Major Emerging Markets and World Crude Oil Prices, by Market Participation, 1996–2000

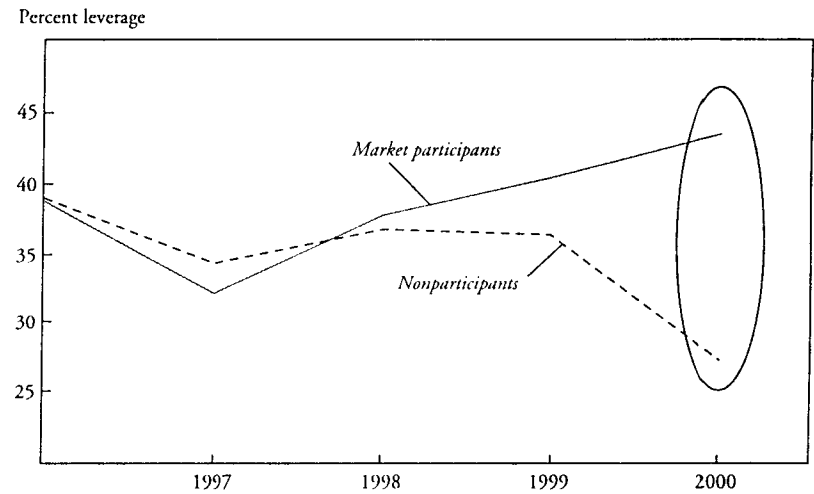


participants and 0 for others.¹⁹ The control variables are log(firm size), log(firm size) squared, capital intensity (proxied by capital stock as a ratio of assets), capital intensity squared, real GDP growth, lagged mean earnings, and lagged earnings volatility (the last two variables indicate expected returns and risks).²⁰ The indicator for market participation is also included in all the specifications in order to capture the difference in average performance of market participants and nonparticipants. Dummies to account for fixed effects relating to country and sector, and year effects to capture global shocks common to the sample of emerging markets, are added to the regressions. The specification does not explicitly include variables representing institutions that may affect profit rates and leverage; the time-

19. Market participants are firms that participated in international debt markets in the past and have foreign debt outstanding at the beginning of the current period (see appendix A).

20. Firm size is measured as the average of total assets in 1998–2001 in millions of U.S. dollars. Using the logarithm of firm size instead of actual firm size has the advantage that it gives a much smaller weight to large firms. Net profits and cash flows (as a percentage of assets) are used as measures of firm performance. Some analysts use earnings growth to measure firm performance (Forbes 2002).

Figure 15-15. Leverage Ratios in the Oil and Gas Sector in Major Emerging Markets, by Market Participation, 1996–2000



invariant component of these variables is captured indirectly through the inclusion of country fixed effects.²¹ Similar regressions were run using earnings—earnings before interest, taxes, depreciation, and amortization as a percentage of assets—as the dependent variable. The results are summarized in table 15-2.

This regression analysis of the association between leverage and corporate profitability (controlling for other factors that also affect profitability) yields several interesting results. First, both profits and cash flows (earnings before interest, taxes) decline as a percentage of assets as firms take on more debt relative to their assets. This is similar to the finding of Harvey, Lins, and Roper that, although some debt may improve market discipline in

21. See IMF (2002a, p. 99); Klapper and Love (2002). Previous studies have identified historical origins of the contracting environment—creditor protection and laws favoring minority shareholders—as an important determinant of firm leverage, ownership structure, and firm performance (see Demirgüç-Kunt and Maksimovic 1999; Himmelberg, Hubbard, and Love 2002; La Porta and others 1997). Country fixed effects in our regressions control for such time-invariant differences in institutional variables across countries. But institutions also can change over time; for instance, financial liberalization can widen the investor base and make raising equity more attractive for firms. Similarly, deregulation of securities markets and easier access to foreign bank lending can encourage firms to increase their leverage. Severe financial crises can also produce a forced corporate “deleveraging.”

Table 15-2. *Regression Results: The Relation between Leverage and Firm Profitability^a*

Variable	Net profit			Cash flows		
	(1)	(2)	(3)	(4)	(5)	(6)
Leverage	-29.0	-27.7	-10.3	-15.4	-14.0	-0.3
Market participant	-0.677	1.029	1.339	-0.763	1.872	1.862
	-2.7	1.3	1.5	-2.8	2.1	1.9
Leverage*market participant		-0.031	-0.033		-0.047	-0.046
		-1.9	-1.8		-2.8	-2.6
log(size)	3.458	3.468	0.653	2.802	2.828	-0.114
	9.3	9.3	2.0	6.7	6.7	-0.3
log(size) squared	-0.219	-0.220	0.005	-0.185	-0.188	0.051
	-7.1	-7.1	0.2	-5.3	-5.3	1.7
Capital intensity	0.265	0.141	-1.798	19.095	18.947	15.487
	0.2	0.1	-0.9	9.2	9.2	6.4
Capital intensity squared	-7.644	-7.498	-3.270	-25.166	-24.980	-18.425
	-4.3	-4.2	-1.6	-11.5	-11.4	-7.2
Real GDP growth	0.182	0.180	0.165	0.071	0.067	0.034
	6.4	6.4	5.0	2.3	2.2	1.0
Mean earnings, five-year moving average (lagged)			0.653			0.722
			24.1			24.7
Earnings volatility, five-year rolling standard deviation (lagged)			0.019			0.085
			0.5			2.0
Number of observations	16,299	16,299	10,137	15,291	15,291	9,724
R ²	0.1872	0.1875	0.3099	0.1950	0.1955	0.3209

a. The dependent variable is net profit or firm cash flows as a percentage of assets. Leverage is lagged one period. The regressions include industry, country and regional fixed effects (not shown here). Year dummies were added to proxy for global business cycle effects. Five-year moving average of earnings and earnings volatility were calculated using at least three years of lagged earnings. *t* statistics were calculated using Huber-White heteroskedasticity-corrected robust standard errors and are reported below the coefficient estimates.

firms, the effect may be overcome by increasing financial risks at higher levels of leverage.²² Second, the marginal (negative) effect of an increase in leverage on earnings is larger for firms that participate in international debt markets than for other firms.

Why do earnings decline as leverage increases? One reason may be diminishing returns. A firm may take on debt with a view to expanding its

22. Harvey, Lins, and Roper (2001).

operations, but revenue growth is likely to slow as it scales up. Moreover, revenue growth may slow faster in larger firms. This would explain the larger negative association between leverage and returns for market participants, which is usually significantly larger than for nonparticipants. Another reason is that at lower leverage ratios, the benefit of the lower cost of foreign borrowing may sufficiently offset losses due to currency depreciation and sudden collapses in investor confidence. As debt levels rise, however, these costs may become predominant.

The Effects of Financial Crisis

Some of the important emerging markets in our sample experienced devaluations and severe currency crises during the 1990s. How did crisis affect the performance of firms that were highly leveraged or had foreign currency debt? We estimated variants of the following regression for the two sets of firms in order to examine this question:

$$(15-2) \quad \text{Performance}_{it} = c_0 + c_1 * \text{Leverage}_{it-1} + c_2 * \text{EMCrisis}_{it} \\ + c_3 * \text{Leverage}_{it-1} * \text{EMCrisis}_{it} \\ + d * (\text{Control Variables}) + \varepsilon_{it}$$

where *EMCrisis*_{*it*} is an indicator for emerging-markets currency crisis. The countries in our sample that experienced currency crises (or major episodes of devaluation) are Mexico (1994–95), Venezuela (1994, 1996), Indonesia, Korea, Malaysia, Philippines, and Thailand (1997–98), Russia (1998), Brazil (1999), and Turkey (2001). We allow for a lagged effect of currency crisis on firm performance by including the year subsequent to the initial devaluation as part of the crisis event. The set of control variables is similar to the earlier specification.²³ Since the timing, severity, and other aspects of currency crises differed across regions, we ran similar regressions separately for East Asia and for Latin America.²⁴ Table 15-3 summarizes the relation between leverage and firm performance for the major emerging regions during states of crisis and no crisis (the full set of regressions is

23. Lagged average earnings and lagged earnings volatility were excluded from the current and subsequent regressions in order to maximize the sample size, even though these variables improve the fit of the regression (including these variables causes the sample size to decrease more than a third). However, the sign and significance of the relevant coefficients and interaction terms are fairly robust to the exclusion of these and other control variables.

24. This allows the set of control variables to have different slope coefficients across the two emerging regions.

Table 15-3. *Leverage and Firm Profitability during Emerging Markets Crisis: Marginal Effects of Leverage for Market Participants and Nonparticipants^a*

Dependent variable and region	Nonparticipants		Market participants	
	No crisis	Crisis	No crisis	Crisis
<i>Net profit^b</i>				
All regions	-0.151	-0.225	-0.197	-0.280
East Asia and Pacific	-0.142	-0.192	-0.225	-0.268
Latin America and Caribbean	-0.148	-0.192	-0.045	-0.166
<i>Cash flow^c</i>				
All regions	-0.085	-0.128	-0.142	-0.232
East Asia and Pacific	-0.087	-0.131	-0.161	-0.233
Latin America and Caribbean	-0.040	-0.120	-0.130	-0.223

a. The dependent variable is net profit or cash flows as a percentage of assets. Leverage is lagged one period. The regressions include the control variables, industry, country and regional fixed effects, and year dummies (not shown here). The sample period is 1992–2001. The full set of regressions is reported in appendix B.

b. The number of nonparticipants is 14,060, and the number of market participants is 2,239.

c. The number of nonparticipants is 13,147, and the number of market participants is 2,144.

reported in appendix B). The main messages from this set of regressions are as follows.

First, higher leverage is associated with lower firm profitability in all regions, during both no-crisis and crisis states. The magnitude of the coefficient of leverage is similar for nonparticipants in the full sample, in East Asia, and in Latin America during no-crisis states. This is noteworthy given the differences in institutional structure, level of economic and financial development, and macroeconomic policies and performance across the two emerging regions.

Second, market participants have a larger negative coefficient relative to nonparticipants for the full sample during both crisis and no-crisis states. Foreign borrowing is therefore associated with a larger decline in profitability per unit increase in leverage. However, there are important regional variations. A finding similar to that of the aggregate sample is observed for firms in East Asia.²⁵ For firms in Latin America, the effect of

25. The coefficient has the expected sign but is not statistically significant at the 5 percent level.

leverage on firm profitability is smaller for market participants during both crisis and no-crisis states. Latin American market participants therefore seem to benefit from foreign borrowing more than East Asian market participants during no-crisis states. There is also no significant difference in the effect of leverage on cash flows across crisis and no-crisis states for East Asian market participants.

Third, currency crises affect firm profitability and cash flows through leverage. In the event of a crisis, firms with higher leverage seem to be more adversely affected. This is true for both market participants as well as nonparticipants. There is also no independent effect of leverage for both market participants and nonparticipants (in the full sample and in East Asia) after including the interaction term for currency crisis and leverage. This indicates that leverage is particularly important during currency devaluations. However, the reason for higher sensitivity may be different for the two sets of firms. Nonparticipants with high leverage can be affected by a rise in domestic interest rates during a currency crisis, while market participants with high leverage and foreign exchange liabilities are likely to be adversely affected through the “balance sheet” effect of foreign exchange devaluation.

The next set of regressions explores this trade-off between devaluation risk and interest rate risk for market participants and nonparticipants. Market participants have access to a wider set of financing instruments and markets, which can allow them to fund their liabilities at a lower cost but subjects them to the risk of currency devaluation. Nonparticipants with high leverage do not face foreign exchange risk, but they do face the risk of an increase in interest rates, which often occur prior to or accompany currency devaluations (see figure 15-1 for benchmark short-term interest rates in East Asia during in 1997–98. Similar trends are observed for other emerging markets that faced large currency devaluations).²⁶ We test these two hypotheses formally below.

In order to measure the sensitivity of firm performance to currency risk, variants of the following regressions were estimated for both market participants and nonparticipants:

26. The purpose of a monetary contraction in such a situation is to stabilize the exchange rate and prevent capital outflows. Exchange rate stability can also be maintained through reserve losses (Eichengreen, Rose, and Wyplosz 1996). A large rise in domestic interest rates may also be part of an IMF stabilization program during a currency crisis (Stiglitz 2002).

$$(15-3) \text{ Performance}_{it} = c_0 + c_1 * \text{Leverage}_{it-1} + c_2 * \text{Currency Depreciation}_{it} + c_3 * (\text{Leverage}_{it-1}) * (\text{Currency Depreciation}_{it}) + d * (\text{Control Variables}) + \varepsilon_{it}$$

where *Currency Depreciation_{it}* is the change in the logarithm of the nominal exchange rate over the previous period.²⁷ This specification follows the literature on measuring foreign exposure using firm- and industry-level returns.²⁸ The regressions control for differences in firm, industry, country, and regional characteristics, domestic fundamentals, global business cycle factors, and systematic differences in performance across market participants and nonparticipants. Since currency depreciations may be related with contemporaneous control variables (such a real GDP growth), we report separate regressions first with only firm size as a control variable and then with the full set of control variables in tables 15-4 and 15-5. The coefficient of the relevant interaction terms, and thus the main messages, are robust to the inclusion of control variables other than firm size. The results are presented in table 15-4. The messages that come from this set of regressions are as follows:

Currency devaluations are associated with an adverse effect on profitability of market participants. Nonparticipants, however, do not seem to be exposed to changes in the nominal exchange rate *on average*.²⁹ Domínguez and Tesar find that a fraction of firms in the developing countries in their sample were exposed to changes in the foreign exchange rate but are not able to identify specific channels for foreign exchange exposure.³⁰ Our results indicate that market participants in emerging markets are relatively more exposed to changes in the exchange rate than nonparticipants.³¹ Second, higher leverage is associated with a larger sensitivity to changes in the nominal exchange rate for both market participants and

27. Using the logarithm of exchange rates instead of levels reduces the effect of extreme changes in the nominal exchange rate.

28. See Adler and Dumas (1984); Bartov and Bodnar (1994); Domínguez and Tesar (2001a, 2001b).

29. The performance of *market nonparticipant* firms can be adversely or beneficially affected by changes in the terms of trade following devaluation, but the average effect is expected to be independent of leverage. This is confirmed by our regression analysis.

30. Domínguez and Tesar (2001a, 2001b).

31. Domínguez and Tesar (2001b) do not find any evidence of a relationship between trade and foreign exchange exposure for the developing countries in their sample. Our subsequent regression shows that this finding could be due to the fact that they control only for trade effects rather than for both trade and foreign borrowing.

Table 15-4. *Nominal Exchange Rate Devaluation, Leverage, and Firm Profitability^a*

Variable	Nonparticipants			Market participants				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Leverage	-0.156 -27.0	-0.142 -22.5	-0.156 -27.3	-0.142 -22.8	-0.192 -9.9	-0.168 -8.4	-0.202 -9.9	-0.177 -8.5
Currency depreciation _{it}	-3.87 -4.2	3.42 1.8	-1.19 -1.1	5.86 3.1	-7.37 -4.1	7.05 1.2	-9.76 -4.4	5.09 0.9
Leverage*currency depreciation _{it}		-0.146 -3.8		-0.144 -3.8		-0.226 -2.4		-0.236 -2.5
log(size)	1.05 12.6	1.05 12.6	4.08 9.6	4.08 9.6	1.22 5.1	1.20 5.0	4.38 2.7	4.45 2.8
log(size) squared			-0.29 -7.9	-0.29 -7.9			-0.21 -2.0	-0.22 -2.1
Capital intensity			1.1 0.6	0.8 0.4			-11.5 -2.4	-11.2 -2.3
Capital intensity squared			-8.34 -4.4	-8.07 -4.2			4.41 0.9	4.03 0.8
Real GDP growth			0.17 4.8	0.16 4.6			-0.17 -2.2	-0.19 -2.3
Number of observations	14,089	14,089	14,060	14,060	2,246	2,246	2,239	2,239
R ²	0.1664	0.1683	0.1916	0.1935	0.2190	0.2270	0.2398	0.2485

a. The dependent variable is net profit as a percentage of assets. Leverage is lagged one period. Currency depreciation_{it} is the change in logarithm of the nominal exchange rate (depreciation) over the previous period. The regressions include industry, country, and regional fixed effects (not shown here). Year dummies were added to proxy for global business cycle effects. *t* statistics were calculated using Huber-White heteroskedasticity-corrected robust standard errors and are reported below the coefficient estimates. The sample period is 1992–2001.

nonparticipants. However, highly leveraged market participants are 60 percent more sensitive to changes in the nominal exchange rate than nonparticipants with similar leverage. Highly leveraged market participants therefore face a direct adverse shock to profitability during devaluations. Nonparticipants are not exposed directly to changes in the exchange rate, but highly leveraged nonparticipants experience lower profitability during devaluations.

In order to measure the relative interest rate risk for market participants and nonparticipants during devaluations, we ran regressions similar to the one above, but with the interest expense as a percentage of assets as the dependent variable.³² The results are presented in table 15-5. Nominal devaluations are associated with an increase in interest charges for both market participants and nonparticipant. Further, nominal devaluations are associated with a much larger effect of leverage on interest payments for nonparticipants relative to market participants (the size of this effect is almost three times larger than for market participants and is highly significant). Nonparticipants with higher leverage therefore face higher interest rate risk during devaluations than market participants with similar leverage.

At first glance, it may seem almost tautological that market participants with foreign debt would be adversely affected by currency devaluations relative to nonparticipants.³³ This is clearly not the case, since the effects on firm-level performance are net effects—net of optimizing decisions by firms regarding aggregate leverage, foreign debt, and possible hedging of foreign exchange risk, either through foreign trade or through the use of foreign exchange derivatives contracts. A strong and significant effect of devaluation on performance of market participants indicates an increased risk of foreign debt during devaluations *after* all possible measures that the firm may have taken to protect itself against such risk.³⁴ Moreover, the

32. Using interest charges relative to assets, instead of relative to total debt, makes the coefficients comparable to ones in the regressions reported in tables 15-2 through 15-4 and allows for interpretation of the interaction term. We control for the direct (positive) effect of leverage on interest expenses by including it as an explanatory variable.

33. The amount of foreign debt in local currency terms goes up by the percentage depreciation. Claessens, Djankov, and Ferri (1999) estimate the increase in firm-level foreign debt (in terms of local currency) for East Asian firms using foreign debt outstanding prior to the crisis and the percentage depreciation during the crisis.

34. Allayannis, Brown, and Klapper (2000) report that foreign exchange hedging by East Asian firms during 1996–98 was largely ineffective: firms that hedged foreign debt exposure actually did worse than firms that did not, after controlling for a variety of firm- and country-level factors. They

Table 15-5. Interest Expenses of Firms during Nominal Devaluations^a

Variable	Nonparticipants			Market participants				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Leverage	0.093 40.6	0.077 30.4	0.093 40.8	0.077 30.2	0.095 17.9	0.089 16.5	0.095 17.7	0.090 16.4
Currency depreciation _{it}	4.02 9.7	-4.32 -3.9	2.77 5.6	-5.44 -4.7	3.97 5.7	0.26 0.1	4.14 5.0	0.43 0.2
Leverage*currency depreciation _{it}		0.163 7.2		0.163 7.2		0.057 1.7		0.058 1.8
log(size)	-0.24 -8.6	-0.24 -8.6	-0.27 -2.6	-0.28 -2.7	-0.29 -3.8	-0.29 -3.7	0.00 0.0	-0.02 0.0
log(size) squared			0.003 0.3	0.004 0.4			-0.027 -0.9	-0.025 -0.9
Capital intensity			0.11 0.1	0.44 0.5			3.09 2.0	2.96 1.9
Capital intensity squared			0.90 1.0	0.59 0.6			-2.01 -1.3	-1.88 -1.2
Real GDP growth			-0.083 -5.1	-0.075 -4.8			0.010 0.3	0.012 0.4
Number of observations	13,476		13,476	13,453	13,453	2,206	2,206	2,200
R ²	0.3462	0.3593	0.3601	0.3735	0.4195	0.4227	0.4292	0.4324

a. The dependent variable is interest expenses as a percentage of assets. Leverage is lagged one period. Currency depreciation, is the change in the logarithm of the nominal exchange rate over the previous period. The regressions include industry, country, and regional fixed effects (not shown here). Year dummies were added to proxy for global business cycle effects. *t* statistics were calculated using Huber-White heteroskedasticity-corrected robust standard errors and are reported below the coefficient estimates. The sample period is 1992–2001.

larger increase in interest expense for nonparticipants during devaluations, relative to market participants with similar leverage, indicates that nonparticipants may face a higher cost of capital during a currency crisis due to a restricted set of financing options. Market participants, in contrast, are less vulnerable to domestic interest rate increases because they have access to external (international) finance. But the overall picture that emerges is that the lower cost of capital obtained by market participants is not sufficient to offset the direct adverse effect of currency depreciation on firm balance sheets.

This conclusion, however, should be taken with caution for purposes of policy formulation since the regression results are conditional on the sample period. The initial part of the sample period, or the "pre-crisis" period in emerging markets, was characterized by relatively stable or fixed exchange rates. The collective expectations of market participants may have been biased toward underestimating the risk of a future devaluation. The later part of the decade saw a broad shift (a forced and wrenching move in many cases) toward market-determined exchange rates. Since market-based exchange rates "price in" all available information, there is less chance of a systematic misalignment of expectations. Further, there has been significant growth in foreign exchange derivatives in recent years, indicating enhanced opportunities for risk-sharing.³⁵ These beneficial changes greatly reduce the currency risks that market participants may have faced during the last decade.

Our final specification considers the relation between foreign borrowing, foreign trade, and firm performance for market participants. Market participants in the tradable goods sector—for example, the oil and gas sector—might be able to raise foreign debt more easily because they have access to foreign currency earnings.³⁶ Further, access to foreign markets might make them less vulnerable to exchange rate devaluations even if they have a high ratio of foreign borrowing to assets. Market participants in nontradable sectors (such as utilities) that have primarily domestic earnings and high foreign debt thus are relatively more vulnerable.³⁷ In order to test

attribute this to illiquidity in foreign currency derivatives markets during the peak of the Asian crisis. The IMF provides some additional reasons: "While derivatives do play a positive role by reallocating risks and facilitating growth of capital flows to emerging markets, they can also allow market participants to take on excessive leverage, avoid prudential regulations, and manipulate accounting rules when financial supervision and internal risk management systems are weak or inadequate" (IMF 2002b, p. 67).

35. See IMF (2002b, ch. 3).

36. See Martínez and Werner (2002) for a case study of Mexico.

this hypothesis, variants of the following regression were estimated for the sample of market participants:

$$(15-4) \text{ Performance}_{it} = c_0 + c_1 * \text{Leverage}_{it-1} + c_2 * (\text{Foreign Debt/Total Debt})_{it} \\ + c_3 * \text{Tradable Dummy}_{it} \\ + c_4 * (\text{Foreign Debt/Total Debt})_{it} * \text{Tradable Dummy}_{it} \\ + d * (\text{Control Variables}) + \epsilon_{it},$$

where $(\text{Foreign Debt/Total Debt})_{it}$ is the share of foreign debt in total debt and $\text{Tradable Dummy}_{it}$ is an indicator for whether the firm is in a tradable sector.³⁸ The set of control variables is similar to the earlier specifications. The results are summarized in table 15-6. The important messages that come from this analysis are as follows.

Among market participants, firms with higher foreign debt (as a share of total debt) do better on average in terms of both net profits and cash flows. This could be due to several reasons—market participants with higher foreign exposure are larger, are concentrated in tradable sectors, and may benefit from government-sponsored corporate "bailout" measures. When we include a differential effect of leverage for market participants in the tradable sectors, the relation between foreign debt and firm performance is positive and statistically significant for firms in tradable sectors. Further, there is no independent effect of foreign debt on the performance of market participants after controlling for trade effects (the effect of higher foreign debt is negative for market participants in nontradable sectors, but the coefficient is not statistically significant).³⁹ Market participants in the tradable sectors appear to benefit from foreign financing.

37. Foreign debt outstanding (or foreign debt as a share of total debt) was not used in the earlier specifications because firm debt issuance and debt maturity were used to estimate foreign debt outstanding. This measure of foreign debt outstanding is biased to some extent since (1) debt covenants can specify higher interest payments or early repayment following a rating downgrade or "rating trigger," (2) negotiated debt restructuring can reduce principal and interest payments and extend maturity of existing debt instruments, and (3) there may be significant cross-sectional variation in the amortization profile of international loan issues. The indicator for market participation is less affected by such measurement errors.

38. The classification of SIC (Standard Industrial Classification) two-digit sectors into "tradables" and "nontradables" is based on Forbes (2002). Using actual firm-level foreign sales is preferable, but the disadvantage with this approach is that firms in developing countries typically underreport foreign sales on their balance sheets. Dominguez and Tesar (2001a) report a similar issue for both developed and developing countries in their sample.

39. This result is conditional on the inclusion of control variables for firm productivity parameters and real GDP growth. The coefficient of the interaction term for trade sector and foreign debt is positive but not statistically significant in the absence of controls.

Table 15-6. *Foreign Debt Outstanding, Trade Exposure, and Firm Performance for Market Participants, 1992–2001*^a

Variable	Net profit		Cash flows	
	(1)	(2)	(3)	(4)
Leverage	-0.175 -8.1	-0.172 -7.9	-0.125 -6.0	-0.122 -5.9
Ratio of foreign debt to total debt	0.049 4.5	-0.001 -0.1	0.038 3.3	-0.024 -1.4
Tradable sector dummy		-2.673 -0.3		4.109 1.5
Ratio of foreign debt to total debt* Tradable sector dummy		0.073 3.6		0.092 4.3
log(size)	6.03 3.0	5.89 2.9	2.34 1.3	2.21 1.2
log(size) squared	-0.312 -2.4	-0.297 -2.2	-0.090 -0.7	-0.075 -0.6
Capital intensity	-11.4 -2.2	-12.2 -2.3	0.0 0.0	-1.1 -0.2
Capital intensity squared	4.95 0.9	5.61 1.0	-4.43 -0.8	-3.53 -0.6
Real GDP growth	0.129 1.9	0.129 1.9	-0.001 0.0	0.001 0.0
Number of observations	2,083	2,083	1,997	1,997
R ²	0.2252	0.2295	0.2219	0.2288

a. The dependent variable is net profit or cash flows as a percentage of assets. Leverage is lagged one period. Tradable and nontradable sectors are based on the SIC two-digit classification of Forbes (2002). The regressions include industry, country, and regional fixed effects (not shown here). Year dummies were added to proxy for global business cycle effects. *t* statistics were calculated using Huber-White heteroskedasticity-corrected robust standard errors and are reported below the coefficient estimates. The sample period is 1992–2001.

Conclusions

Despite efforts to pay down debt since the 1997–98 crisis and the broad shift to flexible exchange rates, the corporate sector in developing countries remains subject to considerable risk. Corporate profitability in developing countries has shown a significant decline in recent years. Many Asian corporations remain highly leveraged, in part because they substituted domestic for external debt and also in part because the range of financing instruments available in emerging markets remains limited. Companies in Latin America and Eastern Europe, also highly leveraged, have increased their

dependence on foreign finance. An excessive dependence on external finance hurt many Asian corporations in 1997–98. While firms (especially Latin American firms) active in international markets during the 1990s appear to have benefited from a lower cost of capital, high leverage remains a cause for concern in many emerging markets. These high levels of leverage appear sustainable in the low-interest environment prevailing currently, but they make firms vulnerable to interest rate risks.

The analysis presented in this chapter is as good as the quality of balance sheet data reported by companies in the major emerging markets. There may be inconsistencies in corporate reporting standards over the years and across emerging markets. Local accounting principles may allow for asset revaluations, which is an artificial way to mark up equity and “deleverage.”⁴⁰ Foreign exchange losses and derivatives positions are frequently not marked-to-market and can be amortized over several years (for example, Indonesia). There is, therefore, a need to improve the quality and timeliness of corporate data in developing countries. Corporate scandals in industrial countries have brought to light the deficiencies of corporate information even in the major markets. There is considerable uncertainty over the true state of corporate balance sheets, especially over the nature and magnitude of off-balance-sheet risks. As the corporate sector is increasingly becoming the main conduit for development finance, and given the risks of rapid reversal of financial flows when corporate performance does not meet market expectations, it has become increasingly important for policymakers and market participants alike to be aware of the scope of corporate sector indebtedness (both domestic and foreign) and performance in emerging markets. That this is not easily achieved was underlined by recent corporate scandals in major industrial countries.

Appendix A. Methodology

Two types of data are especially useful in tracking trends in corporate finance in developing countries: (a) macroeconomic data, or “top-down” data, from surveys carried out by national and international data collectors and (b) microeconomic data, or “bottom-up” data, compiled from corporate reports. Each source has strengths and weaknesses.

40. This may partly explain why leverage ratios declined in Korea after the Asian crisis even while total debt was relatively stable.

The macro data are, in principle, the most comprehensive and generally quite timely. But they often provide little detail. If too highly aggregated, they make it impossible to distinguish the nonfinancial corporate sector from other parts of the private sector. The flow-of-funds data compiled for the United States by the Federal Reserve are a model of top-down data. Few developing countries, however, produce such complete accounts.

Firm-level data provide far more detail but suffer from the risk of sample bias. Often only the largest, most sophisticated enterprises are covered, because they are the ones that produce detailed reports. They may also have a time lag arising from the compilers' effort to gather comprehensive cross-country data.

The absence of comprehensive, timely data is more than a hindrance for researchers; it also is a concern for market participants and policymakers. With financial markets prone to sharp adjustments and given the easy availability of derivatives and other structuring products that allow corporates to both hedge and increase their risk exposures, it is increasingly important for market participants to be aware of the extent of exposure of the corporate sector as a whole. If the entire sector is over-exposed, individual companies are likely to have trouble rolling over their debt in times of market stress.

Four sources of macroeconomic data are used in this study to paint a picture of the liabilities on the aggregate balance sheet of the nonfinancial corporate sector:

—Data on domestic bank credit from the International Monetary Fund are used to estimate bank credit, the primary source of credit for most corporate entities in the developing world.⁴¹ The IMF's *International Financial Statistics* (line 32d) includes all credit to the private sector (including households), but the publication does not disaggregate bank credit to consumers. Although this is small in most developing countries, it does bias the debt numbers up.

—The *BIS Quarterly Review* provides data on cross-border bank claims, foreign bond issuance, and local bond market issuance.⁴²

—Domestic equity is estimated using the figures on market capitalization reported in Standard and Poor's Emerging Market Data Base. This source has two drawbacks. First, the use of market values rather than book values makes the equity component (and thus debt-equity ratios) more volatile. Second, the source does not include privately held equity.

41. IMF (various years).

42. Bank for International Settlements (various years).

—Foreign-held equity is estimated using the data on FDI stock from chapter 4 of *Global Development Finance, 2003*.⁴³

The firm-level data used in this study are from the Worldscope database. We select only firms for which all the relevant balance sheet items are available. The regional breakdown of the sample is given in table A-1.

We built a database by matching firm-level balance sheets from Worldscope (December 2002 edition) with issuance data on bonds and syndicated loans from Dealogic Bondware and Loanware. On average, about half of annual bond issuance and about 35 percent of annual loan issuance are accounted for by firms matched with Worldscope balance sheet data.

The resulting database covers 4,682 firms in twenty-one emerging markets: Argentina, Brazil, Chile, China, Colombia, the Czech Republic, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Pakistan, Peru, the Philippines, Poland, Russia, South Africa, Thailand, Turkey, and Venezuela. Because Worldscope data appear quite comprehensive for 1992–2001, the analysis in the main text focuses on this period. (Depending on the variable, the number of firms covered in the regression analysis ranges from 1,122 in 1992 to 3,629 in 2000 and 3,073 in 2001.)

The summary statistics presented in the analysis, unless otherwise mentioned, are weighted averages of the financial ratios (with firm assets used as weights). For example, the debt-asset ratio is computed as the ratio (expressed as a percentage) of the sum of debt for all firms to that of assets for all firms.

The findings related to foreign market access are derived as follows.

First, firms that had outstanding foreign debt in a given period (called "market participants") are compared with those that had no outstanding foreign debt ("nonparticipants" in the international debt markets, at least for that year). Outstanding foreign debt is calculated by summing all debt issues in international markets (syndicated loans and bonds) during 1990–2001 and subtracting debt that matured during the period. This method ignores outstanding debt issued before 1990, but because private debt flows to the corporate sector in emerging markets (and stocks in those markets) were small in the aftermath of the debt crisis of the 1980s, this omission is unlikely to affect the results presented here.

Second, considering all firms with outstanding foreign debt, firms that borrowed from international markets in the current period (that is, firms with "rollover") are compared with those that did not (firms without rollover).

43. World Bank (2003).

Table A-1. *Number of Firms in the Sample, 1992–2001*

Region	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
All	1,122	1,288	1,538	1,928	2,242	2,559	2,998	3,565	3,629	3,073
East Asia and Pacific	582	691	774	1,032	1,181	1,245	1,347	1,618	1,840	1,695
Latin America and the Caribbean	141	162	264	308	354	390	533	862	834	706
Europe and Central Asia	17	19	20	68	132	155	177	185	165	117
Others	382	416	480	520	575	769	941	900	790	555

Appendix B. Details of the Regressions Reported in Table 15-3

Table B-1. *Regressions for Net Profits of Nonparticipants and Market Participants, by Region, 1992–2001^a*

Variable	Nonparticipants			Market participants		
	All regions	East Asia and Pacific	Latin America and the Caribbean	All regions	East Asia and Pacific	Latin America and the Caribbean
Leverage	-0.151 -26.3	-0.142 -17.6	-0.148 -10.1	-0.197 -9.5	-0.225 -7.6	-0.045 -1.0
Crisis	0.723 1.4	-1.228 -1.2	2.035 2.5	1.882 1.6	-0.889 -0.3	3.644 2.5
Crisis*leverage	-0.073 -5.8	-0.051 -2.8	-0.115 -3.9	-0.083 -4.0	-0.043 -1.0	-0.122 -2.5
log(size)	4.07 9.6	2.59 4.9	4.90 4.7	4.30 2.6	5.45 2.4	4.51 1.2
log(size) squared	-0.290 -7.9	-0.156 -3.5	-0.369 -4.4	-0.206 -1.9	-0.304 -2.0	-0.133 -0.6
Capital intensity	0.959 0.5	7.303 3.0	-2.806 -0.6	-12.389 -2.6	-0.121 0.0	-25.953 -2.8
Capital intensity squared	-8.27 -4.3	-13.46 -5.1	-1.10 -0.3	5.38 1.1	-7.69 -1.0	23.77 2.6
Real GDP growth	0.203 5.7	0.038 0.6	0.302 3.9	0.184 2.0	-0.052 -0.4	0.246 1.8
Number of observations	14,060	6,785	2,505	2,239	1,240	537
R ²	0.1952	0.1799	0.2365	0.2308	0.2371	0.2968

a. The dependent variable is net profit as a percentage of assets. Leverage is lagged one period. Crisis is an indicator for currency crisis (see text). Firm size is measured as average total assets in 1998–2001 in millions of U.S. dollars. The regressions include firm, industry, country, and regional fixed effects (not shown here). Year dummies are added to proxy for global business cycle effects. *t* statistics are calculated using Huber-White heteroskedasticity-corrected robust standard errors and are reported below the coefficient estimates.

Table B-2. *Regressions for Cash Flows of Nonparticipants and Market Participants, by Region, 1992–2001^a*

Variable	Nonparticipants			Market participants		
	All regions	East Asia and Pacific	Latin America and the Caribbean	All regions	East Asia and Pacific	Latin America and the Caribbean
Leverage	-0.085 -13.3	-0.087 -9.8	-0.040 -2.5	-0.142 -7.1	-0.161 -5.7	0.013 0.3
Crisis	0.851 1.4	-1.561 -1.4	2.126 2.2	1.144 1.0	-1.090 -0.4	3.721 2.7
Crisis*leverage	-0.043 -3.1	-0.044 -2.4	-0.080 -2.1	-0.090 -4.6	-0.072 -1.5	-0.093 -2.2
log(size)	3.54 7.3	1.52 2.3	5.97 4.5	1.57 1.0	1.85 0.9	-1.45 -0.4
log(size) squared	-0.265 -6.2	-0.075 -1.3	-0.483 -4.6	-0.042 -0.4	-0.060 -0.4	0.214 0.9
Capital intensity	20.8 9.3	24.4 8.0	20.0 3.2	-1.9 -0.4	9.9 1.5	-7.7 -0.7
Capital intensity squared	-26.8 -11.3	-29.1 -8.5	-22.6 -3.8	-3.6 -0.7	-16.6 -2.3	9.5 0.9
Real GDP growth	0.106 2.5	-0.076 -1.2	0.403 4.4	0.016 0.2	-0.190 -1.2	0.203 1.6
Number of observations	13,147	6,453	2,213	2,144	1,206	482
R ²	0.2051	0.1514	0.1658	0.2306	0.2341	0.3489

a. The dependent variable is firm cash flows as a percentage of assets. Leverage is lagged one period. Crisis is an indicator for currency crisis (see text). Firm size is measured as average total assets in 1998–2001 in millions of U.S. dollars. The regressions include firm, industry, country, and regional fixed effects (not shown here). Year dummies are added to proxy for global business cycle effects. *t* statistics are calculated using Huber-White heteroskedasticity-corrected robust standard errors and are reported below the coefficient estimates.

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