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# Capital Structures in Developing Countries

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**ABSTRACT**

This study uses a new data set to assess whether capital structure theory is portable across countries with different institutional structures. We analyze capital structure choices of firms in 10 developing countries, and provide evidence that these decisions are affected by the same variables as in developed countries. However, there are persistent differences across countries, indicating that specific country factors are at work. Our findings suggest that although some of the insights from modern finance theory are portable across countries, much remains to be done to understand the impact of different institutional features on capital structure choices.

OUR KNOWLEDGE OF CAPITAL STRUCTURES has mostly been derived from data from developed economies that have many institutional similarities. The purpose of this paper is to analyze the capital structure choices made by companies from developing countries that have different institutional structures.

The prevailing view, for example Mayer (1990), seems to be that financial decisions in developing countries are somehow different. Mayer is the most recent researcher to use aggregate flow of funds data to differentiate between financial systems based on the "Anglo-Saxon" capital markets model and those based on a "Continental-German-Japanese" banking model. However, because Mayer's data comes from aggregate flow of funds data and not from individual firms, there is a problem with this approach. The differences between private, public, and foreign ownership structures have a profound influence on such data, but the differences may tell us little about how profit-oriented firms make their individual financial decisions.

This paper uses a new firm-level database to examine the financial structures of firms in a sample of 10 developing countries. Thus, this study helps determine whether the stylized facts we have learned from studies of developed countries apply only to these markets, or whether they have more general applicability. Our focus is on answering three questions:

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1. Do corporate financial leverage decisions differ significantly between developing and developed countries?
2. Are the factors that affect cross-sectional variability in individual countries' capital structures similar between developed and developing countries?
3. Are the predictions of conventional capital structure models improved by knowing the nationality of the company?

This last question is particularly important, because different institutional factors, such as tax rates and business risk, can result in different financing patterns, which then show up in firm data as well as the aggregate flow of funds data. Therefore, it is interesting to consider the added value of company analysis versus a simple country classification.

Very few studies have used cross-country comparisons to test theories of corporate financial leverage. Rajan and Zingales (1995) is a notable exception, where they use four key independent variables to analyze the determinants of capital structures across the G-7[1] countries: the tangibility of assets, market-to-book ratio, logarithm of sales as a size proxy, and a measure of profitability.

Our data are for 10 developing countries: India, Pakistan, Thailand, Malaysia, Turkey, Zimbabwe, Mexico, Brazil, Jordan, and Korea. These 10 countries include five former British colonies, two Latin American countries with a common inflationary experience, and three "others." Hence, as well as reflecting the Anglo-Saxon capital markets and the Continental-German-Japanese banking systems, there is a diversity of cultural and economic factors that should severely test whether extant capital structure models are portable.

The paper is organized as follows: Section I discusses the data set and the principal characteristics of the financing patterns in the 10 developing countries. Section II discusses the determinants of capital structure. Section III discusses the estimation of the capital structure model on a country-by-country basis. Section IV analyzes the data as a single data set to compare country factors with "economic factors." Section V concludes and offers suggestions for further research.

## I. Data Sources and Macro Financial Information

Our primary source is data collected by the International Finance Corporation (IFC). The IFC data comprise abbreviated balance sheets and income statements for the largest companies in each country from 1980 to 1990, although all time periods are not available for every country. The criteria used by the IFC for choosing the countries were that quality data were available for a reasonably large sample of firms in the period from 1980 to 1991, and that developing countries from every continent were represented.

[1] The countries are the United States, Germany, Canada, Italy, France, Japan, and the United Kingdom.

The IFC collected annual financial statements and in some cases stock price data for a maximum of the 100 largest publicly traded firms in each country for which ongoing data were available throughout the sample period. The IFC chose large publicly traded firms in an effort to obtain high quality financial statements. For some of the smaller countries, fewer than 100 firms are traded or meet the data availability criteria, which resulted in smaller samples. For several countries, high-quality data for the early years of the sample were not available. For these countries, the sample starts after 1980.[2] The IFC database contains stock price data for 8 of the 10 countries. Unfortunately, stock price data are not available for any of the companies from Brazil or Mexico and are only available for some companies and/or years for several other countries.

Another drawback is that there are no data from the sources and uses-of-funds statement, and for most countries there is little useful data going from sales to earnings before tax. The IFC collected the data for reasons other than those of this research. Thus, as a practical matter it is impossible to go back and get data on alternative company variables that other studies have found useful. For example, there is no data on advertising and research and development (R&D) expenses that are known to give rise to intangible assets that are difficult to borrow against. Similarly, the data on corporate income taxes are rudimentary. Therefore, it is impossible to create sophisticated tax variables to handle the effect of loss carry-forwards or other tax incentives. As a result, the analysis cannot be as sophisticated as that contained in the best studies on U.S. data, such as, for example, Bradley, Jarrell, and Kim (1984), Titman and Wessels (1988), and Kale, Noe, and Ramirez (1992).

Despite these weaknesses, the IFC data set is still the most detailed data set available on capital structures in developing countries, and is much more comprehensive, in terms of company coverage, than competing commercial data sets. Moreover, it allows for the calculation of many variables that are known to be relevant from studies of firms in developed countries.

We calculate a firm's total book-debt ratio as its total liabilities divided by total liabilities and net worth. Although this ratio has some problems, it is the only ratio that can be calculated for all 10 countries, since there are no data available on Thailand's current liabilities. For the remaining nine countries, we can calculate long-term liabilities, divided by long-term liabilities plus net worth. For seven countries, we can calculate a market long-term debt ratio by substituting the average equity market value for net worth. These two ratios should help us analyze the empirical validity of capital structure models. Unlike the evidence for the G-7 countries used by Rajan and Zingales (1995), variables such as unfunded pension liabilities and deferred taxes are not a significant part of the liability structure of the companies in our sample.

[2] The data are described in detail, together with primary sources, in Singh et al. (1992). Capital structures are analyzed in Glen and Pinto (1994) and Booth (1995).

**Table I**

## Debt Ratios

We define the total-debt ratio as total liabilities divided by total liabilities plus net worth. We define the long-term book-debt ratio as total liabilities minus current liabilities divided by total liabilities minus current liabilities plus net worth. The long-term market-debt ratio substitutes equity market value for net worth in the long-term book-debt ratio definition. The first row is for the complete time period available for each country, the second row is for the common period 1985 to 1987. The data for developing countries were collected by the International Finance Corporation (IFC) and consist primarily of abbreviated balance sheets and income statements for the largest companies in each country. Data for the United States, Japan, Germany, France, Italy, the United Kingdom, and Canada are from Rajan and Zingales (1995, Table IIIa) (note their estimate of the long-term debt ratio includes all nonequity liabilities). For Pakistan, Turkey, and Zimbabwe, we estimate debt ratios over the larger sample that includes firms without market-to-book or tangibility ratios.

| | No. of Firms | Time Period | Total Debt Ratio (%) | Long-term Book-debt Ratio (%) | Long-term Market-debt Ratio (%) |
|---|---|---|---|---|---|
| Brazil | 49 | 1985–1991 | 30.3 | 9.7 | N/A |
| | | 1985–1987 | 30.7 | 8.4 | N/A |
| Mexico | 99 | 1984–1990 | 34.7 | 13.8 | N/A |
| | | 1985–1987 | 35.4 | 15.6 | N/A |
| India | 99 | 1980–1990 | 67.1 | 34.0 | 34.7 |
| | | 1985–1987 | 66.1 | 35.7 | 36.7 |
| South Korea | 93 | 1980–1990 | 73.4 | 49.4 | 64.3 |
| | | 1985–1987 | 72.8 | 50.3 | 59.3 |
| Jordan | 38 | 1983–1990 | 47.0 | 11.5 | 18.6 |
| | | 1985–1987 | 44.7 | 10.9 | 20.1 |
| Malaysia | 96 | 1983–1990 | 41.8 | 13.1 | 7.1 |
| | | 1985–1987 | 40.9 | 13.1 | 7.7 |
| Pakistan | 96 | 1980–1987 | 65.6 | 26.0 | 18.9 |
| | | 1985–1987 | 65.2 | 32.5 | 17.6 |
| Thailand | 64 | 1983–1990 | 49.4 | N/A | N/A |
| | | 1985–1987 | 50.9 | N/A | N/A |
| Turkey | 45 | 1983–1990 | 59.1 | 24.2 | 10.8 |
| | | 1985–1987 | 61.8 | 24.5 | 10.8 |
| Zimbabwe | 48 | 1980–1988 | 41.5 | 13.0 | 26.3 |
| | | 1985–1987 | 40.3 | 11.4 | 26.0 |
| United States | 2,580 | 1991 | 58 | 37 | 28 |
| Japan | 514 | 1991 | 69 | 53 | 29 |
| Germany | 191 | 1991 | 73 | 38 | 23 |
| France | 225 | 1991 | 71 | 48 | 41 |
| Italy | 118 | 1991 | 70 | 47 | 46 |
| United Kingdom | 608 | 1991 | 54 | 28 | 19 |
| Canada | 318 | 1991 | 56 | 39 | 35 |

N/A: Not Available.

Table I provides summary data on the distribution of the three capital structure ratios across the 10 developing countries. For comparison, the table also includes the G-7 economies reported in Rajan and Zingales (1995). For

the developing countries, we estimate the averages from the data for the entire period for all the available companies in each country.[3]

Based on total liabilities, the book-debt ratio varies from a low of 30.3 percent in Brazil to a high of 73.4 percent in South Korea. The countries seem to fall into a low-debt group, consisting of Brazil, Mexico, Malaysia, and Zimbabwe; a high-debt group, consisting of South Korea, India, and Pakistan; and a middle group consisting of Jordan, Turkey, and Thailand. We find a similar ranking in the long-term debt ratios when we use both book and market data. The only qualification is that companies in Zimbabwe (and to a lesser extent, Jordan) fall into a high-debt group based on market-debt ratios. Overall, except for South Korea (by far the most developed country in our sample), almost all the developing countries have a debt level, regardless of whether it is book or market, that is below the median of the G-7 countries.

We note that the difference between the total book-debt and long-term debt ratios is much more pronounced in developing countries than it is in the developed countries. Consistent with the findings of Demirguc-Kunt and Maksimovic (1999), a major difference between developing and developed countries is that developing countries have substantially lower amounts of long-term debt. To the extent that the theories of capital structure explain capital structures of firms in developed countries (e.g., we assume well-developed legal systems), this difference, in long versus short-term debt, might limit their explanatory power in developing countries.

We also note that the estimates in Table I come from different time periods. For example, the data from Pakistan is for the period 1980 to 1987, but that for Brazil covers 1985 to 1991. This introduces a potential business-cycle bias into the debt estimates, because book-debt ratios tend to increase during recessions and fall during expansionary periods. For this reason, beneath the estimates for the full time period we include the estimates for the single common period, 1985 to 1987. Although this three-year period is not likely to be a full business cycle, each country's debt-ratio estimate is substantially the same as for the full period. This finding indicates that the problem of differing time periods across countries is not likely to bias the estimates.

When we examine Tables I and II, we see that our sample contains a large proportion of the listed companies in all the countries except for Brazil and India. Table II also shows the percentage of equity market capitalization for all the companies included in the IFC Emerging Stock Markets Database. We note that in 1986, the sample of companies in the IFC Emerging Stock Markets Database formed a significant proportion of the total equity capitalization in all the economies in our sample, ranging from a low of 28.9 percent for Brazil to a high of 63.8 percent for Malaysia. The capitalization ratios for our sample should be at least as high, because our data contain

[3] The analysis makes extensive use of ratios, which sometimes results in extreme outliers. To alleviate the problem of spurious results based on these outliers, we discard all values that are at least three standard deviations from the average value for that country.

## Table II
## Macro Financial Data

The data are from the *Emerging Stock Market Fact Book* (International Finance Corporation, 1995), *Trends in Developing Economies: Extracts, Emerging Capital Markets*, Volume 2, (World Bank, 1993), *International Financial Statistics* (International Monetary Fund, 1999), and *World Development Report* (The World Bank, 1992). Turnover ratio is the value of stocks actually traded expressed as a percentage of the average total value of listed stocks. The Number and Value of Stocks pertain to stocks in the IFC Emerging Markets Database: a: 1986 to 1990; b: 1983 to 1985; c: 1987 to 1990; d: 1982 to 1985. Liquid liabilities/GDP data were provided by Ross Levine and come from King and Levine (1993). Accounting standards and investor protection are rated according to the following key: G = Good, of internationally acceptable quality; A = Adequate; P = Poor; requires reform; S = Functioning securities commission/government agency regulating market activity. The tax data are from the Price-Waterhouse and Ernst and Young, "Doing Business In . . . ," series, except for the United States, which is from Rajan and Zingales (1995, Table IV). The Miller tax term is, $1 - (1 - T_c)(1 - T_e)/(1 - T_i)$, where the equity tax rate is either that on capital gains or dividends.

| | | Brazil | Mexico | India | South Korea | Jordan | Malaysia | Pakistan | Thailand | Turkey | Zimbabwe | United States |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. of listed companies | 1982 | 1,100 | 206 | 3,358 | 334 | 86 | 194 | 326 | 81 | NA | 62 | 6834 |
| | 1990 | 1,193 | 199 | 6,200 | 669 | 105 | 282 | 487 | 214 | 110 | 57 | 6342 |
| Stock-market value | 1982 | 10,261 | 1,719 | 7,058 | 4,408 | 2,845 | 13,903 | 877 | 1,260 | NA | 355 | 1,520,167 |
| (millions of $) | 1990 | 16,354 | 32,725 | 38,567 | 110,594 | 2,001 | 48,611 | 2,985 | 23,896 | 19,065 | 2,395 | 3,072,303 |
| Turnover ratio (%) | 1981–1985 | 44 | 50 | 64 | 68 | 10 | 16 | NA | 23 | NA | 6[b] | 38 |
| (Yearly average) | 1986–1990 | 39 | 75 | 63 | 100 | 17 | 18[c] | 9 | 82 | 18 | 4 | 68 |
| Number of stocks | 1986 | 29 | 26 | 47 | 23 | 10 | 40 | 52 | 10 | 14 | 11 | |
| in IFC sample | 1990 | 56 | 54 | 60 | 63 | 25 | 62 | 49 | 34 | 18 | 16 | |
| Share of market value | 1986 | 28.9 | 56.3 | 45.9 | 39.3 | 44.3 | 63.8 | 38.0 | 62.8 | 39.9 | 43.8 | |
| of IFC sample (%) | 1990 | 40.1 | 62.5 | 40.7 | 57.4 | 74.3 | 46.9 | 31.9 | 44.0 | 23.2 | 56.5 | |
| GNP per capita ($U.S.) | 1990 | 2,680 | 2,490 | 350 | 5,400 | 1,240 | 2,320 | 380 | 1,420 | 1,630 | 640 | 22,380 |
| Real GDP growth rate (%) | 1980–1985 | 0.9 | 1.2 | 5.2 | 8.5 | NA | 5.4 | 6.4 | 5.6 | 4.7 | 3.4 | 2.1 |
| | 1985–1989 | 1.9 | 1.6 | 6.2 | 9.6 | −1.6 | 6.9 | 5.8 | 10.1 | 5.3 | 3.8 | 3.1 |
| Stock-market value/GDP | 1981–1985 | 9.7 | 2.1 | 4.2 | 6.7 | 66.3 | 59.7 | 3.8 | 3.9 | NA | 5.2[d] | 52.8 |
| (%) (Yearly Average) | 1981–1989 | 10.0 | 4.6 | 5.8 | 21.3 | 57.0 | 68.0 | 4.8 | 9.9 | NA | 9.3[e] | 56.2 |
| Inflation rate (%) | 1980 | 84.2 | 26.4 | 11.4 | 28.7 | 11.1 | 6.7 | 11.9 | 19.7 | 110.2 | 5.4 | 13.5 |
| | 1990 | 2,937.8 | 26.7 | 9.0 | 8.6 | 16.2 | 2.6 | 9.1 | 5.9 | 60.3 | 17.4 | 5.4 |
| Liquid liabilities/GDP | 1980–1989 | 0.10 | 0.25 | 0.40 | 0.37 | 1.14 | 0.94 | 0.4 | 0.54 | 0.24 | 0.39 | 0.64 |
| Accounting standards | | A | G | A | G | A | G | A | A | A | A | |
| Investor protection | | AS | GS | AS | GS | AS | GS | AS | AS | AS | AS | |
| Corporate tax rate ($T_c$) | | 0.300 | 0.370 | 0.450 | 0.365 | 0.380 | 0.350 | 0.460 | 0.300 | 0.250 | 0.500 | 0.458 |
| Highest personal tax rate ($T_i$) | | 0.250 | 0.400 | 0.400 | 0.500 | 0.450 | 0.400 | 0.350 | 0.370 | 0.550 | 0.600 | 0.358 |
| Miller tax adv. of interest to dividends | | 0.142 | 0.482 | 0.000 | 0.635 | 0.380 | −0.083 | 0.460 | 0.300 | −0.360 | 0.000 | 0.450 |
| Miller tax adv. of interest to cap. gains | | 0.300 | 0.203 | 0.340 | 0.794 | 0.380 | −0.083 | 0.610 | −0.110 | −0.360 | 0.125 | 0.450 |

NA: Not Available.

more companies for each country than does the IFC Emerging Stock Markets Database, and our data pertain to the largest companies in each country. Hence, in terms of both the number of companies and equity market capitalization, our sample contains a significant proportion of the listed companies in these countries. Moreover, this coverage is much broader than that of other databases, which include some firms from developing countries, such as Worldscope.

It is not always clear whether the differences in book-debt ratios across countries reflect the differences in optimal capital structure policies, or differences in accounting practices. All countries in our sample, except for Korea and Thailand, follow accounting practices consistent with North American Generally Accepted Accounting Principles (GAAP). These principles flow from the capital markets perspective of Anglo-Saxon countries, which emphasize the information needed by external creditors. In contrast, Korea and Thailand use accounting systems similar to those of Germany and Japan, which reflect a banking orientation. One major difference between the two systems is that North American GAAP relies on fair-market valuation; the German and Japanese systems rely on strict historic cost accounting.

Because of these accounting differences, it is not always easy to compare financial statements across countries. For example, companies in Germany, Japan, South Korea, and Thailand might seem to be more leveraged than those in the United States, Canada, Brazil, and Mexico. This is because the first group uses strict historic cost accounting, which values many assets below their current market value. In contrast, and particularly for countries such as Brazil and Mexico, which have high inflation rates, adjustments to market values are especially important. These accounting differences could have an impact, especially on the book-debt ratios, although their impact on the market-value debt ratios is moot.

Table II provides information obtained from the IFC Emerging Stock Markets Fact Book on the quality of accounting standards for our sample of countries. Out of three possible quality rankings on accounting standards, most of the countries in our sample received a ranking of "adequate." Mexico, South Korea, and Malaysia received a ranking of "good." The table also indicates that all countries in our sample have either a functioning securities commission or an equivalent government agency.

Table II also provides some basic institutional information on macroeconomic variables. Several of the countries, such as Jordan, Brazil, and Mexico, have experienced relatively weak real economic growth. Others, such as Thailand and South Korea, show very high real-growth rates over the sample period. Although all of the countries have had relatively high inflation rates, Brazil and Mexico have been classic hyperinflationary environments. There are also unique combinations, such as low-inflation, low-growth countries like Jordan, low-inflation, high-growth countries like Malaysia, high-inflation, low-growth countries like Brazil and Mexico, and high-inflation, high-growth countries like South Korea, and there are middle-ground countries. Such a heterogeneity of economic environments poses a severe test for

any model, even though macroeconomic variables supposedly play no role in most capital structure models. Certainly these factors do not affect the personal versus corporate leverage decision that is at the heart of the Modigliani and Miller (1958) capital structure framework.

Table II indicates that there are greater differences in financial-market institutions among the countries in our sample than there are in those of the G-7 countries studied by Rajan and Zingales (1995). For example, the ratio of stock market capitalization to GDP is a good approximation for the importance of the equity market. This ratio varies from a low of 2.1 percent in Mexico to a high of 78.5 percent in Malaysia. In most countries, the ratio of stock market capitalization to GDP increases over time, but for some countries the trend is imperceptible. We note that the two highest GDP growth countries, South Korea and Thailand, have the most dramatic jump in stock market capitalization from 6.7 percent and 3.9 percent of GDP to 39.6 percent and 17.4 percent of GDP, respectively. Over a similar period the market capitalization in the lowest-growth country, Jordan, declined from 66.3 percent to 44.5 percent of GDP.

Although the actual amount of equity capitalization is important, so too is the volume of transactions. If a large amount of equity is not traded, it can be just as inhibiting to corporate financing as a small amount that is traded. The trading statistics indicate that several of the countries have active markets with turnover ratios equal to that of the United States (about 55 percent). For several countries, the turnover ratios are significantly lower. If we put the turnover ratios together with the market capitalization data, we see that the equity markets appear to be viable in South Korea and Thailand; that Jordan and Malaysia have relatively large amounts of equities available that are not traded very often; that Brazil, India, and Mexico trade a relatively small number of equities quite actively; and that Pakistan, Zimbabwe, and Turkey have relatively limited equity markets combined with lower levels of trading. It is important to note that the equity market data on the last three countries is sporadic, consisting of data limited for the number of years or companies.

Studies of corporate financing in advanced industrial economies, such as those by Mayer (1990) and Rajan and Zingales (1995), examine the differences in the development of banks versus financial markets as possible determinants of capital structure. However, as the Rajan and Zingales study shows, the relative importance of banking is less indicative of differences in corporate leverage than it is of differences in the relative amounts of private financing (bank loans) and arms-length financing through open-market securities.[4]

[4] Demirguc-Kunt and Maksimovic (1996) find a negative relation between the level of stock market development and the ratios of both long- and short-term debt to total equity of firms, and a positive relation between bank development and leverage. Furthermore, in developing countries, large firms become more leveraged as stock markets develop, but smaller firms do not appear to be significantly affected by market development.

The financial systems in our sample exhibit a variety of models. At one extreme, commercial banks in Malaysia and Pakistan are universal banks that are involved in merchant banking as well as commercial lending. At the other extreme, in countries such as India and Zimbabwe, banking and commerce are separated. Separate institutions provide different services.

Table II gives a summary measure of financial intermediary development and liquid liabilities as a percentage of GDP. The principal features of the financial systems and the extent of government intervention in credit allocation in each country are described in the Appendix. Table II indicates a relatively high development of the financial intermediary sector in Jordan, Malaysia, and Thailand. South Korea, Zimbabwe, Pakistan, and India have an average level of development. Turkey, Mexico, and Brazil show a relatively low level of development, but even in these countries, the banking systems are complex. For example, in Turkey in 1980, there were over 40 institutions, including publicly owned banks, private commercial banks, development banks, and foreign banks. However, in most of the countries, the banking system is concentrated. The top three or four banks frequently hold a substantial share of financial assets. (The ratio ranges from 100 percent in the case of Zimbabwe to 20 percent for South Korea in 1990.)

In developing countries, the distinction between bank and market-based financing is further complicated by extensive government ownership and regulation of the financial system. Controls on the prices in security markets, along with government-directed credit programs to preferred sectors, could have a significant impact on corporate financing patterns.[5] We detail each country's directed credit policy in the Appendix. However, to illustrate the types of distortions that occur, we note that in India, government-imposed ceilings on interest rates could have led to a greater reliance on debt financing. However, there were also controls on the issue price of equity which might have forced many companies to issue convertible debt to recoup part of their loss due to equity underpricing.[6] Similar credit policy measures are at work in most of the 10 developing countries.

La Porta et al. (1998) develop indexes for a large sample of countries to study the quality of legal protection for shareholders and creditors. They find that investor rights tend to be stronger in Anglo-Saxon common-law countries as compared to French civil-law countries, whereas German civil-law countries fall somewhere in the middle. La Porta et al. also find that

[5] Financial liberalization policies in the 1990s eased controls in some of these countries. Note also that most corporate debt in India is convertible into common shares. Controls on the issue price of equity in India was phased out in 1992.

[6] Glen and Pinto (1994, page 49) note "Most (Indian) corporate debt is really quasi-equity, being convertible into shares. This is explicable by the earlier controls on the issue price of shares. Partially convertible debentures were configured in such a way that the pure debt portion would carry a very low interest rate, say 12% when the market rate was 19%. The investor, who cared only for the equity portion (because of the huge initial gain owing to equity price controls) would sell the nonconvertible portion to a financial institution at a discount."

better investor protection in common-law countries is not offset, but rather reinforced, by stronger law enforcement. They also find that companies in countries with weak investor rights tend to have higher ownership concentration.

According to La Porta et al. (1998), overall creditor rights for our sample of countries are stronger in India, Malaysia, Pakistan, Thailand, Zimbabwe, and South Korea, and weaker for Brazil, Jordan, Mexico, and Turkey. Shareholder rights are also strongest in our sample of common-law countries and weakest for our civil-law countries. The only exception is Brazil, which has shareholder rights similar to those of common-law countries.

When we review some of the salient institutional factors, it is clear that there can be no simple "matching" of countries into neat, self-contained boxes. Our sample of developing countries encompasses too wide a range of institutional characteristics. Therefore, it is not surprising that Tables I and II show no strong relation between measures of bank and stock market development, broad macroeconomic factors, and aggregate capital structures for developing countries. For example, Malaysia, South Korea, and Thailand all have high measures of bank and stock market development, but different overall leverage ratios.

Table II also presents data on the tax advantages of debt financing for each country. For all 10 countries, interest on corporate debt is tax deductible, which induces a corporate tax advantage for debt financing. This corporate tax shield ranges from a high of 0.55 in Pakistan to a low of 0.3 in Thailand.

In contrast to the corporate tax shield, the Miller (1977) gains-to-leverage formula,

$$1 - \frac{(1 - T_c)(1 - T_e)}{(1 - T_i)} \tag{1}$$

takes into account not just the corporate tax rate, $T_c$, but also the personal tax rate on interest income, $T_i$, and equity income ($T_e$). By assuming the highest personal tax rate for equity income from listed securities, we can estimate the Miller tax shield for each of the countries in our sample with equity income coming from either dividends or capital gains.

Table II indicates that debt has a "Miller" tax advantage over equity in most of these developing countries. The possible exceptions are Malaysia and Turkey, and perhaps India and Zimbabwe, depending on source income. However, it is important to note that the ranking based on corporate tax-shield values differs from that on Miller tax shields. For example, Zimbabwe and India have high tax-shield values based purely on corporate income taxes, but low Miller tax advantages to debt financing when income is paid out in dividends. On the other hand, South Korea moves from a medium ranking on corporate tax-shield value to a very high Miller value. Some countries like Pakistan and Turkey remain high on both measures. Notice that there

**Table III**

**Macroeconomic Influences on Capital Structure Choice**

The table shows the results of regressions of various debt measures against a set of independent macroeconomic variables. We define the total-debt ratio as total liabilities divided by total liabilities plus net worth. We define the long-term book-debt ratio as total liabilities minus current liabilities, divided by total liabilities minus current liabilities plus net worth. The long-term market debt ratio substitutes equity market value for net worth in the long-term book-debt ratio definition. Macroeconomic variables are as defined in Table II and the Miller tax variable as in the text. The data for developing countries were collected by the International Finance Corporation (IFC) and consist primarily of abbreviated balance sheets and income statements for the largest companies in each country. Data for the United States, Japan, Germany, France, Italy, the United Kingdom, and Canada are from Rajan and Zingales (1995). *t*-statistics are in parentheses.

| | Total-debt Ratio (%) | Long-term Book-debt Ratio (%) | Long-term Market-debt Ratio (%) |
|---|---|---|---|
| Intercept | 46.05 | 20.32 | 31.5 |
| | (3.49) | (1.35) | (1.86) |
| Stock market value/GDP | −0.16 | −0.02 | −0.03 |
| | (−1.22) | (0.10) | (−0.19) |
| Liquid liabilities/GDP | 0.14 | 0.17 | −0.17 |
| | (0.86) | (0.09) | (−0.98) |
| Real GDP growth rate | 1.18 | 1.2 | −0.11 |
| | (0.96) | (−0.75) | (−0.07) |
| Inflation rate | −0.1 | −0.1 | 0.01 |
| | (−1.15) | (−1.18) | (0.02) |
| Miller tax term | 0.21 | 0.26 | 0.3 |
| | (1.92) | (2.00) | (1.09) |
| Number of observations | 17 | 16 | 14 |
| Adjusted $R^2$ | 27.5% | 22.4% | 25.8% |

is a positive association between tax-shield ranking and the debt ratios for South Korea and Pakistan (in the high-debt country group) and for Malaysia (a low-debt country).[7]

Another interesting point is that, unlike the United States, although all these countries allow loss carryforwards, none allows loss carrybacks. As a result, a succession of profitable years with significant tax payments could be negated by a succession of bad years. The absence of loss carrybacks reduces the tax advantage of debt financing for a high-risk firm. It should also be remembered that the tax code has many attributes aside from the statutory tax rates and may not be well enforced.

Table III offers some preliminary conclusions on the relation between aggregate capital structure and institutional characteristics. These conclusions are generated by pooling the data from the developing and developed

[7] It is possible that the marginal taxpayer lives in another country. In this case, foreign, rather than domestic, tax rates would apply to the tax calculations. However, cross-border financing for these countries was not significant prior to 1990.

countries and creating an enhanced sample of 17 countries. Table III shows the results of the cross-sectional regressions in which the dependent variables are the three debt measures defined in Table I, and the independent variables are the main macroeconomic factors listed in Table II, plus the Miller (1977) tax-shield value.

The obvious caveat to the results in Table III is that with only 17 countries, the standard errors of the coefficients are too large for the coefficients to be judged significant at normal levels. This is particularly true when the sample size shrinks to 14, when we use the market long-term debt ratio. However, some interesting generalizations emerge; for example, all three debt ratios vary negatively with the equity market capitalization, whereas, except for the long-term market-debt ratio, the debt ratios vary positively with the proportion of liquid liabilities to GDP.

As equity markets become more developed, they become a viable option for corporate financing and firms make less use of debt financing. Similarly, more highly developed debt markets are associated with higher private sector debt ratios. The fact that we do not see this relation for the long-term market-debt ratio could be because we cannot calculate this ratio for companies from Brazil, Mexico, and Thailand, and as a result, companies from these low-debt countries are not included in the estimates.

Higher real economic growth tends to cause the two book-debt ratios to increase, and higher inflation causes them to decrease. This implies that companies can borrow against real, but not inflationary growth prospects. Despite inflation pushing up the monetary value of the firm's assets, the higher interest rate and monetary risk caused by inflation causes book-debt ratios to fall. These results do not hold when we use market values to calculate the debt ratio. However, the coefficients are not significant. The results could be due to sample selection problems, particularly because neither of the two hyperinflationary countries, Brazil and Mexico, have stock market data.

Finally, the Miller (1977) tax term is significant in two of the three regression equations. This indicates that more debt is used in those countries that assign a higher tax advantage to debt financing. This is interesting, because most studies use data from a single country, in which all companies face similar marginal tax rates. As a result, there is usually little heterogeneity in marginal tax rates.[8]

The institutional data and regression analysis offer tantalizing glimpses of what country factors really mean. Is Brazil special because it is Brazil, or because it is a hyperinflationary country with low real growth and poorly developed financial markets? We cannot answer this question definitively. However, there is enough circumstantial evidence to indicate that this is an important topic for future research.

[8] See Graham (1996).

## II. Capital Structure Determinants and Aggregate Values

We choose variables to explain capital structure differences by considering the three principal theoretical models of capital structure: the Static Trade-off Model (STO), the Pecking-Order Hypothesis (POH), and the Agency Theoretic Framework (ATF). In each model, the choice between debt and equity depends on both firm-specific and institutional factors. In the STO model, capital structure moves towards a target that reflects tax rates, asset type, business risk, profitability, and the bankruptcy code. In the ATF, potential conflicts of interest between inside and outside investors determines an optimal capital structure that trades off agency costs against other financing costs. The nature of the firm's assets and growth opportunities are important factors in the importance of these agency costs. In the POH, financial market imperfections are central. Transaction costs and asymmetric information link the firm's ability to undertake new investments to its internally generated funds. If the firm must rely on external funds, as in the Myers and Majluf (1984) model, then it prefers debt to equity due to the lesser impact of information asymmetries.

Empirically, distinguishing between these hypotheses has proven difficult. In cross-sectional tests, variables that describe the POH can be classified as STO or ATF variables and vice versa. Moreover, in time-series tests, Shyam-Sunder and Myers (1999) show that many of the current empirical tests lack sufficient statistical power to distinguish between the models. As a result, recent empirical research has focused on explaining capital structure choice by using cross-sectional tests and a variety of variables that can be justified using any or all of the three models. We consider in turn the impact of taxes, agency conflicts, financial distress, and the impact of informational asymmetries.

### *A. The Impact of Taxes*

For individual firms, defining tax variables is difficult, because the marginal value of the tax shield should be either zero or positive for all firms. To serve as a proxy for these interactions, we calculate an average tax rate from data on both earnings before and earnings after tax. We do this for all countries except Malaysia, for which we use earnings before tax and taxes paid, as this is the only available data.

The advantage of the average tax rate is that it includes the impact of tax loss carryforwards and the use of corporations as a conduit for income flows. These average tax rates vary from a low of 13.9 percent in Brazil to a high of 40 percent in Zimbabwe, and are closely correlated with the statutory tax rates. The only notable exception is Pakistan, where the statutory tax rate of 46 percent works out to an average tax rate for our sample of firms of only 13.2 percent. This is a reminder that although the tax rate is important, so too is the base to which it is applied.

*B. Agency Costs and Financial Distress*

Conflicts between principals (shareholders) and their agents (managers) can also affect capital structure choice. For example, the decision to use large amounts of outside financing, such as common equity, can generate agency costs of managerial discretion. As Jung, Kim, and Stulz (1996) show, when management pursues growth objectives, external common equity is valuable for firms with strong investment opportunities, because management and shareholder interests coincide. In contrast, for firms without strong investment opportunities, debt serves to limit the agency costs of managerial discretion as explained by Jensen (1986) and Stulz (1990), and recently shown by Berger, Ofek, and Yermack (1997).

Although the use of debt controls the agency costs of managerial discretion, it also generates its own agency costs. A highly debt-financed firm might forgo good investment opportunities due to the debt overhang problem analyzed by Jensen and Meckling (1976) and Myers (1977). The problem is that with risky debt, the debt holders can share in any profitable future investment returns, thereby extracting some of the net present value. This transfer of wealth can cause the shareholders to turn down good investment opportunities. The value of the forgone opportunities plus the costs of enforcing contractual provisions constitute the agency cost of debt. As Aivazian and Callen (1980) point out, if recontracting costs are low, the underinvestment incentives are reduced. Moreover, to the extent that these recontracting costs differ across countries due to differences in legal systems, we would expect agency costs to differ. As a result, the solution to the capital structure problem may differ across countries, even though the theoretical model may be equally valid.

Improvements in a firm's growth opportunities lead to an increase in the agency costs of debt and a reduction in the agency costs of managerial discretion. Smith and Watts (1992) provide empirical evidence, using U.S. data, that support a negative relation between leverage and growth opportunities. Titman and Wessels (1988) also estimate a negative empirical relation between leverage and R&D expenses, in which R&D is frequently treated as a proxy for growth opportunities. Where the potential for corporate opportunism is high, for example, for small firms with largely intangible assets, debt levels will be low and will consist mainly of short-term debt.

The costs of financial distress in the STO model are closely related to the same factors that are important from the ATF. For example, the costs of financial distress can be thought of as the product of the probability of entering a distressed situation and the costs of resolving such a situation should it occur. A high proportion of hard tangible assets then increases debt capacity, not only because of the reduction in distress costs, but also because it can reduce the proportion of growth opportunities, and as a result the agency costs of managerial discretion.

We estimate the probability of financial distress as the variability of the return on assets over the available time period. This is our business risk proxy. We calculate the return on assets as the earnings before interest and

tax divided by total assets. Increased variability in the return on assets implies an increase in the short-term operational component of business risk. The drawback is that this variable cannot capture longer-term risks, such as competitive entry.

Table IV shows the averages for the business-risk proxy. The averages vary from a low of 3.04 percent for South Korea to a high of 9 percent for Brazil. Note from Table II that the lowest business-risk countries, South Korea and Malaysia, also have the highest real-growth rates, but the highest business-risk countries, Brazil and Jordan, have the lowest real-growth rates. A drawback to the business-risk proxy is that it is estimated as a single value for all years. By identifying each firm, it thus acts like a dummy variable in the time series estimates.

The tangibility of the firm's assets and its market-to-book ratio are proxies for agency costs and the costs of financial distress. The more tangible the firm's assets, the greater its ability to issue secured debt and the less information revealed about future profits. Myers (1977) notes that high market-to-book ratios indicate the presence of Miller and Modigliani (1961) growth opportunities, which can be thought of as real options. Given the agency costs attached to these options, it is relatively more difficult to borrow against them than against tangible fixed assets. Scott (1977) provides a similar rationale for the importance of collateral to secure a loan.

We define the tangibility of assets as total assets minus current assets, divided by total assets. Rajan and Zingales (1995) use a similar definition. However, given our three measures of debt financing, the influence of tangibility will differ between the long-term and total-debt ratios as firms match the maturity of their debt to the tangibility of their assets. We define the market-to-book ratio as the equity market value divided by net worth.

Table IV shows that the tangibility of assets is similar across countries at about 40 percent, with Brazil an outlier at 67.5 percent. In contrast, the market-to-book ratio varies from a discount in Pakistan, South Korea, and Zimbabwe to a premium in Malaysia and Thailand. South Korea, like Japan, uses strict historic cost accounting so that hidden assets, such as land, can exist on the balance sheet. South Korea also allows reserves to smooth out earnings, which could explain its low business-risk value. The market-to-book ratio in South Korea also shows a significant upward trend over time. These factors imply that the market-to-book ratio is only imperfectly correlated with Tobin's Q ratio, and that the degree of correlation will differ across countries according to the accounting principles adopted.

### *C. Financing Hierarchies and the Pecking-Order Hypothesis*

Myers and Majluf (1984) point out that high-quality firms can reduce the costs of informational asymmetries by resorting to external financing only if financing cannot be generated internally. If external financing is necessary, the same argument implies that firms should issue debt before considering external equity. Informational asymmetries thus provide a justification for a

**Table IV**

## Independent Variables: Averages and Standard Deviations

The data were collected by the International Finance Corporation (IFC) and consist primarily of abbreviated balance sheets and income statements for the largest companies in each country from 1980 to 1990, although all time periods are not available for each country. We estimate the average tax rate from before- and after-tax income. We measure asset tangibility by total assets less current assets divided by total assets. We define return on assets as earnings before tax divided by total assets, and measure business risk as the standard deviation of the return on assets. Size is the natural logarithm of sales both in local currency units and converted to U.S. dollars at year-end exchange rates divided by 100. The market-to-book-ratio is the market value of equity divided by the book value of equity. For each variable, the first row is the average and the second is the standard deviation.

| | Brazil | Mexico | India | South Korea | Jordan | Malaysia | Pakistan | Thailand | Turkey | Zimbabwe |
|---|---|---|---|---|---|---|---|---|---|---|
| Tax rate | 13.9 | 26.3 | 21.8 | 29.9 | 16.3 | 32.2 | 12.4 | 28.8 | 29.7 | 28.9 |
| | 16.7 | 57.1 | 20.9 | 19.7 | 17.9 | 44.4 | 20.1 | 8.7 | 18.5 | 21.2 |
| Business risk | 9.0 | 5.6 | 4.5 | 3.1 | 7.5 | 4.5 | 6.2 | 3.4 | 5.5 | 5.7 |
| | 4.7 | 2.9 | 2.6 | 1.8 | 4.2 | 3.3 | 3.8 | 2.7 | 2.6 | 5.7 |
| Asset tangibility | 67.5 | 32.8 | 41 | 48.9 | 47.3 | 57.6 | 38.2 | 36 | 41.1 | 44.4 |
| | 18.5 | 30.1 | 17.5 | 15.2 | 21.5 | 21.8 | 19.8 | 17.2 | 19.2 | 12.7 |
| Size (local currency) | 0.112 | 0.114 | 0.142 | 0.117 | 0.076 | 0.115 | 0.06 | 0.136 | 0.103 | 0.103 |
| | 0.043 | 0.017 | 0.009 | 0.008 | 0.015 | 0.013 | 0.010 | 0.011 | 0.017 | 0.010 |
| Size (U.S. dollars) | 0.131 | 0.112 | 0.184 | 0.189 | 0.098 | 0.174 | 0.171 | 0.167 | 0.172 | 0.167 |
| | 0.010 | 0.014 | 0.010 | 0.009 | 0.003 | 0.016 | 0.011 | 0.013 | 0.017 | 0.016 |
| Return on assets | 6.7 | 8.1 | 7.1 | 3.7 | 6.8 | 6.9 | 9.4 | 13 | 9.9 | 11.6 |
| | 11.5 | 8.1 | 6.7 | 3.8 | 10.6 | 7.3 | 9.7 | 7.1 | 8.8 | 8.8 |
| Market-to-book ratio | N/A | N/A | 1.4 | 0.7 | 1.4 | 2.3 | 0.9 | 3.2 | 1.9 | 0.6 |
| | | | 1.1 | 0.7 | 0.7 | 1.8 | 0.7 | 2.1 | 1.3 | 0.6 |

N/A: Not Available.

financing-hierarchies approach. Donaldson (1963) reaches a similar conclusion using a managerial theory of the firm and the agency costs of managerial discretion. In both cases, capital structure choice depends on the firm's investment opportunities and its profitability. Highly profitable firms might be able to finance their growth by using retained earnings and by maintaining a constant debt ratio. In contrast, less profitable firms will be forced to resort to debt financing.

In general, highly profitable slow-growing firms should generate the most cash, but less profitable fast-growing firms will need significant external financing. Higgins (1977) discusses these links between sales growth, profitability, and external financing needs. We note that there may be a further link with the agency cost arguments if the existence of strong investment opportunities is correlated with current levels of profitability.

We define the return on assets (ROA) as the earnings before tax divided by total assets. We use the ROA as our profitability measure, because it is the only variable that can be calculated across all 10 countries. Average profitability ranges from a low of 3.7 percent in South Korea to a high of 13 percent in Thailand. The South Korean figure looks low, but like the market-to-book ratio, it changes over time. Note that the same strict historic cost accounting and conservatism that produce hidden assets also tend to result in an understatement of profits.

### *D. Empirical Model*

The basic empirical model is a cross-sectional regression of the three different measures of the firm's debt ratio against the firm's tax rate, the standard deviation of its return on assets, the tangibility of its assets, the natural logarithm of its sales, its return on assets, and its market-to-book ratio. This estimating equation extends the model used by Rajan and Zingales (1995) for the G-7 countries to include an average tax rate and business-risk variables.

Following Rajan and Zingales (1995) we include size as an independent variable, because it is associated with survival and the agency costs of both debt and equity. We define size in the conventional way as the natural logarithm of sales rescaled by multiplying by 100. Table IV presents means and standard deviations for all the independent variables.

## III. What the Data Tell Us

Given the sometimes limited number of companies for some countries and time periods, we first use panel data techniques for the sample of firms within each country. Accordingly, the empirical model is expressed as

$$\frac{D_{i,t}}{V_{i,t}} = (\alpha_i + \alpha_t) + \sum_{j=1}^{n} \beta_j X_{i,j,t}\, \varepsilon_{i,t}, \tag{2}$$

where $X_{i,j,t}$ is the $j$th explanatory variable for the $i$th firm at time $t$, $\varepsilon_{i,t}$ is the random error term for firm $i$ at time $t$, $D_{i,t}/V_{i,t}$ is one of the three debt ratios for the $i$th firm at time $t$ and $\alpha$ is the intercept. Note that the coefficients on the independent variables for each country are assumed to be the same, but the regression intercept $(\alpha_i + \alpha_t)$ can vary across companies and over time.

The simplest model is to pool the data in which case there is one fixed intercept. However, it is unlikely that the capital structure models are fully specified. For example, there are no available proxies for factors such as the magnitude of distress costs or industry effects that we know are important. As well, the data set is unbalanced, as the number of observations for each company is different. As a result, a simple pooling might not result in either efficient or unbiased parameter estimates.

The fixed-effects model allows us to use all the data, while the intercept is allowed to vary across firms and/or time. In this way the effects of omitted explanatory variables can be captured in the changing company intercept. Also, by including a fixed-time effect, the model automatically assesses the impact of the inflationary environment in Mexico and Brazil. In both cases, the marginal significance of the explanatory variables can still be tested. However, as Hsiao (1986) points out, in the presence of measurement error the fixed-effects model can produce more biased estimators than simple pooling. For this reason, we report both the pooled ordinary least squares as well as the fixed-effects estimates.[9]

Tables V through VII give the results based on the fullest possible data set with each explanatory variable included. However, because the tangibility or market-to-book data is missing for Zimbabwe, Pakistan, and Turkey, the number of observations is dramatically reduced. To increase sample size for these three countries, we present the estimates (as row B) without the constraining variable.

We draw three general conclusions from Tables V through VII. First, the adjusted $R^2$s look reasonable, varying significantly across countries (partly due to the differing degrees of freedom). Second, the adjusted $R^2$ for the fixed-effects model is uniformly higher than for the simple pooling model, indicating the existence of omitted variables. Finally, the results indicate that there is a story to tell about the determinants of capital structure for each country, as there are many significant $t$ statistics. However, the story seems to vary across countries.

For the total book-debt ratio in Table V, the adjusted $R^2$ for the simple pooling model varies from 19 percent to 60 percent. This is in line with results obtained elsewhere, where the quality of the data is better. Only for Zimbabwe do the results look weak. Individually, each set of estimates would not look out of place in a separate country analysis.

[9] A third model, the random effects model, assumes that the company specific intercept is a random variable and uses a generalized least squares estimation procedure. For our sample, the Hausman (1978) specification test indicated that in almost all cases the assumptions of the model are violated.

However, the impact of the independent variables is not completely uniform across countries. For example, the sign on the average tax rate is generally negative, but turns positive for three countries when the fixed effects are introduced. Similarly, the sign on asset tangibility varies between the different estimation techniques, indicating that it is highly correlated with the fixed effects; only for Brazil, India, Pakistan, and Turkey is it consistently negative. This would suggest that knowing the industrial composition of these companies would be very useful. The coefficient on business risk is negative for six countries and positive for four. The size variable is generally positive and highly significant for many of the countries, particularly when the fixed effects are added. The sign on the market-to-book ratio is generally positive, except for South Korea and Pakistan. For South Korea, it becomes positive when fixed effects are allowed.

The most successful of the independent variables is profitability, as it is consistently negative and highly significant. The only exception is for the reduced Zimbabwe sample. We note also that, except for Thailand, the average tax rate is determined from pre- and after-tax income. Despite the existence of tax loss carryforwards, when firms are profitable they pay taxes, but from the data it is apparent that when they lose money they do not get a refund. As a result, the tax rate seems to be a proxy for profitability, rather than for tax-shield effects. This could explain why the tax variable, like the profitability variable, varies inversely with the amount of debt financing.

Overall, the strongest result is that profitable firms use less total debt. The strength of this finding is striking; it holds for all but the restricted Zimbabwe sample. Also, the size of the coefficient is generally around $-0.6$ for the fixed-effects model, indicating that a 10 percent difference in profitability is associated with a 6 percent reduction in the debt ratio. Cross-sectional differences across countries could then largely result from estimation error.

The importance of profitability is related to the significant agency and informational asymmetry problems in these countries, and to the relatively undeveloped nature of their long-term bond markets. It is also possible that profitability is correlated with growth opportunities, so that the negative correlation between profitability and leverage is a proxy for the difficulty in borrowing against intangible growth opportunities.[10] For the static trade-off model, which holds growth opportunities fixed, we would expect leverage to increase with profitability.

The results in Table VI for the long-term book-debt ratio are similar to those for the total-debt ratio, although in some cases a little weaker. The major exception is for the tangibility ratio, where the results are largely reversed. For the total-debt ratio, tangibility tends to be associated with decreases in the debt ratio, but with the long-term debt ratio, it is associated with increases in the debt ratio. This implies that a firm with more tangible

[10] Our thanks to Professor René Stulz, for pointing this out. See Jung et al. (1996) and Shyam-Sunder and Myers (1999).

**Table V**

## Total Book-debt Ratio

The table shows regressions of total book-debt ratio on firm-specific variables. The first row is for the simple pooling, the second for the fixed-effects model. The $R^2$ for the pooling and fixed-effects models are adjusted for degrees of freedom. We could not calculate intercepts for the fixed-effects model, because it was estimated indirectly rather than directly, using dummy variables (see Judge et al. (1985)). The business-risk variable acts as a firm dummy and cannot be used in the fixed-effects model. The data were collected by the International Finance Corporation (IFC) and consist primarily of abbreviated balance sheets and income statements for the largest companies in each country from 1980 to 1990, although all time periods are not available for each country. We define the total-debt ratio as total liabilities divided by total liabilities plus net worth. We estimate the average tax rate from before- and after-tax income and measure asset tangibility by total assets less current assets divided by total assets. We define return on assets as earnings before tax divided by total assets. We measure business risk as the standard deviation of the return on assets. Size is the natural logarithm of local currency sales divided by 100. The market-to-book ratio is the market value of equity divided by the book value of equity. The B Set of estimates for Pakistan, Turkey, and Zimbabwe are without the market-to-book and tangibility ratios, respectively, which severely limit sample size. *t*-statistics are in parentheses.

| | Intercept | Average Tax Rate | Asset Tangibility | Business Risk | Size | Return on Assets | Market-to-book Ratio | Observations | $R^2$ |
|---|---|---|---|---|---|---|---|---|---|
| Brazil | 0.638 | −0.026 | −0.45 | −0.139 | 0.132 | −0.223 | | 335 | 31% |
| | (17.11) | (−0.56) | (−11.82) | (−0.98) | (0.8) | (−5.92) | | | |
| | | −0.017 | −0.392 | | 0.014 | −0.22 | | 335 | 72% |
| | | (−0.43) | (−6.60) | | (0.02) | (−3.81) | | | |
| Mexico | 0.353 | −0.036 | 0.066 | 1.245 | −0.328 | −0.616 | | 642 | 19% |
| | (8.23) | (−3.67) | (3.43) | (6.07) | (−0.97) | (−8.46) | | | |
| | | −0.2 | −0.244 | | 6.529 | −0.627 | | 642 | 59% |
| | | (−2.51) | (−3.47) | | (5.56) | (−8.33) | | | |
| India | 1.019 | −0.095 | −0.195 | 0.043 | −1.319 | −0.961 | 0.004 | 880 | 31% |
| | (17.24) | (−4.26) | (−7.93) | (0.30) | (−3.22) | (−14.63) | (1.21) | | |
| | | −0.021 | −0.261 | | 1.186 | −0.664 | 0.015 | 880 | 75% |
| | | (−1.44) | (−7.71) | | (1.34) | (−12.70) | (5.06) | | |
| South Korea | 0.806 | −0.01 | −0.128 | −1.61 | 0.938 | −1.5 | −0.019 | 965 | 36% |
| | (17.94) | (−0.41) | (−6.43) | (−9.17) | (2.45) | (−17.32) | (−4.07) | | |
| | | 0.029 | 0.013 | | 1.801 | −0.934 | 0.014 | 965 | 74% |
| | | (2.28) | (0.49) | | (2.8) | (−13.07) | (2.18) | | |
| Jordan | −0.189 | −0.084 | −0.126 | 0.888 | 7.860 | −0.703 | 0.012 | 319 | 60% |
| | (−4.10) | −2.06 | (−3.56) | (5.67) | (17.77) | (−9.44) | (6.08) | | |
| | | 0.046 | 0.065 | | 19.89 | −0.31 | 0.016 | 319 | 88% |
| | | (1.53) | (1.62) | | (.24) | (−5.74) | (2.02) | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Malaysia | 0.071 | −0.011 | −0.312 | 0.361 | 4.836 | −1.30 | 0.02 | 693 | 46% |
| | (1.17) | (−0.87) | (−11.16) | (1.93) | (10.54) | (−15.36) | (5.96) | | |
| | | −0.019 | 0.062 | | 6.64 | −0.52 | 0.014 | 693 | 80% |
| | | (−2.31) | (1.3) | | (8.33) | (−6.74) | (4.98) | | |
| A: Pakistan | 0.686 | −0.182 | −0.092 | −0.15 | 2.21 | −1.14 | −0.016 | 204 | 45% |
| | (6.8) | (−2.90) | (−1.62) | (−0.47) | (1.6) | (−9.24) | (−0.95) | | |
| | | −0.113 | −0.135 | | 3.376 | −0.392 | −0.01 | 204 | 80% |
| | | (−2.00) | (−0.89) | | (1.34) | (−2.89) | (−0.48) | | |
| B: Pakistan | 0.806 | −0.128 | −0.18 | −0.172 | 0.809 | −1.079 | | 896 | 37% |
| | (20.04) | (−4.81) | (−6.89) | (−1.31) | (1.46) | (−19.50) | | | |
| | | −0.068 | −0.182 | | 3.192 | −0.555 | | 896 | 76% |
| | | (−.291) | (−4.58) | | (2.95) | (−11.48) | | | |
| Thailand | 0.217 | 0.251 | 0.076 | −0.794 | 2.497 | −1.42 | 0.015 | 191 | 39% |
| | (1.49) | (2.06) | (1.25) | (−1.95) | (2.56) | (−9.56) | (3.12) | | |
| | | 0.216 | 0.326 | | 3.855 | −0.539 | 0.019 | 191 | 71% |
| | | (1.73) | (3.09) | | (0.79) | (−2.58) | (3.61) | | |
| A: Turkey | 0.64 | −0.249 | −0.235 | −0.863 | 2.110 | −0.727 | 0.025 | 58 | 53% |
| | (4.43) | (−2.91) | (−3.13) | (−1.69) | (1.65) | (−4.32) | (2.29) | | |
| | | −0.127 | 0.011 | | 3.243 | −0.689 | 0.005 | 58 | 73% |
| | | (−1.14) | (0.19) | | (0.37) | (−2.04) | (0.16) | | |
| B: Turkey | 0.922 | −0.048 | −0.274 | −0.662 | −0.608 | −1.069 | | 374 | 42% |
| | (16.04) | (−1.20) | (−7.11) | (−2.47) | (−1.37) | (−13.33) | | | |
| | | 0.048 | −0.046 | | 4.367 | −0.854 | | 374 | 70% |
| | | (1.34) | (−0.89) | | (2.94) | (−10.07) | | | |
| A: Zimbabwe | 1.318 | 0.109 | −0.259 | −2.32 | −7.061 | 0.441 | −0.051 | 54 | 29% |
| | (3.34) | (0.85) | (−1.63) | (−2.56) | (−2.18) | (1.57) | (−1.74) | | |
| | | 0.143 | 0.02 | | 2.733 | 0.249 | −0.027 | 54 | 89% |
| | | (2.21) | (0.27) | | (0.76) | (1.16) | (−1.08) | | |
| B: Zimbabwe | 0.268 | −0.06 | | −0.094 | 1.690 | −0.301 | 0.054 | 407 | 7% |
| | (3.95) | (−1.78) | | (−0.79) | (3.63) | (−2.94) | (4.09) | | |
| | | 0.0 | | | 1.60 | −0.407 | 0.045 | 407 | 75% |
| | | (−0.04) | | | (3.67) | (−5.67) | (3.72) | | |

**Table VI**

## Long-term Book-debt Ratio

Regressions of long-term book-debt ratio on firm specific variables. First row is for the simple pooling, the second for the fixed-effects model. The $R^2$ for the pooling and fixed-effects models are adjusted for degrees of freedom. Intercepts could not be calculated for the fixed-effects model, because it was estimated indirectly rather than directly, using dummy variables (see Judge et al. (1985)). The business-risk variable acts as a firm dummy and cannot be used in the fixed-effects model. The data were collected by the International Finance Corporation (IFC) and consist primarily of abbreviated balance sheets and income statements for the largest companies in each country from 1980 to 1990, although all time periods are not available for each country. The long-term book-debt ratio is defined as total liabilities minus current liabilities divided by total liabilities minus current liabilities plus net worth. The average tax rate is estimated from before- and after-tax income; asset tangibility is measured by total assets less current assets divided by total assets; return on assets is defined as earnings before tax divided by total assets; business risk is measured as the standard deviation of the return on assets; size is the natural logarithm of local currency sales divided by 100; market-to-book ratio is the market value of equity divided by the book value of equity. The B set of estimates for Pakistan, Turkey, and Zimbabwe are without the market-to-book and tangibility ratios, respectively, which severely limit sample size. *t*-statistics are in parentheses.

| | Intercept | Average Tax Rate | Asset Tangibility | Business Risk | Size | Return on Assets | Market-to-book Ratio | Observations | $R^2$ |
|---|---|---|---|---|---|---|---|---|---|
| Brazil | 0.161 | −0.051 | −0.084 | −0.212 | 0.248 | −0.135 | N/A | 330 | 8% |
| | (5.81) | (−1.49) | (−2.96) | (−2.01) | (2.01) | (−2.52) | | | |
| | | −0.021 | −0.045 | | −0.155 | −0.109 | N/A | 330 | 57% |
| | | (−0.69) | (−0.94) | | (−0.23) | (−2.34) | | | |
| Mexico | 0.138 | −0.022 | 0.042 | 0.45 | 0.055 | −0.469 | N/A | 633 | 9% |
| | (3.19) | (−2.17) | (2.15) | (2.13) | (0.16) | (−6.36) | | | |
| | | −0.009 | −0.092 | | 5.289 | −0.562 | N/A | 633 | 63% |
| | | (−1.23) | (−1.45) | | (4.98) | (−8.29) | | | |
| India | 0.211 | −0.216 | 0.428 | 0.741 | 0.073 | −0.915 | 0.009 | 877 | 43% |
| | (2.45) | (−6.64) | (11.96) | (3.49) | (0.12) | (−9.51) | (2.98) | | |
| | | −0.111 | 0.116 | | 0.697 | −0.662 | 0.012 | 877 | 74% |
| | | (−4.07) | (2.11) | | (0.48) | (−7.76) | (2.54) | | |
| Korea | 0.545 | −0.025 | 0.208 | −1.69 | −0.284 | −1.66 | 0.001 | 970 | 31% |
| | (9.03) | (−1.11) | (7.77) | (−7.23) | (−0.55) | (−14.20) | (10.11) | | |
| | | 0.038 | 0.316 | | −4.55 | −1.108 | 0.034 | 970 | 61% |
| | | (1.86) | (7.50) | | (−4.56) | (−9.99) | (3.41) | | |
| Jordan | −0.447 | 0.038 | 0.317 | 0.522 | 4.816 | −0.031 | −0.002 | 316 | 44% |
| | (−9.75) | (0.93) | (9.03) | (3.37) | (11.00) | (−0.42) | (−0.20) | | |
| | | 0.063 | 0.189 | | 8.328 | −0.147 | 0.003 | 316 | 68% |
| | | (1.51) | (3.36) | | (7.18) | (−1.93) | (0.26) | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Malaysia | −0.23 | −0.011 | 0.038 | 0.348 | 3.014 | −0.737 | 0.007 | 693 | 16% |
| | (−3.97) | (−0.81) | (1.4) | (1.94) | (7.15) | (−9.05) | (2.11) | | |
| | | −0.011 | 0.34 | | 5.069 | −0.283 | 0.002 | 693 | 72% |
| | | (−1.50) | (7.24) | | (6.48) | (−3.67) | (0.64) | | |
| A: Pakistan | 0.883 | −0.261 | 0.088 | −0.835 | −0.37 | −0.791 | −0.424 | 206 | 20% |
| | (1.81) | (−0.85) | (0.32) | (−0.55) | (−0.06) | (−1.34) | (−5.16) | | |
| | | −0.112 | 0.164 | | 6.766 | −0.309 | −0.149 | 206 | 95% |
| | | (−0.97) | (0.57) | | (1.19) | (−1.12) | (−3.49) | | |
| B: Pakistan | 0.169 | −0.073 | 0.532 | −0.005 | 0.687 | −1.471 | | 910 | 5% |
| | (0.77) | (−0.51) | (3.74) | (−0.01) | (0.23) | (−5.02) | | | |
| | | 0.095 | 0.364 | | 7.63 | −1.256 | | 910 | 2% |
| | | (0.45) | (1.02) | | (0.78) | (−2.91) | | | |
| A: Turkey | −0.219 | −0.093 | 0.306 | −0.937 | 4.02 | −0.504 | 0.024 | 58 | 28% |
| | (−0.92) | (−0.66) | (2.48) | (−1.12) | (1.92) | (−1.82) | (1.35) | | |
| | | −0.465 | 0.701 | | −4.32 | 0.009 | 0.038 | 58 | 57% |
| | | (−2.61) | (1.35) | | (−0.32) | (0.19) | (0.77) | | |
| B: Turkey | 0.215 | 0.052 | 0.136 | −0.016 | 0.332 | −0.783 | | 372 | 16% |
| | (3.06) | (1.01) | (2.78) | (−0.05) | (0.59) | (−7.92) | | | |
| | | −0.017 | 0.257 | | 0.616 | −0.641 | | 372 | 51% |
| | | (−0.36) | (3.60) | | (0.3) | (−5.62) | | | |
| A: Zimbabwe | 1.18 | 0.205 | 0.14 | −3.03 | −10.23 | 0.477 | −0.093 | 53 | 26% |
| | (2.82) | (1.49) | (0.80) | (−3.13) | (−2.96) | (1.55) | (−2.94) | | |
| | | 0.071 | 0.389 | | 8.404 | 0.199 | −0.20 | 53 | 89% |
| | | (1.01) | (4.80) | | (2.07) | (0.09) | (−0.45) | | |
| B: Zimbabwe | 0.101 | −0.162 | | 0.14 | 0.928 | −0.27 | 0.007 | 406 | 14% |
| | (1.56) | (−5.06) | | (1.24) | (1.52) | (−2.77) | (0.58) | | |
| | | −0.068 | | | 1.582 | −0.31 | −0.002 | 406 | 72% |
| | | (−2.69) | | | (0.93) | (−4.16) | (−0.13) | | |

N/A: Not Available.

**Table VII**

## Long-term Market-debt Ratio

The table presents regressions of long-term market-debt ratio on firm-specific variables. The first row is for the simple pooling, the second is for the fixed-effects model. The $R^2$ for the pooling and fixed-effects models are adjusted for degrees of freedom. Intercepts could not be calculated for the fixed-effects model, because it was estimated indirectly rather than directly using dummy variables (see Judge et al. (1985)). The business-risk variable acts as a firm dummy and cannot be used in the fixed-effects model. The data were collected by the International Finance Corporation (IFC) and consist primarily of abbreviated balance sheets and income statements for the largest companies in each country from 1980 to 1990, although all time periods are not available for each country. The average tax rate is estimated from before- and after-tax income; asset tangibility is measured by total assets less current assets divided by total assets; return on assets is defined as earnings before tax divided by total assets; business risk is measured as the standard deviation of the return on assets; size is the natural logarithm of local currency sales divided by 100; market-to-book ratio is the market value of equity divided by the book value of equity. The fixed effects regression could not be estimated for Turkey due to insufficient degrees of freedom. The fixed effects estimates (B) for Zimbabwe are without the market-to-book and tangibility ratios, which severely limit sample size. *t*-statistics in parentheses.

| | Intercept | Average Tax Rate | Asset Tangibility | Business Risk | Size | Return on Assets | Market-to-book Ratio | Observations | $R^2$ |
|---|---|---|---|---|---|---|---|---|---|
| India | 0.586 | −0.207 | 0.492 | 0.097 | −1.724 | −0.693 | −0.076 | 877 | 57% |
| | (6.56) | (−6.10) | (13.2) | (0.44) | (−2.77) | (−6.93) | (−14.20) | | |
| | | −0.088 | 0.234 | | −0.256 | −0.438 | −0.066 | 877 | 79% |
| | | (−3.02) | (3.96) | | (−0.23) | (−4.78) | (−12.81) | | |
| Korea | 1.15 | −0.067 | 0.057 | −1.410 | −1.848 | −1.197 | −0.284 | 970 | 71% |
| | (18.66) | (−2.92) | (2.10) | (−5.86) | (−3.52) | (−10.10) | (−42.95) | | |
| | | 0.049 | 0.312 | | 1.584 | −0.80 | −0.202 | 970 | 84% |
| | | (2.44) | (7.44) | | (1.59) | (−7.23) | (−20.42) | | |
| Jordan | −0.746 | 0.018 | 0.555 | 0.647 | 9.151 | 0.049 | −0.074 | 316 | 40% |
| | (−7.63) | (0.21) | (7.42) | (1.96) | (9.8) | (0.31) | (−3.46) | | |
| | | 0.089 | 0.325 | | 13.47 | −0.037 | −0.087 | 316 | 68% |
| | | (0.93) | (2.5) | | (5.03) | (−0.21) | (−3.28) | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Malaysia | −0.113 | −0.002 | 0.047 | 0.43 | 1.642 | −0.42 | −0.008 | 670 | 22% |
| | (−3.59) | (−0.25) | (3.19) | (4.38) | (6.75) | (−9.19) | (−4.70) | | |
| | | −0.005 | 0.155 | | 2.93 | −0.24 | −0.011 | 670 | 66% |
| | | (−0.92) | (5.14) | | (5.76) | (−4.89) | (−6.26) | | |
| Pakistan | 0.098 | −0.091 | 0.562 | −1.22 | 1.06 | −0.337 | −0.039 | 172 | 47% |
| | (0.96) | (−1.57) | (9.2) | (−4.05) | (0.75) | (−2.95) | (−2.29) | | |
| | | −0.131 | 0.376 | | 3.18 | −0.055 | −0.017 | 172 | 69% |
| | | (−1.88) | (2.18) | | (0.95) | (−0.34) | (−0.43) | | |
| Turkey | −0.116 | 0.076 | 0.11 | −0.232 | 2.73 | −0.227 | −0.032 | 45 | 19% |
| | (−0.76) | (0.91) | (1.41) | (−0.48) | (2.03) | (−1.47) | (−2.86) | | |
| A: Zimbabwe | 1.930 | 0.292 | 0.012 | −3.780 | −16.02 | −0.634 | −0.17 | 54 | 36% |
| | (3.11) | (1.45) | (0.05) | (−2.66) | (−3.16) | (−1.44) | (−3.64) | | |
| | | 0.057 | 0.381 | | 13.17 | −0.239 | 0.002 | 54 | 81% |
| | | (0.40) | (2.34) | | (1.66) | (−0.51) | (0.04) | | |
| B: Zimbabwe | 0.472 | −0.374 | | 0.497 | 0.217 | −800 | −0.10 | 408 | 36% |
| | (4.17) | (−6.63) | | (2.52) | (0.2) | (−4.68) | (−4.54) | | |
| | | −0.153 | | | −0.066 | −0.741 | −0.045 | 408 | 73% |
| | | (−3.00) | | | (−0.19) | (−4.88) | (−1.81) | | |

assets will use more long-term debt, but that overall its debt ratio goes down. This is consistent with a traditional matching argument that long-term assets should be financed with long-term liabilities and with the observation that less can be borrowed against long-term assets than from short-term assets. This result is consistent with the static trade-off model, in terms of distress costs. It also supports the pecking-order hypothesis and agency theoretic frameworks from the point of view of agency and informational asymmetry costs.

The overall importance and signs on the coefficients for size, tangibility, and profitability are similar to those in Rajan and Zingales (1995) in their sample of G-7 countries, except that the evidence in favor of a negative relation between profitability and leverage is much stronger. The business-risk proxy continues to have the same mixed effect.

Table VII presents the estimates for the long-term debt ratio using the market value of equity. These estimates should be treated more cautiously, because market data are not available for three of the 10 countries, and are limited for Turkey and Pakistan. However, the models continue to show consistency in supporting the determinants of leverage. For example, the ambiguity in the effects of the tangibility and size variables is largely removed, as now both have mostly significant positive signs. The notable exceptions are the size variable for India and possibly South Korea. Similarly, high levels of profitability continue to be uniformly associated with low levels of debt.

The only significant difference between the results in Tables VI and VII is in the influence of the market-to-book ratio, which changes from mixed, but largely positive, to uniformly negative and highly significant. Rajan and Zingales (1995) find a similar phenomenon for their G-7 countries, except with slightly stronger evidence of a negative influence for the long-term book-debt ratio. This result could be due to spurious correlation introduced by having market values in the numerator of the market-to-book ratio and the denominator of the market long-term debt ratio. Short-run market movements, absent immediate reaction by corporations, will automatically induce a negative correlation between the two. Given the frictions in the capital markets in these developing countries, this is likely to be a severe problem

One implication of these results is that the marginal borrowing power on a dollar of market value is less than that on book value. This implication supports the secured debt hypothesis of Scott (1977) and the growth option argument of Myers (1977).

Despite the standard caveats, there is a message in the data, which is as strong as the message from equivalent work for developed countries: Capital structure models do have predictive power. This means that in cross-sectional tests, the "normal" independent variables are significant and have similar explanatory power. This in part answers the second question posed in the introduction: The factors that influence capital structures choice are similar between developed and developing countries. However, the signs on some of the coefficients, particularly business risk and the market-to-book ratio, are sometimes the opposite of what we would expect. One explanation

could be the greater dependence of firms in developing countries on short-term debt and trade credit, which have different determinants than long-term debt.

## IV. A Common World Model of Capital Structure

The individual country models in Tables V through VII generally support conventional capital structure models. However, apart from the profitability measure, the regression coefficients differ across the countries, both in size and sign. There are several possible reasons, some statistical and some financial.

First, there are different numbers of observations for different countries. For example, when we estimate the models over subsets of the data (for example, for Pakistan, Zimbabwe, and Turkey), the coefficients invariably change. This could be due to sampling problems, or it could indicate the effect of missing variables. Second, there could be different institutional factors that cause the coefficients to vary across countries. Even within a country, we would not expect the signs to be the same across different industries; for example, we normally insert a dummy variable for regulated industries to correct for the fact that we do not expect the coefficient on the business-risk variable to be the same across regulated and unregulated industries. For the same reason, it may be unreasonable to assume that business risk has the same impact across different legal systems.

Despite these concerns, it is interesting to consider the predictive ability of one pooled model across all countries. This model could then be compared to a simple null hypothesis that everything is institutional and that we can explain capital structure differences by knowing the nationality of a company. In this respect, the comparison is biased against the pooled capital structure model, because the coefficients should vary (in unknown ways) across countries.

Table VIII gives the results of three regression models using country dummies as the sole independent variables. We exclude the dummy for Turkey, which is a middle-level debt country, so the coefficients should be interpreted as the significance of debt ratio differences relative to Turkey. For the total debt ratio, all the coefficients are significant. The exceptions are for Pakistan and Thailand, which Table I shows as having the closest debt ratios to Turkey. Five countries have significantly lower total-debt ratios and two have significantly higher total-debt ratios. For the long-term book-debt ratio, the results are identical, except that the overall explanatory power of the country dummies is lowered. For the market-debt ratio, the explanatory power is the same as for the long-term book-debt ratio, but the higher debt ratio for both Zimbabwe and Jordan is evident.

The Table VIII estimates can be taken as the null hypothesis. For the total debt ratio we can explain 43.3 percent of the variability in debt ratios by knowing the nationality of the company. For the long-term book and market ratios, the explanatory power is 12 percent. There are three possible explanations for these results. First, the different debt ratios reflect differences in industrial structure and other company-specific factors, such as business

**Table VIII**

## Country Factors in Capital Structures

The table presents regression of debt ratios using country dummies as sole explanatory variables. The excluded dummy is for Turkey. The total book-debt ratio is defined as total liabilities divided by total liabilities plus net worth. The long-term book-debt ratio is defined as total liabilities minus current liabilities, divided by total liabilities minus current liabilities plus net worth. The long-term market-debt ratio substitutes equity market value for net worth in the long-term book-debt ratio definition. The data were collected by the International Finance Corporation (IFC) and pertain to the the largest companies in each country from 1980 to 1990, although all time periods are not available for each country. First values are coefficients on country dummy variables and the numbers in parentheses are *t*-statistics.

| | Total-debt Ratio | Long-term Book-debt Ratio | Long-term Market-debt Ratio |
|---|---|---|---|
| Intercept | 0.593 | 0.241 | 0.108 |
| | (70.87) | (12.78) | (3.31) |
| Brazil | −0.288 | −0.145 | N/A |
| | (−23.63) | (−5.26) | |
| Mexico | −0.247 | −0.103 | N/A |
| | (−23.44) | (−4.33) | |
| India | 0.079 | 0.095 | 0.226 |
| | (8.08) | (0.43) | (6.76) |
| Korea | 0.14 | 0.254 | 0.014 |
| | (14.31) | (11.5) | (4.32) |
| Jordan | −0.131 | −0.114 | −0.86 |
| | (−11.2) | (−4.29) | (−2.45) |
| Malaysia | −0.169 | −0.106 | −0.38 |
| | (−16.40) | (−4.53) | (−1.12) |
| Pakistan | 0.065 | 0.023 | 0.078 |
| | (6.53) | (1.05) | (2.11) |
| Thailand | (0.009) | N/A | N/A |
| | (0.81) | | |
| Turkey | No dummy variable: base case | | |
| Zimbabwe | −0.174 | −0.111 | 0.157 |
| | (−15.13) | (−4.26) | (4.54) |
| Observations | 6403 | 5902 | 3702 |
| Adjusted $R^2$ | 43.2% | 11.6% | 11.8% |

N/A: Not Available.

risk. If this is true, once firm-specific factors are included, the influence of the country dummies should decline. Second, there are systematic differences in the effect of factors such as taxation, legal structures, and bankruptcy laws that affect the debt ratios. In this case, the coefficients on the independent variables should differ, and there should be country effects attributable to missing variables. However, the independent variables should still have marginal significance. Finally, the differences could be spurious either because of inadequate data or because Miller's (1977) neutral mutations theory applies. As a result, no additional explanatory variables should cause the dummies to change.

Table IX shows the results from pooling across all countries with both country dummies and independent variables. These results omit time and company fixed effects. One problem is that data on long-term debt are not available for Thailand, and market data are not available for Brazil and Mexico. This means that there are implicit country effects at work. To compensate for this, we estimate the models for the two book-debt ratios both with and without the market-to-book ratio. Thus we increase sample size and achieve greater comparability. Another problem is converting local currency sales to U.S. dollar sales, when exchange controls and fixed exchange rates periodically lead to dramatic currency revaluations and changes in the relative sizes of different companies.

For the total book-debt ratio, the adjusted $R^2$s are 40 percent and 56 percent, respectively, for the models with and without the country dummies. When we run the models on the same sample without the market-to-book ratio, the adjusted $R^2$s are 43 percent and 58 percent, respectively, indicating that the marginal predictive value of the market-to-book ratio is very low. The regression coefficients are also almost identical.

We also note that the firm-specific coefficients are almost identical in most cases. By firm specific, we mean the variables that are most apt to be determined by the unique characteristics of the firm. These are the firm's average tax rate, asset tangibility, firm size, and firm profitability. In contrast, the market-to-book ratio picks up the capital market's valuation of the company, which will in turn be affected by common conditions in the capital market. Consequently, the market-to-book ratio is most closely associated with external country factors. This could explain why its sign reverses as country dummies are added.

To a great extent capital structure theory has much to say that is portable across countries: total-debt ratios decrease with the tangibility of assets, profitability, and the average tax rate and increase with size. Put another way, small, profitable firms in a tax-paying position with large proportions of tangible assets tend to have less debt. Other factors, such as the market-to-book ratio and business risk, are important in isolation, but tend to be subsumed within country dummies. These results continue to hold when we drop the market-to-book ratio. This increases the sample size by including firms from Mexico and Brazil, as well as companies in some of the other countries.

For the long-term debt ratio, the message is much the same: long-term debt ratios decrease with higher tax rates, size, and profitability. However, similar to the individual country results, more tangible assets leads to higher long-term debt ratios. Because they lose or change their significance in the expanded model, the influence of the market-to-book ratio and the business-risk variables tends to be subsumed within the country dummies. These results are largely the same whether or not the sample includes all firms with market-to-book ratio data.

Finally, the long-term market-debt ratio is negatively correlated with average tax rates, profitability, and the market-to-book ratio, and positively correlated with the tangibility of assets. Again the influence of the business-

**Table IX**

## Country Factors and Capital Structure

The table presents regressions of debt ratios using firm-specific explanatory variables, with and without country dummies. The total debt ratio is defined as total liabilities divided by total liabilities plus net worth. The long-term book-debt ratio is defined as total liabilities minus current liabilities divided by total liabilities minus current liabilities plus net worth. The long-term market-debt ratio is defined as total liabilities divided by total liabilities plus equity market value. The average tax rate is estimated from before- and after-tax income; asset tangibility is measured by total assets less current assets divided by total assets; return on assets is defined as earnings before tax divided by total assets; business risk is measured as the standard deviation of the return on assets; market-to-book ratio is the market value of equity divided by the book value of equity; size is the natural logarithm of U.S. dollar sales divided by 100. Generally when the coefficient of size was significant, there were five decimal places before the first nonzero number. The first row indicates the model without country dummies, the second with country dummies, and the third without the market-to-book ratio or country dummies. *t*-statistics are in parentheses.

| | Intercept | Tax Rate | Tangibility | Business Risk | Size | Return on Assets | Market-to-book Ratio | Observations | $R^2$ |
|---|---|---|---|---|---|---|---|---|---|
| Total book-debt ratio | 0.465 | −0.056 | −0.343 | −0.013 | 2.363 | −1.150 | −0.014 | 3,386 | 40% |
| | (20.72) | (−5.48) | (−24.52) | (−0.136) | (22.41) | (−29.74) | (−7.42) | | |
| (With country dummies) | 0.463 | −0.027 | −0.216 | −0.028 | 1.931 | −1.070 | 0.015 | 3,386 | 57% |
| | (10.42) | (−3.03) | (−16.92) | (−0.34) | (8.53) | (−30.78) | (7.61) | | |
| Without the market-to-book ratio | 0.177 | −0.067 | −0.248 | 0.158 | 3.536 | −0.994 | | 5,573 | 43% |
| | (11.85) | (−9.12) | (−24.58) | (2.32) | (47.26) | (−35.82) | | | |
| (With country dummies) | 0.458 | −0.036 | −0.167 | 0.138 | 1.704 | −0.910 | | 5,573 | 58% |
| | (14.48) | (−5.55) | (−17.67) | (2.22) | (9.94) | (−36.52) | | | |
| Long-term book-debt ratio | −0.106 | −0.092 | 0.075 | −0.093 | 3.049 | −1.063 | −1.02 | 3,196 | 22% |
| | (−2.68) | (−5.08) | (2.96) | (−0.55) | (16.44) | (−14.51) | (−14.59) | | |
| (With country dummies) | 0.037 | −0.068 | 0.225 | −0.001 | 1.258 | −0.902 | 0.002 | 3,196 | 32% |
| | (0.43) | (−3.93) | (8.95) | (−0.00) | (2.83) | (−13.15) | (0.48) | | |
| Without the market-to-book ratio | −0.129 | −0.054 | 0.085 | −0.242 | 2.813 | −1.023 | | 5,357 | 11% |
| | (−3.74) | (−3.24) | (3.42) | (−1.53) | (16.35) | (−15.77) | | | |
| (With country dummies) | −0.038 | −0.048 | 0.187 | 0.197 | 1.68 | −0.856 | | 5,357 | 16% |
| | (−0.454) | (−2.88) | (7.44) | (1.21) | (3.71) | (−13.13) | | | |
| Long-term market-debt ratio | 0.138 | −0.072 | 0.075 | −0.615 | 2.498 | −0.978 | −0.109 | 3,133 | 38% |
| | (3.63) | (−3.96) | (3.11) | (−3.75) | (14.08) | (−14.41) | (−29.40) | | |
| (With country dummies) | 0.456 | −0.084 | 0.205 | −0.084 | −1.05 | −0.597 | −0.060 | 3,133 | 56% |
| | (5.93) | (−5.29) | (9.34) | (−0.60) | (−2.71) | (−9.98) | (−16.95) | | |

risk variable is subsumed within the country dummy, as is the size variable, which changes sign. Unlike the results for the book-debt ratios, the market-to-book ratio continues to be negatively related to the market-debt ratio, even when country dummies are introduced.

We note that the results for the long-term book and market-debt ratios are substantially the same. The only difference is that the explanatory power of the market-debt ratio model is much greater with or without country dummies. This result is consistent with other results from developed countries and could be due to either measurement error or slow capital structure adjustments to market prices.

We draw two major conclusions from the results in Table IX. First, there is support for the importance of variables such as profitability, the tangibility of assets, size, etc., across all the countries in this data set. This is encouraging news. It seems that the stylized facts we know to be true from research on developed-country data sets are also true for our more primitive data set for these 10 developing countries. This belies the notion that finance is not portable from developed to developing countries. In fact, the results in Table IX, even without the country dummies, would not look out of place in the Rajan and Zingales (1995) study of developed-country capital structures.

Second, and discouraging but not surprising, is that country factors clearly matter as much as the financial variables analyzed in this paper. The adjusted $R^2$ indicates that the dummy variables alone explain 43 percent, 12 percent, and 12 percent of the variation in the total-debt, long-term book-debt, and long-term market-debt ratios, respectively. In contrast, the financial variables alone explain 40 to 43 percent, 11 to 22 percent, and 38 percent of the variation, respectively, depending on whether we use the restricted or full-sample results. To predict the total-debt and sometimes the long-term book-debt ratios, it seems that knowing the values of these financial variables is less informative than knowing the firm's country. For the market-debt ratio, the opposite is true: knowing the financial variables, and in particular the market-to-book ratio, is more informative than the country of origin.

## V. Conclusions

This paper partly answers the questions posed in the introduction. It offers some hope, but also some skepticism. We find that the variables that are relevant for explaining capital structures in the United States and European countries are also relevant in developing countries, despite the profound differences in institutional factors across these developing countries. Knowing these factors helps predict the financial structure of a firm better than knowing only its nationality.

A consistent result in both the country and pooled data results is that the more profitable the firm, the lower the debt ratio, regardless of how the debt ratio is defined. This finding is consistent with the Pecking-Order Hypothesis. It also supports the existence of significant information asymmetries. This result suggests that external financing is costly and therefore avoided by firms.

However, a more direct explanation is that profitable firms have less demand for external financing, as discussed by Donaldson (1963) and Higgins (1977). This explanation would support the argument that there are agency costs of managerial discretion. Also, this result does not sit well with the static trade-off model, under which we would expect that highly profitable firms would use more debt to lower their tax bill. We could argue that such firms also have large growth options and high market-to-book ratios, so that the agency costs of debt would imply low debt ratios. However, this possibility relies on an argument that high market-to-book ratios are associated with high levels of current profitability, which is not necessarily true. The importance of profitability also explains why the average-tax-rate variable tends to have a negative effect on debt ratios, because rather than being a proxy for debt tax-shield values, it seems to be an alternative measure of profitability.

There is also support for the role of asset tangibility in financing decisions. Clearly, asset tangibility affects total and long-term debt decisions differently. We would expect this from the long-standing argument concerning matching and from the emphasis in bank financing on collateral for shorter-term loans. Generally, the more tangible the asset mix, the higher the long-term debt ratio, but the smaller the total-debt ratio. This indicates that as the tangibility of a firm's assets increases, by say, one percent, although the long-term debt ratio increases, the total-debt ratio falls; that is, the substitution of long-term for short-term debt is less than one.

In the individual country data, we also find support for the impact of intangibles and growth options as discussed by Myers (1977) and Scott (1977). Although in the aggregate data it seems that companies reduce their debt financing, as measured by the book-debt ratios, when the market-to-book ratio increases, these effects seem to be proxies for general country factors. These effects do not remain when we include country dummies. Finally, the estimated empirical average tax rate does not seem to affect financing decisions, except as a proxy for corporate profitability.

Thus, the answer to the first two questions posed in the introduction is:

> In general, debt ratios in developing countries seem to be affected in the same way and by the same types of variables that are significant in developed countries. However, there are systematic differences in the way these ratios are affected by country factors, such as GDP growth rates, inflation rates, and the development of capital markets.

Why our skepticism? Because, although some of the independent variables have the expected sign, their overall impact is low and the signs sometimes vary across countries. This latter observation could be due to the differing sample sizes, but it could also imply significant institutional differences that affect the importance of the independent variables. To some extent, we expect this, because the institutional framework governing bankruptcy, the

preparation of financial statements, and the availability of different forms of financing is at least as important as the direct variables they measure. Therefore, there is a somewhat negative answer to the third question:

> Knowing the country of origin is usually at least as important as knowing the size of the independent variables for both the total and long-term book-debt ratios. Only for the market-debt ratio is this not true.

Consequently, there is much that needs to be done, both in terms of empirical research as the quality of international databases increases, and in developing theoretical models that provide a more direct link between profitability and capital structure choice.

## Appendix: Description of the Financial System and Government Intervention in Credit Allocation

The following information is summarized in Table AI.

### *Brazil*

#### *Financial Structure*

The Brazilian financial system comprises the central bank, 28 state banks, and 74 private banks, of which 18 are foreign. There are also investment banks, consumer finance companies, housing finance institutions, and credit cooperatives. There are 15 development banks with assets as large as commercial banks.

#### *Ownership*

Both public and private banks. In 1987, public banks held 75 percent of commercial bank assets.

#### *Concentration*

Total assets of four largest banks as a percentage of banking assets were around 40 percent in 1980 and fell to 33 percent in 1987. Banks are generally very profitable. From 1980 to 1984 ROE was 66 percent. From 1985 to 1987 it was around 60 percent.

#### *Banking Model*

Until 1988, different institutions performed different functions (i.e., commercial banks, insurance, brokerage, leasing, etc.) but they were all interconnected through stock holdings. Several types of institutions were centered around commercial banks, creating financial conglomerates. This was true for both private and public banks. In 1988, banks became universal banks.

**Table A1**

## Financial Institutions and Directed Credit Policies

Interest margin is average lending rate minus deposit rate. Foreign commercial banks is percent of total commercial bank assets. Public financial institutions is the sum of public banks and public specialized institutions as a percent of total financial assets minus central bank assets.

| | | | | | | Directed Credit Policies | |
|---|---|---|---|---|---|---|---|
| | Banking Model | Commercial Bank Ownership | Bank Concentration (% of Bank Assets) | Interest Margin (%) | Foreign Commercial Banks (%) | Public Financial Institutions in Total (%) | Commercial Bank Resources that are Directed (%) |
| Brazil 1980 | Banking and commerce separate in 1980s. However, bank holding companies blurred the separation. | 56% private | Top 4 banks: 40 | 1.6 | n.a. | 70 | 70<br>Mostly to agriculture and poor regions. |
| 1990 | In 1988 banks became universal. | 56% private | Top 4 banks: 33 | 3.1 | 5 | 70 | (Subsidy/gdp peaked in 1987 to 7–8% and later declined to 3–4%.) |
| Mexico 1980 | Banking and commerce separate till later in 1980s. | 100% public | Top 3 banks: 70 | 7.5 | 0 (only Citibank before NAFTA) | 70 | 60–90 till 1989.<br>Abolished in 1989. |
| 1990 | Universal | 100% private after 1992. | Top 3 banks: 70 | 14 | n.a. | 23 | Most of directed credit went to public enterprises and housing. Also very small amount to exporters. |
| India 1980 | Universal | Public | Top 4 banks: 45 | 3 | 4 | 92 | 80 |
| 1990 | Universal | 8% private | Top 4 banks: 45 | 3 | 5 | 92 | Credit is directed mostly to agriculture and small enterprises. |
| South Korea 1980 | During 1980s banks could hold stock but could not underwrite. | Mostly public. Privatized by end of 1983. | Top 5 banks: 30 | 7 | 12 | 84 | 50 (has declined from 55 in the 1980s) |
| 1990 | In 1990s they are becoming universal. | 100% private | Top 5 banks: 20 | 4.6 | 11 | 63 | (Subsidy/GDP was 1% for 1980–1990.) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Jordan<br>1980 | Banks can hold stock but cannot underwrite or trade. | Mostly private | n.a. | 4 | n.a. | 20 | 8<br>Credit is directed through government specialized banks to agriculture, housing, and only small start-up manufacturing businesses. |
| 1990 | | | Top 3 banks: 65% of deposits | 3.25 | 5 foreign banks | 23 | |
| Malaysia<br>1980 | Universal | Mostly private | Top 5 banks: 53 | 1.5 | 38 | 28 | 59<br>Credit is directed to indigenous groups, low-cost housing and small enterprises. |
| 1990 | Universal | Mostly private | Top 5 banks: 53 | 1.26 | 24 | 27 | |
| Pakistan<br>1980 | Universal | 90% public | n.a. | 4.4 | 14 | 87 | 80<br>Credit is directed mostly to agriculture, housing and small industrial firms. |
| 1990 | Universal | 27% private after 1991 | Top 5 banks: 86 | 2.4 | 11 | 76 | |
| Thailand<br>1980<br>1990 | Banks can hold stock but can underwrite through their affiliates only. However, affiliates are generally fully controlled although legally there is a 10% limit. | 80% private | Top 3 banks: 59 | 4 | 6 | 25 | 25–30<br>Credit is directed mostly to agriculture, small scale industry and exporters. |
| 1990 | | | Top 3 banks: 55 | 5.5 | 5 | 22 | |
| Turkey<br>1980 | Universal.<br>Banks started getting involved in securities markets in the second half of 1980s. | 53% private | Top 4 banks: 64% of deposits | 17 | 3 | 55 | In the 1980s, decreased from 50% to around 18% in 1990s.<br>Directed credit mostly went to state enterprises, farmers, artisans and small firms, backward regions and small industrial firms. |
| 1990 | Universal | 53% private | Top 4 banks: 64% of deposits | 20 | 4 | 48 | |
| Zimbabwe<br>1980 | Banking and commerce separate | Mostly private. Dominated by foreign (U.K.) banks. | Top 4 banks: 100 | 14 | Mostly foreign | 6 | Substantial directed credit, mostly to public sector.<br>Private firms do not receive much directed credit. |
| 1990 | | | Top 4 banks: 100 | 3 | | 5 | |

n.a.: Not Available.

### *Directed Credit Policies*

In 1988, Brazil's reserve requirements ranged from 8 to 43 percent of demand deposits, based on the bank's size (lower for small banks) and location (lower in poor regions). Government credit programs accounted for more than 70 percent of credit outstanding to the public and private sectors. Commercial banks were required to lend 20 to 60 percent (depending on bank size) of their sight deposits for agriculture. Eighteen percent went to state enterprises. Analysts estimated that the implicit subsidy on a sample of largest directed credit programs was about seven to eight percent of GDP in 1987, but later declined to three to four percent. These directed credits are now being phased out.

## *Mexico*

### *Financial Structure*

In 1989, the financial system comprised the central bank, 18 state-owned commercial banks, 2 private banks, 8 state-owned development banks, and 25 privately owned brokerage firms. Between 1982 and 1989, the government consolidated the banks, reducing their numbers from 60 to 20.

### *Ownership*

Mexican banks were nationalized in 1982 following the devaluation of the peso. The government sold the brokerage operations of the universal banks and their nonbank equity holdings. For the period 1982 to 1991, the banks remained publicly owned. Foreign banks were not allowed during this period. Banks were reprivatized in 1991 and 1992. They now operate as universal banks and maintain close ties to large industrial groups.

### *Concentration*

The 3 largest banks account for over 62 percent of banking assets. In 1987, this figure was 80 percent. By 1990, it had dropped to 70 percent. From 1985 to 1989, banks were very profitable with real ROE of over 50 percent in some cases.

### *Banking Model*

Between 1982 and 1991, commercial banks faced many restrictions on their operations. However, private brokers were left relatively free and encouraged to expand into banking activities. Restrictions were slowly eased and banks were privatized in 1991 and 1992. They now operate as universal banks.

### *Directed Credit Policies*

Before 1989, there was a 10 percent reserve requirement on deposits and government required that 31 percent of deposits be held in government bonds. In addition, 16.2 percent of deposits were allocated for "development activities," 10 percent lent to development banks, 10 percent lent for housing, and 1.2 percent for exporters. In 1989, reserve requirements and directed credit programs were replaced by a 30 percent liquidity requirement held in the form of interest-bearing government paper or central bank deposits.

## *India*

### *Financial Structure*

Commercial banking is dominated by 20 public banks (nationalized in 1969 and 1980) and 196 regional rural banks. Public banks account for over 90 percent of commercial bank assets and deposits. Private commercial banks consist of 29 Indian scheduled banks, 21 foreign banks, and 3 small nonscheduled banks. There are also postal savings banks, three term-lending institutions, two insurance corporations, and an Exim bank, all of which are public.

### *Ownership*

Mostly public. Very recently, there have been some efforts to privatize.

### *Concentration*

Twenty national banks account for 92 percent of banking assets and the four-bank concentration ratio is 45 percent. Market shares remained virtually unchanged for a long time. Public sector banks do not compete among themselves. They are among the least profitable in the world.

### *Banking Model*

Banks operate as universal banks with widespread branches. They can accept all types of deposits and offer many kinds of loans. Banks have established subsidiaries for leasing, underwriting, mutual funds, merchant banking, and other corporate services.

### *Directed Credit Policies*

Forced investments in public debt are the largest portion of the government's credit allocation. Around 50 percent of bank deposits are invested in government paper to satisfy reserve and liquidity requirements at lower-than-market rates. The remaining resources of commercial banks (after cash and liquidity requirements) must be invested in priority sectors, such as agriculture and small enterprises, at subsidized rates of interest. Only about 20 percent of bank resources can be allocated freely.

*South Korea*

*Financial Structure*

The financial system comprises the Bank of South Korea (central bank), 5 nationwide city banks, 10 regional banks, 6 specialized banks, 31 branches of foreign banks, and 3 development banks. There are also savings institutions, insurance companies, and investment companies.

*Ownership*

Bank privatization started in the early 1980s. By 1983, all city banks were privatized. Although banks are mostly private, the Bank of South Korea continues to have significant control over their operations.

*Concentration*

In 1980, the top 5 banks held 30 percent of financial assets. By 1990, this had dropped to around 20 percent. Compared to G-7 countries, South Korean banks are among the most profitable.

*Banking Model*

In the 1990s, South Korean banks started to own investment and finance companies as subsidiaries. In the 1980s, they were allowed to hold stock up to 25 percent of their liabilities (up to 10 percent of stock in any nonbank), but they could not underwrite stocks.

*Directed Credit Policies*

Banks traditionally lent large sums to the big business groups (chaebols). In 1988, 23.7 percent of bank loans went to the 30 largest chaebols. In 1987, the South Korean government introduced restrictions in the form of "moral suasion" to reduce corporate leverage and forced the chaebols to raise capital in the stock market. This was done to increase credit access by small and medium enterprises. By 1990, the 30 largest chaebols were getting only 19.8 percent of total bank loans.

The Korean banking system has always been the most important channel for implementing the directed credit policies of the government. Thus, the banks entered the 1980s with a substantial proportion of nonperforming loans. Most of the directed credit went to developing heavy and chemical industries. These loans, although still quite substantial, have been declining. The ratio of policy loans (directed credit) to total loans of banks, which was 60 percent at the end of the 1970s, declined to 50 percent by the mid-1980s and to 40 percent at the end of 1991. However, the yearly subsidy provided by directed credit as a ratio of GDP has been approximately one percent for the period from 1980 to 1990. There is an eight to 11 percent reserve requirement on bank deposits.

*Jordan*

*Financial Structure*

The Jordanian financial system consists of the Central Bank of Jordan, 19 commercial banks, 5 foreign banks, investment banks, and 4 specialized banks.

*Ownership*

Mostly private. The 4 public specialized institutions had around 15 percent of total financial assets.

*Malaysia*

*Financial Structure*

The Malaysian financial system comprises the central bank, 38 commercial banks (22 domestic, 16 foreign), finance companies, merchant banks, discount houses, development institutions, and various other nonbank institutions. The banking system is well developed and diverse.

*Ownership*

Mostly private.

*Concentration*

In 1959, the five largest commercial banks in the country were all foreign. By 1988, four of the five largest banks were domestic. In 1959, the 5 top banks held 72 percent of bank assets. By 1988, this had fallen to 53 percent.

*Banking Model*

Initially, banking activities were confined to financing of external trade. In the 1970s, and especially in the 1980s, diversified bank holding companies developed with subsidiaries engaged in merchant banking, hire-purchase finance, housing, factoring, leasing, and other specialized activities. Since 1986, banks have also been engaged in stockbroking.

*Directed Credit Policies*

Banks are required to keep around 25 percent of their resources as reserve and liquidity funds. Approximately half of this amount is invested in government securities. In addition, there is directed credit to indigenous groups, small-scale enterprises, and low-cost housing projects, which add up to around 47 percent of bank loans.

*Pakistan*

*Financial Structure*

In the 1980s, the Pakistani financial system consisted of the central bank, five state banks, and nine foreign banks. In 1991, two of the state banks were privatized and new private banks were established.

*Ownership*

Until 1991, all commercial banks were public (except for the nine foreign banks). With the privatization in 1991, 73 percent of assets still remain public. Fourteen percent are newly privatized and 13 percent are foreign.

*Concentration*

Banking has always been heavily concentrated. In 1991, the top 3 state banks held 72 percent of assets.

*Banking Model*

Banks are universal banks. Almost all financial institutions in Pakistan are involved in the securities business. All public and private banks are active in the underwriting business.

*Directed Credit Policies*

The public sector has a very large borrowing requirement, which leaves little credit for the private sector. Allocation of this credit to the private sector is heavily influenced by the directed credit policies. State banks have little autonomy, as the Pakistan Banking Council approves most important decisions and there is considerable political interference in all lending and collection efforts. In addition to directed credit through commercial banks, several development banks are operating to provide long-term credit to specific clients at subsidized rates. These serve the industry, housing, and agriculture sectors.

*Thailand*

*Financial Structure*

The Thai financial system comprises the central bank, 15 domestic banks, and 14 foreign commercial banks, specialized financial institutions, and nonbanks. Nonbanks have been gaining importance in recent years.

*Ownership*

Commercial banks are mostly private, with one government-owned bank, which holds eight percent of commercial bank assets. In 1900, banking in Thailand was controlled by foreign institutions. Domestic banks were later established by the government, the army, and rich families. Original ownership groups continue to maintain tight control over banks.

### *Concentration*

Market concentration has been decreasing. In 1980, the top 3 banks held 59 percent of assets. In 1988, this became 55 percent.

### *Banking Model*

Banks and corporations form financial groups through cross-ownership of stock. Banks cannot engage directly in investment banking, but do so through their affiliates.

### *Directed Credit Policies*

As part of their reserve requirements, banks must hold 2 percent of their deposits in the form of deposits with Bank of Thailand, and 2.5 to 5 percent of their deposits as government securities. To satisfy the liquidity requirement, 16 percent of deposits must be invested in eligible securities.

The Thai government adopted directed credit policies out of concern that the agricultural sector might be discriminated against by the financial system. Commercial banks are required to lend 20 percent of their previous year's deposits to the agricultural sector. In addition, bank lending for exports, small-scale industry, and agricultural production are at subsidized rates. Also according to the "local lending requirement," each bank branch established outside Bangkok since 1975 must lend at least three-fifths of its deposit resources locally. Since 1988, there has been a sharp decline in directed credit.

## *Turkey*

### *Financial Structure*

In 1980, Turkey's financial system comprised the Central Bank, 12 publicly owned commercial banks, 24 private commercial banks, 4 foreign banks, and 2 development banks. Public banks accounted for 50.3 percent of the assets, private banks for 46.7 percent, and foreign banks accounted for only 3 percent. In 1990, the basic structure of the system was not much different. Foreign banks increased in number to 26, but their share of the assets only increased to 3.8 percent.

### *Ownership*

Divided almost equally between public and private.

### *Concentration*

In 1980, the top 4 banks accounted for more than 64 percent of deposits, and the top 4 private banks held 78 percent of private bank deposits. In 1990, the top 4 banks continued to hold more than half of all deposits, and

the top 4 private banks held over 65 percent of private deposits. Profits in the banking sector increased substantially, particularly after the mid-1980s, and by the end of 1990 had reached levels more than three times the OECD average.

#### *Banking Model*

Banks and corporations form banking groups with interlocking ownership and management. With the development of stock markets in the late 1980s, banks became more involved in the securities markets and began operating as universal banks.

#### *Directed Credit Policies*

Directed credit and discounts made available by the Central Bank were reduced from 49 percent of total credit in 1980 to 18 percent in 1987. In the early 1980s, borrowers were public administration, state enterprises, farmers, exporters, artisans and small firms, backward regions, industrial investors, and so on. By the late 1980s, preferential credit was provided only for agriculture, industrial artisans, exports, and housing. There is currently a reserve requirement equal to 25 percent of deposits.

### *Zimbabwe*

#### *Financial Structure*

The Zimbabwe financial system comprises the Central Bank, four commercial banks, four merchant banks, five finance houses, three discount houses, three building societies, a post office savings bank, a number of insurance companies and pension funds, and several development banks. Its financial system is diverse compared to other sub-Saharan countries with relatively significant nonbank financial sectors.

#### *Ownership*

Banks are private and predominantly foreign.

#### *Concentration*

The commercial banking sector is dominated by branches or subsidiaries of British banks. There are only four banks. Banks are quite profitable.

#### *Banking Model*

British model. Banking and commerce are separate. Separate institutions provide different services.

*Directed Credit Policies*

Most of the private savings are lent to the public sector in the form of short-term loans, and medium-to-long-term public bonds. This lending is facilitated by a range of required asset requirements that effectively channel the resources into these public liabilities. Private corporations do not receive much directed credit.

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