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Capital Structures in Developing Countries

Evidence from Ten Countries

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Summary findings

Demirgüç-Kunt and Maksimovic investigate capital structures in a sample of the largest publicly traded firms in ten developing countries — Brazil, India, Jordan, the Republic of Korea, Malaysia, Mexico, Pakistan, Thailand, Turkey, and Zimbabwe — for 1980–91.

The firms in the sample are smaller than comparable U.S. firms, and the financial systems and regulations in these countries differ significantly from those in the United States. Not every country has well-functioning liquid financial markets in which investors can diversify risks. Nor do all countries have efficient legal systems in which a broad range of property rights can be enforced.

Still, variables that predict capital structure in the United States also predict choices of capital structure in the countries sampled.

Variables suggested by agency theory explain more of the variation than variables suggested by tax-based theories. For both short-term and long-term equations in most countries, the asset structure, liquidity, and industry effects have more explanatory power than firm size, growth opportunities, and tax effects.

In several countries, total indebtedness is negatively related to net fixed assets, suggesting that markets for long-term debt do not function effectively.

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Capital Structures in Developing Countries: Evidence from Ten Country Cases

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I. Introduction

There exists a large literature that describes and attempts to explain observed capital structure choices in developed economies (see the survey by Harris and Raviv (1990). This literature normally takes as given, first, the existence of well functioning liquid financial markets in which investors can diversify risks and second, the existence of an efficient legal system in which a broad range of property rights can be enforced. While appropriate for the analysis of financing choices in the U.S., these assumptions are often not satisfied in other economies. In many economies financial markets are at early stages of development: only a small proportion of the risks is traded, the markets are relatively illiquid and heavily regulated. Little is known about the effect of such conditions on the optimal financing choices of firms.

In this paper we provide evidence on the capital structure choices of firms for a panel of ten developing countries using annual data for 1980-1991. We describe observed financial structure choices and compare them to U.S. financial structure choices. We ask whether models of developed for United States institutions explain capital structure choices in our panel of developing countries.

While our findings bear most directly on developing economies, they are of more general interest. Models of financial structure have been developed with the aim of explaining U.S. data. They are based on U.S. institutions. Predictions often depend on specific assumptions about institutional structure of these models. Testing the models with data from economies with less developed financial markets and very different institutions provides a test of robustness of these models. In this sense our paper can be viewed as a complement to the work of Bradley, Jarrell

and Kim (1984) and Titman and Wessels (1988) for the U.S., and Ragan and Zingales (1994) for a sample of several developed countries.

The the paper is organized as follows. Section II discusses the principal differences between the U.S. and the developing economies that we are analyzing. Section III discusses the theoretical framework. Section IV presents the empirical results and Section V concludes.

II. Institutions in Developing Countries

We investigate capital structures in Korea, Malaysia, Brazil, Mexico, Turkey, Jordan, Zimbabwe, India, Thailand and Pakistan. We identify four broad reasons why developing country capital structures may be different: differences in the level of economic and financial development, institutional differences, smaller firm size, and different tax treatment of debt and equity.

A. Economic and Financial Development:

As shown in Table 1, the per capita GDP in these countries is much lower than in the U.S. It ranges from about 22.5% of the U.S. level in the case of Korea to just 1.9% in the case of Pakistan. These economies and their financial systems differ in other significant respects from that in the U.S. In this section we review some of these differences and discuss how they may affect the firm's capital structure decision.

One measure of market development is the ratio of market capitalization to Gross Domestic Product, MCAP/GDP. As revealed in column (3) of Table 1, MCAP/GDP ranges from 16.1% in the case of Turkey to 70% in the case of Malaysia, with a median of 23%. The corresponding statistic for the U.S. is 74.5%. However, MCAP/GDP of most of the countries

in our sample is greater those in some developed countries, such as Germany and Italy (Pagano (1993)). Thus, stock markets in most of the countries in the sample are consequential in their economies.

Financial intermediaries are another source of financing for corporations. While it is difficult to measure the development of financial intermediaries, it is likely that the availability of financing is positively related to the size of financial intermediary sector. Hence, the size of the formal financial intermediary sector relative to economic activity has frequently been used as a measure the financial sector development.[1] Column (2) of Table 1 lists the ratio of M3, the liquid liabilities of the financial system, to GDP.[2] The Table reveals a wide variation in our sample. It reflects Jordan's role as a regional financial center and the relative sophistication of Malaysia's financial sector.

Corporations' ability to raise external financing may be related to the stability of the price level. Mean inflation rates over the sample period are listed in column (5). Our sample contains countries with very high rates of inflation (Brazil, Mexico and Turkey) and very low rates (Jordan and Malaysia). As expected, the inflation rate is negatively correlated with the ratio of M3 to GDP.[3]

B. Institutional Differences:

There are some significant institutional differences between the financial system in our sample of countries and those in the United States. In capital markets, certain pricing decisions

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[1] See, for example, Goldsmith (1969) and McKinnon (1973).

[2] Liquid liabilities are measured by M3, which is defined as the currency held outside the banking system plus demand and interest bearing liabilities of banks and nonbank financial intermediaries.

[3] The Spearman rank coefficient is -0.97.

are much frequently more heavily regulated, whereas there are often fewer protections for investors. Table 2 summarizes some key institutional features of the markets in our sample.

A key deviation from U.S. practice is that with the exception of Brazil, Mexico and Jordan, in all the countries in our sample there exist restrictions on the pricing or issue of bonds or stocks. In some cases these restrictions are significant, particularly for new issues. For example, during our sample period in Pakistan companies could not offer shares at above book value (Mirza (1993, page 208)). Similar restrictions existed in India (Glen and Pinto (1994)). In Malaysia, "looming over the entire industry is the feared Central Issues Committee" which, among other powers, has the right to determine the prices of initial public offerings and which may take up to six months to rule on a price (Seaward (1993), page 153).[4]

As revealed in Table 2, financial markets in our sample countries differ in the amount of protection offered to investors. According to data compiled by the Internatonal Finance Corporation, accounting standards are adequate or of internationally acceptable quality for all countries except Jordan.[5] By the end of 1992 all the countries in the sample had a securities commission or a similar government agency. India, Korea, Malaysia Mexico and Zimbabwe also have bond rating agencies.

Differences from U.S. practice are not confined to the regulation of capital markets. Governments of the countries in our sample are in general more active in business affairs. Most importantly, in some countries financial intermediaries are required to provide directed long-term

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[4] See Seward for an argument that the Capital Issues Committee sets prices of initial public offerings artificially low (page 152). Ritter (1993) provides evidence that average underpricing of initial public offerings in Malaysia is 149%.

[5] In some cases some requirements appear to be stricter than in the U.S. In Malaysia the Central Issues Committee holds directors of newly floated companies responsible for deviations of more than 10% from forecasts in prelisting prospectuses (Seaward (1993)).

credit to selected firms (see, for example Baer et al (1994) and their references).

C. Differences in Firm Size:

A further difference between the U.S. market and the countries studied here is in the size of firms. As shown in Table 3, publicly traded firms in the U.S. are much larger than publicly traded firms in our sample countries. Only in Korea does the average size of firms in the highest quartile exceed the average size of firms in the lowest quartile in the U.S. At the other extreme, in Zimbabwe, the average firm in the largest quartile is six times smaller than the average firm in the lowest U.S. quartile. However, although these firms are small by U.S. standards, they are large relative to their local economies. Hence, they may receive attention from local financial communities that U.S. firms of comparable size would not.

D. Tax Treatment of Debt vs. Equity:

Table 4 summarizes the tax treatment of interest income, dividends and capital gains. In most countries the personal income tax rates vary with income. To provide a consistent comparison of tax levels across countries we have assumed that the marginal investor is a private individual who is sufficiently wealthy to be paying personal income taxes at the highest rates.[6] Using this benchmark, interest payments are clearly the most tax advantaged form of payment in only two countries: India and Korea. In Brazil, Malaysia, Mexico, Pakistan and Thailand the net tax burden is generally lower on equity income.

III. Determinants of Capital Structure

[6] Rajan and Zingales (1993) make the same assumption in their comparison of tax burdens in a sample of developed economies. Similarly, when there exists multiple corporate tax rates we have assumed that firms face the highest rate. Thresholds for the maximum rate are typically set very low.

In this section we introduce a framework for discussing the firm's choice of financial structure in developing economies. We review the existing literature on financial structure and discuss its applicability to developing economies. The corporate finance literature has focused on two broad determinants of capital structure: agency theoretic explanations that stress conflicts of interest between various stakeholders in the firm and explanations that stress tax consequences of capital structure choices. We review each in turn and describe the variables that we use to measure the predicted effects.

A. Agency Theoretic Explanations of Capital Structure:

Several distinct conflicts of interest that arise between the investors holding different classes of securities have been identified in the literature. These conflicts arise because holders of one class of investors (typically equityholders) act as agents for other investors and take decisions that affect the value of the firm as a whole.[7] As a result, these investors have an incentive to engage in opportunistic behavior that increases their payoffs at the expense of other classes of investors and the firm as a whole.

The reduction in the firm's value that results from opportunistic behavior by those in control of a corporation is termed the agency cost of financing. If they are rational, the holders of securities whose value is reduced by opportunistic behavior factor their expected losses into the price that they are willing to pay for their securities. Hence, it is in the firms' residual owners' interest to choose capital structures that minimizes agency costs, and thereby maximizes the price at which each firm's securities can be sold. As a result of these choices, if agency theoretic explanations are valid, the observed capital structure of each firm should depend on

[7] For example, the equityholders may make decisions that alter the riskiness of the firm's operations.

the potential for opportunistic behavior in that firm.

The potential for opportunistic behavior depends on the extent to which the agents' actions affect value and the extent to which contracts that regulate actions can be written and enforced. Thus, agency costs will depend on the firm's technology, development of financial institutions and markets, the investors' incentives to monitor and the legal system in each country, among other factors. The firm's optimal capital structure will in general also depend on these factors.

The corporate finance literature has identified several conflicts of interest that arise in many situations and analyzed financial structures that minimize them. The two most important conflicts are between the firm's insiders and outside investors and the conflicts between equityholders and debtholders.

The firms insiders frequently have opportunities to consume perquisites in ways that cannot be easily monitored by outside investors. This creates a conflict of interest between insiders and outside investors. This conflict can be mitigated in following ways:

- By issuing debt securities instead of equity the insiders can contractually commit themselves to a prespecified level of payment to outside investors, thus reducing opportunities for opportunistic behavior.
- By issuing debt securities with shorter maturities the insiders commit themselves to renegotiating the firm's financing at short intervals. This reduces their insiders to exploit their creditors.

A second important conflict of interest is that between the firm's equity holders and the

firm's debt holders.[8] As leverage increases, the equityholders have an incentive to siphon funds out of the firm through dividends and stock repurchases. This is because all the siphoned funds go to the equityholders whereas the consequent reduction in the firm value is shared with the debtholders. In addition, because the value of equity is a convex function of the value of the firm, as leverage increases equityholders have an incentive to select risky policies even if they lead to decreases in firm value. The conflict between equityholders and debt holders can be reduced by:

- Reducing debt levels in industries where the potential for opportunistic behavior is high.
- Securing long term investments with specific capital assets.
- Shortening the maturity of debt.

As the maturity of debt is a critical variable in agency models, we analyze the firm's choice of long-term and short-term debt levels separately. Our measure of long term indebtedness is the ratio of the book values of long term debt to total equity, LTDTE, and our measure of short-term indebtedness, STDTE, is the ratio of the book value of short-term debt to the book value of debt. The determinants of financial structure are:[9]

Asset Structure: The composition of the firm's assets affects its ability to commit not to engage in opportunistic behavior. Fixed assets usually have collateral value. A firm with fixed assets can issue secured debt, thereby limiting its ability to expropriate the debt-holders. Thus, we expect firms with greater amounts of fixed assets to issue more long-term debt than firms with fewer fixed assets. We use the ratio of net fixed assets to total assets, NFATA as our

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[8] For a detailed analysis see Hart (1993).

[9] We give below the interpretations of variables that we find most plausible. Additional interpretations of some variables are possible, as in for example Titman and Wessels (1988).

measure of the firm's asset structure. We expect that this ratio is positively related to LTDTE and negatively related to STDTE.

In the absence of collateral, a greater degree of monitoring by creditors may be optimal. Monitoring by creditors is facilitated by issuing debt with shorter maturity. Thus, we would expect firms which do not borrow to finance fixed assets to have more short term debt. A measure of the firm's financing needs, other than the need to finance fixed assets, is the Ratio of Net Sales to Net Fixed Assets, NSNFA. Firms with a high ratio of sales to net fixed assets have cost structures requiring more monitoring, and are therefore expected to have more short-term debt and less long-term debt.

Leverage and Liquidity Constraints: Recent literature, following Myers-Majluf (1984) has suggested that internal generated capital is cheaper for the firm than external financing. This suggests that firms would finance internally first, and issue debt only when such low cost sources of financing have been exhausted. We measure the firm's initial excess internal funds by DIVCSH, the ratio of dividends paid out to shareholders to its cash flow available for reinvestment: earnings after taxes plus depreciation. The higher this variable the less cash constrained the firm is. Thus, we would expect both LTDTE and STDTE to be negatively related to DIVCSH.[10]

An alternative variable that has been used to measure the firm's ability to generate capital internally, by Titman and Wessels (1988) among others, is earnings before interest and taxes over total assets, PROFIT. In studies of the U.S. economy this variable has repeatedly been

[10] For some countries data on depreciation and earnings after tax is not available. For those countries we use the ratio of dividends to total assets, DIVTA, to proxy for cash constraints.

found to be negatively correlated with leverage and we expect it to be similarly related to financing choices in our sample.

Growth: As suggested by Myers (1977), equityholders in highly leveraged firms with significant growth opportunities have incentives to adopt suboptimal investment policies. If this agency cost is significant, we expect fast growing firms to be financed with equity or with short-term debt. Our measure of growth is the rate of growth of real total assets, GROWTH. We expect this variable to be negatively related to LTDTE and to be unrelated or positively related to STDTE.

Firm Size: There is considerable evidence that firm financing patterns in developed countries differ for firms according to size. Barclay and Smith (1993) have shown that size is an important predictor of debt maturity in the U.S. and Baias and Hillion (1991) have shown that the amount of short term credit is predicted by firm size. This effect may arise because access to financial markets may be a function of firm size. Additionally, the amount of monitoring by investors may depend on the liquidity of the market for the firm's equity, which, in turn, is related to firm size.[11] We allow for these effects by segmenting our sample into quartiles by size of total assets and including size dummies in our equations, SZ1-SZ4, where SZ1 denotes the smallest quartile. An alternative size vaiable we also use is firm total assets to GDP, TAGDP.

Firm Age: There are arguments supporting the prediction that younger firms will be less indebted (Titman and Wessels (1988)). Younger firms have shorter credit histories which makes it more difficult to judge their quality. Younger firms also tend to be riskier since they exit

[11] As shown by Ritter (1987), there exist economies of scale in the issuance of equity.

more frequently. To test for the age effect we construct two variables: the age of the firm, AGE, and a dummy variable, YOUNG, which takes the value one if AGE is less than or equal to five, and zero otherwise.

Industry Classification: The product market structure and type of competitive interaction across firms differs from industry to industry. To the extent that capital structure affect the incentives of firms to enter into implicit contracts with rivals (Maksimovic (1988)) or to maintain reputations (Maksimovic and Titman (1990)), capital structures will differ systematically across industries. To control for these industry effects, we include when available dummies for industry classification (at the 2 digit SIC code level).[12] These industry dummies may also pick up differences in asset structure across industries that are not captured by NFATA and NSNFA.

Market's Valuation of Equity: Our measures of the firm's capital structure, the ratios of the book values of long-term and short-term debt to total equity, implicitly assume that book values adequately measure the economic values used in determining the firm's capital structure. However, book values do not directly measure the market's valuation of the firm's growth opportunities. If the firm can borrow against the value of growth opportunities, firm's with higher market valuations will have higher book value of debt to equity ratios (LTDTE and STDTE).[13] To control for this we include the difference between the market's valuation of the firm's equity and its book value, scaled by the book value, (MV-BV)/BV, as an explanatory variable. We expect this variable to be positively related to LTDTE and STDTE.

B. Taxation and the Capital Structure:

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[12] Firms were classified into 2-digit SIC codes on the basis of descriptions of the firm's principal industry.

[13] It is unlikely that the firm can borrow against its growth opportunities in the same way that it can borrow against fixed assets. For a discussion of these issues see Myers (1977) and Hart and Moore (1991).

The second important determinant of capital structure is the tax system. The firm's financing choice affects its tax liabilities because the total amount of taxes paid by the firm's investors, at both the corporate and personal levels, differs according to whether they hold equity or debt securities. This differential treatment of investment income induces investors' preferences for holding equity or debt securities. Firms attempt to satisfy these preferences by optimally altering their capital structure. Depending on the level of personal and corporate taxes, this optimizing behavior by firms results in one of two outcomes.

First, if tax rates are such that one form of financing (debt or equity) is unambiguously tax advantaged, then there may exist an optimal debt-equity ratio for each firm that minimizes its total taxes and that depends on the firm's tax liabilities.[14] Second, for some tax regimes the aggregate supply of debt and equity securities in the economy may adjust so that individual firms are indifferent between issuing debt or equity (Miller (1977)). In both cases individual firms may have an incentive to chose low debt levels if they cannot utilize debt tax shields (DeAngelo and Masulis (1980)).

We examine the relationship between an individual firm's debt level and two measures of non-debt tax shields, depreciation expanse over total assets, DEPTA, and estimated non-debt tax shields over total assets, NDTS. Following Titman and Wessels (1988), we estimate the latter as

$$NDTS = EBT - (EBT\text{-}EAT)/T_C$$

where EBT is income before taxes, EAT is income after taxes and T_C is the corporate tax rate.

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[14] This follows from the analysis of (Modigliani-Miller (1958)).

IV. Empirical Results

A. Discussion of the Data:

The data for this study were collected by the International Finance Corporation. The description of the data set and the definition of each variable are given in the Appendix.[15] The means of the variables used in the study are shown in Table 5.

Inspection of Table 5 reveals that in every case for which we have data, the mean short-term debt exceeds the mean long-term debt. India, Korea and Pakistan have the highest mean levels of total debt and Brazil, Mexico and Zimbabwe have the lowest levels. These contrasts are also shown by time series of aggregate levels of short-term, long-term and total debt by country in Figure 1.

B. Regression Results:

In this subsection we examine the financial capital structures of the firms in our sample. We follow the literature, in regressing measures of capital structure STDTE and LTDTE on the determinants discussed above.[16] In interpreting the results of the regressions it is necessary to keep in mind that short-term debt and long-term debt are both components of total indebtedness. In some cases theory predicts different determinants of long-term and short-term debt

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[15] We have deleted some observations from the data set when they seemed to contain obvious errors or to pertain to situations not within the scope of this research. Thus, for example, observations which did not report full fiscal year results were deleted. Likewise, observations which reported implausibly highly negative growth rates were also eliminated. Details are available from the authors.

[16] This is also consistent with the theoretical models on which the above list of capital structure determinants is based. These models derive capital structure as a function of given determinants. This suggests statistical tests in which the determinants are taken as exogenous. A more general approach would be to derive a structural model of financing in developing economies. Our approach may be viewed as an initial step towards that approach.

indebtedness: asset structure, for example, is predicted to affect each differently. In other cases, only the total level of debt may matter: for example in shielding income from taxes. In the latter case, the sign of any single component of debt may differ from that predicted by theory for the total level of debt.[17]

Consider first asset structure as a determinant of capital structure. Agency theory suggests that firms with large fixed assets have a comparative advantage in obtaining long-term debt, whereas firms with high sales relative to fix assets have a comparative advantage in borrowing over shorter periods. This suggests that NFATA is positively related to long-term indebtedness LTDTE and that NSNFA is positively related to short-term indebtedness, STDTE. By implication, we expect that firms NFATA is negatively related to STDTE and that NSNFA is negatively related to LTDTE.

Panels (a) and (b) of Table 6 reveals that of the eight countries for which we have data on these variables (we do not have data on net fixed assets for Zimbabwe) the relationship between NFATA and LTDTE is positive and significant at the 5% level or better in five of the eight cases. The relationship between NFATA and STDTE is even more striking. In seven of the eight countries the relationship is negative and significant. The only exception is Mexico, where it is positive but not significant.

The signs of the coefficients of NSNFA also support the predictions, although they are less clear cut. NSNFA is significant at the 5% level or better and positively related to STDTE in four cases. It is negatively related in only two cases, and they are not statistically significant.

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[17] We have rerun the regressions reported below, normalizing debt with total assets instead of total equity. The general conclusions are unaffected.

Taken together, these results offer strong support for the prediction that firms with large amounts of fixed assets have a comparative advantage in borrowing over the long-term. They offer more qualified support for the proposition that firms with high ratios of sales over net fixed assets have a comparative advantage in short term borrowing.

The finding that firms with large net fixed assets have a comparative advantage in long-term borrowing does not imply that such firms have a comparative advantage in long-term borrowing over equity financing. Panel 6(c) shows the results of the regression of total debt on total equity, TDTE. NFATA in the TDTE equation is significant and negative in four cases and significant and positive in one case, that of Mexico. NSNFA is significant and negative in two cases. It is also significant and positive in two other cases. These results imply that, if anything, firms with more fixed assets have less total debt than firms with fewer fixed assets. This finding is counterintuitive in a partial equilibrium framework that abstracts from the state of development of the market for credit. However, it may be explained as discussed by Shleifer and Vishny (1992) and Worthington (1994), if asset specificity reduces the collateral value of fixed assets, or if the market for long-term debt financing in the sample countries is less developed than the market for equity financing.[18]

Next, consider the effect of the firms cash flow on its capital structure. Our preferred measure of excess funds, DIVCSH is available for five of the nine countries. Of these five cases it is significantly related to STDTE in three instances. The relationship is negative in all these cases. DIVCSH is significantly related to LTDTE in three instances, all of them negatively so.

For four countries we do not have information to calculate DIVCSH. In three of these

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[18] This would be the case, for example, if property rights of long-term debt-holders are costly to enforce.

cases (Brazil, Jordan and Turkey) we proxy for excess cash flow by using the ratio of dividends to total assets, DIVTA.[19] Four of the six coefficients have the predicted negative sign. However, only one, in the STDTE for Turkey is it statistically significant.

Inspection of Table 6 reveals an even stronger negative relationship between profitability and leverage. PROFIT is negatively related to STDTE for all nine countries (eight of them significantly) and also negatively related to LTDTE in eight of the nine countries (five of them significantly).[20] The exception is Pakistan, where PROFIT is positively, but insignificantly related to LTDTE. However, even in the case of Pakistan there is a significant negative relationship between PROFIT and STDTE.

The signs of the liquidity and profit variables, DIVCSH, DIVTA and PROFIT, in the TDTE equations are also consistent with a negative relationship between profitability and leverage. The signs are significant three, two and eight times respectively and are uniformly negative when significant.

Taken together, these results point to a strong negative relationship between internally generated resources and indebtedness -- profitable firms and firms that make large payments to equityholders borrow less. In conjunction with the finding above that firms with high net fixed assets do not take advantage of their asset structure to borrow more in total, perhaps as a result of monitoring issues identified above, this suggests that a lack of liquidity, may be an important determinant of debt financing in the sample countries.

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[19] This variable measures the ratio of cash paid out to equityholders to total assets. Thus, it is a less accurate measure of the firm's voluntary payouts to equityholders than DIVCSH, which measures the proportion of available cash-flow paid out.

[20] For Jordan and Mexico profit is defined as EBT instead of EBIT. Therefore, the negative relationship is built in.

The relationship between the rate of growth and leverage is weak but consistent with predictions of agency theory, in particular Myers (1977). The theory predicts that fast growing firms will issue short term debt in preference to long term debt in order to align the incentives of equityholders and bondholders. For six of the nine countries in our sample the coefficient of GROWTH in the equation explaining STDTE is positive. It is only statistically significant in two of these cases. The coefficient is not statistically significant in either of the three cases in which it is negative. In the equation explaining LTDTE the pattern is even weaker. Only one of the four positive coefficients is significant. One of the five negative coefficients is also significant. The results for the TDTE equation are equally inconclusive: the coefficient of the growth variable is more mixed: it is positive and significant in two of the four cases and negative and significant in one.

The excess of market valuation to book valuation (MV-BV)/BV is predicted to be positively related to STDTE and LTDTE.[21] We have market value data for five countries. Inspection of Table 6 shows that for all five the coefficient of (MV-BV)/BV is positive in the STDTE equation. It is statistically significant in three of the five cases. For four out of the five cases the coefficient of (MV-BV)/BV is positive in the LTDTE equation. However, it is only significant in two of these cases. The results for the TDTE equation are similar: the coefficient of (MV-BV)/BV is positive in each case, but is only significant in two of these cases.

Tax effects are measured by two variables. The most direct measure is the estimate of the firm's non-debt tax shields, NDTS. Theory predicts that debt and non-debt tax shields are

[21] More precisely, this variable is predicted to be positively related to the debt level, not necessarily to each of the components of indebtedness.

substitutes. The coefficient of NDTS in the STDTE equation is significant in four instances. It is negative in each case. In the LTDTE equation the coefficient is negative in five of the eight cases, but is significant in only two. Similarly, the coefficient of NDTS is negative in seven out of the eight cases in the TDTE equation. However, it is significant in only three cases, and for Mexico the coefficient is positive.

The other measure of non-debt tax shields is DEPTA, depreciation over total assets. Data are available for five countries. Inspection of Table 6 reveals that the coefficient of DEPTA in the STDTE equation is significant (and negative) in three of the five cases. It is significant and positive for only Malaysia. The relationship between LTDTE and DEPTA is significant only in the case of Korea, where it is negative.

Turning to the size dummies, the coefficient of SZ4 in the LTDTE equation is positive and significant in five of the nine cases (it is insignificant in the other four cases). The coefficients for SZ2 are predominantly negative and all three of the significant coefficients are negative. This suggests that largest firms find it easier to obtain long term financing compared to smaller firms which find it more difficult. There is no similar pattern in the STDTE equation. When we substitute size dummies with total asset size to GDP, TAGDP, in the LTDTE equation the coefficients are positive for seven out of nine countries and significant in four of them. The results of the STDTE are mixed.

Finally, our age variables do not have significant coefficients in any of our regressions. One reason for this is that the firms in our sample tend to be mostly older, over ten years of age.

In our equations we have included industry dummies. This specification is consistent with

methodology used in previous cross-sectional studies of capital structure such as Bradley, Jarrell and Kim (1984) and Titman and Wessels (1988) for the U.S. The inclusion of industry dummies is also motivated by the considerable theoretical literature that predicts industry effects.[22] In order to investigate the effect of including industry effects we have reestimated the equations reported in Table 6 without the industry dummies and with individual firm dummies replacing the industry dummies.

The two alternative specifications have differing implications for the interpretation of the regression equations. The specification without the industry dummies risks attributing to the variables included in our study differences in capital structure across industries that are caused by omitted variables. By contrast, if individual firm dummies are included, then the explanatory power of variables determining firm level results may be reduced because differences in firms' capital structures are "explained" by firm specific dummies.

When industry specific dummies were dropped, R^2 coefficients fell. However, the number of significant coefficients increased.[23] By contrast, including firm specific dummies alters the results to a greater extent. Whereas the R^2 coefficients increase, some of the explanatory variables lose significance. In a few instances, particularly that of India, Brazil and Turkey more variables become significant. The significant variables retain their signs.

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[22] Theoretical models by Titman (1984), Maksimovic (1988), Maksimovic and Titman (1990) and others predict industry effects. Empirical evidence on industry effects is provided by Chevalier (1993) and Phillips (1994).

[23] For example the GROWTH coefficient which had been insignificant become positive and significant in two instances in the LTDTE equation (Malaysia and Turkey) and one instance in the STDTE equation (Brazil). The most interesting case was that of (MV-BV)/BV, which gains significance in the STDTE equation in two instances (India and Malaysia). In the LTDTE equation (MV-BV)/BV lost significance in one case (India) and gained in another (Zimbabwe).

Our sample also includes few publicly controlled enterprises.[24] However, excluding them from the sample does not alter the results significantly.

C. Relative Explanatory Power of Different Determinants of Capital Structure:

In this section we analyze the relative importance of different determinants of capital in explaining the variation in debt levels for each country in the sample. We compare the explanatory power of regressions that include all the variables identified above as determinants of financial capital structure with regressions in which some variables are deleted. The difference in explanatory power provides a measure of the importance of the deleted variables in explaining sample variation.

Table 7 presents the decomposition of R^2 for short-term and long-term debt in each country in the sample. In accordance with the discussion above, the determinants of capital structure are classified into asset structure, liquidity, growth opportunity, size effect, tax effect and industry effect variables.

Inspection of Table 7 reveals that the rankings of the average explanatory power of all the variables are very similar for short-term and long-term debt equations (last three rows), the only difference being in the relative importance of industry effects and asset structure. In both of the debt equations the industry effects and the asset structure composition have the greatest explanatory power, followed by liquidity effects, the size effect, growth opportunities and taxes.[25] This is consistent with an inspection of individual country results, in which asset

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[24] One in Korea, three in Turkey, and one in Mexico.

[25] If Brazil is omitted from short-term averages industry effects still have the greatest explanatory power, however liquidity effect becomes more important than asset structure.

structure and liquidity variables, together with industry effects usually have more explanatory power than growth opportunities, size effects and tax effects.

All the variables with the exception of the tax and size effects have on average more explanatory power in the short-term than in the long-term debt equations. One interpretation of these results is that in our sample markets for short-term financing may be functioning better than markets for long term capital.

V. Conclusions

In this paper we have tested agency theoretic and tax-based explanations of capital structure choice on data from a panel of developing countries. In these countries financial markets are underdeveloped and much more heavily regulated than in the U.S. The firms in the sample are much smaller than U.S. firms on which financial structure models are usually tested. Tax treatment of debt and equity also vary considerably in each country.

Despite these differences, both the agency theoretic and tax-based models of capital structure predicted capital structures in our sample well. Net fixed assets are positively related to long-term debt and negatively related to long-term debt. More profitable firms and firms that are making large payouts to shareholders have less debt. Firms with high market to book ratios have more debt. Firms with high non-debt tax shields have less debt.

Interestingly, total indebtedness is negatively related to the ratio of net fixed assets to total assets. Thus, even firms with assets that could serve as collateral, finance themselves by retained earnings or equity issues rather than by issuance of long-term debt. This suggests that

markets for long-term credit do not function effectively in several countries in the sample.

A comparison of the relative explanatory power of the determinants of capital structure shows that for both short-term and long-term equations in most countries the asset structure, liquidity and industry effects have more explanatory power than firm size, growth opportunities and tax effects.

The explanatory power of theory in our sample is quite strong when compared to Titman and Wessels' (1988) study using US data. This may be in part due to differences in market efficiency and the legal systems. If alternative contractual means of resolving agency conflicts are not avaialable, then the relationships derived from simple agency-theoretic models are more likely to have empirical validity.

In this paper we focused on firm level differences in capital structure within each country. In our future work we will investigate cross-country differences in capital structure in greater depth.

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Figure 1.a.
LTD/TE

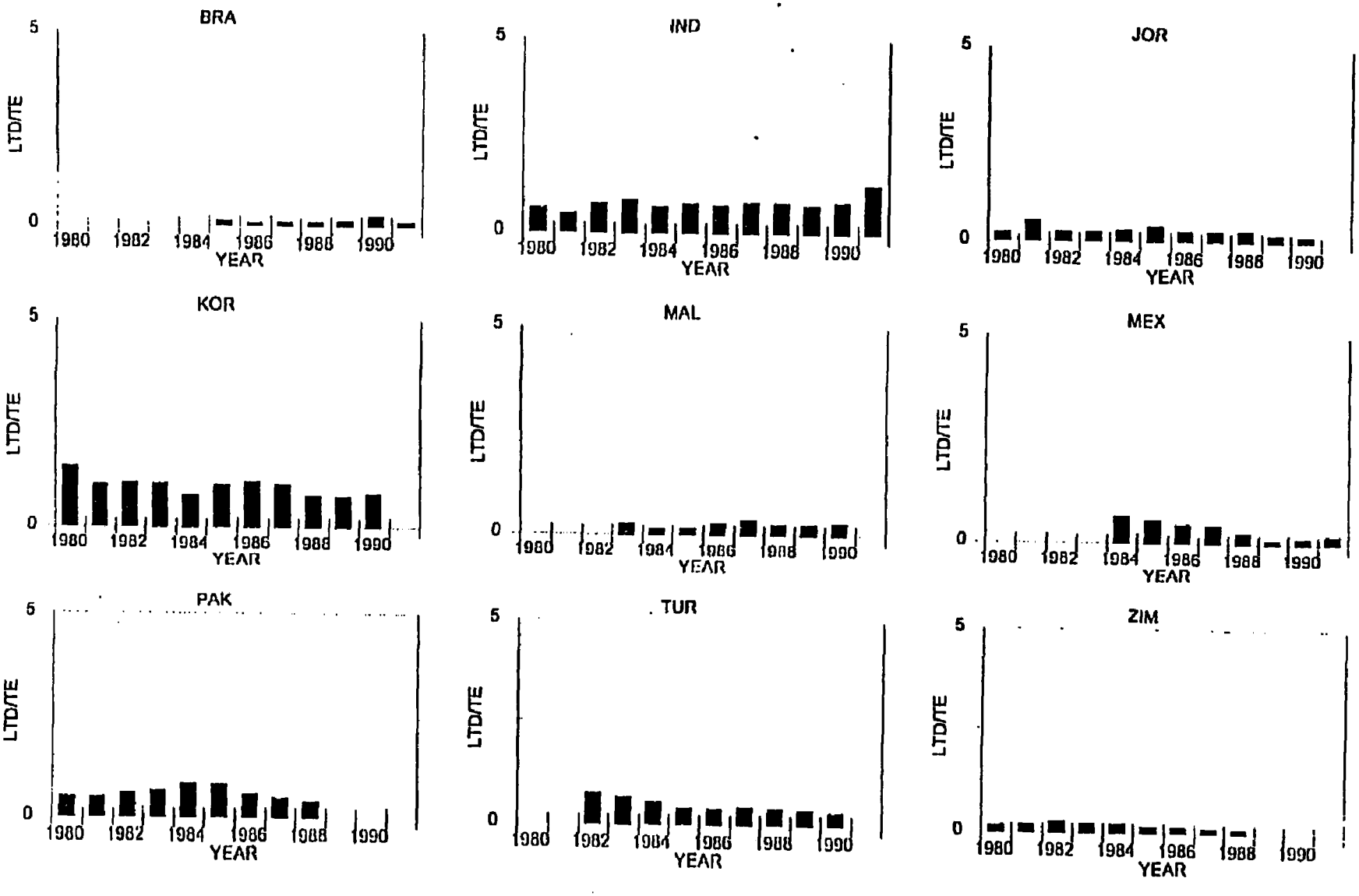

Figure 1.b.
STD/TE

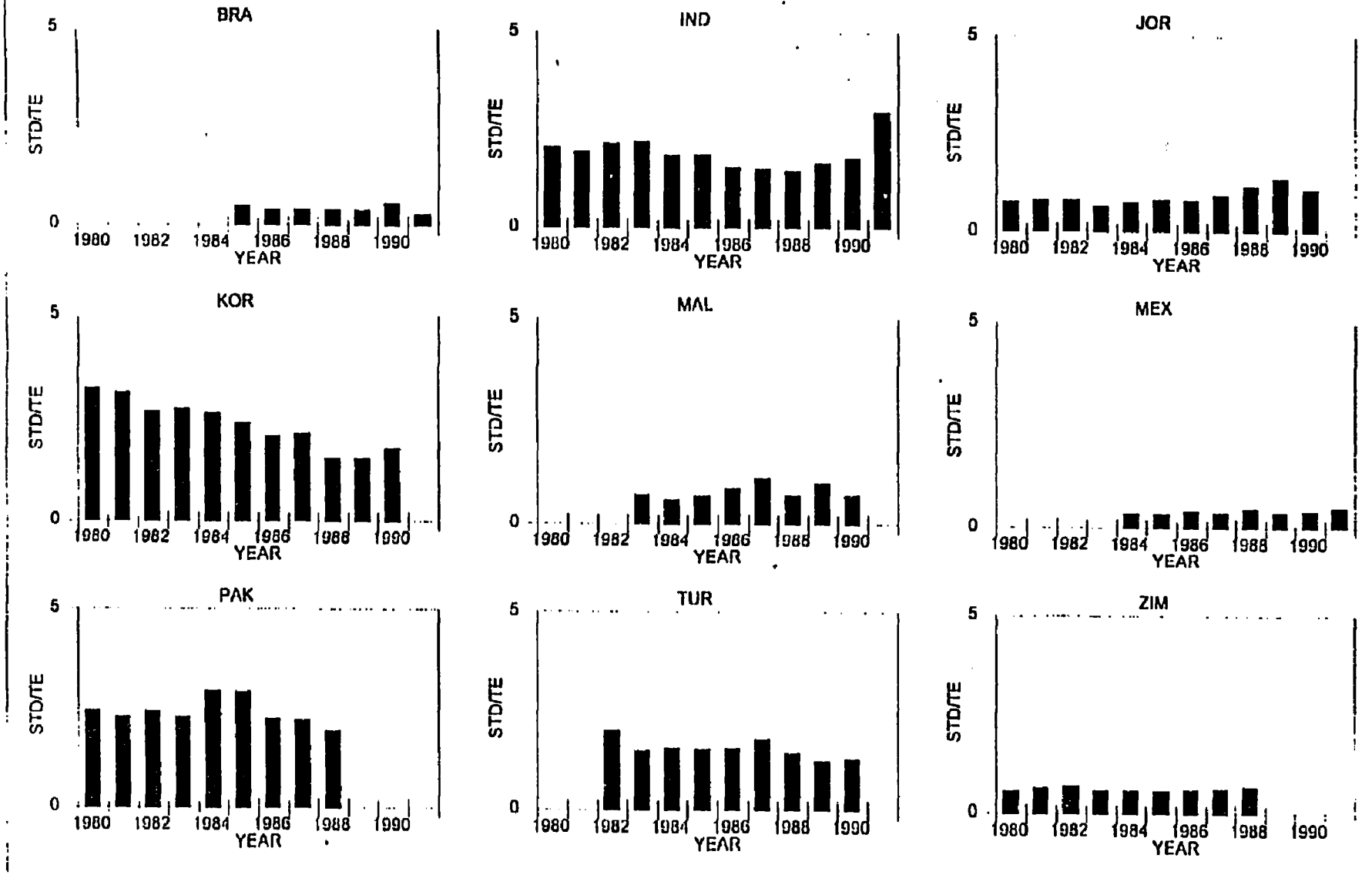

Figure 1.c.
TD/TE

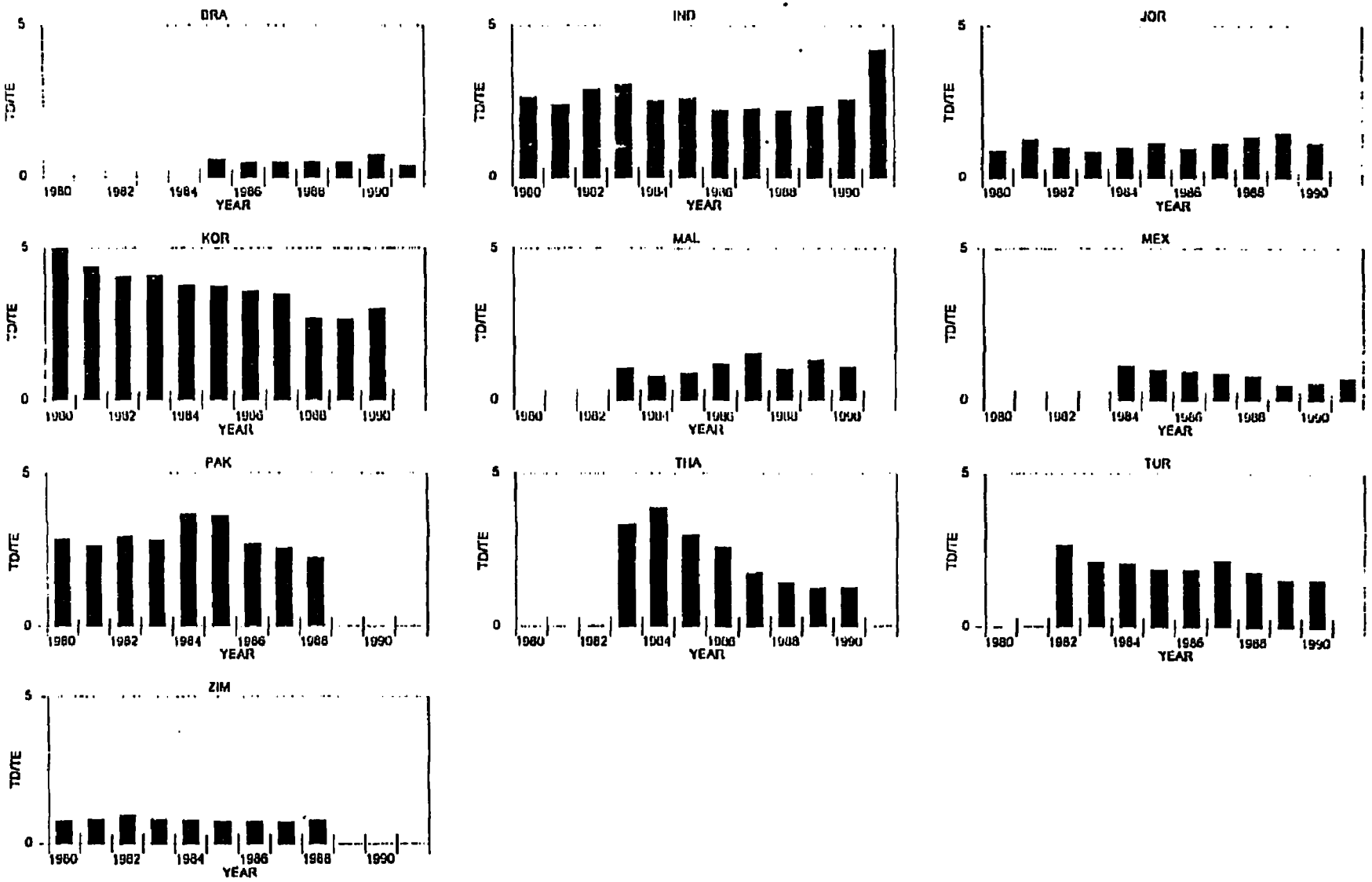

Table 1. Economic and Financial Development Indicators - 1991

GDP/CAP is the GDP per capita in US$. M3/GDP is the currency held outside the banking system plus demand and interest bearing liabilities of banks and nonbank financial intermediaries divided by GDP. MCAP is the stock market capitalization in millions of US$. MCAP/GDP is the stock market capitalization divided by GDP. Average annaul inflation is given for the period 1980-1991.

	GDP/CAP ($)	M3/GDP	MCAP (mill$)	MCAP/GDP	Average Annual Inflation 80-91 (%)
United States	18,934	67.0	4,180,210	74.5	4.2
Korea	4,268	52.3	96,373	38.4	5.6
Malaysia	2,449	114.67*	58,627	70.0*	1.7
Brazil	1,893	13.1	42,759	28.3	327.6
Mexico	1,812	25.0	98,178	22.8	66.5
Turkey	1,375	29.4	15,703	16.1	44.7
Jordan	1,372	135.9	2,512	55.3	1.6
Thailand	1,304	71.4	35,815	39.4	3.7
Zimbabwe	653	42.7	1,394	36.0	12.5
India	369	44.2	47,730	17.5	8.2
Pakistan	359	36.5	7,326	19.1	7.0

* 1988 Figure

Table 2. Developing Countries -- Institutional Factors

Column (1) 0=published, 1=comprehensive and published internationally; Columns (2) and (3), 0=poor, 1=adequate, 2=good, of internationally acceptable quality; Column (4), 1=functioning securities commission or similar government agency, 0=no agency; Column (5), 0=free, 1=some restrictions, 2=restricted; Column (6), 0=no restrictions, 1=restrictions; Column (7) 1=formal rating agency, 0=no formal agency. All data are as of 1992. Columns 1-5 are based on the information provided in the Emerging Markets Factbook published by the International Finance Company. Columns 6-7 are from The World's Emerging Stock Markets, 1993, by K. Park and A. Van Agtmail, published by Porobus, Chicago and sources in the World Bank.

Country	(1) Regular Publication of P/E yield	(2) Accounting Standards	(3) Investor Protection	(4) Securities Commission	(5) Restrictions on:			(6) Restrictions on pricing or issue of bonds or stocks	(7) Formal Rating Agency
					dividend repat.	capital repat.	foreign entry		
Brazil	1	2	2	1	0	0	0	0	0
Mexico	1	2	2	1	0	0	0	0	1
India	1	2	2	1	1	1	1	1*	1
Korea	1	2	2	1	0	0	1	1	1
Malaysia	1	2	2	1	0	0	0	1	1
Pakistan	0	1	1	1	0	0	0	1	0
Thailand	1	1	1	1	0	0	0	1	0
Jordan	0	0	1	1	0	0	0	0	0
Turkey	1	1	0	1	0	0	0	1	0
Zimbabwe	0	1	1	1	2	2	1	1	1

* *Indian restrictions were abolished in May 1992.*

Table 3. Average Size in Each Quartile (in US$)

The values are average $ total assets, for each quartile of firms classified by total assets, over the country's sample period.

	SMALL	MEDIUM	LARGE	VERY LARGE
US	4,350,000	26,030,000	147,680,000	7,909,830,000
KOREA	630,000	1,210,000	1,780,000	5,270,000
MALAYSIA	198,000	401,000	760,000	3,403,000
INDIA	283,000	572,000	898,000	2,860,000
MEXICO	59,000	180,000	443,000	2,106,000
JORDAN	41,000	96,000	173,000	1,778,000
BRAZIL	99,000	178,000	308,000	939,000
THAILAND	50,000	106,000	200,000	850,000
TURKEY	78,000	176,000	292,000	814,000
PAKISTAN	57,000	118,000	176,000	765,000
ZIMBABWE	59,000	116,000	210,000	644,000

Table 4. Tax Advantage of Debt with respect to Dividend and Capital Gains

The tax rates used are the statutory ones. Data are obtained from various editions of Coopers & Lybrand, International Tax Summaries.

COUNTRY	KOREA		MALAYSIA		INDIA		MEXICO		BRAZIL		TURKEY		PAKISTAN		ZIMBABWE		THAILAND	
YEAR	1980	1990	1981	1990	1980	1990	1984	1990	1984	1991	1982	1990	1980	1988	1980	1988	1982	1990
X_1 corporate tax rate	0.420	0.375	0.500	0.390	0.591	0.525	0.420	0.360	0.450	0.450	0.400	0.492	0.525	0.400	0.495	0.500	0.300	0.300
X_2 corporate tax rate on distributed profits	0.420	0.375	0.500	0.390	0.591	0.525	0.000	0.000	0.450	0.450	0.400	0.492	0.525	0.400	0.495	0.500	0.300	0.300
X_3 high personal tax rate	0.744	0.600	0.550	0.400	0.720	0.525	0.550	0.450	0.600	0.500	0.650	0.500	0.660	0.450	0.495	0.600	0.650	0.550
X_4 personal capital gains tax	0.744	0.600	0.000	0.000	0.720	0.525	0.550	0.450	0.600	0.250	0.650	0.500	0.000	0.000	0.000	0.300	0.000	0.000
X_5 rate on interest income	0.744	0.600	0.550	0.400	0.720	0.525	0.550	0.450	0.600	0.500	0.650	0.500	0.660	0.450	0.495	0.600	0.650	0.550
X_6 rate on dividend income	0.744	0.600	0.400	0.350	0.720	0.525	0.000	0.000	0.230	0.080	0.650	0.500	0.660	0.450	0.200	0.200	0.650	0.550
X_9 tax rebate on dividends	0.150	0.120	0.400	0.350	0.000	0.000	0.000	0.000	0.000	0.000	0.330	0.330	0.000	0.000	0.000	0.000	0.350	0.300
X_8 net interest income per $1	0.256	0.400	0.450	0.600	0.280	0.475	0.450	0.550	0.400	0.500	0.350	0.500	0.340	0.550	0.505	0.400	0.350	0.450
X_9 net capital gains per $1	0.148	0.250	0.500	0.610	0.114	0.226	0.261	0.352	0.220	0.413	0.210	0.254	0.475	0.600	0.505	0.350	0.700	0.700
X_{10} net dividends per $1	0.235	0.325	0.500	0.610	0.114	0.226	1.000	1.000	0.424	0.506	0.408	0.421	0.162	0.330	0.404	0.400	0.490	0.525
X_{11} tax disadvantage of dividends w.r.t. debt	0.080	0.188	-0.111	-0.017	0.591	0.525	-1.222	-0.818	-0.059	-0.012	-0.166	0.157	0.525	0.400	0.200	0.000	-0.400	-0.167
X_{12} tax disadvantage of capital gains w.r.t debt	0.420	0.375	-0.111	-0.017	0.591	0.525	0.420	0.360	0.450	0.175	0.400	0.492	-0.397	-0.091	0.000	0.125	-1.000	-0.556

$X_8 = 1 - X_5$, $X_9 = (1 - X_1)(1-X_4)$, $X_{10} = (1 - X_2)(1-X_6 + X_3)$, $X_{11} = (X_8 - X_{10})/X_8$ and $X_{12} = (X_8 - X_9)/X_8$

Table 5. Capital Structure - Descriptive Statistics by Country

LTD\TE is the book value of long term debt divided by book value of equity. STD/TE and TD/TE are the book value of short term and total debt divided by book value of equity. NFATA is the net fixed assets divided by total assets. DIVCSH is the dividends divided by earnings after taxes plus depreciation. DIVTA is the dividends divided by total assets. GROWTH is the growth rate of real total assets. PROFIT is the income before interest and taxes divided by total assets. (MV-BV)/BV is the market value of equity minus book value of equity divided by book value of equity. NSNFA is the net sales divided by net fixed assets. NDTS is the non-debt tax shield which is earnings before taxes minus the ratio of corporate taxes paid to corporate taxe rate, deflated by total assets. TA/GDP is total assets divided by the GDP of the country. The value of each item is calculated as the average of all firms for each country's sample period. Extended variable definitions and sources are given in the Appendix.

	LTD/TE	STD/TE	TD/TE	NFATA	DEPTA	DIVCSH	DIVTA	GROWTH	PROFIT	MV-BV / BV	NSNFA	NDTS	TA/GDP
BRAZIL	.139	.421	.560	.640	-	-	.002	.170	.057	-	1.164	017	-
INDIA	.745	1.850	2.595	.411	.039	.193	.018	.109	.132	.835	5.691	.028	.0006
JORDAN	.274	.506	1.180	.469	-	-	.032	.077	.065	.439	2.760	-	.0087
KOREA	1.058	2.391	3.449	.371	.053	.122	.008	.104	.100	-.218	4.336	.002	.0023
MALAYSIA	.278	.833	1.111	.465	.023	.350	.024	.170	.085	1.247	3.025	.003	.0041
MEXICO	.401	.417	.818	.569	-	-	-	.034	.079	-	1.463	.013	-
PAKISTAN	.596	2.359	2.955	.384	.038	.232	.028	.080	.115	-	11.144	.055	.0011
TURKEY	.485	1.509	1.994	.415	-	-	.068	.080	.238	-	4.231	.010	.0010
ZIMBABWE	.187	.615	.802	-	.031	.260	.028	.034	.131	-.437	-	.033	.0062
THAILAND	-	-	2.332	.398	-	-	.041	.223	-	2.021	5.380	-	.0007

Table 6.a. Capital Structure in Developing Countries -LTD/TE

Estimated model is: LTD/TE = $\alpha + \beta_1$ SZ + β_2 IN + β_3T + β_4 NFATA + β_5 DEPTA + β_6 DIVCSH (or DIVTA) + β_7 GROWTH + β_8 PROFIT + β_9 (MV-BV/BV) + β_{10} NSNFA + β_{11} NDTS + e. The dependent variable is long term debt to equity ratio. Definitions of independent variables are given in the appendix. Regression is estimated using Ordinary Least Squares. Not reported below are sector (IN) and year (T) dummy variables. White's heteroskedasticity-corrected standard errors are given in parenthesis. ** and * indicate that the coefficient is significantly different from zero at 1 and 5 percent levels respectively.

	KOREA	MALAYSIA	INDIA	MEXICO	JORDAN	BRAZIL	TURKEY	PAKISTAN	ZIMBABWE
NFATA	1.498** (.409)	-.310 (.176)	1.704** (.233)	6.146** (2.247)	.617** (.195)	-.112 (.060)	.297 (.402)	1.992** (.462)	
DEPTA	-7.382** (1.192)	-.916 (1.526)	-1.301 (1.097)					-2.023 (1.327)	-.068 (.787)
DIVCSH	-.735 (.528)	.033 (.027)	-1.355** (.564)					-.547** (.154)	-.271** (.086)
DIVTA					.389 (.872)	-.607 (.696)	-1.175 (.782)		
GROWTH	-.881** (.247)	.137 (.088)	-.054 (.125)	-.002 (.003)	.051 (.109)	-.008 (.005)	.296 (.184)	.667** (.264)	-.050 (.075)
PROFIT	-5.607** (1.386)	-2.515** (.532)	-.435 (.345)	-3.388** (1.158)	-.181 (.329)	-.445** (.118)	-1.176** (.276)	.464 (.554)	-.466 (.473)
MV-BV / BV	.832* (.421)	.025 (.014)	.026* (.012)		-.029 (.052)				.173 (.124)
NSNFA	.002 (.010)	-.011** (.003)	.002 (.002)	.545** (.209)	-.006 (.009)	-.002 (.008)	-.028* (.012)	-.002 (.002)	
NDTS	-4.263** (1.807)	.402 (.250)	-1.115 (.841)	3.420* (1.583)		-.268 (.216)	.142 (.294)	-2.427** (.646)	.136 (.586)
SZ2	-.163* (.082)	-.058 (.044)	-.203** (.064)	.163 (.173)	-.088 (.082)	-.023 (.019)	-.117 (.081)	.171 (.157)	-.121** (.043)
SZ3	-.020 (.070)	.187** (.057)	-.046 (.073)	- .050 (.289)	.039 (.079)	-.003 (.022)	-.138 (.081)	-.205 (.107)	-.083** (.041)
SZ4	.688** (.141)	.181** (.065)	-.089 (.066)	.907* (.434)	.241** (.062)	.095** (.026)	-.064 (.108)	-.126 (.137)	.033 (.059)
R^2	.26	.20	.30	.30	.35	.24	.23	.28	.21
adj R^2	.23	.15	.27	.21	.28	.22	.14	.25	.17
N	981	630	743	277	320	598	325	809	321

Table 6.b. Capital Structure in Developing Countries - STD/TE

Estimated model is: STD/TE = $\alpha + \beta_1$ SZ + β_2 IN + β_3T + β_4 NFATA + β_5 DEPTA + β_6 DIVCSH (or DIVTA) + β_7 GROWTH + β_8 PROFIT + β_9 (MV-BV/BV) + β_{10} NSNFA + β_{11} NDTS + e. The dependent variable is short term debt to equity ratio. Definitions of independent variables are given in the appendix. Regression is estimated using Ordinary Least Squares. Not reported below are sector (IN) and year (T) dummy variables. White's heteroskedasticity-corrected standard errors are given in parenthesis. ** and * indicate that the coefficient is significantly different from zero at 1 and 5 percent levels respectively.

	KOREA	MALAYSIA	INDIA	MEXICO	JORDAN	BRAZIL	TURKEY	PAKISTAN	ZIMBABWE
NFATA	-1.733** (.567)	-.732** (.110)	-1.339** (.385)	.819 (.527)	-1.606** (.418)	-1.096** (.140)	-2.652** (.505)	-2.833** (.820)	
DEPTA	-4.914** (2.001)	8.532** (2.509)	-7.576** (1.820)					-3.086 (2.715)	-1.954** (.547)
DIVCSH	-1.056 (.808)	-.031 (.043)	-1.914** (.919)					-1.928** (.553)	-.164* (.078)
DIVTA					-1.324 (1.956)	1.711 (2.477)	-2.917** (1.088)		
GROWTH	.289 (.370)	-.002 (.047)	-.149 (.238)	-.001 (.001)	.223 (.181)	.009 (.010)	.629** (.155)	1.341** (.514)	.104 (.079)
PROFIT	-4.090** (2.021)	-2.670** (.625)	-4.493** (.706)	-2.098** (.420)	-3.135** (1.124)	-.519 (.285)	-3.240** (.623)	-3.923** (.931)	-.940** (.380)
MV-BV / BV	.542** (.214)	.076 (.074)	.052 (.035)		.305** (.146)				.404** (.130)
NSNFA	.003 (.009)	-.003 (.002)	.035** (.010)	.118* (.061)	-.023 (.026)	.051** (.019)	.007 (.024)	.018** (.004)	
NDTS	-9.184* (4.458)	-.918* (.433)	-2.270 (1.780)	.541 (.509)		-.972** (.420)	-.821 (.441)	-5.678** (1.908)	-.501 (.378)
SZ2	-.089 (.139)	-.140** (.065)	-.510** (.127)	-.100 (.091)	.109 (.225)	-.023 (.038)	.111 (.189)	1.024* (.584)	.033 (.050)
SZ3	-.176 (.160)	.237* (.097)	-.175 (.114)	-.347** (.128)	-.115 (.204)	-.008 (.040)	-.027 (.135)	-.491 (.432)	-.166** (.046)
SZ4	.465** (.166)	.097 (.081)	-.440** (.111)	-.079 (.122)	.338 (.194)	.132** (.056)	.665** (.216)	-.381 (.418)	-.177** (.054)
R^2	.31	.29	.37	.28	.46	.43	.43	.18	.24
adj R^2	.29	.25	.34	.19	.40	.42	.37	.14	.20
N	981	630	743	277	320	598	325	809	321

Table 6.c. Capital Structure in Developing Countries -TD/TE

Estimated model is: $TD/TE = \alpha + \beta_1 SZ + \beta_2 IN + \beta_3 T + \beta_4 NFATA + \beta_5 DEPTA + \beta_6 DIVCSH$ (or DIVTA) $+ \beta_7 GROWTH + \beta_8 PROFIT + \beta_9 (MV\text{-}BV/BV) + \beta_{10} NSNFA + \beta_{11} NDTS + e$. The dependent variable is total debt to equity ratio. Definitions of independent variables are given in the appendix. Regression is estimated using Ordinary Least Squares. Not reported below are sector (IN) and year (T) dummy variables. White's heteroskedasticity-corrected standard errors are given in parenthesis. ** and * indicate that the coefficient is significantly different from zero at 1 and 5 percent levels respectively.

	KOREA	MALAYSIA	INDIA	MEXICO	JORDAN	BRAZIL	TURKEY	PAKISTAN	ZIMBABWE	THAILAND
NFATA	-.555 (.759)	-1.042** (.206)	.365 (.543)	6.965** (2.611)	- .998* (.478)	-1.208** (.159)	-2.355** (.669)	-.856 (1.074)		-.247 (.894)
DEPTA	-10.505** (2.781)	7.616** (2.779)	-8.878** (2.635)					-5.119 (3.722)	-2.022** (1.023)	
DIVCSH	-1.845 (1.347)	.002 (.054)	-3.270** (1.431)					-2.475** (.674)	-.435** (.146)	
DIVTA					-.935 (2.177)	1.105 (2.248)	-4.092* (1.531)			-8.678** (3.411)
GROWTH	-.541 (.483)	.135 (.093)	-.204 (.331)	- .003 (.004)	.273 (.240)	-.001 (.013)	.925** (.291)	2.009** (.671)	.053 (.127)	-.699** (.261)
PROFIT	-10.252** (2.758)	-5.185** (.863)	-4.928** (.974)	-5.486** (1.379)	-3.316** (1.185)	-.974** (.311)	-4.417** (.729)	-3.461** (1.114)	-1.406 (.752)	
MV-BV / BV	1.341* (.619)	.101 (.074)	.078 (.045)		.276 (.170)				.577** (.221)	.153 (.089)
NSNFA	.008 (.015)	-.014** (.004)	.037** (.012)	.663** (.241)	-.028 (.032)	.049** (.022)	-.022 (.029)	-.017** (.005)		.008 (.026)
NDTS	-14.278** (5.973)	-.516 (.512)	-3.384 (2.481)	3.961* (1.828)		-1.240** (.545)	-.680 (.493)	-8.107** (1.489)	-.364 (.787)	
SZ2	.095 (.194)	.083 (.083)	-.713** (.174)	.063 (.221)	.021 (.248)	-.047 (.047)	-.006 (.224)	1.201* (.686)	-.087 (.082)	-.048 (.343)
SZ3	-.237 (.191)	.425** (.116)	-.220 (.166)	-.397 (.363)	-.076 (.239)	.005 (.052)	-.165 (.168)	-.690 (.468)	-.249** (.079)	.508 (.429)
SZ4	1.136** (.253)	.278** (.107)	-.529** (.159)	.828 (.514)	.580** (.220)	.228** (.068)	-.601** (.272)	-.501 (.488)	-.143 (.102)	.965** (.308)
R^2	.33	.32	.25	.29	.42	.42	.38	.18	.21	.19
adj R^2	.31	.29	.22	.20	.35	.40	.32	.15	.17	.12
N	981	630	743	277	320	598	325	809	321	371

Table 7. Determinants of Capital Structure - Relative Explanatory Power

Reported numbers are the adjusted R^2s after deleting the specified variables. The difference between the adjusted R^2 of the full model and that of the deleted models are given in parenthesis and are averaged in the last rows. Variable definitions and sources are given in the Appendix.

		Full	Asset Structure Omits NFATA, NSNFA	Liquidity Omits DIVCSH/DIVTA Profit	Growth Opportunities Omits Growth (MV-BV)/BV	Size Effect Omits Size Dummies	Tax Effect Omits NDTS DEPTA	Industry Effect Omits Industry Dummies
KOREA	LTD	.23	.22 (.01)	.20 (.03)	.16 (.07)	.20 (.03)	.21 (.02)	.20 (.03)
	STD	.29	.28 (.01)	.28 (.01)	.28 (.01)	.28 (.01)	.27 (.02)	.19 (.10)
MALAYSIA	LTD	.15	.13 (.02)	.11 (.04)	.13 (.02)	.13 (.02)	.15 (0)	.13 (.02)
	STD	.25	.23 (.02)	.23 (.02)	.24 (.01)	.25 (0)	.24 (.01)	.17 (.08)
INDIA	LTD	.27	.20 (.07)	.23 (.04)	.26 (.01)	.26 (.01)	.26 (.01)	.25 (.02)
	STD	.34	.27 (.07)	.25 (.09)	.34 (0)	.33 (.01)	.33 (.01)	.33 (.01)
PAKISTAN	LTD	.25	.20 (.05)	.24 (.01)	.24 (.01)	.24 (.01)	.23 (.02)	.18 (.07)
	STD	.14	.12 (.02)	.12 (.02)	.14 (0)	.13 (.01)	.13 (.01)	.11 (.03)
TURKEY	LTD	.14	.13 (.01)	.11 (.03)	.13 (.01)	.15 (-.01)	.15 (-.01)	.10 (.04)
	STD	.37	.26 (.11)	.24 (.13)	.35 (.02)	.33 (.04)	.36 (.01)	.33 (.04)
JORDAN	LTD	.28	.25 (.03)	.28 (0)	.28 (0)	.25 (.03)	- -	.21 (.07)
	STD	.40	.36 (.04)	.32 (.08)	.37 (.03)	.38 (.02)	- -	.30 (.10)
MEXICO	LTD	.21	.11 (.10)	.20 (.01)	.21 (0)	.19 (.02)	.20 (.01)	.16 (.05)
	STD	.19	.18 (.01)	.14 (.05)	.19 (0)	.16 (.03)	.19 (0)	.16 (.03)
BRAZIL	LTD	.22	.21 (.01)	.21 (.01)	.22 (0)	.18 (.04)	.22 (0)	- -
	STD	.42	.16 (.26)	.42 (0)	.42 (0)	.41 (.01)	.41 (.01)	- -
ZIMBABWE	LTD	.17	- -	.10 (.07)	.14 (.03)	.12 (.05)	.18 (.01)	- -
	STD	.20	- -	.17 (.03)	.08 (.12)	.13 (.07)	.18 (.02)	- -
THAILAND	TD	.12	.12 (0)	.09 (.03)	.09 (.03)	.11 (.01)	- -	.10 (.02)
Average	LTD		(.038)	(.027)	(.017)	(.022)	(.008)	(.043)
	STD		(.068)	(.048)	(.021)	(.022)	(.001)	(.056)
	All		(.049)	(.037)	(.020)	(.022)	(.009)	(.047)

Appendix: Variable Definitions and Sources

Variables:

LTD/TE

Long term debt to total equity

STD/TE

Short term debt to total equity

TD/TE

Total debt to total equity

NFATA = NFA/TA

Net fixed assets divided by total assets

DEPTA = DEP/TA

Depreciation divided by total assets

DIVCSH = DIV/(EAT+DEP)

Dividends divided by earnings after taxes plus depreciation

DIVTA = DIV/TA

Dividends divided by total assets

GROWTH = ((TA/GDPDEF)-LAG(TA/GDPDEF))/LAG(TA/GDPDEF)

Growth rate of real total assets

PROFIT = EBIT/TA

Earnings before interest and taxes divided by total assets. If EBIT is not available EBT is used instead

(MV-BV)/BV

Market value of equity minus book value of equity, divided by book value

NSNFA = NS/NFA

Net sales divided by net fixed assets

NDTS = (OI - FE - (EBT-EAT)/CTR)/TA = (EBT - TAX/CTR)/TA

Non-debt tax shields equals earnings before taxes (operating income minus financial expenses) minus the ratio of corporate taxes paid to corporate tax rate, all deflated by total assets

SZ1-SZ4

Size quartile dummies. SZ1 takes the value 1 if the company is in the first asset quartile in the country and zero if it is not.

TAGDP = TA/GDP

Total asset size of the company relative to GDP of the country

SIC1-SIC61

Sector dummy variables for different SIC codes

AGE = YEAR - ESTYEAR

Year minus year established.

YOUNG

Dummy variable that takes the value 1 if AGE is less than or equal to 5 and zero otherwise.

Sources:

Firm level variables are constructed from IFC's Corporate Finance data set (see Table A1 for a summary).

Tax data are from Coopers & Lybrand, International Tax Summaries, John Wiley and Sons, N.Y., various issues.

Table A1. IFC's Corporate Finance Data Base

COUNTRY	BRAZIL	INDIA	JORDAN	KOREA	MALAYSIA	MEXICO	PAKISTAN	THAILAND	TURKEY	ZIMBABWE
Industry		X	X	X	X	X	X	X	X	
Listed Date		X		X	X	X		X	X	
Established Date		X	X	X	X	X		X	X	
Current Assets	X	X	X	X	X	O	X		X	
Net Fixed Assets	X	X	X	X	X	X	X	X	X	
Total Assets	X	X	X	X	X	X	X	X	X	X
Current Liabilities	X	X	X	X	X	X	X		X	X
Long Term Liabilities (LTD)	X	X	X	X	X	X	X		X	X
Total Liabilities	X	X	X	X	X	X	X	X	X	X
Paid in Capital	X	X	X	X	X	X	X	X	X	
Reserves & Retained Earnings		X	X	X	X	X	X	X	X	
Revaluation Fund						X			X	
Total Equity	X	X	X	X	X	X	X	X	X	X
Sales	X	X	X	X	X	X	X	X	X	X
Financial Expenses		X		X	X	X		O	X	
EBT	X	X	X	X	X	X	X		X	X
EAT	X	X	X	X	X	X	X	X	X	X
Depreciation		X		X			X			X
Dividends	X	X	X	X	X		X	X	X	X
Price		X	X	X	X		O	X	X	X
Number of Shares	X	X	X	X	X		X	X	X	X
Net Assets	X	X	X	X	X	X	X	X		X
Market Value		X	X	X	X		O	X	X	X
Years	85-91	80-90	80-90	80-90	83-90	84-91	80-88	83-90	82-90	80-88
Number of Firms	100	100	38	100	100	100	100	69	45	48

O represents fewer data points.

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